THE IMPACT OF COMPUTERS ON FEDERAL INCOME TAXATION

Thesis for the Degree of Ph. D.
MICHIGAN STATE UNIVERSITY
PAUL STEPHEN SPECE
1969

This is to certify that the

thesis entitled

THE IMPACT OF COMPUTERS ON

FEDERAL INCOME TAXATION

presented by

Paul Stephen Spece

has been accepted towards fulfillment
of the requirements for

Ph. D. degree in Business

Administration

Date Aug. 8, 1969

O-169

ABSTRACT

THE IMPACT OF COMPUTERS ON FEDERAL INCOME TAXATION

By

Paul Stephen Spece

The problem examined in this dissertation involves an investigation of the influence of computers on Federal income taxation from the viewpoint of the tax accountant so that he will be equipped with timely knowledge of the latest technological developments in his field. No major works have been written on this subject but substantial literature is available in the form of short articles and news stories.

It is the thesis of this study that the application of computers to Federal income taxes represents a revolutionary change that is causing repercussions in most all areas of Federal income tax activity. The primary objectives of this study are (1) to draw together some of the scattered descriptions and evaluations of the application of computers to Federal income tax activity; (2) to identify the major areas affected and analyze the repercussions induced therein; (3) to reach some conclusions about the developing directions of the major emerging changes; and (4) to contribute to our understanding of the impact of computers on Federal income taxes.

The study is limited to the Federal income tax; no attempt is made to consider state or local taxes in detail or the highly technical aspects of computers.

This study is especially significant because it affects all taxpayers and their relationship not only with the Federal government but also with their professional advisers--lawyers, accountants, and other tax practitioners.

Information was gathered and integrated from personal interviews, the various sources in the published literature, and the Annual Reports of the Commissioner of Internal Revenue and of the Secretary of the Treasury.

The major areas of activity affected by computers are (1) tax collecting, (2) tax research, and (3) tax returns preparation. The computer system of the Internal Revenue Service for collecting income taxes is described, then evaluated, and found to be complex and vast but successful in handling the steadily increasing workload. Despite many problems, it is operating efficiently in the short-run but needs to be updated to achieve growth and continued efficiency in the long-run. Present IRS plans call for installation of a completely new fourth generation computer system in the early 1970's.

For the tax administrator, tax collecting has been greatly centralized, both the administrative control function and the efficiency of operations have significantly improved. Under computerized operations, public confidence in the tax laws and in the integrity of the IRS has resulted in increased voluntary compliance and diminished tax evasion. The computerized tax system of the United States has become a model that representatives of other nations come to see and then try to imitate. Computers have increased the opportunity for error

on the part of both the Government and the taxpayers and this has increased Government-taxpayer contacts through computer-generated notices.

The application of computers to processing of tax data at the National Computer Center and the Detroit Data Center has enhanced tax research. It has induced many changes and technical improvements in the old programs and has created new programs, the major ones of which concern Taxpayer Compliance Measurement, Taxpayer Assistance, Master File of Tax Exempt Organizations and Pension Trust Funds, Statistics of Income and Computerized Tax Models, Discriminant Function Audit Criteria, and Federal-State Cooperation.

Major implications resulting from the study are: (1) eventual Government audits "through" rather than "around" the computer as the audit trail disappears into the computer; (2) with "discriminant function" selection of returns for audit, the Government may employ the CPA of the taxpayer business involved to do the auditing for the Government; (3) the possibility exists that one combined tax return might be developed and used for Federal, state, and local levels with the Federal level collecting and processing returns and then reimbursing lower levels; (4) direct payment at banks by individuals of their taxes due; and (5) tax bills issued by the Federal government to replace returns filed by taxpayers as computers provide this capability.

Paul Stephen Spece

Taxpayers have become more concerned about their tax responsibilities as computerized review and examination of returns has become sharper and more comprehensive. All United States taxpayers are now identified and listed in the Master File at the National Computer Center with a tax account that contains enough personal data to constitute a tax dossier. Taxpayer reliance on professional tax services for help has thus increased.

Professional tax services have become inundated with many clients. To obtain relief from the increased workload, private tax practitioners have been seeking help, increasingly, from the computerized tax return preparation services.

A new service-type industry has been emerging--the computerized tax returns preparation industry. Computax is the leader among the field of eight firms all of which expect to grow rapidly in the future. The computer-printed tax return has the following effects: (1) it takes the drudgery out of the tax practitioner's tax season; (2) it enhances the prestige of the tax practitioner; (3) the computerized efficiency of the various services matches that of the Internal Revenue Service and constitutes a defense for the taxpayer against the growing efficiency of the Government computers; (4) it helps the Government to reduce errors and audits.

The implications of computer-printed tax returns are: (1) tax forms replacement by computerized tape; (2) the standardization of state tax return forms; and (3) direct dealings with the public by service firms thus eliminating the need for the tax practitioner middleman.

THE IMPACT OF COMPUTERS ON FEDERAL INCOME TAXATION

By

Paul Stephen Spece

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Accounting and Financial Administration

1969

ACKNOWLEDGMENTS

Many obligations have been incurred during the preparation of this dissertation. I wish to acknowledge my sincere gratitude to Professor Charles J. Gaa who proposed the topic, supervised the study, and made many helpful suggestions to improve the technical aspects and clarity of style. I am also grateful for the valuable assistance and encouragement of the other members of my dissertation committee: Professor James Don Edwards and Professor Milton Taylor. For the help and encouragement over crucial periods in the doctoral program, I owe a deep debt of gratitude especially to Professors James Don Edwards, Charles J. Gaa, George C. Mead, and Milton B. Dickerson.

I wish to acknowledge others who have provided valuable technical assistance and relevant data as follows: Mr. A. Wayne Lowry, Office of Assistant Commissioner for Data Processing, Internal Revenue Service, Pension Building, Washington, D. C.; Mr. Frank H. Burke, Assistant Director, Central Service Center, Internal Revenue Service, Covington, Kentucky (Cincinnati, Ohio); Professor John C. Lyons, Co-Director, Computers-in-Law Institute, The George Washington University; Messrs. Daniel R. Mason, Sidney Feldman, and

Kenneth Krapohl of the Computax Corporation; and Messrs. George W. Kinnard and Maitland K. Flood of Autotax, Tax Computer Associates, Inc.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Purpose of This Study

The purpose of this study is to inquire into the causes and effects of the shift from manual to machine methods in Federal income taxation. It especially seeks to investigate the effects of computers on Federal income taxes from the point of view of the tax accountant in order that he will be equipped with timely knowledge of the latest technological developments in his field.

Influence of the Computer on Society

Society has witnessed one of the most significant periods ever achieved by man for technological development and innovation during the two decades following the end of World War II in 1945. The electronic computer, since its inception in 1945,[1] has sparkled brightly among the newest

[1]The Army became interested in computers in 1943 and awarded a development contract to the Moore School of Engineering at the University of Pennsylvania. In 1945 Professors Mauchly and Eckert completed the first all electronic digital sequential computer which they called ENIAC (Electrical-Numerical Integrator and Computer). Eckert and Mauchley resigned in 1946 from the University of Pennsylvania,

and most versatile tools to evolve during this period. It is having one of the greatest impacts on society of any contemporary development because of its unlimited potential to increase man's capacity to handle information. The computer has been inducing revolutionary changes in the fields of business, science, education, and government.[2] Its influence has been so divergent in each one of these broad areas that leaders in these fields are only beginning to assess the possible results. The computer revolution, it has been predicted, will prove to be more important than the industrial revolution.[3]

Contemporary society has assimilated the computer without hesitation and is being reshaped by it.

> The electronic computer, just past its twenty-first birthday, has come of age, progressing from scientific curiosity to essential part of human life in a remarkably

---

organized their own company which was purchased in 1950 by Remington-Rand, now Sperry Rand Corporation. At this firm they produced UNIVAC (Universal Automatic Computer), which became generally recognized as the first of our present line of computers. The early computers developed up to UNIVAC were used for scientific and engineering purposes. The first business oriented computer was delivered in 1951 to the United States Bureau of Census. It was called UNIVAC I. It operated 24 hours a day, 7 days a week, for 12-1/2 years, until 1963, when the Bureau of Census presented it to the Smithsonian Institution, Washington, D. C.

[2]See the following for applications in each one of these fields: F. Robert Crawford, Introduction to Data Processing (Englewood Cliffs: Prentice-Hall Incorporated, 1968). p. 5.

[3]"Tomorrow's Management," Fortune, LXXIV, No. 1 (July 1, 1966), pp. 2, 88.

> short time. No single technological development in history has had a greater impact on man and on the way he lives. In many respects, computers have erased time, altered the ordinary boundaries and relationships that affect our lives and our organization, and accelerated the rate of change . . .[4]

The computer has become a familiar part of modern man's daily life. A computer is almost certain to be involved each time contemporary man, for example, receives a paycheck, purchases goods on credit with a bankard, makes a telephone call, pays an electric bill, deposits or withdraws money from the bank, subscribes to a book or record club, invests in corporate stock, makes an airline reservation, buys gasoline on credit or purchases insurance, registers at a university, watches astronauts launched in space-probing satellites or election returns on television, answers a census taker, or files his Federal income tax return.

A noted scientist-educator contends that the computer is already having a profound impact on the operation of our society and will herald a new form of society. He says, "Technological developments always eliminate some kind of limitation that previously existed in what society could do, what the individual could do."[5] Then he cites as

---

[4]"The Information Explosion: The Computer in Society," The General Electric Forum, X, No. 4 (Winter, 1967-68), p. 3.

[5]Robert M. Fano, "The World At Our Fingertips?" The General Electric Forum, X, No. 4 (Winter, 1967-68), p. 5. Dr. Fano is Ford Professor of Engineering at Massachusetts Institute of Technology.

examples telephones and various forms of transportation as eliminating distances; the printing press as providing opportunity for mass transfer of information and exchange of ideas. The invention of the wheel and electric power eliminated man's need to do certain kinds of physical work. The operation of society changes and achieves a new equilibrium when previously existing limitations are erased.

> Computers are beginning to make a similar impact on society for two related reasons: first, because they deal with information--the glue that holds society together--and secondly, because they are beginning to allow us to deal more successfully with complexity.
>
> My feeling is that the structural complexity of today's society, and the multitude of interactions that take place within it, are really straining the ability of each of us to comprehend and deal successfully with the variety of problems that confront us in our daily lives--as individuals, as members of working organizations, as citizens. I see the computer as the essential tool that can provide the intellectual assistance needed to make each of us more capable of dealing with these growing complexities of life.[6]

Computers are aiding society today in many ways. Business organizations, financial institutions, labor organizations, scientific and professional organizations, schools and universities, and government agencies are all benefiting from computer systems, and many have their own installations. Some observers feel that one reason for the growth of the economy of the United States in the past seven years has been due to the use of computers in

---

[6] Ibid.

inventory control by individual businesses.[7] The printing press provided the opportunity for mass transfer of information and ideas and the ability to accumulate data into a static inventory of books and papers. The more sophisticated electronic computer permits massive quantities of information to be gathered, transferred, stored, retrieved, and then manipulated at will. The computer has made information mobile. The computer has enhanced the utility value of information by making it operational and fluid. The computer has shifted data from a static, remote concept into a moving, readily accessible concept.

The computer is an efficient information processing device, an intellectual tool that helps modern man to think more logically, to make more valid decisions, to successfully solve his problems of life and work. It enables contemporary man to undertake much more complex tasks than his predecessors. Just as the wheel and electric power have taken the drudgery out of man's physical work, the computer is taking the drudgery out of man's mental tasks. The computer is a creative force for human enrichment which makes society more productive and life more satisfying.

---

[7] J. Sanford Smith, "Man and Computer: The New Partnership," The General Electric Forum, X, No. 4 (Winter, 1967-68), p. 8. Mr. Smith is Vice-President and Group Executive, Information Systems, General Electric Company.

Greatest benefits of the computer to society are expected to come from placing the computer at the direct service of the individual himself. The individual must use the computer as a knowledgeable and skillful assistant to make him adept in his particular activities. The computer will, in such a manner, give the individual more freedom of choice by providing more data and a better means of information processing. Conformity in society due to lack of information will give way to diversity which is made possible by more data through the computer. Fano says, ". . . in an information-rich society, the individual will have much more freedom of choice because society will be able to stand much more diversity among its members without the results being chaotic."[8] The limitation of the necessity to conform is erased by substantially improved methods of information processing and information flow.

A closer look at the computer and computer technology is in order. The elements of a computer system include a computer and several related machines called peripheral equipment. The system sometimes is called a computer configuration. The computer is the center of the system. Basic components of the computer are the memory, control, and arithmetic unit. The memory is the storage place for the data and results. The control unit consists of the

---

[8]Fano, "The World At Our Fingertips," p.5.

circuitry which controls the operations. The arithmetic unit is where all calculations take place. The basic computer functions can be summarized as memory, control, and calculation. The peripheral equipment includes the input devices and the output devices. Common input devices are card reader, paper tape reader, typewriter, character reader, magnetic tape unit. Common output devices are card punch, paper tape punch, typewriter, magnetic tape unit, and printer. All peripheral devices operate at much lower speeds than the internal speed of the computer itself.

Computer technology can be divided into two parts, hardware and software. Hardware refers to the machines and software refers primarily but not exclusively to the programming. Software, in the broadest terms, refers to the method of controlling the components of the system's hardware to produce results. In this sense, software includes not only the computer program but also feasibility studies, training materials such as films and manuals, studies of equipment requirements and everything about the system other than the hardware and the personnel. Great progress has been achieved in computer hardware technology. Development of computer software technology has lagged behind that of hardware. The computer can do only what it is told to do. The program tells the computer what to do. It is fitting, therefore, to consider the program next.

A computer program can be defined as an exact sequence of instructions that the computer follows to solve a problem. Linguistic compounds of the word "program" have become familiar, such as the verbal form "programming" and the noun "programmer." Programming for automatic digital computers has developed into an important and well-paying occupation in the computer field. It is a highly technical phase of the computer occupation. On this point, the editor of the journal, Computers and Automation, said,

> A good deal of knowledge, common sense, and training is needed to program well for it requires:
>
> 1. Understanding the operations of a business or the steps of a scientific calculation;
> 2. Understanding the best ways for having a computer carry out these operations and steps;
> 3. Arriving at a good sequence of commands for the computer to solve the problem; and
> 4. Adequately translating these commands into computer language.
>
> In fact, programming has proved a bottleneck in many applications of computers, and so a good deal of effort among computer manufacturers has gone into methods of automatic programming . . .[9]

The methods of automatic programming have taken three main forms: (1) compilers, (2) interpreters, and (3) common languages. The construction of "compiling programs" or compilers involves the use of the computer to take subprograms, which are portions of a main program, out of a library of machine programs and connect them

---

[9]Edmund C. Berkeley, The Computer Revolution (Garden City, New Jersey: Doubleday and Company, 1962), p. 18.

together in such a way as to solve a new problem. The construction of automatic programs designed as "interpreters" involves the acceptance of instructions in particular standard words and then the translation of these words into machine language so that the computer can understand what the words mean. Common languages have been developed for automatic programming of problems which when expressed in such languages, are solved by the computer. The two most widely used problem languages are FORTRAN and COBOL.

Most computers manufactured in the United States have FORTRAN and COBOL capability. FORTRAN is an acronym for FORmula TRANslation system. It is the leading scientific-mathematic language. COBOL is an acronym for Common Business Oriented Language. It was developed in 1959 by a committee composed of computer manufacturers, government agencies, user organizations and universities. COBOL was designed to be a tool of the business data processing community. In 1960, the Department of Defense, the world's largest single user of computers, announced it would not lease nor purchase computers without COBOL capability. The Federal Government has thus given a great deal of impetus to the swing toward COBOL. Most of the large manufacturers of computers rushed to fulfill this requirement as the Government is their biggest customer. Programming Language 1 (PL/1) was developed in the middle of the 1960's by IBM and a committee of users for the IBM System/360 family of

computers. It can be used for solving all types of business and scientific problems and is being promoted as a universal language. There is the possibility that PL/1 could replace both FORTRAN and COBOL and for this reason it is being watched closely. Other computer languages developed by IBM for its System 360 are Autocoder, Assembler Language, and Report Program Generator (RPG).

Stages in the development of computer hardware technology are referred to as generations. Computer technology of the first generation featured vacuum tubes. The first electronic computers of the 1940's were, therefore, large and bulky and very costly; they required considerable power and produced heat in quantities that created air conditioning problems. To overcome these limitations researchers produced the second generation of computers, which were characterized by transistors instead of vacuum tubes. Transistors were much smaller, lower in cost, required less power, produced less heat, and had greater reliability. The third generation is characterized as one which miniaturized and refined the components of the second generation. This miniaturization and refinement became known as Solid Logic Technology, sometimes called Solid State. Also characteristic of this generation is the increased software or programming sophistication. We are presently in the latter stages of this third generation. Researchers are busy seeking to introduce the fourth

generation. They are busy working to develop an improved, more versatile computer which will calculate faster, store larger volumes of information, consume less power, occupy less space, and cost fewer dollars.

Computers, in the future, are expected to be made available to the public on an individual basis and will be programmed to act as helpful assistants. The most feasible way for personal use of computers to be implemented is expected to be achieved through "time sharing." This is the technique which distributes the use of a large central computer over several users or subscribers. Each subscriber operates from a remote teletypewriter terminal. Computer time-sharing service is at present being offered on a commercial basis by some pioneer companies. Research and development work on more powerful and more sophisticated systems is being conducted currently. Networks of time-sharing computer systems, interconnected, and capable of communicating not only with each other but with remote subscribers anywhere in the system can be expected in the near future. These systems will have a huge memory capable of storing data from individuals or groups of subscribers. Telephone systems are interconnected into national and international networks. Electric power systems are linked together into vast networks that go beyond national borders. Likewise, computers, on a time-sharing basis, will be linked together into national and international systems, perhaps a

universal network. Such a system called Multics is currently being researched and developed by the Massachusetts Institute of Technology in collaboration with the General Electric Company and Bell Telephone Laboratories.[10]

A universal network of computer time-sharing systems can lead to important changes and new things. Some of these new possibilities are (1) the "checkless method of payment" or the "checkless society," (2) the computerized Federal income tax declaration or the Government's billing taxpayers for taxes due instead of taxpayers preparing their returns, (3) educational opportunities vested in self-monitoring of students when they use computers, (4) information utilities, and (5) data banks.

The electronic computer, like other major technological improvements and innovations, is going to reshape society as it revamps the patterns of modern man's private, business, and public lives. Ray Eppert, former President of Burroughs Corporation, made the judgment that, "The electronic computer has a more beneficial potential for the human race than any other invention in history"; an increasing number of people with special competence in computer circles are coming to the same conclusion.[11] "From the

---

[10]Robert M. Fano, "The World At Our Fingertips," p.6.

[11]Gilbert Burck and Editors of Fortune, The Computer Age (New York: Harper & Row, Publishers, 1965), p. 1.

point of view of the general management of a business, however, we are still probably only on the threshold of really significant use."[12]

There has been swift technological progress and intense competition in the computer industry.

> In the past 10 or 15 years, computer speeds have increased by a factor of 1,000 to 1. Costs of computation have gone way down, on the order of 400 to 1. Memory capacity is up 1,000 to 1.[13]

The first electronic computer began operating in 1946.[14] Twenty years later in 1966, approximately 35,000 computers were in use on a world-wide basis, with 28,000 installations located in the United States.[15]

> Few technologies have experienced such swift progress. As a measure of the present commitment to electronic information systems--there are now over 40,000 such systems installed on a world-wide basis with an if-sold value of almost $20 billion. Those numbers are expected to more than double by 1975.[16]

---

[12]Hershner Cross, "A General Management View of Computers," Computers and Management, The 1967 Leatherbee Lectures (Boston: Harvard University, Graduate School of Business Administration, 1967), p. 14.

[13]J. Stanford Smith, "Man and Computer," p. 7.

[14]Robert G. Van Ness, Principles of Data Processing With Computers (Elmhurst, Illinois: The Business Press, 1966), p. 2.

[15]T. A. Wise, "I.B.M.'s $5,000,000 Gamble," Fortune, LXXIV, No. 4 (September, 1966), p. 119; Thomas J. Kelly (ed.), "EDP International," The Arthur Young Journal, Winter, 1968, p. 25.

[16]J. Stanford Smith, "Man and Computer," p. 7.

International Business Machines, Incorporated, has been the computer industry's top producer of computer hardware and has maintained its leading position with its introduction in 1964 of its third generation family of computer models, known as System/360.[17] Other leading companies which manufacture computers are Control Data Corporation, Burroughs Corporation, General Electric Company, Minneapolis-Honeywell, National Cash Register, Radio Corporation of America, and Sperry Rand.

Application of Computers to Federal Income Taxes

The utilization of computers to help the tax collector, the taxpayer, and the tax adviser has been a recent development. Computers are now being used by the United States Government to verify all tax returns and to check up on the nation's taxpayers to make sure they comply with the Federal tax laws. Computers are being used currently by tax advisers to store, retrieve, process, and disseminate legal information on which to base opinions and advice for use in Federal income tax litigation. Computers are also being applied to the actual preparation of tax returns for taxpayers.

---

[17] T. A. Wise, "IBM's $5,000,000 Gamble," p. 25.

Statement of Need for Study

Why should a study be made of the impact of computers on Federal income tax accounting? Generally speaking, a compelling desire on the part of keen and alert tax accountants to keep up with developments induced by technological change in their field suggests it. Perhaps a clearer and more direct answer to this question can be visualized by raising a series of questions. What are the implications of computers for Federal tax administration and tax policy as it affects tax practitioners and taxpayers? What effect will the Federal Government's recently installed computer system have on the Federal income tax-collecting activity of the Internal Revenue Service? Will this effect have any implications for the areas of accounting and auditing practice? Is it possible and also probable that one combined tax return might be developed and used for Federal, state, and local levels? Is it possible and probable that the Federal tax return might be eliminated and that in its place the Government might send a bill to all citizens for taxes due?

How will computers affect tax research procedures of the Internal Revenue Service and research procedures of tax practitioners regarding the preparation of advice and opinions for their clients?

How are the new computerized tax return preparation services making out? What is the attitude of practitioners, like C.P.A. firms and lawyers, toward these new services? Will the large practitioners use these newly developing services or develop their own computerization of tax returns?

These and other questions have aroused much curiosity and a compelling desire on the part of competent tax accountants to keep up with the revolutionary developments induced by technological change in the realm of Federal income taxes. Improved technology in the form of electronic data processing with high speed computers impinged upon Federal income tax activity has been inducing profound changes which are having penetrating results and widespread repercussions on tax accounting management.[18]

Statement of the Problem and Objectives

It is the thesis of this study that the application of computers to Federal income taxes represents a revolutionary change that is causing repercussions in most all areas of Federal income tax activity.[19] To identify, to

---

[18] See Richard C. Brown, "The Impact of Computers on Tax Practice," Journal of Accountancy, CXXII, No. 1 (July, 1966), pp. 23-24.

[19] See E. L. Meek, "A.D.P.'s Tax Administration Revolution: Its Advantages, Effects, and Problems," The Journal of Taxation, XXIV, No. 5 (May, 1966), pp. 304-05.

analyze these repercussions, and to reach some conclusions about the developing directions of the major changes is the focus of this study. The principal objective of this study is to contribute to our understanding of the influence of computers on Federal income taxes.

Research has indicated some of the major areas of Federal income tax activity being penetrated by computers which require investigation. Some of these activities to be considered are income tax returns preparation by professional practitioners for their clients; collection of taxes, processing of tax returns, and auditing of returns by the Internal Revenue Service; research for opinions and advice and for case presentation in tax litigation by both the Internal Revenue Service and practitioners; research and planning by the Treasury for amendment of tax laws; direction of IRS audit effort; and collection and communication of income tax statistics. If we group like elements together, this study can be subdivided and focused on three broad phases, as follows: (1) a consideration of the tax-collection activity, (2) a consideration of tax research procedures, and (3) a consideration of tax returns preparation. With this approach the following seven steps emerge to simplify and clarify this study.

First to be considered will be the changes induced by the application of computers in the realm of the tax-collection activity of the Internal Revenue Service.

Second, the effects of these tax-collection changes will be noted. Third, tax research methods and procedures will be considered. Fourth, the effects of these tax research changes will follow. Fifth, a consideration of the changes induced by the application of computers to the preparation of tax returns by practitioners for their taxpaying clients will be in order. Sixth, the effects of these changes regarding tax returns preparation will be noted. Seventh, some general conclusions will emerge about the repercussions and the developing directions of the changes caused by computers applied to Federal income taxation.

This study is especially significant because it affects all taxpayers and their professional advisers--accountants and lawyers. It is imperative that all three groups realize fully the revolutionary changes that are taking place for the repercussions will necessitate permanent modifications not only in their work but also in the instruments used at work.

Limitations of the Study

This study is limited to a consideration of the Federal income tax only. There is no intention to consider state or local income taxes in detail. Nor is any attempt made to get into the highly technical aspects of computers.

Literature Written on the Subject of Automation in Federal Income Taxation

A canvass of the literature reveals that no major works have been written on this subject. Some articles have been written on particular phases of the operational, technical, and professional aspects of the computerization of taxes. Most of what has been written is authored primarily by officials of the Government, who are primarily with the Internal Revenue Service, and some accountants and attorneys, in the professional journals and proceedings of tax institutes and conferences.

News notes, short accounts, and some articles about computerized tax returns have appeared in the Journal of Accountancy, The National Public Accountant, Business Week, Datamation, and The Wall Street Journal. Empirical accounts of some of the results and effects obtained in regions where the computers were first installed and operated, like the pilot region in Georgia, have been recently reported in the United States News and World Report and The Wall Street Journal. These two journals also carried reports of taxpayer errors and law violations disclosed as the computers became fully operational nationally. They also indicated some of the problems the IRS has been having with the computerized system.

Because taxes are a topic of popular interest to all income recipients and because the Government wants to

make widely known its use of computers to check more efficiently on taxpayers, stories of the "new machines and tax returns" appear in many popular magazines, journals, newspapers and business advisories.

Description of Proposed Study Project

The purpose of the study and an introduction and orientation into the proposed study is taken up in this chapter.

Description and analysis of the IRS's new computer system to identify the main elements of change in the tax-collecting activity of gathering and processing returns represents the first phase of this study project and is the subject of Chapter II. Identification and analysis of the effects of these changes, along with an evaluation of the computerized system, is the second phase of this study and is covered in Chapter III. Chapter IV provides a description and analysis of the application of computers to tax research and information coordination, the third phase of the study. The information is to be obtained largely from Internal Revenue Service personnel through integration of published interviews, short articles and speeches of government officials, and from news accounts in the public prints. Reliable information is also to be obtained from the official government documents such as the Annual Reports

of the Commissioner of Internal Revenue and the Annual Reports of the Secretary of the Treasury.

Identification, description, and analysis of the changes induced by the application of computers to the preparation of Federal income tax returns by the computerized tax return preparation services represent the fourth phase of this study. Analysis and implications of these changes is the fifth phase. The information is to be obtained largely through interviews with practitioners and the computer services; also from an integration of published accounts, interviews, and speeches by practitioners and officials of the computerized services. This is the scope of Chapter V.

Integration and synthesis into summary, conclusions and implications regarding this technological change from manual to machine methods in Federal income taxation is the sixth phase and Chapter VI of this study project.

CHAPTER II

THE APPLICATION OF COMPUTERS IN THE TAX-COLLECTING ACTIVITY OF THE INTERNAL REVENUE SERVICE (IRS)

The automated methods under the computer system[1] in the Internal Revenue Service are a welcome change from the manual methods for handling the almost impossible task of processing mountains of paper. The Internal Revenue Service has completed its second full year of computerized operations. This computer installation has been heralded as the greatest change in a century of tax collection,[2] and has been characterized as the most complicated application of its type in the world.[3] Five years were required to

---

[1]For early details at the inception of the new system's installation, see: "Conference on Automatic Data Processing and Its Use by IRS," The Tax Executive, XIV, No. 2 (January, 1962), pp. 115-73. This conference was arranged by the then Commissioner, Mortimer M. Caplin, in order to acquaint interested persons with the plans of the IRS to modernize its processing facilities; See also: "Uncle Sam's Electronic Tax Collector," Forbes, XCV, No. 4 (February, 1965), pp. 38-40.

[2]Lillian Doris (ed.), "Greatest Change in a Century of Tax Collection--Automatic Data Processing (ADP)," in her American Way in Taxation: Internal Revenue, 1862-1963 (Englewood Cliffs: Prentice-Hall, Incorporated, 1963), pp. 74-82.

[3]Robert L. Jack, "ADP--An Analysis of Its Operations and Results," 1966 Proceedings of New York University Twenty-Fourth Annual Institute on Federal Taxation, p. 99.

phase-in the system, which became fully operational on a national basis in the year 1967.

In this chapter an examination is made of the philosophy of the tax system of the United States, the need to have computers assist tax administrators, the organization and operation of the IRS and its computer system, the computer equipment being used by the IRS, and expectations of the computer system.

Taxpayer Self-Assessment Tax System

The system of taxation in the United States is called a self-assessment system because each taxpayer has the responsibility to determine his tax liability and pay the amount due to the Government. Under such a self-assessment system, the taxpayer is responsible for becoming acquainted with those sections of tax laws, rules and regulations necessary for him to properly fulfill his tax obligations. The IRS maintains a continuing program of taxpayer service to help the individual to understand his rights and responsibilities. In order to maximize effectiveness of this service to taxpayers, the Government publishes regulations, rulings, and tax guides covering specific tax situations. It releases information through mass communication media, especially radio, newspapers and television. It maintains throughout the country offices staffed with tax specialists who are available to answer

questions either in the office or on the telephone. The IRS also provides tax materials and speakers to schools and other groups. It distributes tax forms and instructions to the millions of taxpayers in the United States.

This system of taxation is unique. It is based on a philosophy of self-government. Taxpayers assess themselves but they are subject to review and examination which have become sharper with the newly installed computers. Supreme Court Justice Robert H. Jackson has said, "That a people so numerous, scattered and individualistic annually assesses itself with a tax liability, often in highly burdensome amounts, is a reassuring sign of the stability and vitality of our system of self-government."[4] Many foreign countries do not understand our success with self-assessment. Some countries have requested the United States Government to send some of its key tax representatives to help them develop a tax system similar to ours. Many others have sent their own representatives to the United States to examine and study our methods so that they can set up a similar system. The American system of taxation, with its taxpayer self-assessment feature and its well-known efficiency of operation, recently increased by a

---

[4]Sheldon S. Cohen, 1967 Annual Report of the Commissioner of Internal Revenue, Internal Revenue Service, United States Treasury Department, Publication Number 55 (Washington: Government Printing Office, 1967), p. 11.

computerized installation, has become a model for the rest of the world to follow.

The United States system of taxpayer self-assessment has required that taxpayers be well informed, just as any successful democracy has required that its electorate be well informed. This has been especially so in recent years for at least three reasons. Contemporary taxpayers have been faced with tax laws that have become extremely complex and comprehensive. The tax system has become automated with electronic data processing of returns that utilizes modern computer technology. Taxpayer compliance measurement has also become more important.

One of the major aims of the IRS has been to supply the public "more information, better understood information, more easily accessible information."[5] The Service has instituted new programs of taxpayer assistance and has upgraded taxpayer assistance facilities on the theory that accurate dissemination of taxpayer information will encourage accurate filing of returns. Tax return forms and the related instructions have constituted the main communication link between the Service and the taxpayers of the nation. Communication has been the key to the success of the self-assessment system.

---

[5]Sheldon S. Cohen, 1967 Annual Report, p. 4.

This vast communication network has consisted of a chain of about 300 tax returns and related forms,[6] and approximately 1,700 forms and form letters like bills and notices. About one third of the 300 tax returns and related forms must be revised annually because they bear temporary designations of one year only.[7] Constant revision and improvement in these 2,000 documents has been sought and maintained.[8] A professional consulting firm has been employed by the IRS to review especially the computer-generated notices and form letters. These computerized

---

[6]For a government published list of the more important tax return forms, see: Description of Principal Federal Tax Returns, Related Forms, and Publications, Internal Revenue Service, United States Treasury Department, Publication Number 481 (7-67) (Washington: Government Printing Office, July, 1967), Pamphlet of 39 pages.

[7]Sheldon S. Cohen, 1967 Annual Report, p. 7.

[8]During the 1967 fiscal year, five new forms were issued and three others were eliminated as follows: The forms eliminated were 754, 755, and 2948. The new forms added were W-2 (Optional)--Wage and Tax Statement; W-4, Schedule A - Determination of Withholding Allowances for Itemized Deductions; 1040-ES (OIO)--Declaration of Estimated Income Tax for Nonresident Alien Individuals; 4277 Quarterly Transmittal Return to Tax Withheld at Source. During the 1968 fiscal year, twelve new forms were issued and seven others were eliminated. Forms added were 1040X - Amended U. S. Individual Income Tax Return, 1040-ES (Spanish), 1040NR - U.S. Nonresident Alien Income Tax Return, 1099M - U.S. Information Return of Distributions by Regulated Investment Companies During Calendar Year, 1120-ES (Amended) --Amended Declaration of Estimated Income Tax for Corporation, 1120-W U.S. Corporation Worksheet for Computation of Estimated Income Tax, 2848D, 4322, 4322-A, 4347, 4361, 4415. Forms eliminated were 1040B, 1040Q, 1040NB, 1040NB-a, 2848-A, 3625, 3626. These changes are found on page 84 of the 1968 Annual Report.

notices had been causing difficulties with the public but are being constantly reviewed. The goal is to present clear messages with proper wording but at the same time to avoid shocking the public with a harsh automated tone.[9] A well-informed and properly educated taxpaying public has been essential to voluntary compliance, and voluntary compliance has been the foundation of the unique American self-assessment system.

Need for Computers to Assist Tax Administrators

The world's largest user of data processing systems is the Federal Government. The computer system now operating in the Internal Revenue Service is one of the most complex installations in the United States government outside of science and defense areas.[10]

The question arises as to why computers should be used in Federal tax administration. Examination of the developing workload situation will help provide an answer to this logical question. The Federal income tax-collecting task has been expanding at an unprecedented rate during the last thirty years, and especially since the beginning of World War II. Three major factors are responsible for this

---

[9] Sheldon S. Cohen, 1967 Annual Report, p. 7.

[10] F. Robert Crawford, Introduction to Data Processing, p. 5.

growth. A steady increase in population, the vast increase in economic activity, and the enactment of more comprehensive tax legislation are the factors that have converged to create a serious operating problem for the Internal Revenue Service. It is, of course expected that the IRS will operate its returns processing and enforcement activities effectively, efficiently, and economically as it has done in the past. The big problem that has been emerging is the challenge to operate efficiently in spite of the sharply rising workload. This workload has been increasing at a rate exceeding that of the human resources employed for handling the monumental job.

More specifically, the IRS has had the challenging task, in recent years, of annually collecting, recording, and processing approximately five hundred million important pieces of paper.[11] The bulk of this half billion source documents is composed primarily of self-assessed tax returns like the various versions of Form 1040 and Form 1120, and information returns like Forms W-2, 1099, and 1087. There are about 300 tax returns and related forms and approximately 1,700 forms and form letters, like bills and notices, to make a total of about 2,000 types of documents

---

[11]Dean J. Barron, "Why Computers?" National Public Accountant, XI, No. 5 (May, 1965), p. 8. Barron is Regional Commissioner of the Mid-Atlantic Region of the IRS.

used by the IRS to conduct its business and activities. Not to be excluded are the checks received in payment of taxes and the checks issued as refunds, all of which represents more paper to be processed. The IRS, therefore, is in the paper business as well as the banking business. Perhaps it can eliminate its teller operations and reduce or better control its paper activities through the medium of the computer. The magnitude of the massive job faced by the IRS is demonstrated in Table 2-1 Summary of Growth of IRS Operations.

Analysis of the figures presented in Table 2-1 shows that in 1930 only 5.9 million tax returns, representing three billion dollars in revenue, were filed. This volume was handled by 12,000 employees, at an operating cost of 34.4 million dollars. The cost of collecting $100 of revenue was $1.13, and the number of returns processed per employee was about 492. In 1967, there were 105.4 million tax returns, representing 148.4 billion dollars collected. This volume was handled by 65,100 employees, at an operating cost of 667.1 million dollars. The cost of collecting $100 of revenue was $.45 and the number of returns processed per employee was 1,619.

During this long-run period--from 1930 to 1967--the ratio of returns that were processed per employee went up from about 500 to approximately 1600. In other words, the massive volume of paper work involved in processing returns

Fiscal Year

(July 1 of Prior Year to June 30 of Years Shown Below)

Table 2-1.--Summary of growth of IRS operations for fiscal years 1930 through 1968.

	Fiscal Year (July 1 of Prior Year to June 30 of Years Shown Below)							
	1930	1940	1950	1960	1965	1966	1967	1968
1. Gross Collections (billion dollars)	3.0	5.3	39.0	91.8	114.4	128.9	148.4	153.6
2. Gross Refunds, Including Interest (billion dollars)	.1	.07	2.2	5.3	6.1	7.3	9.6	11.4
3. Total Returns Filed (millions)	5.9	19.2	89.3	94.4	102.5	104.1	105.4	107.6
4. Estimated Population (millions)	123.2	132.6	152.3	180.7	194.6	196.8	198.9	201.1
5. Operating Costs (million dollars)	34.4	59.7	230.4	363.7	597.4	624.9	667.1	699.2
6. Cost of Collecting $100	$1.13	$1.12	$ .59	$ .40	$ .52	$ .48	$ .45	$ .46
7. IRS Employees (thousands):								
a. National Office	3.5	4.0	4.3	2.7	3.6	3.6	3.9	3.7
b. Field Offices	8.5	18.4	51.3	47.5	56.8	58.1	61.2	61.5
c. Total	12.0	22.4	55.6	50.2	60.4	61.7	65.1	65.2
8. Number of Returns per Employee	491.7	857.1	1,606.1	1,880.5	1,697.0	1,687.1	1,619.0	1,650.3

Source: Annual Reports of Commissioner of Internal Revenue.

and accounting for revenue during the past thirty-seven years has multiplied about 3.2 times as rapidly as the number of workers available to handle it. Meanwhile, the ratio representing the cost of collecting $100 of revenue declined from $1.13 to $.45. This is a drop of $.68. In other words, the gross collection of revenue multiplied about 2-1/2 times as rapidly as the operating costs of collecting it. The savings of $.68 per $100 of revenue collected is efficiency in its clearest form and is a testimonial to the economy and effectiveness of the IRS administrators. Automation has made this increased efficiency of operations possible. Automation has made possible the handling of an increased workload at a decreasing cost. Will this progress be continued up to 1980 in which year it has been estimated 137 million tax returns will be filed?[12]

The 1960 figures on Table 2-1 appear to be out of line but they are not. Compared with 1950 figures, the 1960 cost of collecting $100 dropped from $.59 to $.40 due to the fact that gross collections went up 135% while operating costs went up only 58%. However, from 1960 to 1967, costs increased faster than the collections, causing the collection cost to go up from $.40 to $.45. During the

---

[12]Sheldon S. Cohen, "The Information Explosion: The Computer in Society--Government Services," The General Electric Forum: A Journal of Leadership Opinion, X, No. 4 (Winter, 1967-68), p. 21.

1950's the IRS began to use mechanical automation; electronic automation came in after 1961. Also during the 1950's the IRS was able to centralize its returns processing into three service centers; just one center with a master file came in after 1961. Also, the number of IRS employees in 1960 was 5-1/2 thousand less than in 1950. Returns filed in 1960 increased over that of 1950 while the number of employees decreased. This opposite relationship in these two factors caused the high ratio of 1880.5 number of returns per employee for item eight on Table 2-1. The decreased number of employees in 1960 was due to political, technical, and cyclical factors. The Republicans traditionally cut government payrolls and 1960 represents the end of a Republican reign. Benefits of mechanical automation in the 1950's were permitting payroll reductions. Also the economic situation in the form of cyclical recessions in 1958 and 1960 encouraged austerity in the government payrolls. The long-run trends show the workload of tax returns and refunds to be processed has steadily increased. With automation the long-range trend shows total operating costs have also gone up but less rapidly than the increase in workload. Also automation, phased-in over a five-year period, was completed in 1967. With the full benefits of complete automation in 1967 and thereafter, short-run fluctuations in costs and employment should stabilize and cause a tapering off of the long run trends for

the two ratios being discussed and analyzed here. The long-run trends show the directions of the general activity and are important. Short-run fluctuations reflect any one or a combination of political, cyclical, seasonal or abrupt technical changes. These fluctuations are less important than the long-run trends.

The above analysis, it should be pointed out, excludes from consideration the various types of information returns and other source documents handled. From 1959 to 1967, figures in the Annual Report of the Commissioner show that the volume of information returns has grown from about 300 million to nearly 350 million.

In order to manage this progressively increasing workload and to process the mountains of paper accurately and economically, the IRS has followed two basic approaches in recent years. First, it concentrated on increasing the efficiency of work performance and, secondly, it sought to eliminate low priority operations.[13] While many procedural improvements have helped, only the substitution of machines for people has given promise of complete relief from the otherwise overwhelming workload problem. Automation in the offices was the logical solution to the problem of how to increase the efficiency of work performance in the Internal Revenue Service.

---

[13]Sheldon S. Cohen, 1965 Annual Report, p. 14.

Punched card equipment in the largest district offices constituted the first authentic step toward mechanization for the IRS in the year 1948. Since large-scale operations are necessary in order to maximize the utilization of labor-saving machinery, the IRS began to centralize its returns processing operations into three area Service Centers. The first Service Center was established on a test basis in 1955 at Kansas City, Missouri. A second one followed in 1956 in Lawrence, Massachusetts and a third in Ogden, Utah in 1957. By 1961, these three area Service Centers were responsible for processing the bulk of the Nation's 61.3 million individual income tax returns, the sorting and handling of over 330 million information returns, and the addressing and mailing of about 140 carloads of tax return forms.

Punch card equipment was installed gradually in the largest District Offices during the period beginning in 1948 and lasting through 1955. Centralization of equipment took place from 1955 to 1961. Then the equipment was updated. Punch card machinery was gradually replaced by contemporary high-speed computers which utilized magnetic tape. However, mechanical automation alone was insufficient to solve the long-run problem of efficiently processing the ever growing massive mountains of paper. It became evident that a whole new electronic system, with new concepts, would be required to meet the needs of the IRS

administrators who wished to utilize fully the latest computer technology in order to cope with the paper explosion.

A feasibility study was instituted regarding a whole new electronic system. This study developed into the ADP Plan, which has been characterized as a natural, but dramatic, step forward in tax administration. The new ADP Plan was dramatic in that it featured novel concepts in tax administration such as (1) a master file centralized in one location, (2) a taxpayer identifying number system, (3) consolidated tax accounts, and (4) increased centralization of processing of tax returns, information returns, and refunds.

Previous efforts to perfect a master file in the 1950's, when the IRS had first mechanized its operations, resulted in failure because technological limitations of available equipment prohibited consolidation of all information regarding taxpayers. Since then, effective planning and efficient organization on the part of the IRS, as well as vastly improved computer technology, have permitted the master file concept to become an operational reality.

Increased centralization resulting from the utilization of computers was confined to the returns processing activity. Other important IRS functions like taxpayer assistance, collection, and audit were continued on a local basis, decentralized to the fifty-eight District Offices. A major advantage of the use of computers for centralized

returns processing is that it frees the people in many of the District Offices from routine paper handling so that they can devote full time to these other important functions and duties.

Important organizational changes in the National Office were made to recognize the growing contribution computers were making to the objectives of the IRS. The former Collection Division was divided into two new divisions effective January 1, 1961. The new ADP Division was delegated the responsibility for implementation of the ADP Plan and the installation of the new computerized system along with the management of the closely related returns processing, revenue accounting, and service center operations. The new Collection Division retained responsibility for enforcement activities.[14]

Organization of the IRS and Its Computer System

The administrative organization of the IRS is designed in three layers, and the electronic data processing organization follows this same three-layered pattern.[15]

---

[14]Mortimer M. Caplin, 1961 Annual Report of Commissioner of Internal Revenue, Internal Revenue Service, Department of the Treasury, Publication Number 55 (Washington: Government Printing Office, 1961), p. 64. Mr. Caplin was Commissioner from February 7, 1961 to July 10, 1964.

[15]Lancelot W. Armstrong, "The Development and Operation of the Internal Revenue Service Network," The Computer: Tool for Management (Business Equipment Manufacturers Association, Elmhurst, Illinois: The Business Press, 1968), p. 67. Mr. Armstrong is Director, Systems Development Division, IRS, Wash., D.C.

National, regional, and district offices constitute the three layers in the administrative organization. The National Computer Center at Martinsburg and the National Data Center at Detroit, the seven regional service centers, and the fifty-eight district offices constitute the three layers of the computer network.

In order to understand the present IRS ADP system as a whole, it is imperative that the component parts of the entire system are viewed in proper perspective and related to the whole in a meaningful fashion. This calls for a clear understanding of the role of the IRS, its organization and main functions, both at the National Office level in Washington, D. C. and at the decentralized field organization level of regions and districts because superimposed upon this vast network is a complex computer system. The Office of Assistant Commissioner for Data Processing in the National Office has been charged with the organizational responsibility for the design, installation, and the operation of the computer system and is the focal point of this technical configuration as it directs the decentralized service centers. Behind the operation of this vast and complicated system is a new tax administration concept, the concept of the computerized master file[16] of all taxpayer

---

[16]Robert L. Jack, "ADP--An Analysis of Its Operations and Result," 1966 Proceedings of New York University Twenty-Fourth Annual Institute on Federal Taxation, p. 99. Mr. Jack is Assistant Commissioner for Data Processing in the National Office of the IRS.

entities, an understanding of which makes the system easier to comprehend.

Mission of the IRS

The clear and simple mission of the Internal Revenue Service, as stated in all recent issues of the Annual Reports of the Commissioner, is to achieve the highest possible degree of voluntary compliance on the part of taxpayers with the tax laws and regulations, and to achieve as well as maintain the highest degree of public confidence in the integrity and efficiency of the Internal Revenue Service. Included with the concept of efficiency would be the collection of the most revenue due the Government at the least cost. The mission also includes communicating the requirements of the law to the public, determining the extent of compliance and the causes of noncompliance, and doing that which is required to properly enforce the law.

IRS career officials in the National Office point out two important events that have helped achieve this mission. Pay-as-you-go, instituted in the early days of the Roosevelt Era, was the first significant event that contributed greatly to the achievement of this objective. Automatic data processing of returns, achieved on a nationwide basis by the IRS in 1967, has been the second big event to facilitate greatly the achievement of this mission. What influences this second event has been having on the mission of the IRS is a major part of the objective of this study.

First, it is necessary to understand the vast organization and intricate functions of the IRS, how responsibility for the computerized operations is distributed, and what equipment is being used.

National Office and Decentralized Field Offices

The IRS is organized as an integral part of the Treasury Department and is headed by the Commissioner of Internal Revenue, who serves under the direction of the Secretary of the Treasury. The Commissioner of Internal Revenue presides over the administration of the two main component parts of the Service: (1) the National Office in Washington, D. C. and (2) the field organization. Figures 2-1 and 2-2 depict these two component parts.

The National Office is charged with the responsibility for the development of broad nationwide policies and programs for the administration of the tax laws and management of the activities, operations, and endeavors of the Service. The organizational components which comprise the National Headquarters are (1) the Office of the Commissioner, which includes a Deputy Commissioner, The Assistant to The Commissioner, and the Foreign Tax Assistance Staff; (2) the Office of the Chief Counsel and (3) six Assistant Commissioner Offices, one each for the major functions of Inspection, Administration, Compliance, Data Processing, Planning and Research, and Technical. This study will be concerned

Figure 2-1. Internal Revenue Service Organization

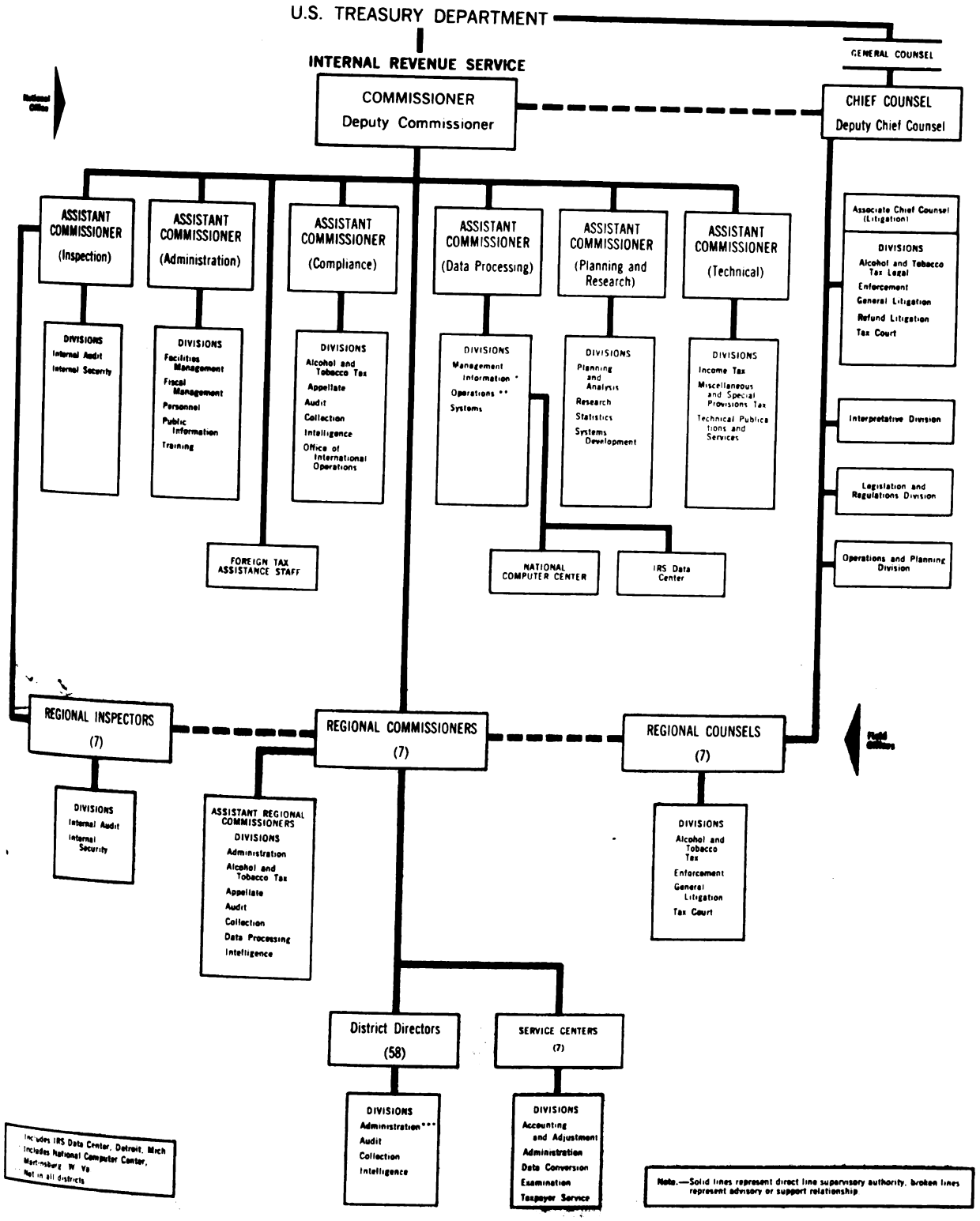
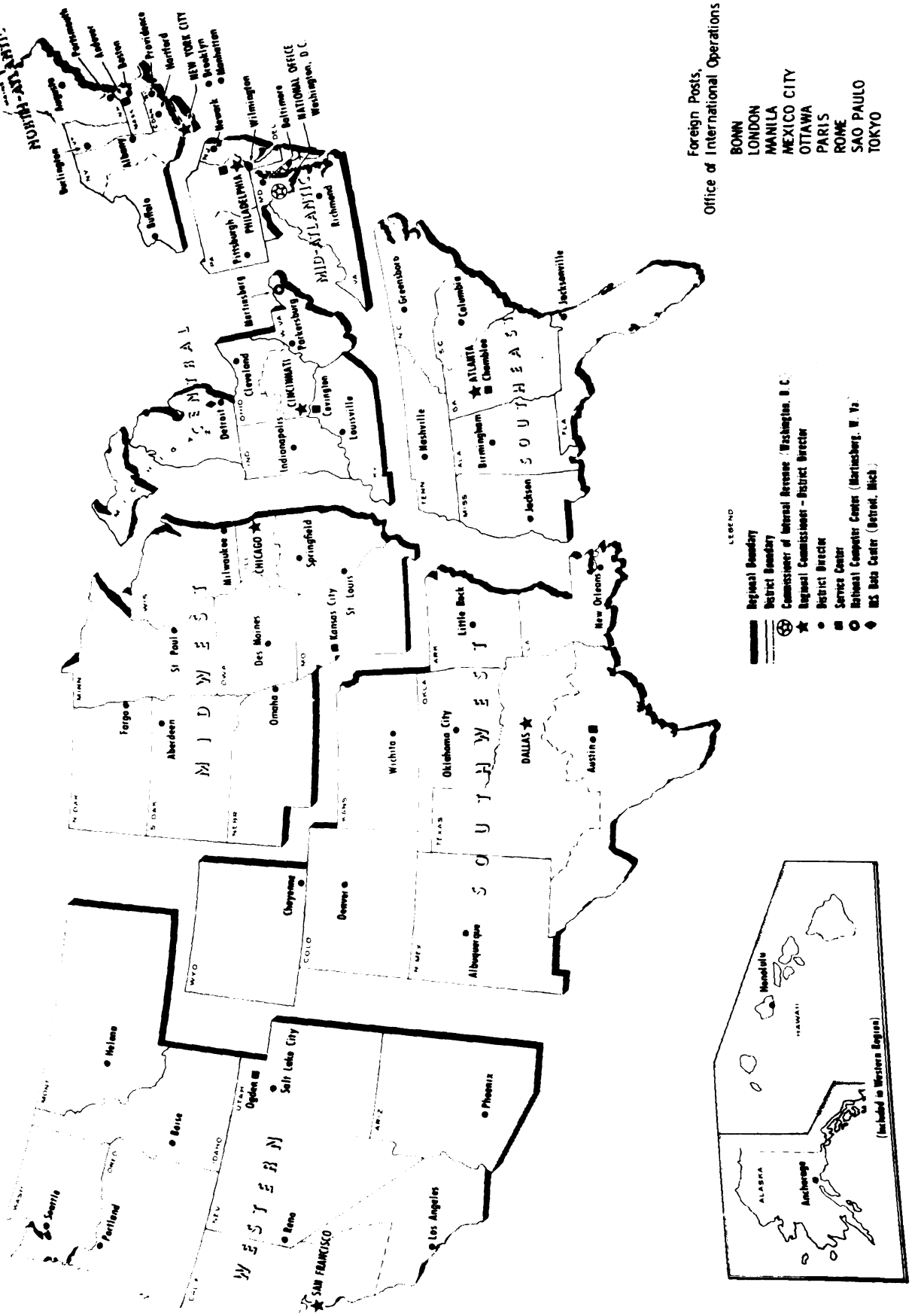


Figure 2-2. Map of Internal Revenue Service Regions and Districts



340-033 O - 69 - 6

primarily with the Office of the Assistant Commissioner for Data Processing.

The field organization consists of seven Internal Revenue Regions, each directed by a Regional Commissioner who reports to the Deputy Commissioner; fifty-eight Internal Revenue Districts, each administered by a District Director; seven service centers, each headed by a Director who reports to a Regional Commissioner; and a computer center and a data center, both of which are directed by the Assistant Commissioner for Data Processing of the National Office. The computer center is the National Computer Center (NCC) situated at Martinsburg, West Virginia and the Data Center is located at Detroit, Michigan. The field organization also includes seven Regional Inspectors who report to the Assistant Commissioner for Inspection in the National Office, and seven Regional Counsels who report to the Office of the Chief Counsel in the National Office.

Office of the Assistant Commissioner for Data Processing

The Assistant Commissioner for Data Processing is the principal assistant responsible to the Commissioner's Office for (1) all matters pertaining to the development of programs, systems, procedures, and methods for the implementation and operation of the IRS ADP Plan; (2) the receipt and integrated data processing tax returns and payments; (3) the accounting for the internal revenue; and (4) the review

and coordination of all reports. He exercises responsibility for direct line supervision over (1) the activities performed in his own Administrative Office, the Systems Division, Operations Division, and the Reports Division in the National Office; (2) the National Computer Center at Martinsburg, and (3) the Data Center at Detroit. He exercises functional, or staff, responsibility for the ADP activities in the seven Regional Service Centers, and the 58 District Offices. He often confers and collaborates with officials from other government agencies, private industry, and business to assure compatibility of relevant data which will be integrated into the ADP system of each. Figure 2-3 depicts the organization of the Office of the Assistant Commissioner for Data Processing.

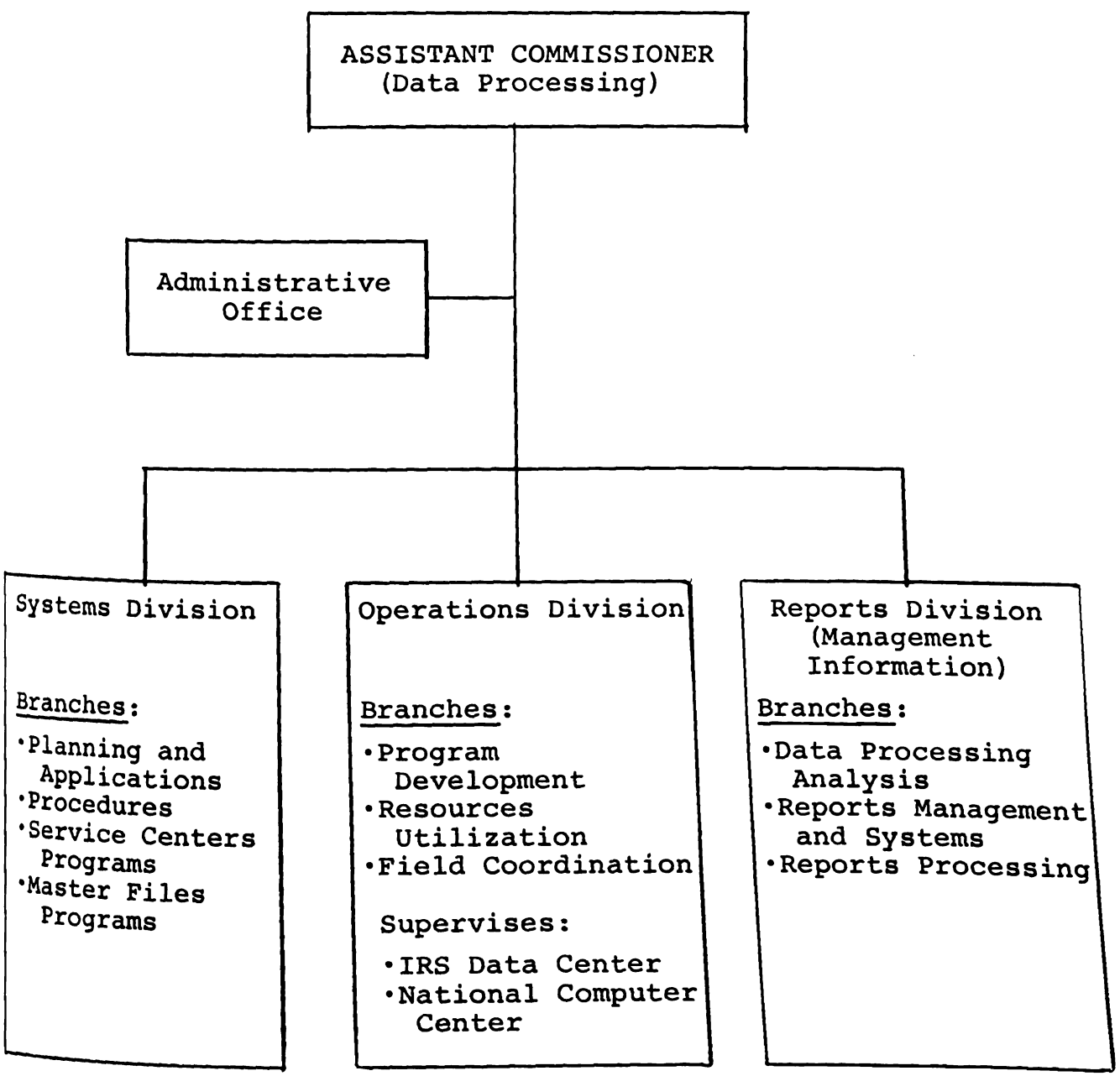
Attention is directed to the computer system which processes tax returns and is now being used to check up on the taxpayers of the nation to make sure they comply with the Federal tax laws. Five main characteristics of this computer system can be identified. These characteristics concern (1) organization, (2) taxpayer identifying numbers, (3) goals, (4) operational flow of information, and (5) general implementation and phasing in.

Organization of the computer system follows the three layers found in the administrative organization. The computer system is composed of a centralized master file of consolidated tax accounts for tax accounting and data

Figure 2-3

Internal Revenue Service

Organization of the Office of Assistant Commissioner
(Data Processing)



reconciliation by taxpayer identification numbers at the National Computer Center (NCC) and decentralized data collection by seven Regional Service Computers and the 58 District Offices. Each attribute in this computer system is discussed in detail later under the topics of the National Computer Center, the master file concept, consolidated tax accounts, and tax account numbers. The seven regional Service Centers, which are feeders into the National Computer Center, tape all tax returns on their computers and forward the tapes to the National Computer Center. The 58 District Offices, under the old, manual method and during the phasing-in period for computers, collected the millions of individual and corporate returns and forwarded them to the seven regional Service Centers. Since the new system became fully operational on a national basis in 1967, the filing of returns by all taxpayers has been directly with the regional Service Centers, thus freeing the District Offices for auditing and other important duties.

The second main characteristic of the new computer system is the single identifying number for each taxpayer entity which is the key feature, perhaps, of the entire system.[17] The Social Security number is used by

---

[17]Mortimer M. Caplin, "The Taxpayer-Identification Number System: The Key to Modern Tax Administration," American Bar Association Journal, XLIX, No. 12 (December, 1963), pp. 1161-65.

individuals; the existing employer identification number system has been adopted for use by business entities. These tax account numbers are discussed in detail later.

The goals which constitute the third main feature of the system have been identified clearly and have been defined adequately.[18] Under the American tax system of voluntary self-assessment, the government relies upon the individual taxpayer to apply the tax laws to his own situation and to report and pay what is rightfully due. Under this concept, the IRS will seek to carry out four main obligations or goals with its new computer installations as follows: (1) to assure that taxpayers file all required returns, (2) to assure that taxpayers report all their income, (3) to collect all taxes due, and (4) to assure that overpaid taxes are returned.[19]

Operational flow of information begins with the filing of returns with the Regional Service Centers. Information returns are filed by businesses and others who pay taxpayer recipients their incomes from salaries, wages,

---

[18] See page 188 of Chapter II.

[19] Robert L. Jack, "The IRS Automatic Data Processing System," Remarks delivered at First Annual Conference on the Impact of Computers on the Tax Practice, Co-sponsored by the American and Federal Bar Associations and the National Law Center of the George Washington University, Washington, D. C., June, 1966; Also, see: Sheldon S. Cohen (U.S. Commissioner of Internal Revenue), "New Tax Collector Tells His Goals," Nation's Business, LIII, No. 4 (April, 1963), pp. 31, 68-73.

interest, and dividends. Self-assessed tax returns are filed by taxpayers with the Regional Service Centers. At the Service Centers, all returns are mathematically verified, taped, and forwarded to the National Computer Center; there they are posted to taxpayer accounts. The information is examined by audit criteria.[20] Income reported by taxpayers on tax returns is correlated and reconciled with that reported on information returns by means of the taxpayer's identifying number. All discrepancies are investigated. Many returns are selected for audit.

General implementation and phasing-in of the IRS' computer system began in 1962. Installation of the present computer system was initiated with the construction of the National Computer Center, the establishment of the Master File, and the selection of a pilot Regional Service Center in Chamblee, Georgia, in the Southeast Region. The first year of pilot experience with the Business Master File segment supported the hope that a venture of this magnitude would be successful and live up to expectations. The many problems which developed were solved. After the first year of pilot experience, the other six Regional Service Centers were phased in gradually on a carefully chosen schedule. Plans for implementation and nation-wide phasing-in to full capacity operation in all seven Regional Service Centers

---

[20] See page in Chapter IV.

called for 1967 to be a crucial year. The Assistant Assistant Commissioner for Automatic Data Processing said,

> Nationwide implementation of ADP is being accomplished on a gradual, phasing-in basis because of the problems of logistics--housing, equipment and staffing and service centers required by the System--and also because an abrupt change would disrupt and cripple our operations.[21]

The complete, five-year schedule for phasing-in the computerized system on a gradual basis until nationwide coverage of computer operations could be finally achieved is shown in Figure 2-4.

The Chamblee, Georgia, Service Center, which is located in the northern suburbs of Atlanta has been the pilot center which began operations for the Business Master File (BMF) in 1962 and the Individual Master File (IMF) in 1963. This center has been serving the District Offices of the states of Alabama, Mississippi, Florida, Georgia, Tennessee, North Carolina, and South Carolina. These states comprise the Southeastern Region which is the smallest of the seven regions as far as number of returns and volume of dollars collected are concerned. Trial runs of new programs and tests of new facets of the system as it developed and expanded were conducted and perfected in this pilot center before their use and operation in other regions. The pilot

---

[21]Robert L. Jack, "ADP--An Analysis of Its Operations and Results," 1966 Proceedings of New York University Twenty-Fourth Annual Institute on Federal Taxation, p. 105.

Region	Service Center	1962	1963	1964	1965	1966	1967
1. Southeast	Chamblee (Atlanta), Ga.	BMF	IMF				
2. Mid-Atlantic	Philadelphia, Pa.		BMF		IMF		
3. Central	Covington (Cincinnati), Ky.			BMF		IMF[a]	
4. Southwestern	Austin, Texas			BMF		IMF	
5. Midwest	Kansas City, Mo.				BMF		IMF
6. North-Atlantic	Lawrence, Massachusetts				BMF		IMF
7. Western	Ogden, Utah				BMF	IMF[b]	

[a]Except Mighigan, brought in 1-1-67.

[b]Except California, brought in 1-1-67.

Source: Robert L. Jack, "ADP--An Analysis of Its Operations and Results," 1966 Proceedings of New York University Twenty-Fourth Annual Institute on Federal Taxation, p. 105.

Figure 2-4. Internal Revenue Service ADP phase-in schedule.

region has been used for system innovation tryouts before positive adoption and extension to other centers. Carefully selected administrative personnel were assigned to staff this center, which became a training ground from which key men were obtained when other centers opened. Chamblee began to build up its work force for processing tax returns and more specifically for processing business tax returns in January, 1962.

Significant highlights for the installation of ADP during the 1961 fiscal year included the following:

1. Creation of the new ADP Division at the National Office by splitting it off from the Collection Division,
2. Selection and training of systems analysts and programmers,
3. Systems design for business returns processing,
4. Planning for personnel redeployment,
5. Establishment of the pilot service center in Chamblee,
6. Initiation of construction of the National Computer Center at Martinsburg, West Virginia.[22]

The old Collection Division in the National Office was split into two divisions: the ADP Division and the Collection Division. Over 100 Service employees such as internal revenue agents, revenue officers, tax examiners, and others were carefully selected and trained to become the pioneer digital computer systems analysts and programmers

---

[22]Mortimer M. Caplin, 1961 Annual Report of Commissioner of Internal Revenue, Internal Revenue Service, U. S. Treasury Department, Publication Number 55 (Government Printing Office: Washington, D. C., 1961), p. 23.

in the newly developing system. These key employees were chosen on the basis of nationwide competition and were intensively trained ten to twenty-one weeks in systems analysis and programming. After this training, these key people began system design for the processing of business returns, which was scheduled to begin in 1962 in the pilot center at Chamblee.

Internal Revenue Service Programming

The design of the present IRS ADP system was achieved in three major phases: development of the procedures, the programming, and the Systems Acceptability Test (SAT). The first phase involved the preparation of a synopsis or outline of the new or revised step-by-step sequence of instructions to accomplish the objectives. The origin, expected results, and proposed implementation was included.

After it was decided what was to be accomplished, instructions had to be communicated to the computers. The procedural instructions developed in the first phase had to be converted into machine language through programming. The computers were programmed by first writing the English equivalent of machine codes or absolute machine language. Then this was translated into machine language by means of a compiler program. All Federal government programming of computers is required to be done in Cobol.

The programming required in the IRS ADP system was centralized in the office of Assistant Commissioner for Data Processing in Washington, D. C., at the Pension Building. The job of programming the present IRS ADP system was a huge technical undertaking. For example, the programming required over 2,000 pages of handbook issuances, 34 Honeywell H-200 computer programs, 89 IBM 7074 programs and 21 other programs. This total of 144 programs involved approximately 300,000 symbolic or English language instructions and required the testing of over 500,000 machine instructions.[23]

Inefficiency of computer programs is a luxury that cannot be tolerated with the volume of data handled. The average execution time of a programmed instruction in the Honeywell H-200 model found in all the service centers is 40 microseconds, or 40 millionths of a second. While this seems infintesimal, it could be costly with faulty programming. For example, if there were ten excess instructions which need to be multiplied by the execution time which is applied to about 60 odd million documents that a single computer program will handle yearly, the result would be a costly 40-hour shift of H-200 computer time.

---

[23]Robert L. Jack, "ADP--An Analysis of Its Operations and Results," 1966 Proceedings of New York University Twenty-Fourth Annual Institute on Federal Taxation, p. 102.

The Systems Acceptability Test followed the testing of the programs. This involved a pre-production run of each new or modified procedure and related computer program. After these tests, the computer program books and console Operator's Handbooks were published for use in actual production operations.

The National Computer Center (NCC)

The National Computer Center (NCC) is located on a five-acre site four miles from Martinsburg, West Virginia, and sixty-eight miles northwest of Washington, D. C. The NCC is the nerve center of the nationwide system for electronic computer processing of tax returns and related documents. It is charged with the responsibility for the creation, maintenance and updating of individual and business tax accounts, which comprise the Master File. The functions of the NCC are (1) to receive input data from the seven regional Service Centers; (2) to process the input data against the Master File; (3) to produce output data for use in issuing refund checks, sending bills, issuing notices, answering inquiries, making delinquency investigations, detecting fraudulent refund claims, classifying returns for audit purposes, preparing reports; (4) to perform other ADP activities as required.

There is no flow of paper into or out of the NCC. Instead of paper, the flow consists of magnetic tape--reels and cartridges of it. All work at Martinsburg is based on

magnetic tape. Taxable events, tax returns and all other applicable tax data for each tax entity are taped together into a single fabric--the consolidated tax account--so that all significant facts are available to the tax administrator when he deals with any particular taxpayer. Each account is a tax dossier. Together all of the accounts make up the Master file, which is the unique feature of the ADP Plan that has distinguished the present system from that of the past.

The NCC at Martinsburg is the world's largest computer operation. The U. S. archivist recently informed the IRS that their tax return files are unique among all Federal government records, both in terms of size and frequency of use. The IRS taxpayer files have grown to three times the size of the Social Security Administration's files, four times the size of the enlistees' files of the combined Army, Navy and Air Force, six times the size of the Veterans Administration's files, and over nine times the size of the Selective Service Administration's files.

Not only is its operations large but it is also complex; it is considered to be the most sophisticated batch processing job in the world. The NCC runs continuously twenty-four hours a day, seven days a week, 52 weeks a year. It must meet the rigid deadline of processing all refund returns within 45 days after the April 15 due date for filing of returns by individuals, as the Federal

government is required by law to pay interest on all refunds not processed within this period. This deadline adds considerable pressure to the NCC's workload and explains why refund returns are processed first before all other types.

The data processing cycle at the NCC covers a one-week period. The staff has not missed a single processing cycle since the center's inception in 1962. The weekly cycle begins every Saturday at six p.m. The deadline for all seven regional service centers to have their weekly tax data transported by air to Washington and then by motor to Martinsburg is Friday afternoon; the processing cycle begins the next day. The first step in the processing cycle consists of sorting the various transaction tapes data into the master file sequence of taxpayer identification numbers. Then the numbers are validated by matching them with master lists. The transaction taxes are then used to locate for updating the master tapes that are filed in the NCC library, which comprises 20,000 hypertape[24] cartridges and 15,000 conventional reels. Only five per cent of this total library is updated in each weekly cycle.[25] The master tapes needing updating are identified by passing

---

[24]Hypertape is a wider version of magnetic tape; superhypertape is even wider.

[25]"You Can't Beat The Systems At Martinsburg," Business Automation, XVI, No. 3 (March, 1969), pp. 56-59.

the batch of transaction tapes against the whole file. Sixty-five hours of processing is needed to make this complete identification run each week. From the selected master file tapes that have been updated by the transaction tapes, an active file is produced and then analyzed to determine the various output tapes that need to be run. Some examples of output tapes that are produced are (1) tax refunds, (2) balance due notices, (3) mailing labels used on tax forms, (4) a directory of basic reference data in alphabetic sequence, (5) returns to be audited. These output tapes are forwarded to the service centers for making print-outs and further processing.

To produce the updated file each week, thirty-five hours of the 65 hours of processing time is required at peak periods of April and May to do the posting and analyzing. During this peak period, seven million transactions a week are passed against the master file of 88 million accounts; five million a week are passed during the remainder of the year. This amounts to 276 million transactions passing through 88 million taxpayer accounts yearly.

After the tapes are analyzed to determine what further work is required, they are edited accordingly, which takes about 85 hours of the weekly cycle. Refund output tapes begin moving from Martinsburg to Treasury dispursing offices, which have their own computer installations, by Thursday. All output tapes are dispatched by

Friday, midnight. Fresh tapes from the service centers are now on hand to begin a new weekly cycle the following Saturday evening at six p.m.

The Master File Concept

The Master File is set up and maintained in two segments--the Business Master File (BMF) and the Individual Master File (IMF). The BMF increased from 6.2 million accounts at the end of 1967 to about seven million at the close of Fiscal 1968, and the IMF from 70.4 million to 81 million. The Master File, therefore, contains a total of about 88 million accounts by the end of the 1968 fiscal year and going into the 1969 tax season.[26]

The BMF is composed of accounts for trusts and estates and taxpayer entities identified as businesses, which includes corporations. Tax data are recorded in these files from the tax returns for (1) employment taxes (F.I.C.A. and Federal Unemployment taxes), (2) excise taxes, and (3) corporate income taxes. The information in the accounts of the BMF is derived primarily from the high-volume business returns filed on the following tax forms:

1. 940 Employer's Annual Federal Unemployment Tax Return

---

[26]Sheldon S. Cohen, 1968 Annual Report of the Commissioner of Internal Revenue, Internal Revenue Service, United States Treasury Department, Publication No. 55 (Washington: Government Printing Office, 1968), p. 15.

2. 941 Employer's Quarterly Federal F.I.C.A. Tax Return

3. CT-1 Employer's Quarterly Railroad Retirement Tax Return

4. 720 Quarterly Excise Tax Return

5. 1120 U. S. Corporate Income Tax Return

6. 1120ES U. S. Declaration of Estimated Income Tax for Corporations[27]

7. 7004 Application for Automatic Extension of Time to File U.S. Income Tax Return (Used by corporations to request an automatic extension of three months to file corporate income tax returns)

The first three forms listed above are employment tax returns; the fourth one is an excise tax return. The last three are Federal income tax returns filed by corporations. In addition to these voluminous business returns, the BMF also includes data filed by fiduciaries for estates and trusts on Form 1141 U. S. Fiduciary Income Tax Return.

---

[27]The Revenue and Expenditures Control Act of 1968 has done away with the requirement of filing a declaration of estimated tax for corporations (Form 1120ES). For an outline of the estimated tax requirement changes made by this Act, see: Fred M. Dellorfano, Jr., "New Federal Estimated Tax Requirements For Corporations and Individuals," Massachusetts CPA Review, XLII, No. 4 (December, 1968--January, 1969), pp. 117-20.

The IMF is composed of accounts for individual taxpayer entities. Tax data from individuals are recorded from returns filed on the following tax forms:

1. 1040 U. S. Individual Income Tax Return
2. 1040A U. S. Individual Income Tax Return (Less than $10,000 Total Income)[28]
3. 1040ES Declaration of Estimated Income Tax for Individuals

These forms also include income from proprietorships and partnerships.

The retention period for master file data has been changed from three years to twenty-seven months. Each account was to contain a three-year running record on magnetic tape. This three-year period was changed in 1967 as a result of the adoption of a new policy for retaining master file data, determined from a cost-benefit study. The new policy was designed to strike a balance between the needs for computer-retrieval of tax return data and the increasing costs of retaining such data on a progressively lengthening tape file.

> Under the new master file retention policy, tax settlement data will be retained for 27 months beyond the posting data of the transaction that brings the tax account to a zero balance or frees the account from any prior holding condition. Tax base data will be removed from the master files annually after the completion of scheduled computer runs for Service programs (e.g.,

---

[28]This form was dropped in 1969.

> mathematical verification, information documents matching, audit selection, state tape program, etc.). This new policy relates to data on master tape files and does not change Service policies for retention and disposition of tax returns and related source documents.[29]

The statute of limitations usually governs the period records are retained. In business, this is seven years. For income taxes, it is three years. Original tax returns filed by taxpayers directly with Service Centers are retained there about one year and then forwarded to Federal Record Center storage depots.

The master file is a new concept in tax administration. It promotes the administrative function of control. The concept features the idea that the tax system should be one in which all tax transactions of each taxpayer are recorded in one place in order to provide a truly effective information base from which to administer the tax laws and to assure fair and impartial treatment of all taxpayers and the government.

Consolidated Tax Accounts

Each consolidated tax account in both segments of the Master File--the BMF and the IMF--contains two sections as follows: (1) the entity section and (2) the returns and

---

[29]Sheldon S. Cohen, 1967 Annual Report of The Commissioner of Internal Revenue, Internal Revenue Service, United States Treasury Department, Publication Number 55 (Washington: Government Printing Office, 1967), p. 55.

account section.[30] The entity section contains the somewhat permanent taxpayer identifying data such as tax account number, name of taxpayer, street address, codes to indicate marital status, spouse's tax account number, and mail-file requirements.

The returns and account section includes such data as debit and credit activity in the account; current debit or credit tax balance; accounting transactions which indicate tax liability, payments, assessed or paid interest; the status of return as to whether it is fully paid or past due; tax base data that are used to compute liability; audit criteria used for selecting return for closer examination; and data used to prepare IRS reports and statistical compilations. All this is maintained on magnetic tape and gives a complete history of the account for a 27 months period. Updating of each account is made on a weekly basis.

Each individual's record is compressed on one half inch of magnetic tape. No more than one half inch is usually allowed for each individual taxpayer. Some corporations are allowed up to ten inches of magnetic tape for their records.

---

[30]Robert L. Jack, "ADP--An Analysis of Its Operation and Results," 1966 Proceedings of New York University Twenty-Fourth Annual Institute on Federal Taxation, pp. 100-101.

Taxpayer Account Numbers

The tax account number assigned to each taxpayer entity theoretically provides dependable and reliable identification of each taxpayer and is considered to be the key to the success of the operation of the Master File. Great emphasis has been placed upon this taxpayer identification number,[31] and it has been defended as a major distinguishing feature of the new ADP system. One of the chief deficiencies of previous efforts to automate the Service in the early 1950's was the lack of the use of such an identifying number. Taxpayers were originally identified by names and addresses only. Therefore, certain earlier difficulties persisted and constituted identity problems that needed to be solved before any automated system could operate successfully. These difficulties are explained below.

First, the identity of taxpayers by names and addresses only was insufficient, unreliable, and inadequate because of the large number of people with identical or similar surnames. IRS records show the following similar names:

1,300,000 Smiths
900,000 Johnsons
750,000 Williams
650,000 Browns

---

[31]Mortimer M. Caplin, "The Taxpayer-Identifying Number System: The Key To Modern Tax Administration," The American Bar Association Journal, XLIX, No. 12 (December, 1963), p. 1161.

650,000 Jones
550,000 Millers
500,000 Davis
450,000 Martins
400,000 Andersons
400,000 Taylors[32]
400,000 Wilsons

When it is realized that a total of approximately seven million people could be listed under one of only eleven names, one can appreciate the problem of identification which confronted the IRS.

Second, the inconsistent ways in which taxpayers reported their names on returns made authentic identification difficult. Taxpayers often switched their given first names with their middle names or initials.

Third, name changes compounded the already difficult identity problem; many people frequently change their names through matrimony, divorce, and remarriage.

Fourth, the high degree of mobility among American taxpayers made tracing difficult. When it is realized that 20 per cent of the U. S. taxpayers move at least once every year, one can appreciate another problem confronting the IRS administrators; especially when people, as they do, migrate from one IRS region or district to another.

---

[32]George J. Leibowitz, "The Use of Taxpayer Identifying Numbers by Individuals, Businesses, and the Government," Taxes, XLI, No. 1 (January, 1963), p. 32.

A number to authentically identify taxpayers and their tax accounts in a national, centralized file was the solution. The National Computer Center features such an identity file.

Congress enacted Public Law 87-397 which requires taxpayers to have and use identifying numbers.[33] The importance of taxpayer identifying numbers as a tool for closing income tax gaps can not be overstressed. The Treasury Department estimated that there was a $25 billion gap between income reportable and the actual amount reported on the 1959 individual income tax returns. Senator Harry F. Byrd directed attention to this fact and called Public Law 87-397 the biggest loophole-closing bill ever presented to the Congress.[34] It was also estimated that the income gap for dividends in 1960 was $1.3 billion; for interest, $3.1 billion. Identifying numbers for taxpayers integrated into a single master file was the extraordinarily useful tool given to the I.R.S. to assist in plugging these income and tax gaps which had constituted a sizeable drain on the nation's treasury.

The taxpayer account number system, as cited in the above paragraph, is required by law. All taxpayers filing returns, statements, or other documents with the IRS must

---

[33]Mortimer M. Caplin, op. cit.

[34]Ibid., p. 1162.

show their identifying numbers of those papers. The penalty for violation of this law is $5.00 per number per time. In addition, all taxpayers are required by law to furnish their identifying numbers on request to other taxpayers, such as payers of interest and dividends, who must file information returns showing these payments identified by such numbers. Banks and corporations, and others, are required by law to report to the Government on information returns the amounts of dividends and interest they pay taxpayers using their taxpayer identification numbers.

The existing Social Security number was designated for individuals to use in reporting their taxes. This number is the familiar three-digit, two-digit, four-digit series such as 195-02-2345.[35] Ninety per cent of the taxpayers already had such a Social Security number at the time the tax system required it. Any individual who must file tax documents with the IRS is required to obtain such a number if he does not already have one. Those individuals who file a tax return calling for a refund will not get the refund if they are not using their correct Social Security numbers. All nine digits of all taxpayer-identification numbers and the first four letters of the last names of all tax returns claiming refunds are checked with listings of

---

[35]Henry B. Jordan, "Taxpayer Identifying Numbers and Their Use By IRS," Lybrand Journal, XLIV, No. 1 (1963), p. 26.

numbers and names from the Social Security offices in Baltimore. Those which do not agree are investigated and correct numbers must be placed on tax returns before any refunds are issued.

The use of incorrect numbers has been the taxpayers' biggest error and the chief source of difficulty in making the system work efficiently by the IRS. Therefore, early in 1968, the IRS established its own tape file of such numbers, beginning with an up-to-date master tape from the Social Security Administration. This new procedure greatly reduced the number of contacts required with taxpayers or Social Security people for validation of non-matching numbers. Even with this safeguard more than one million taxpayers were contacted in Fiscal 1968 for failing to enter their Social Security numbers on their tax returns, or for entering the number incorrectly.

The existing employer identification number was designated for businesses to use in reporting their taxes. This number is the familiar two-digit, seven-digit series such as 24-1105362.[36] For many years approximately four million business firms had been using these assigned employer identification numbers. All corporations, partnerships, associations, estates, trusts, and other types of business entities, also individuals operating business

---

[36] Ibid., p. 27.

(proprietorships) which require the filing of Federal business tax returns, must use this employer identification number, just as they have been doing in the past.

Information Returns

Information returns are filed with the IRS in what amounts to an explosion of paper at the rate of about 350 million a year. The bulk of the volume of information returns is composed of three classifications of documents: Forms W-2, Forms 1099, and Forms 1087. These forms[37] with their official description are as follows:

1. W-2 Wage and Tax Statement--Reports wages and employee tax; income tax withheld; other compensation, and supports credit claimed on individual income tax return.
2. 1099 U. S. Information Return for Calendar Year--Used to report amounts of income (other than wage payments reported on Form W-2).
3. 1087 Nominee's Information Return--Used to report actual ownership of stock issued by domestic and resident corporations.

The W-2 Forms are filed by employers and report wages and withholding data of their employees. Employees get a copy

---

[37] See Description of Principal Federal Tax Returns, Related Forms, and Publications, Internal Revenue Service, U. S. Treasury Department, Publication Number 481 (7-67) (Washington: Government Printing Office, July, 1967), Pamphlet of 39 pages.

of the W-2 Form which is required to be filed with their individual tax returns. The other two forms are filed by payers of interest, dividends, patronage dividends, and various categories of income not subject to withholding tax.

Table 2-2 Number of Information Returns Filed with the Internal Revenue Service, shows that the volume of information returns (W-2, 1099, and 1087) has grown from about 301 million in 1959 to about 343 million in 1968. Two-thirds of this volume consisted of employers' statements of wages paid and tax withheld on Forms W-2, including both the copies attached by employees to their income tax returns and copies filed by employers. Approximately one-third of the volume consisted of the other two forms of information returns, Form 1099 and Form 1087.

Information returns have grown so voluminous in recent years that they have developed into two big problems for the IRS: (1) should information returns be received on magnetic tape from payers of income? and (2) what is the most efficient way to utilize information returns?

The first question has been solved in the affirmative. Magnetic tape, instead of paper documents, may now be used for information returns. The IRS has designed a program to utilize the capabilities of electronic computers in business and government with respect to the filing of information returns. A news release three years ago announced the beginning of this development, as follows:

Table 2-2.--Number of information returns filed with Internal Revenue Service for fiscal years 1959 through 1968.

	TYPE OF INFORMATION RETURN IN MILLIONS					
	Paper Returns				Magnetic Tape Returns	
	Form W-2	Form 1099	Form 1087	Total	Number of Companies Participating in the Tape Program	Number of Information Returns Filed on Magnetic Tape
1959	200.0	96.0	5.5	301.5		
1960	208.0	110.0	6.0	324.0		
1961	214.0	110.0	6.0	330.0		
1962						
1963	213.0	109.0	5.0	327.0		
1964	216.0	111.0	3.0	330.0		
1965				340.0	10	1.7[a]
1966			Not Available		70	18.0[b]
1967			Not Available		590	25.0[c]
1968				343.0	1,050	34.0

Source for Paper Returns: Annual Reports of Commissioner of Internal Revenue.

[a] Wall Street Journal, Vol. XLVI, No. 177 (June 22, 1966), p. 1, Column 5.
[b] Sheldon S. Cohen, 1966 Annual Report of Commissioner of Internal Revenue, p. 64.
[c] Wall Street Journal, Vol. XLVII, No. 233 (September 13, 1967), p. 1, Column 5.

> Computerized tape filing of tax information returns grows more commonplace. Last year, for the first time some 1.7 million taped information returns reporting payments of salaries, interest, and dividends were filed experimentally with the IRS by ten companies that made the disbursements; the companies also were required to send along printed returns. For 1966, some 800 paying companies have responded to an IRS invitation to submit tapes, and are expected to file as many as 50 million computerized information returns. This year the companies won't have to forward any paperwork, although the computers will print out copies of information forms that payers must forward to the individuals concerned.
>
> The Service estimates eventually some 250 million information returns will be filed to it on tape annually.[38]

The processing of information document data at the IRS on magnetic tape from payers has proven feasible. Pilot project testing was conducted during 1966. This test confirmed the practicability of receiving from employers and payers their magnetic tape records of Form W-2 wage and tax data as well as Forms 1099 and 1087 information returns.

> . . . The pilot test involved receipt, from 70 participants, of about 18 million data records on 599 reels of magnetic tape, of which 44 reels required translation to a recording code compatible with Service requirements.[39]

A fresh IRS procedure designating acceptable tape formats and other specifications for filing information

---

[38] Wall Street Journal, XLVI, No. 177 (June 22, 1966), p. 1, Column 5.

[39] Sheldon S. Cohen, 1966 Annual Report of Commissioner of Internal Revenue, Internal Revenue Service, United States Treasury Department, Publication No. 55 (Washington: Government Printing Office, 1966), p. 64.

documents has been issued in response to over 900 inquiries during 1966. This procedure has resulted in substantial savings for both the Government and payers of wages, interest and dividends. The Government saves the cost of transcribing data from millions of paper documents to punched cards and subsequent conversion of the data to magnetic tape. The payers filing tapes no longer need to file the previously required paper copy of the information return although they are required to continue furnishing the payee his copy. The IRS will accept a combination of unduplicated magnetic tape and paper returns.

Approximately seven per cent of the information documents filed with the IRS during 1967 were tape records. In 1968 the figure increased to ten per cent.

In regard to the second question raised earlier, the most satisfactory way to use information returns is to correlate the information contained thereon with the self-assessed tax returns of taxpayers. One of the major uses of tapes is in the wage and information documents matching program. The optimum utilization of information returns, including those taped, remains under research by the IRS. Substantial progress has been achieved toward the attainment of a cardinal objective of ADP--information document validation.

> . . . These documents have been of rather limited use to the Service in the past because of their sheer volume and the time it takes to make a manual match of

> data appearing on them with the figures reported by taxpayers on their returns. Introduction of computers, coupled with the tax account number and master file operation, offers processing capabilities not previously available.[40]

Experimental tests were conducted in the pilot Southeastern Region to obtain information and experience in order to derive maximum value from these documents. These tests involved the matching of interest, dividend, and wage payments reported on information documents with those reported on the individual returns of the recipients. Research to explore new potentials for information reporting has continued and this activity has included

1. Analysis of different methods of matching information returns with the corresponding data on tax returns;
2. Methods of obtaining better identification of income recipients; and
3. Possibilities of extending the use of magnetic tape instead of paper information returns.[41]

The IRS Data Center at Detroit

In 1965, the IRS Data Center at Detroit became operational. It is known as an off-line center, that is, it is not connected with the main processor at the National Computer Center, and is responsible for the performance of all non-master file data processing operations for the IRS. It was activated to handle, in a central location, such

---

[40]Sheldon S. Cohen, 1965 Annual Report, p. 18.

[41]Sheldon S. Cohen, 1967 Annual Report, p. 55.

Rev
of
of
tri
inf
tab
ape
all
rel
frac
regi
fro
ser

Revenue Service programs and activities as the preparation of Treasury Department payrolls, fiscal reports, Statistics of Income, taxpayer compliance measurement, tax forms distributions, returns of non-taxable organizations, management information reports, special tax research, and special tabulations and comparisons for states and other Federal agencies. This center frees the ADP system from any and all work except that of processing taxpayer returns and related documents and data.

The Regions of the IRS

There are seven IRS regions which divide the United States. See Figure 2-2 on page 41 for a map of these regions. Each region comprises several states. Taxpayers from each region file their tax returns with their regional service center.

Table 2-3 shows the number of tax returns and total dollars collected by each region for 1968. It also shows the various states of each region and its service center location. A ranking of the regions on the basis of total dollars collected in 1968 would show the following order: (1) North-Atlantic, (2) Central, (3) Midwest, (4) Mid-Atlantic, (5) Western, (6) Southwest, and (7) Southeast. A ranking of the regions on the basis of the total number of tax returns processed in 1968 would show the following order: (1) North-Atlantic, (2) Western, (3) Midwest,

Table 2-3.--1967-68 regional returns and dollars collected - Internal Revenue Service.

	Number of Returns (Millions)	Dollars Collected (Billions)	Region	States	Regional Service Center Location
1967	17.64	$ 34.90	1. North Atlantic:	1. Maine	
1968	17.80	$ 39.70		2. Vermont	
				3. New Hampshire	(Lawrence)
				4. Massachusetts	
				5. Rhode Island	
				6. Connecticut	
				7. New York	
1967	15.44	20.92	2. Mid-Atlantic:	8. Pennsylvania	(Philadelphia)
1968	15.70	24.10		9. New Jersey	
				10. Maryland and Wash. D.C.	
				11. Delaware	
				12. Virginia	
1967	13.14	11.18	3. Southeast:	13. North Carolina	
1968	13.50	13.20		14. South Carolina	
				15. Tennessee	
				16. Mississippi	
				17. Alabama	
				18. Georgia	(Chamblee)
				19. Florida	
1967	14.58	25.19	4. Central:	20. Michigan	
1968	14.90	29.70		21. Ohio	
				22. Indiana	
				23. West Virginia	
				24. Kentucky	(Covington)
1967	16.03	22.36	5. Midwest:	25. Wisconsin	
1968	16.30	26.20		26. Illinois	
				27. Minnesota	
				28. Iowa	
				29. Missouri	(Kansas City)
				30. North Dakota	
				31. South Dakota	
				32. Nebraska	
1967	12.12	11.72	6. Southwest:	33. Wyoming	
1968	12.40	13.80		34. Colorado	
				35. Kansas	
				36. New Mexico	
				37. Taxes	(Austin)
				38. Arkansas	
				39. Louisiana	
				40. Oklahoma	
1967	15.98	17.86	7. Western:	41. Washington	
1968	16.50	21.40		42. Oregon	
				43. Montana	
				44. Idaho	
				45. California	
				46. Nevada	
				47. Utah	(Ogden)
				48. Arizona	
				49. Alaska	
				50. Hawaii	
1967	105.43	$148.38	Totals		
1968	107.60	$153.64	Totals		

Source: 1967 Annual Report of Commissioner of Internal Revenue
1968 Annual Report of Commissioner of Internal Revenue

(4) Mid-Atlantic, (5) Central, (6) Southeast, and (7) Southwest. The North-Atlantic region is first in both categories because it includes New York.

Each region is directed by a Regional Commissioner who is responsible to the Deputy Commissioner in the National Office for the execution of the broad nationwide policies and programs and for the administration of the internal revenue laws as well as the direction and coordination of the functions and activities of the many district offices within his region.

Figure 2-5 depicts the organization of the Office of Regional Commissioner. Among the various divisions of this office, each of which is headed by an Assistant Regional Commissioner, is that for data processing. The Assistant Regional Commissioner for Data Processing is responsible to the Regional Commissioner for planning, coordinating, and evaluating the tax returns processing, data processing, and revenue accounting activities of the region. He exercises line responsibility for supervision over those activities at the regional office, and functional or staff responsibility over those activities at the service center and the various district offices within his region.

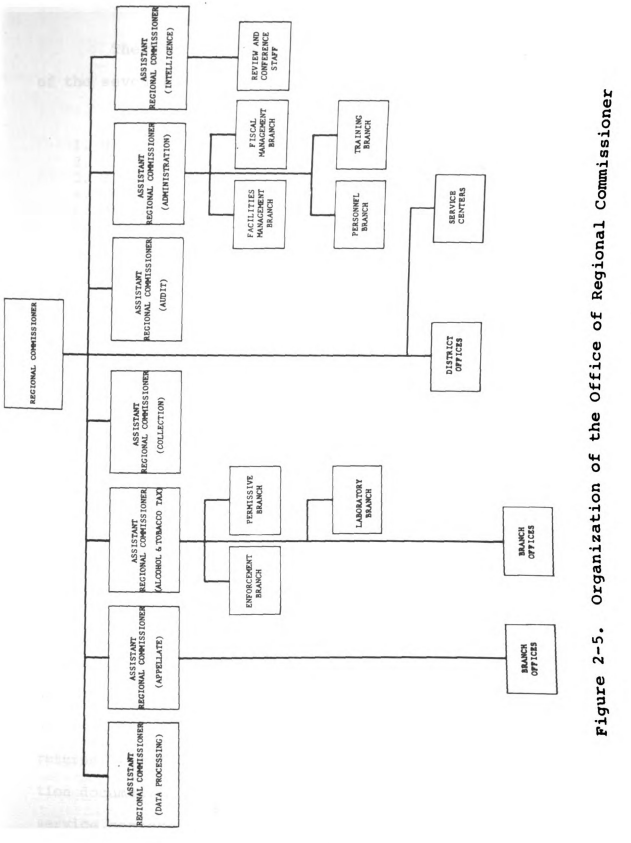


Figure 2-5. Organization of the Office of Regional Commissioner

The Service Centers

There are seven IRS service centers, one in each of the seven IRS regions as follows:

Region	Service Center Location
1. North-Atlantic	1. Lawrence, Massachusetts
2. Mid-Atlantic	2. Philadelphia, Pennsylvania
3. Southeastern	3. Chamblee, Georgia
4. Central	4. Covington, Kentucky
5. Midwest	5. Kansas City, Missouri
6. Southwest	6. Austin, Texas
7. Western	7. Ogden, Utah

Line responsibility for supervision of each service center is vested in the Regional Commissioner having jurisdiction in the area of its location. Each service center processes tax documents filed directly with it by taxpayers in that region. A Director heads each Service Center. He is directly responsible to the Regional Commissioner and through him to the National Office for implementing programs assigned to the center. This includes participation with the National Office in planning, coordinating, and evaluating projects of an experimental nature to develop improved techniques and methods for processing tax returns. All work programs performed in each service center are prescribed and assigned by the National Office in Washington and would include, among others, the processing, analysis and accounting control of income tax returns, estimated tax returns, withholding tax documents and related tax information documents. The phasing-in schedule to convert all service centers to ADP systems was completed in 1967;

since then all service centers have been operating with the aid of high-speed computers.

The organization of the IRS service center is shown in Figure 2-6. In addition to the immediate office of its Director, the Administration Division and Program Analysis Staff, each service center is organized into the four divisions for the main functions performed for tax returns as follows: Examination Division, Data Conversion Division, Taxpayer Service Division, and Accounting and Adjustment Division. The bulk of the detailed work necessary to convert the nation's tax data from the original paper source documents to magnetic tape is carried on in these four divisions in the seven service centers. Work flow through a service center is taken up next.

Flow of Tax Returns through Centers[42]

Each tax return received in a service center is permitted a nine-day cycle for processing. Manual operations before and after computer action consume most of this time. The nine-day cycle actually accounts for approximately thirty per cent of the total span of time between the taxpayer's filing date and the data action is taken on the return.

---

[42]Most of the information in this section on service centers was obtained through a personal interview arranged by the Office of the Assistant Commissioner for Data Processing in the National Office in Washington with the Assistant Director of the Service Center in the Central Region at Covington, Kentucky, through the Assistant Regional Commissioner's Office in Cincinnati.

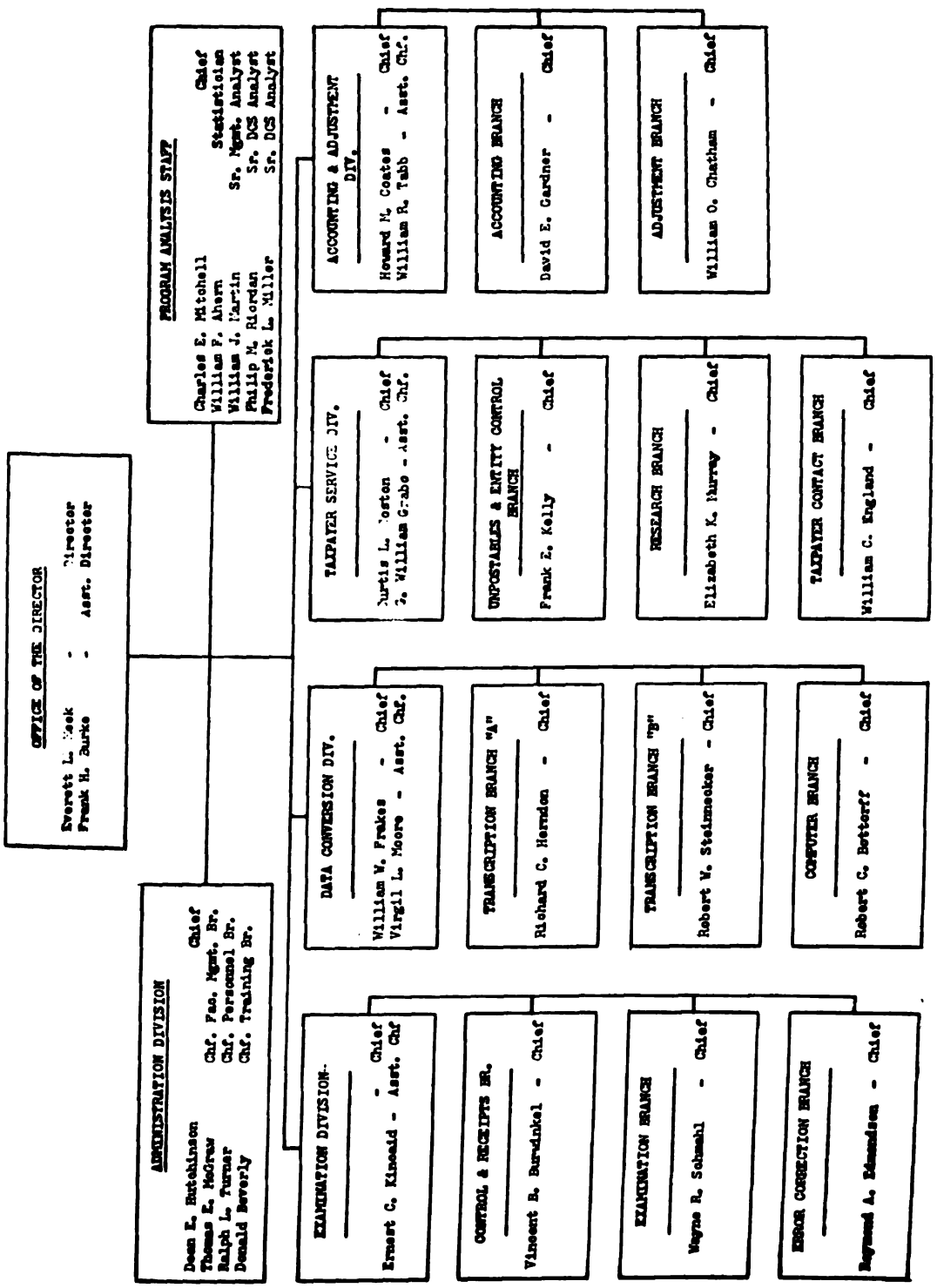


Figure 2-6. Organization of Office of Director at Service Center, Central Region, Covington, Kentucky

> The average length of time in the processing cycle of posting mathematically verified return information and issuing refund checks is 29 calendar days; at peak periods, 35 days. By Revenue Law, IRS must inform taxpayers of the status of their returns no later than 45 days following the April 15 filing period--or by June 30.[43]

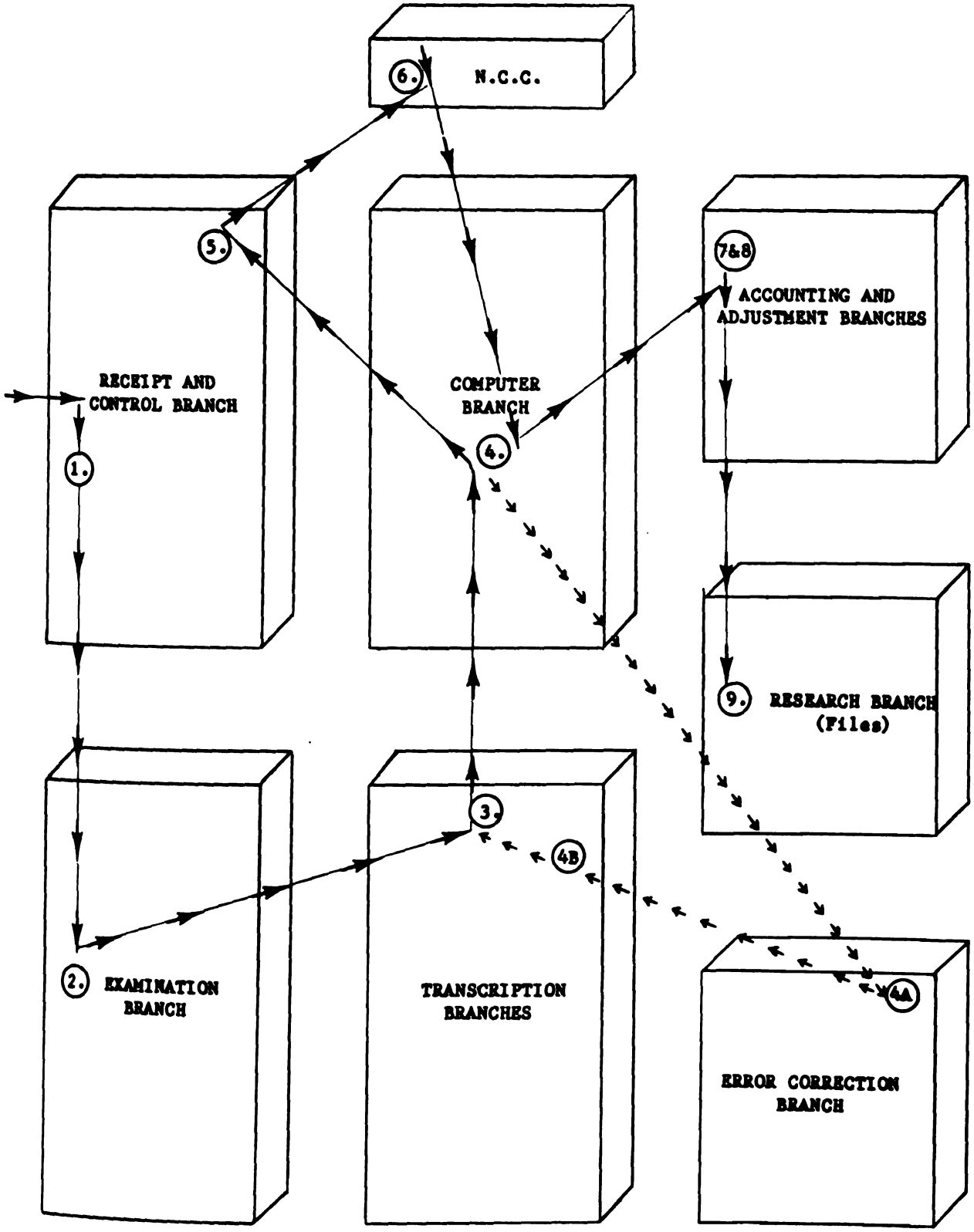
Figure 2-7 depicts the work flow sequence of steps through which tax returns pass as they are processed through the service centers.

All tax returns, remittances, correspondence, and other documents are received in the Receipts and Control Branches of the Examination Division. Classification of items and routing then follows. In this Branch as mail is received from taxpayers all letters are logged, opened, contents stapled together, and sorted. The tax returns are sorted by hand according to geographic location. Next they are separated according to the final result of the return; that is, whether or not they call for refunds, end in a zero balance with nothing owed and nothing to be refunded, or have a check enclosed for balance due the Government over and above the amount withheld by employers. Those returns with refunds due taxpayers are processed first before all others because interest is required to be paid on the refund amount after a period specified by the law.

---

[43]Dean J. Barron, "Why Computers," National Public Accountant, XI, No. 5 (May, 1965), p. 11.

Figure 2-7. Work Flow of Central Service Center at Covington, Kentucky



Revised 3/68

The Receipt and Control Branch also verifies tax returns and all supporting documents with remittances and determines their acceptability for deposit. It not only classifies all the various documents and initially accounts for all remittances by class of tax but also performs all teller operations in the service center. This branch also establishes physical control over all paper documents, and maintains integrity of processing categories through preliminary steps such as counting and blocking, batching, numbering, and the preparation of production control documents.

In the classification process, returns of a similar nature are gathered together and "batched" in lots of 100. For each batch a control card is prepared which designates each function that is to be performed on the batch as it is processed. After batch control is established over the documents, they are released according to work schedules.

From the Receipts and Control Branch, the batches begin their routing through the Service Center by being passed next to the Examination Branch. In the Examination Branch, all tax documents are edited for accuracy and completeness. This branch examines, perfects, and codes all tax documents in preparation for conversion to punch card form. The trained personnel in this branch examine each tax form to verify that all essential information has been recorded and to see if there are any errors in fact.

Sometimes it is necessary to do research to interpret correctly unintelligibly written numbers or to contact taxpayers for additional information to complete the return.

After the editors are satisfied that the returns are complete and correct, each document is coded with a thirteen-digit locator number. The first two digits represent the particular district, the next two represent the type of tax such as individual or business, the next two represent the type of document being processed such as a 1040 form or a 1040A form, the next three digits represent the Julian date of the year, the next three digits represent the block number, and the last two digits represent the serial number in the block which could go from 00 to 99. All returns, after having these thirteen-digit document location numbers stamped on them, are blocked with 100 returns per block.

The Examination Branch also edits, codes, and extracts information from tax returns for audit and statistical programs before the documents are forwarded to the Transcription Branches of the Data Conversion Division.

The largest single operation found in any service center is the Transcription Branch. This branch, using electric key punch and key verifier machines, transcribes and verifies tax data and coded information from tax returns and source documents to punch cards. It also processes documents which have been previously transcribed and for

which error conditions have been detected in subsequent processing. In the Transcription Branch of a typical service center, more than 500 keypunch machines are in operation on a two-shift of eight hours each or a three-shift, round the clock, 24 hours-a-day schedule, during peak periods of operations. Each keypunch operator transcribes pertinent information from about eighteen 1040 forms or thirty-three 1040A forms in about one hour. As many as ten cards may be required for the information from one 1040 form.

Other functions performed by the Transcription Branch include transcription of data to process feedback information, documents, correspondence, and forms to District Offices and taxpayers; transcription of data for accounting purposes; transcription of production and cost records used for tabulation and compilation of management reports; transcription of data for use in programs in administration, audit, statistics, fiscal reports, intelligence and others. Some of this work is in the process of being transferred to the Detroit Data Center.

After the information on the punched cards is verified, the tax returns and verified cards are forwarded to the proving and balancing sections. This is where the "block balancing" operation, one of the many controls to insure that all returns are accounted for, takes place. All cards in each block of documents are sorted, arranged

in numerical sequence and balanced against summary data information. When "block balancing" is completed the punched cards are forwarded to the Computer Branch where they are used as input to the computers. The returns themselves are sent to and retained in the Errors Correction Branch for about nine days, which is the cycle period for processing returns, to be available for any possible future action during the processing. After the returns are retained in the Service Centers for about one year, they are sent to Government storage depots. Microfilming of returns is not necessary as all pertinent information from each return is transcribed, verified and posted to the consolidated tax account in the National Computer Center and transcripts of these records back as far as 27 months are available to tax administrators.

The Computer Branch of each Regional Service Center utilizes peripheral equipment and digital computer systems in the daily processing and conversion of punch card data to magnetic tape records. This process includes the computation and validation of tax liabilities of all taxpayers within each respective region. Tapes are forwarded to the National Computer Center for processing and updating the Master Tape File of all taxpayers records.

Each Computer Branch also maintains and controls hundreds of different programs to process and print various registers, notices, mail labels and other types of documents

as a result of the processing performed at the National Computer Center and internally at the Service Centers. Each Computer Branch also maintains and controls several thousand reels of magnetic tape containing various types of information regarding the taxpayers in the particular region.

Regarding the processing of tax returns in the Computer Branch of a Service Center, the pertinent tax information is transferred from the punched and verified cards to magnetic tape for processing further by Honeywell 200 model computers. On this high-speed printer tax information processed on magnetic tape is converted into readable form. A typical Computer Branch processes returns on a ten-hours-a-day, seven-days-a-week cycle. During the processing cycle when information on the punched cards is transferred to magnetic tape and mathematically verified, any errors discovered by the computer are listed on error registers which are forwarded to the Error Correction Branch.

In the Error Correction Branch, mathematical or other mistakes detected by machine processing are corrected. Since the original returns and documents have been forwarded to this Branch, the personnel of this branch compare, manually, the original returns and documents with the machine print-out of error conditions. The personnel perform research, perfect and resolve both the processing and

taxpayer errors that have been detected during the work cycles within the Service Center. Proper action codes are assigned to correct the errors on the error register which when corrected is forwarded, along with source documents, back to the Transcription Branch which punches up new cards. After the data in the corrected punch cards is verified, the cards are returned to the Computer Branch where the information is converted to magnetic tape and then it joins the normal flow of work. In this manner the transcription tapes are corrected when errors are found.

Magnetic tape output of the Computer Branch containing pertinent tax information from individual and business returns is made ready for mailing to the National Computer Center. At the National Computer Center the information is posted to the accounts in the Master File. The Receipt and Control Branch packages and releases the reels of magnetic tapes to the National Computer Center. They are air mailed to Washington, D. C., and then taken by motor to Martinsburg, West Virginia. They are air mailed because of the time element and the need to arrive on time to make the six p.m. start of the processing cycle Saturday nights at Martinsburg and the Washington airport is the closest big facility. Each 2,400-foot reel of output tape contains an average of 15,000 taxpayer records. On each record is the taxpayer's name, identifying account number and all pertinent data from his return. The Receipts

and Control Branch also sends source documents from which output tapes are prepared to proper file series. This branch also packages and ships documents, tapes, and print-outs to Social Security Administration, Federal Reserve Banks, state employment security agencies, District Offices, and elsewhere.

At the National Computer Center, the magnetic transaction output tapes from the seven service centers become input tapes. The data on them is used to update the Master File each week. Transaction tapes are returned to the various service centers showing changes to the Master File in the form of accounting and adjustment output tapes. Other output tapes have become known as action tapes. When print-outs are prepared from them, they disclose (1) who failed to file a return, (2) who owes taxes for previous years, (3) who filed duplicate claims for refunds, (4) who is entitled to a refund. These output tapes reveal also any discrepancies or unusual characteristics regarding any particular return. The smallest peculiarity is logical grounds for closer examination and audit.

Tax refund tapes listing amounts owed taxpayers are prepared and forwarded directly to the U. S. Treasury Department disbursing offices where refund checks are printed and mailed to taxpayers. Other output action tapes are forwarded to the regional service centers where they

are used to prepare tax bills, delinquent notices, and other types of data to be sent to taxpayers. Output tapes also identify those returns which, according to the audit criteria, are to be considered for audit.

Back in the service centers, the output tapes from the National Computer Center are printed out in the Computer Branch and forwarded to the Accounting and Adjustment Branches. The Accounting Branch controls accounting outputs from the National Computer Center, like settlement registers, and performs required journalization and general ledger posting. It initiates or processes such action as tax account transfers, tax account adjustments, debit or credit transfers, statutory clearances, and other actions, all related to Master File accounts of taxpayers. The Accounting Branch also performs the functions of balancing Master File accounts with the general ledger maintained in the Service Center. It reconciles accounts with regional disbursing offices, prepares periodic trial balances, prepares statements of accountability for the Service Center Director's Office and the Statement of Classified Collections. The Accounting Branch controls accounting documentary data received from District Offices for entry to Master File and processes out-of-region Master File accounting transactions. It also prepares periodic and special financial reports covering deposits and collection data for transmittal to the National, Regional, and District Offices.

The Adjustment Branch receives adjustment requests and determines appropriate action to be taken, including any adjustment to tax due, penalties and interest due, and to the entity section of a module. This branch classifies, numbers, controls, and routes incoming adjustments and claims, and makes adjustments to both Master File and Non-Master File taxpayer accounts. It also controls and processes statutory case adjustments.

The Research Branch establishes, maintains, and controls permanent and temporary tax return files. It retires returns and documents in accordance with prescribed procedures, which call for returns to eventually be stored in Government depots.

District Offices

There are 58 district offices, each headed by a District Director, who is charged with the responsibility of administering the internal revenue laws within the jurisdiction of his district in conformance with established IRS policies and programs of the National and Regional Offices.

Figure 2-8 shows the typical chart of the organization of the office of District Director. It includes four main divisions, which are Audit, Collection, Administration, and Intelligence.

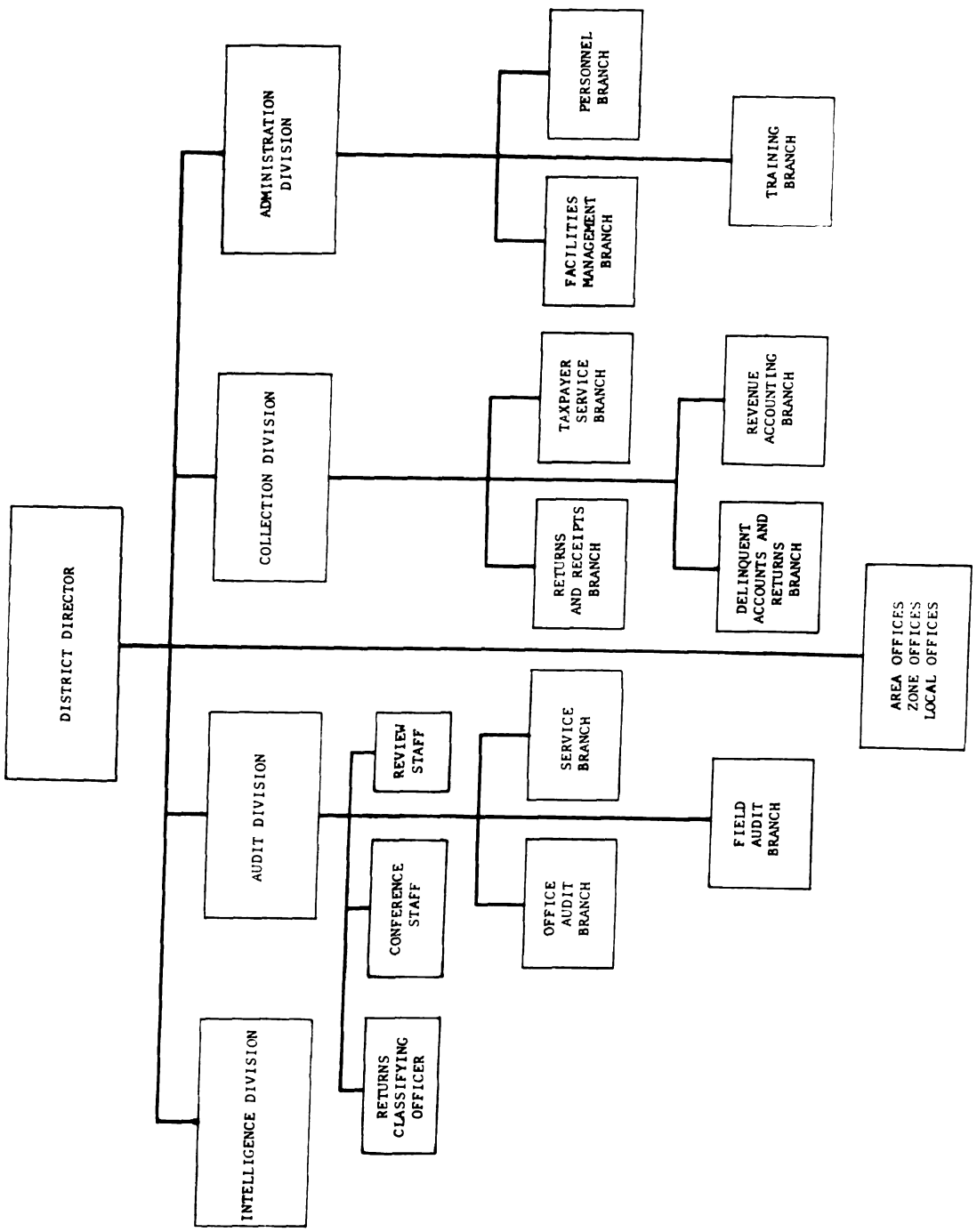


Figure 2-8. Organization of the Office of District Director

Some filing of returns by taxpayers is still going on in district offices. Direct filing with regional service centers is being phased-in gradually up to the year 1970. Until that time some district offices must devote part of their effort to the work load of receiving tax returns, processing them manually and getting them ready for the computers, and then forwarding them to the service centers.

Computer Equipment Being Used by the IRS

The IRS is using modern, high-speed, electronic equipment of the third generation in its nation-wide network of computer systems. The major items of equipment employed by the IRS in this configuration consist of three IBM 360/Systems, five IBM 7074/Systems, nine Honeywell H-200 Main Processor Systems, nine Honeywell H-200 Input/Output Processors, and two Stromberg Carlson Microfilm Printers. Table 2-4 shows the IRS computers and their locations. Computers are located in the National Computer Center, the seven Service Centers, the Detroit Data Center, and in the old Pension Building (headquarters of the Assistant Commissioner for Data Processing) of the Washington, D. C. National Offices.

Most of the equipment is owned but some is leased. The IRS had followed the policy of leasing computers at the inception of the installation and application of its ADP Plan but shifted to a policy of purchasing computers in 1964.

Table 2-4.--Internal Revenue Service computer equipment.

Type of Configuration and Model Description	Quantity	Location
IBM System/360 Model 65	3	National Computer Center
IBM System/7074 (30K)	2	National Computer Center
Honeywell H-200 Main Processor (24K)	7 1 1	One at each Service Center IRS Data Center at Detroit National Office in Washington (Pension Building)
Honeywell H-200 Input/Output Processor (12K)	7 2	One at each Service Center IRS Data Center at Detroit
IBM System/7074 (20K)	3	IRS Data Center at Detroit
Stromberg Carlson Microfilm Printers	2	National Computer Center

> Advantages to the Government in purchasing computer equipment were demonstrated by the Lease-Purchase Study of November, 1963. Accordingly, the three computers at the North-Atlantic, Midwest, and Western Service Centers and the two large-scale computers and support equipment at the National Computer Center were purchased in 1964. Depreciated purchase cost was equal to approximately two years' rental.
>
> Bids were requested from manufacturers for equipment to replace leased equipment (scheduled for purchase) to do the ADP service centers' processing job. The proposal which was accepted provides nonrecurring savings estimated at $1 million over the next three years. Because the multiprocessing capabilities of the selected computer require fewer computer systems to meet operating needs, it now seems likely that $700,000 additional savings will be realized by 1967.[44]

All, or part of, the presently installed computer equipment, it should be recognized, may be subject to change in the future for two reasons. First, the continuing review and analysis of IRS requirements as the ADP system is refined and expanded may cause changes in equipment utilization. Second, technological changes caused by research and development by the many manufacturers in the dynamic electronic industry may make some of the present equipment obsolete.

Changes in the IRS equipment have already been induced by the second reason--rapid technological advances. The IRS computer system originally had two IBM 7074 Systems and one IBM 1401 System, the latter being used primarily as a supporting configuration for the larger 7074's. When IBM

---

[44]Sheldon S. Cohen, 1965 Annual Report, p. 61.

came out with their latest advancement in computer system technology in the form of the 360/System with a whole family of models, the IRS shifted at the National Computer Center to the 360/System, Model 65. However, "In the case of the service centers, a decision was made to replace IBM 1401 computers with Honeywell H-200's."[45]

IBM System/360 in the IRS Network of Computers

The computer configuration utilized by the National Computer Center at Martinsburg, West Virginia consists of three IBM 360/Systems, Model 65 and two IBM 7074/Systems (30K). Another IBM 360/System has been planned for purchase in 1969 and still another sometime after that.[46] The IBM Systems/360 are Model 65 with 14 Hypertapes and disk storage drive units attached. Four dual reel-type (1/2") tape units are included. The system is also equipped with a console typewriter which serves as a communication link between the operator and the system.

Pertinent operational facts would include maximum storage capacity and operating speeds of the component units such as memory, disks, hypertapes, reel-type tapes. The

---

[45]Sheldon S. Cohen, 1965 Annual Report, p. 58.

[46]William H. Smith, in his keynote address before the Computers and Taxes Conference held June 18-19, 1968 in Washington, D. C. at Statler-Hilton Hotel, Sponsored by the George Washington University. Mr. Smith is Deputy Commissioner of the IRS.

memory component has a maximum storage capacity of 262,144 alphabetic characters or 524,288 numeric digits. Rapid operating speeds permit the central processor to add two nine-digit numbers yielding a ten-digit result 153,845 times a second. Maximum disk storage capacity (one disk pack) is 7,250,000 alphabetic characters or 14,500,000 numeric digits. The third IBM 360/System installed in February, 1968 is equipped with three disk storage units. Regarding operating speeds, the disk storage can transfer data between the disk storage unit and the central processor at the rapid rate of 156,000 alphabetic characters or 312,000 numeric digits per second. Access time to locate starting point is 85 milliseconds.

One cartridge of hypertape can contain, as maximum storage capacity, 65,275,200 alphabetic characters or 13,550,400 numeric digits. This is equivalent to 24,176 taxpayer accounts containing a full three-year record. It is also equivalent to 1,613,880 fully punched numeric 80-column cards. Regarding operating speed, hypertape reads and writes 340,000 alphabetic characters or 680,000 numeric digits per second. This is equivalent to reading or writing 125 taxpayer accounts containing a full three-year record in one second.

Regarding maximum storage capacity of reel-type tape, one tape reel can contain 23,040,000 alphabetic

characters or numeric digits. Operating speeds of reel-type tape units permit the reading and writing of 90,000 alphabetic characters or numeric digits per second.

IBM 7074/Systems

There are two IBM 7074/Systems with 30K at the National Computer Center and three IBM 7074/Systems with 20K at the Data Center in Detroit. The 30K Systems have ten Hypertape and seven reel-type tape units attached. They are also equipped with a console typewriter which serves as a communication link between operator and system.

The memory component has a maximum storage capacity of 30,000 ten-position words which can contain 150,000 alphabetic characters or 300,000 numeric digits. Regarding operating speeds, the central processor can add two nine-digit numbers yielding a ten-digit result 125,000 times a second.

Maximum storage capacity of one cartridge of Hypertape is 32,637,600 alphabetic characters or 65,275,200 numeric digits which is equivalent to 12,088 taxpayer accounts containing a full three-year record. Regarding operating speeds, Hypertape reads and writes 170,000 alphabetic characters or 340,000 numeric digits per second. This is equivalent to reading or writing 63 taxpayer accounts, containing a full three-year record, per second.

The maximum storage capacity of one reel of reel-type tape and operating speed of reel-type tape units are the same as that cited above under the IBM 360/Systems.

The IRS Data Center at Detroit has three IBM 7074/ Systems of 20K, with ten tape units attached. They are also equipped with a console typewriter which serves as a communication link between the operator and the system.

The maximum storage capacity of the memory in this 20K system consists of 20,000 ten-position words. It can hold 100,000 alphabetic characters or 200,000 numeric digits. The operating speed of the central processor permits the addition of nine-digit numbers yielding a ten-digit result at the rate of 125,000 times per second.

The maximum storage capacity of the tape units (one tape reel) is 23,040,000 alphabetic characters or numeric digits. Operating speeds of the tape units permit reading and writing at the rate of 60,000 alphabetic characters or numeric digits per second.

Honeywell H-200 Systems

Each one of the seven Service Centers as well as the IRS Data Center at Detroit and the IRS National Office at the Pension Building in Washington, D. C. have a Honeywell H-200 Main Processor System (24K), with five tape units, one printer and one card read/punch unit attached. The maximum storage capacity of the memory component in

this system is 24,000 alphabetic characters or numeric digits. Regarding operating speed, the central processor in this system can add two nine-digit numbers yielding a ten-digit result 14,705 times per second.

The maximum storage capacity of the magnetic tape units, for a one tape reel, is 23,040,000 alphabetic characters or numeric digits, which is equivalent to 288,000 fully punched 80-column cards. Operating speed of the magnetic tape units permit reading and writing of 64,000 alphabetic characters or numeric digits per second. Input cards are read at the rate of 800 cards per minute or 48,000 per hour. Cards are punched at the rate of 250 cards per minute or 15,000 per hour. Printing is at the rate of 900 lines a minute, with 132 characters per line, or 118,800 characters per minute.

Each of the seven Service Centers has one, while the IRS Data Center at Detroit has two Honeywell H-200 Input/Output Processor Systems with 20K, which have two magnetic tape units, one printer and one card read/punch unit attached. One of the 12K systems in the IRS Data Center at Detroit is equipped with two printers.

The maximum storage capacity of the memory in this system is 12,000 alphabetic characters or numeric digits. The operating speed of the central processor permits the addition of nine-digit numbers yielding a ten-digit result at the rate of 14,705 times per second.

The maximum storage capacity of the magnetic tape units (one tape reel) is 23,040,000 alphabetic characters or numeric digits, which is equivalent to 288,000 fully punched 80-column cards. Operating speeds of the magnetic tape units permit reading and writing of 28,800 alphabetic characters or numeric digits per second. Input cards read at the rate of 800 cards per minute or 48,000 per hour. Cards are printed at the rate of 900 lines a minute, with 132 characters per line, or at the rate of 118,000 characters per minute.

Microfilm Printers

The National Computer Center at Martinsburg, West Virginia has two Stromberg Carlson Microfilm Printers. This is a system composed of a magnetic tape unit, a high-speed camera, and a cathode ray tube. A polaroid camera is also attached to photograph test frames. Pertinent operational facts concern capacity of frames and reference lists.

Capacity of each frame fully recorded is 76 lines of information, each line consisting of 135 characters and control symbols. Capacity of total characters on one frame is 10,260. A frame measures 1/2" x 1/2" which means that one frame is equivalent to 135 fully punched 80-column cards or 13.5 inches of reel-type magnetic tape.

When fully operational in 1967 the entire year's reference lists will be printed by microfilm system in about 1,777 hours on 600,000 feet, or 114 miles, of film. To print the same data on hard copy (paper) would require 26,666 hours and 14.6 million feet (2,777 miles) of paper. To record the equivalent amount of information (155,520,000,000 characters) on reel-type magnetic tape, would require 6,750 reels or 3,069 miles of tape.

Expectations of the Automated Federal Tax System

Certain broad objectives were anticipated from the planned application of automatic data processing techniques to taxes which featured a National Computer Center and utilized the novel master file concept, taxpayer-identification number system, consolidated taxpayer accounts, and centralized processing. The following is the original list of objectives that were expected to be achieved in the enforcement and revenue-producing operations of the Internal Revenue Service:

1. Systematic check on failure of individuals and business entities to file returns.

2. Verification of mathematical accuracy of returns filed and computation of tax or refunds due.

3. Determination of taxpayer indebtedness for prior year taxes of all types prior to issuance of a current refund, and identification of duplicate refunds.

4. Provision for a consolidated tax account for each taxpayer that will reflect current tax status at any given point in time.

5. Matching of data reported on information documents with corresponding data on taxpayer returns.

6. Classification of returns for audit purposes.

7. Preparation of management, operating and statistical reports.[47]

These objectives cite advantages of the system to the Government. They are expected to plug tax loopholes and solve some of the pressing problems that have plagued the IRS.

Direct benefits of the automated Federal tax system to taxpayers are expected. They can be cited as follows:

1. Refunds processed quicker.

2. Mobile taxpayers who move without leaving a forwarding address can have their tax return refund checks forwarded properly through number identity in updated master file.

3. Identifying numbers assure authentic credit to proper accounts and not to taxpayers with same or similar names.

4. Repetitive requests for same information from taxpayers eliminated by updating of accounts.

---

[47]Dana Latham, 1960 Annual Report of Commissioner of Internal Revenue, Internal Revenue Service, Department of the Treasury, Publication Number 55 (Washington: Government Printing Office, 1960), pp. 31-32. Mr. Latham was Commissioner of the Internal Revenue Service from November 5, 1958 to January 20, 1961. The dramatic ADP Plan was promulgated during this period.

5. Conscientious taxpayers assured that total tax burden is fairly distributed by the system which identifies those who seek to evade their lawful obligations.[48]

These objectives, which are benefits to both the Government and taxpayers, can be used as criteria by which to judge the effectiveness of the operations of the entire system after it has had a year or two of nationwide experience with all facets completely developed and fully operational. Theoretically, it appears to be a significantly improved system for efficient tax administration and for inspiring voluntary compliance with and confidence in Federal tax laws.

Results of operations and anticipations for the future regarding the automated Federal tax system are taken up in the next chapter.

---

[48]Sheldon S. Cohen, 1965 Annual Report of the Commissioner of Internal Revenue, Internal Revenue Service, U. S. Treasury Department, Publication No. 55 (Washington: Government Printing Office, 1965), p. 15.

CHAPTER III

THE EFFECTS OF THE APPLICATION OF COMPUTERS IN THE TAX-COLLECTING ACTIVITY OF THE INTERNAL REVENUE SERVICE

This chapter considers the effects of the application of computers in the tax-collecting activity of the IRS. The impact of computers on the results of operations is traced by fiscal years through (1) the phase-in period (1962 through 1966) of computer installations at the regional service centers and (2) the first two years (1967 and 1968) of the four-year phase-in period for direct filing of returns with the service centers. An evaluation of the system is included along with future plans.

Results of Operations by Fiscal Years Which End June 30

1962 Results

The year 1962 was a memorable year for the IRS in at least two important respects: (1) it was the year marking a century of operations--its 100th birthday, and (2) it was the first year modern high-speed computers began on a limited basis to process tax returns.

The first year of a five-year phase-in period for the installation of a nation-wide network of computer systems began in 1962. Some of the significant highlights of this first year of the implementation of the ADP Plan were, as follows:

1. Establishment of the Office of Assistant Commissioner, Data Processing,
2. Completion of systems design and programs for processing business returns,
3. Completion of the National Computer Center at Martinsburg, West Virginia, and the new Atlanta Regional Service Center building,
4. Activation of the Philadelphia Regional Service Center,
5. Processing of business returns in the Atlanta Regional Service Center and the National Computer Center,
6. Initiation of systems design for processing individual returns,
7. Selection of sites for the Dallas, Cincinnati, and Omaha regional service centers, and
8. Continuation and improvement of the plan for personnel redeployment.[1]

The Master File had its inception in 1962 when the pilot Southeastern Region's Service Center began processing corporation income tax returns along with certain

---

[1]Mortimer M. Caplin, 1962 Annual Report of Commissioner of Internal Revenue, Internal Revenue Service, U. S. Treasury Department, Publication Number 55 (Washington: Government Printing Office, 1962), p. 25.

employer and excise tax returns. The Business Master File (BMF) was the first segment of the Master File to be activated. "This major effort required the completion of systems development, computer programming, and necessary testing to assure proper systems performance and involved the combined team work of over 100 digital computer systems analysts and programmers.[2]

Systems development progressed on schedule for the activation of the Individual Master File (IMF) segment of the Master File next year, 1963, in the pilot Southeastern Region's Service Center.

1963 Results

A new high of 105.9 billion dollars was collected in the fiscal year of 1963. This new record was an increase of 6.5 billion dollars over the previous year and represented the first time United States revenue collections exceeded 100 billion dollars.

> There are definite indications that substantial improvements in voluntary compliance contributed to the sharp rise in internal revenue collections . . . the conversion to Automatic Data Processing had a salutary effect on taxpayers who had not been measuring up to their tax responsibilities. During the year many taxpayers came into district and local offices to voluntarily disclose unreported income, pay prior years taxes, and state that they wanted

---

[2]Mortimer M. Caplin, 1963 Annual Report, p. 15.

to get their taxes current before ADP was fully implemented.[3]

In 1963 the Master File at the NCC contained the accounts of business entities in the BMF for only the Southeastern and the Mid-Atlantic regions and the accounts of individual taxpayers in the IMF for only the Southeastern Region. The Southeastern Region, the pilot region, became fully automated with both the BMF and the IMF for its area activated.

In the Spring of 1963 a computer took its first look at the magnetic tape record of seven million individual tax returns from the seven states comprising the Southeastern Region. The sensors of this giant computer immediately detected a case where a taxpayer had filed seventeen different tax returns on which he claimed a refund from each.[4] This was the first big fraudulent refund returns case that developed from the use of computers. The taxpayer involved was sentenced to the Federal penitentiary at Atlanta for fraud. Under the old, manual methods, such duplicate refund cases were difficult to detect, but with the computer system's Master

---

[3]Mortimer M. Caplin, 1963 Annual Report, p. 8.

[4]Mortimer M. Caplin, "The Taxpayer-Identifying Number System: The Key To Modern Tax Administration," American Bar Association Journal, XLIX, No. 12 (December, 1963), p. 1161.

File, the duplicate returns problem was on the way to being solved.

> Even in the short span of its operation, and with its limited application, the system has demonstrated its capabilities and worth in the way of protecting the revenue and insuring fairer distribution of the tax burden. This has been accomplished by detecting failures to file required tax returns, detecting instances of multiple filing of overpayment returns by the same taxpayer, and mechanically applying overpayments, otherwise refundable, against outstanding taxes due from the claimants.[5]

1964 Results[6]

Eight million individual returns and declarations of estimated tax from the Southeastern Region were processed through the computers, which picked up five million dollars in collections by detecting mathematical errors and other mistakes. Computers detected mathematical errors at the rate of one out of every eight returns they checked, which was three times as many as human beings were finding.

---

[5]Mortimer M. Caplin, 1963 Annual Report, p. 15.

[6]Sources of 1964 results were the following: Sheldon S. Cohen, "New Tax Collector Tells His Goals," Nation's Business, LIII, No. 4 (April, 1965), p. 78; "When Machines Check on Taxes," U.S. News and World Report, LVIII, No. 16 (April 19, 1965), pp. 103-04; "When The Machines Get Your Tax Return," U.S. News and World Report, LVIII, No. 16 (April 26, 1965), p. 110; Bertrand M. Harding, 1964 Annual Report of Commissioner of Internal Revenue, Internal Revenue Service, U. S. Treasury Department, Publication Number 55 (Washington: Government Printing Office, 1964), p. 12. Mr. Harding was Acting Commissioner from July 11, 1964 to January 24, 1965.

Serious errors and evasions were detected by the computers which permitted the imposition of additional tax assessments. These extra assessments in the Southeastern Region, where the computers were in full operation for both the IMF and the BMF, increased 25% in 1964 compared with a 9% rise in the rest of the country.

Three hundred thousand tax evaders who failed to file returns were uncovered. $2.6 million in duplicate refunds were avoided in 1964. Three fraud cases involving multiple refunds resulted in convictions. Cross-checking by taxpayer number of current returns showing refund claims with back taxes owed for earlier years resulted in the offset of $16.7 million and saved the IRS from paying refunds and then recollecting back taxes from those to whom refunds were made.

On returns filed in 1964, individual taxpayers reported two billion dollars more interest income than in 1963, an increase of twenty-eight percent over the previous year. Also, the number of taxpayer returns showing interest income increased 45 per cent. The number of taxpayer returns reporting dividend income increased twenty per cent in 1964 over 1963. There was also a sharp increase in the dollars amount of dividend income reported in 1964 compared to 1963 for individuals.

Many taxpayers came forth and volunteered, in anticipation of being detected by the new computer system,

to report some of their earlier income that they had neglected to report. $4.8 million of back taxes came in from 1962 through 1964 from such people.

Business returns from the Southeastern, Middle-Atlantic, Central, and Southwestern Regions, representing half the nation, were processed. From the eight million business returns filed and run through the BMF, the computers turned up 185,000 delinquency leads which resulted in $30 million additional taxes.

Other developments regarding the computer system in 1964 were reported by Mortimer M. Caplin, the Commissioner of Internal Revenue, as follows:

> . . . Significant savings in computer processing time were realized by splitting the IMF into active and inactive accounts for each weekly posting cycle. The necessary systems redesign and computer reprogramming is being completed so that this principle can be applied to the BMF in 1965. Preparations are nearing completion for a test to be conducted involving the use of government telephone lines for the transmission of master file input and output data between NCC at Martinsburg, West Virginia and the seven service centers. If this test proves successful, when installed, this process will eliminate numerous shipments of magnetic tape.[7]

1965 Results[8]

A record 114.4 billion dollars were collected in 1965, despite tax rate deductions made effective during

---

[7] 1964 Annual Report, p. 12.

[8] Sources of 1965 Results are as follows: "Computers Get Results on Taxes," U. S. News and World Report, LX, No. 6 (February 7, 1966), p. 82; "Computers Spotting

the years. An all-time high of 102.5 million tax returns were filed. Three hundred and forty million information returns were received.

An important milestone in the ADP Plan was reached on January 1, 1965. In 1965 all business returns from every part of the nation were processed by computers for the first time and recorded in the Business Master File at the National Computer Center.

One of the big features of the ADP System is that it identifies taxpayers who do not file their returns.

> Under ADP, the delinquency check is performed by comparing the recorded returns filed against the filing requirements in each taxpayer's account in the master file . . . . Results of the BMF check for 1965 are as follows:
>
> | | |
> |---|---|
> | Number of notices of nonreceipt issued... | 1,011,366 |
> | Number of delinquent return investigation notices issued..... | 583,749 |
> | Number of delinquent returns secured..... | 396,915 |
> | Dollar value of returns secured..... | $83,289,000[9] |

After the computers identify nonfilers and delinquents and they do not respond to notices, their cases are turned over to the enforcement personnel, who use legal procedures to keep the inventory of delinquent accounts at a minimum.

A delinquency check by computers in the Southeastern region detected fourteen thousand individual tax

---

False Tax Returns," U. S. News and World Report, LX, No. 14 (April 4, 1966), p. 99. Sheldon S. Cohen, 1965 Annual Report of Commissioner of Internal Revenue, pp. 13-19.

[9]Sheldon S. Cohen, 1965 Annual Report, p. 15.

evaders who failed to file returns and revealed the need to investigate 80,000 additional cases.

In the Southeastern and the Middle-Atlantic Regions, the only two regions processing individual returns by computers through the IMF in 1965, 75,000 cases of multiple refund claims by individuals were detected. The Middle-Atlantic region, with service center headquarters in the city of Philadelphia, was phased into the IMF in 1965. That year a duplicate returns case involving three people who had filed twenty-five returns claiming refunds totaling thousands of dollars led to indictments against the trio in California. The point being made here is that, with the Master File, mobility of taxpayers among regions is no longer a problem in detecting duplicate filers and then finding them to impose sanctions of the law on them for their violations.

IRS officials cited other cases as examples of tax fraud uncovered by computers. An accountant tax evader with annual income ranging from $25,000 to $35,000 had not filed any returns since 1957. Another taxpayer had been reporting earnings of $3,000 to $4,000 on his returns, but when his returns were matched with information returns filed by corporations, additional unreported dividends income of $20,000 was revealed. A businessman earning a salary of $10,000 and holding a stock paying dividends of $10,000 evaded taxes by not filing a return,

but cross-matching by the computers revealed his violation.

Mathematical errors detected and corrected in 1965 benefited both taxpayers and the Government. On this point Commissioner Cohen said,

> The mathematical verification of 62.9 million tax returns disclosed 3.9 million errors in computation of tax, an increase of 49 per cent over last year. The tax increase resulting from mathematical verification was $194 million, while the tax decrease was $94 million--a net recovery of $100 million. This net yield was less than eight per cent above the 1964 yield principally because 75 per cent of the additional errors detected involved returns in which the taxpayer overstated his tax liability. In detecting and correcting these errors it was found that the primary cause for the overstatement of tax liability was that taxpayers were not taking advantage of their right to use the standard deduction providing them the greatest tax advantage. This was probably due to the minimum standard deduction being available for the first time with respect to 1964 returns.[10]

Important benefits of mass document processing through the medium of ADP with high-speed computers began to appear and be crystalized in the Service Centers where computerization took place. These were as follows: (1) rapid identification of nonfilers, (2) prevention of duplicate refunds, (3) complete verification of estimated tax credits, and (4) identification of taxpayers who underpaid their estimated taxes.

---

[10] 1965 Annual Report, p. xiii.

Major management improvements by the IRS contributed substantially to cost reduction, which added up to $17.1 million in fiscal 1965. Some examples of ADP system changes made were, as follows:

1. A new system which transfers data directly from magnetic tape to microfilm has been adopted for production of final printed computer outputs such as indexes and settlement registers for use in district offices and service centers. The small volume of microfilm contrasts sharply with the great volume of paper outputs previously necessary. Savings in manpower (four man-years), space, paper, and computer printout time are estimated at $298,700 annually beginning in 1966.

2. A computerized tape library system was devised which enabled the Service to defer additional tape purchases estimated at $303,000.

3. Simplified key punching procedures resulted in first year savings of 136 man-years and $542,800 during fiscal 1965.

4. Purchasing rather than leasing computers and certain other ADP equipment was found to be to the Government's advantage. Nonrecurring savings to be realized through this change are estimated at $1 million over the next three years.

5. Issuance by service centers of follow-up notices on individual income tax accounts completes the mechanization of all major collection notices to the taxpayer. This change-over will result in savings of 128 man-years and $587,000 in fiscal 1966 and ensuing years.

6. Consolidation of New York and Northeast Regions into the North-Atlantic Region.[11]

The 3.5 million returns examined (audited) in fiscal 1965 represents a four per cent decrease from 1964

---

[11]Henry H. Fowler, 1965 Annual Report of the Secretary of the Treasury, Treasury Department, Document No. 3236 (Washington: Government Printing Office, 1966), pp. 115-16.

which was caused by a continuation of the "cutback planned in fiscal 1963 to provide a more balanced program by shifting emphasis from the examination of low income nonbusiness returns to that of higher income nonbusiness returns and small business returns."[12]

The exempt organizations audit program has been expanded in recent years. Specialized training programs and special studies have been developed in this area. A master file of exempt organizations has been established and ADP processing techniques are being applied to this area in order to improve compliance.[13]

1966 Results

The fiscal year 1966 reflected a pattern of continued growth in the national economy, tax returns processed, and dollars of revenue collected. A record number of 104.1 million tax returns was filed and processed. Gross internal revenue collected jumped sharply to a new record of 128.9 billion dollars. Refunds, including interest, increased to a new record of 7.3 billion dollars.

The gradual conversion of IRS to automatic data processing of individual income tax returns remained on schedule. The Southwest, Central (except Michigan), and

---

[12] Ibid., p. 122.

[13] Ibid.

Western (except California) Regions were successfully introduced into the individual master file operation in the year 1966. Remaining regions to be phased into the IMF operation next year were the Mid-West and North-Atlantic Regions and the States of Michigan and California. On January 1, 1965 the BMF had become operational nationwide, with all regions phased-in. The planned schedule called for the ADP system to be completely operational by January 1, 1967.

The master file continued its healthy growth in 1966. The BMF went from 5 million accounts at the close of 1966.[14] Operations in 1966 increased the IMF accounts from 17.8 to 36.9 million.[15]

Employee redeployment in the district offices resulting from implementation of the ADP plan was handled smoothly. The Civil Service Commission helped minimize the impact on employees in this extensive conversion program.

> . . . Permanent staffing in the district office returns processing function was reduced from approximately 12,000 in 1960 to 4,300 in June, 1966, a net reduction of some 7,700 positions. This has been accomplished without once resorting to involuntary

---

[14]Sheldon S. Cohen, 1966 Annual Report of Commissioner of Internal Revenue, Internal Revenue Service, U. S. Treasury Department, Publication Number 55 (Washington: Government Printing Office, 1966), p. 15.

[15]Ibid.

> separation or transfer. All placements were on a voluntary basis, and the majority were made within the employees' own district offices. Present plans call for about 1,800 employees to remain at the end of conversion.[16]

The IRS Data Center at Detroit opened as planned on January 1, 1966. Its purpose was to relieve Regional Service Centers of certain activities. All data processing activities in the Service Centers not directly related to the ADP master file began shifting to this Data Center in Detroit.

There were many improvements in tax administration due to the ADP system. Programmed delinquency check-ups were designed to collect past-due taxes and identify non-filers. Delinquency checks performed in 1966 involved the mechanical comparison of data in the taxpayer accounts located in the master file at the NCC. Recorded returns that were filed were compared with the filing requirements in each consolidated taxpayer account in the BMF only, as the IMF was not yet fully operational.

> . . . Results are shown below for the BMF check in 1966, when all seven regions were included, compared to 1965, when only four regions had been under the BMF for sufficient time to permit this check:

	1965	1966
Number of notices of non-receipt issued	1,011,366	1,981,872

---

[16] Sheldon S. Cohen, 1966 Annual Report of Commissioner of Internal Revenue, Internal Service, U. S. Treasury Department, Publication Number 55 (Washington: Government Printing Office, 1966), p. 16.

	1965	1966
Number of delinquent return investigation notices issues	583,749	1,005,723
Number of delinquent returns secured	396,915	777,624
Dollar value of returns secured	$83,289,000	$171,077,000[17]

A computerized delinquency check of individuals was performed for the Southeastern Region in 1965. This examination uncovered thousands of cases in which taxpayers had been depriving themselves of millions of dollars in legitimate refunds by failing to file tax returns.

Mathematical verification by computers was applied to all the high-volume business returns filed in the nation. The mathematical verification process was also applied to individual returns filed in the five regions having all or part of such returns processed by computers. The computers performed a more comprehensive mathematical verification of Form 1040 than manual methods. All estimated tax credits claimed by individuals were verified by computers in the Southeast and Middle-Atlantic Regions. These verifications were estimated to have yielded about 19.1 million dollars[18] in additional tax revenue that would not have been produced without computers.

Computers were used to calculate net refunds; that is, to check on outstanding accounts before making

---

[17] Ibid.

any refunds. Figures show that the ADP system has been effective in identifying old unpaid taxes before permitting current refunding of overpayments to taxpayers. "In fiscal year 1966, overpayments numbering 291,863 and amounting to $58.7 million were offset against tax liabilities for the same taxpayer."[19]

ADP ended the problem of duplicate refunds. Many taxpayers with honest intentions had filed during one year more than one refundable income tax return, because they had worked at more than one place. Under the old manual system, there was a considerable lag between the time the refunds were made and the duplication "errors" were detected. Recovery of the money at a later date was often very difficult and expensive. Under the new ADP system, duplicate returns requesting refunds can be detected before refund checks are issued. "This system resulted in over $6 million in additional revenue in the calendar year 1965 in the two regions using ADP procedures for processing individual returns."[20]

Research continued on the optimum use of information returns. Tests conducted on the matching of information documents with self-assessed tax returns were fruitful. They revealed the following:

---

[19] Sheldon S. Cohen, 1966 Annual Report, p. 17.

[20] Ibid.

Apparent Law Violators in the Southeastern Region	Number	Additional Taxes and Penalties[21]
1963 Nonfilers.....	1,699	$150,000
1963 Underreporters.....	1,513	193,000
1962 Delinquents.....	372	72,000
1963 Frauds.....	3	132,000
1963 Frauds.....	3	Under Investigation
In Southwestern and Mid-Atlantic Region		
1964 Delinquents.....	11,000	478,000

ADP scrutinized all tax returns in making audit selections. Computers enabled a systematic and rapid screening of tax returns for selection of those with characteristics of tax error.

> . . . For this purpose audit selection criteria are programmed into the computers at the service centers and the National Computer Center. The computers are also programmed to pass over the returns of taxpayers where seemingly questionable issues have been examined for the immediately preceding year and found to be acceptable. This means that generally a taxpayer will not be contacted from year to year for the same reason, a consideration of no small consequence in reducing annoyance to the public. It means also that audit can be extended to cover other taxpayers whose returns may not have been selected for audit because of manpower limitations.[22]

The classification and selection of returns for examination was only the starting point. Manual screening was required after computer selections in order to achieve a manageable audit workload. Using both manual

---

[21] Ibid.

[22] Sheldon S. Cohen, 1966 Annual Report, p. 17.

and machine methods, 18.2 million returns were classified as audit candidates and 2.9 million of that number were selected for examination.[23]

Optional filing of returns with Regional Service Centers was popular in the Southeastern and Mid-Atlantic Regions. This centralization saved costs for sorting, packing, and shipping functions at the district offices estimated at $50,000 for 1965 and $113,000 for 1966.[24]

ADP resulted in increased voluntary compliance, according to the Commissioner.

> Because of the difficulty of determining motivation, no accurate measurement can be made of the amount of revenue realized from taxpayers who have filed delinquent or amended returns because of a fear of being caught through ADP. There are good reasons to believe, however, that many millions of dollars in previously unreported taxes have been realized from taxpayers who have specifically indicated that they were filing delinquent or amended returns because of fear of detection by the ADP system.[25]

Tangible results of the ADP system as it shifted into second gear began to crystalize in 1966. Definite points of improvement in tax administration continued to appear. The list of improvements showed that

1. ADP identified nonfilers,

---

[23] Ibid., p. 22.

[24] Ibid., p. 17.

[25] Sheldon S. Cohen, 1966 Annual Report, p. 20.

2. ADP verified arithmetic on returns,
3. ADP calculated net amounts before refunding,
4. ADP stopped duplicate refunds,
5. ADP matched information documents with returns on a limited basis to reveal apparent
   a. nonfilers,
   b. underreporters,
   c. delinquents,
   d. frauds,
6. ADP scrutinized all returns in making audit selections,
7. ADP saved costs by centralization of filing in service centers,
8. ADP resulted in increased voluntary compliance.

Major management improvements by the IRS contributed toward the efficiency of programs and operations to the extent of tangible savings amounting to $14.4 million in fiscal 1966. Some examples of changes made which related to ADP were as follows:

1. Automated data processing programs are used to identify income tax returns having characteristics that indicate audit potential. The computer identification of returns saved approximately 13 technical man-years or $102,000, in fiscal 1966, and further savings are expected in fiscal 1967 when the program is scheduled to become operational nationwide.
2. A two-part "piggyback" mailing label was distributed with form 1040 individual income tax returns and form 1120 corporate income tax returns this year. Experience this year in two regions

indicates a 51 percent usage of the label, which contributed to faster and more accurate processing of returns and substantial manpower savings.

3. The option of filing returns claiming refunds direct with the service center, which was tried in the Southeast region in fiscal 1965, was extended to the Mid-Atlantic Region in fiscal 1966. Over 80 percent of the overpayment returns in each region were directed by taxpayers to the service center, eliminating the need for the Service to sort, pack, and ship these returns from district offices, to service centers. Savings to the Government in fiscal 1966 were estimated at $113,000. The option will be extended to additional regions in fiscal 1967.[26]

1967 Results

Tax returns, collections, and refunds were processed faster and more accurately than ever before in 1967. This progress was due to the fact that the computer system became fully installed in all regions of the nation. Commissioner Cohen said,

> Culminating 6 years of intensive effort, a major event in the annals of tax administration occurred when the automated Federal tax system became a national network on January 1, 1967. By bringing computers with all their capability and versatility into our administrative structure, the Service is equipping itself to cope with a workload that is constantly growing and tax laws that are ever changing and increasing in complexity.[27]

---

[26]Henry H. Fowler, 1966 Annual Report of the Secretary of the Treasury, Treasury Department (Government Printing Office: Washington, 1966), p. 120.

[27]Sheldon S. Cohen, 1967 Annual Report of Commissioner of Internal Revenue, Internal Revenue Service, U. S. Treasury Department, Publication No. 55 (Government Printing Office: Washington, 1967), p. v.

Highlights of IRS operations for the fiscal year 1967 were as follows:

1967 Operations Highlights[28] Item	MILLIONS 1966	MILLIONS 1967	Percent Change
Gross Collections	$128,880.0	$148,374.8	15.1
Refunds:			
Number	45.1	49.0	8.6
Amount	$ 7,314.6	$ 9,630.9	31.7
Returns Filed	104.1	105.4	1.3
Returns Examined	3.5	3.1	-10.7
Additional Tax From Enforcement	$ 2,862.8	$ 2,729.4	- 4.7
Delinquent Taxes Collected, Total	$ 1,309.7	$ 1,550.0	18.3

The first high point in the phase-in period for computers was reached January 1, 1965 when the first segment of the master file became fully operational. The Business Master File (BMF) became nationwide in scope. The second milestone was achieved January 1, 1967 when the other (IMF) larger segment of the master file was completed. In 1967 the Individual Master File (IMF) coverage became nationwide by the phasing in of the Midwest and North-Atlantic Regions, Detroit, Los Angeles, and San Francisco Districts. Individual income tax returns and accounts from the Office of International Operations (OIO) were scheduled to enter the system in 1968 to achieve complete coverage.

The computer system made a new deposit procedure possible in 1967 for direct payment of corporation

---

[28] Ibid., p. 1.

estimated income tax payments. Plans call for this new method to be extended to other business tax payments in 1968. Payment is required to be made directly to Federal Reserve Banks or member banks. As part of the procedure, taxpayers are provided with preaddressed punch cards which are completed and submitted with payments when due. Federal Reserve Bank deposits remittances to the Treasurer's account and forwards the punch cards to the Office of the Treasurer, where the data are transcribed to magnetic tapes which are forwarded to the National Computer Center. At the NCC the data on these tapes showing taxpayers' deposits are reconciled with amounts claimed as prepayments on returns. This type of procedure may conceivably be applied to individuals in the future. Advantages of this method are:

1. accelerated deposit to Treasury's account in Federal Reserve Banks,
2. taxpayer relieved of requirement to attach validated receipts to tax returns,
3. new deposit form simplifies bank processing, and
4. procedure eliminates several processing operations (like teller) in service centers and thus saves manpower.[29]

Transfer of necessary data to the ADP system was achieved. Complete transfers of non-master file data and programs formerly assigned to regional service centers were

---

[29] Ibid., p. 63.

made to the Data Center at Detroit. Everything in the nature of taxpayer correspondence and adjustments relative to both segments of the master file accounts and tax returns were processed in the Regional Service Centers. Tax returns were selected for audit examination by computers on a nationwide basis using ADP programmed criteria. "To reduce manual processing of prior-year delinquent accounts all business taxpayer open accounts from 1962 and individual accounts from 1963, are incorporated on the master files and processed under ADP procedures."[30] To sum up, the step-by-step phasing in of the installation of the ADP Plan was completed in 1967 on schedule and without major interruptions or unconquerable difficulties.

Enabling legislation to achieve direct filing of returns with the service centers was passed but optional direct filing of refund returns for individuals was extended in 1967.

> Public Law 89-713, enacted on November 2, 1966, authorized the Internal Revenue Service to require taxpayers to file their returns directly with service centers. Prior to this, such filing was optional. The change in filing requirements will be introduced gradually with total installation scheduled for 1970.[31]

---

[30] Ibid., p. 20.

[31] Ibid., p. 20.

Optional direct filing of refund returns was planned to be extended in 1968 to all regions. However, mandatory direct filing of Forms 1040 and 1040A were planned to begin for 1968 in the pilot Southeastern Region. Direct filing of selected business returns, such as Forms 941, 720, CT-1, CT-2, was made mandatory in the pilot Service Center at Chamblee, Georgia. Direct filing will continue to be extended to other regions and other tax return forms gradually up to 1970 when complete nationwide direct filing of all returns in all regions will be mandatory.

Computerized operations on a nationwide basis in 1967 greatly facilitated efficiency in the collection and the enforcement activities of the IRS as follows:

1. ADP verified taxpayer arithmetic,
2. ADP verified estimated tax payments,
3. system helped identify nonfilers,
4. enabled unpaid liabilities to be deducted from refunds due,
5. caught refund duplicated before issuance of check,
6. information document matching extended to detect delinquents,
7. selections for audit facilitated by ADP.[32]

The IRS continued to make significant changes which contributed to progress in cost reduction and

---

[32]Ibid., p. 20.

management improvements. During fiscal 1967 record savings of $16.5 million were reported by the Service. Some examples of changes made that involved ADP were as follows:

1. Many refund checks mailed to taxpayers are undeliverable because the taxpayer moved and did not notify the Post Office or the Internal Revenue Service of his change of address. These checks are returned to the Service. Prior to fiscal 1967, undeliverable checks were redeposited to the taxpayer's account pending receipt of a change of address. In March 1967 a new procedure was begun which delays the redeposit of undeliverable checks. This results in savings for the Government by avoiding the costly process of reissuing checks and improves service to the taxpayers by making checks immediately available for issuance upon receipt of a change of address.

2. The two-part "piggy-back" mailing label, used in two regions for the tax year 1965, was extended to three additional regions for the 1966 tax year. Use of the preaddressed label helps prevent errors, speeds up processing, and contributes materially to keypunch savings.

3. Before the Service authorizes a refund for an overpayment of tax, the taxpayer's account is searched, by computer, for any unpaid liabilities. If any are found, the overpayment is appropriately applied and any remainder refunded. This capability, which could not be applied economically under manual methods, has permitted the Service to amend some of its procedures for collecting past-due accounts. The minimum dollar value of a past-due account which is required before manpower is assigned to its collection has accordingly been raised, reducing the number of small accounts which require expensive collection action. It should be noted that past-due accounts will be accumulated from year to year, and once the minimum dollar value is exceeded, manpower will be assigned to the collection of taxes and interest owed.[33]

---

[33]Henry H. Fowler, 1967 Annual Report of the Secretary of the Treasury, Treasury Department (Government Printing Office: Washington, 1967), pp. 100-101.

Tax audit activity was expanded on the larger and more complex returns. Revised demands on tax administration, due to the fact that the complex to simple returns ratio has been rising, caused this shift. "Continued high-quality audits plus shifts in audit concentration to larger cases resulted in additional tax recommendations of $3.3 in fiscal 1967."[34] A 22 percent reduction in the inventory of individual and corporation older year returns awaiting field audit was achieved during the past two years. "This more current inventory helps reduce the number of requests to extend the statute of limitations, enables taxpayers to know the status of their Federal tax accounts earlier, and reduces the accumulation of interest due on both assessments of additional taxes and on refunds of overassessments."[35]

> The application of team audit techniques has helped reduce the backlog of older returns in the large corporate tax return area. In view of the tremendous growth in the size, number, and complexity of large corporations since World War I the assignment of one man per case was no longer realistic. The new large case audit program applies the concept of a carefully planned, highly coordinated audit using a team approach, with each agent given specific assignments according to a formal overall examination plan. Since its inception in July 1966, this program has been successful in improving the quality of large case audits, obtaining better uniformity of issues raised as well as their resolution, and shortening the time span of examination.[36]

---

[34] *Ibid.*, p. 105.

[35] *Ibid.*

[36] *Ibid.*, p. 106.

A new policy was established for retaining master file data. Data was retained in the master file for three years under the old policy. Under this new policy, brought about as a result of a cost-benefit study,

1. tax settlement data will be retained for 27 months beyond the posting date of the transaction that brings the tax account to a zero balance or releases it from any prior hold placed on the account, and

2. tax base data will be removed from master files annually after completion of scheduled computer runs for Service programs.[37]

1968 Results

The workload of the IRS in terms of volume during the fiscal year of 1968 reflected the expanding economy of the nation. The following highlights of 1968's operations show that last year's records were exceeded in several areas:

1968 Operations Highlights[38]

Item	Millions 1967	Millions 1968	Percent Change
Gross Collections	$148,374.8	$153,636.8	3.5
Refunds:			
Number	49.0	51.9	5.9
Amount	$ 9,630.9	$ 11,420.6	18.6
Returns Filed	105.4	107.6	2.1
Returns Examined	3.1	2.9	-6.6
Additional Tax From Enforcement	r$ 2,833.0	$ 2,929.8	3.4
Delinquent Taxes Collected, Total	r$ 1,552.3	$ 1,521.9	-2.0

rRevised

---

[37] *Ibid.*, p. 110.

[38] Sheldon S. Cohen, 1968 Annual Report of Commissioner of Internal Revenue, Internal Revenue Service, U. S. Treasury Department, Publication No. 55 (Washington: Government Printing Office, 1968), p. v.

Dollars of receipts and refunds, number of returns filed and refunds reached new record levels during 1968. Refunds covered tax overpayments of $11.3 billion to which was added interest of $121 million. To keep the amount of interest paid on refunds at a minimum, the IRS processes first through the computer system all tax returns involving refunds.

In his 1968 Annual Report to the Secretary of the Treasury, Sheldon S. Cohen, Commissioner of Internal Revenue, said,

> The unprecedented build-up of the Service's workload in recent years underscores the wisdom of automating our returns processing operations. Yet the completion of a nationwide ADP network last year did not make it possible to cope fully with the massive and evergrowing document handling operations confronting us.[39]

The biggest bottleneck with the present data input system is the transcription (keypunching) operation, the transference of data from the return into cards. To alleviate this difficulty, a direct entry system has been researched, field tested, and installed during 1968 in the Southwest Service Center only. Installations of this direct entry system to improve computer input efficiency in three more centers are planned for 1969, and in the remaining three service centers in 1970. When these installations are completed, the punching and processing of

---

[39] Ibid., p. i.

approximately 400 million cards a year will be eliminated. This improvement in technology will speed up data input to the computers and save several million dollars each year.

During 1968 the major aspects of the computer program were brought to fruition even though complete direct filing in all seven service centers has not been realized. Progress was achieved during 1968 in the program of phasing-in direct filing of returns with service centers rather than with district offices; complete phasing-in will be achieved in 1970.

The hundreds of millions of tax transactions connected with the receiving and accounting of the unprecented $153.6 billion in collections for fiscal 1968 were processed through the 88 million accounts in the master file at the National Computer Center.

The new deposit system instituted in 1967 only for corporation estimated income tax payments was extended to other areas in 1968. Additionally covered by this system, effective January 1, 1968, are payments of withholding and F.I.C.A. taxes by employers and withholding agents (railroad retirement tax), regular corporation income tax, and tax on unrelated business income of exempt corporations. This new Federal tax deposit system, providing for payment of taxes directly to designated banks, was established to accelerate the flow of tax money through the banking system.

It was developed in coordination with the fiscal services of the Treasury Department and replaced the depositary receipt procedure that had been operating for the past twenty years. This new system speeds up the deposit of taxes to the credit of the Treasurer of the United States and also helps reduce the teller workload of the IRS by eliminating the deposit functions of the service centers and district offices.

Filing requirements were further streamlined for corporation estimated taxes in 1968, in addition to the improvements induced by the new Federal tax deposit system described in the above paragraph. The requirement to file Form 1120ES, Declaration of Estimated Income was discontinued. Form 1120W, a worksheet not to be filed, is now provided to corporations for computing their periodic estimated tax payments. The new computer system made this change possible. The new deposit system, described above, coordinated with the master file processing at the National Computer Center provides for an automatic validation of tax credits claimed on tax returns.

Some accounts of results in the second year of full-scale, nationwide computerized operations in the IRS appeared in the popular public prints. They are worth scrutiny. One report highlights the huge amount of refunds being made in 1968 on 1967 returns filed by taxpayers. "This is the year of the big payoff at the IRS.

Never before have so many taxpayers been eligible for so much in income tax refunds."[40] One reason cited is that taxpayers still do not claim enough exemptions. The report goes on to say that,

> By the day before the April 15 filing deadline, about 39 million returns had been processed. About 32.5 million of these involved refunds. Last year, about 36.8 million returns had been received of which 27 million involved refunds . . . So far, refunds have totaled $5.8 billion, up from $4.4 billion last year.[41]

Early results of returns, of course, reflect the lucky taxpayers eager to get back some of their withholdings. They file early and the IRS follows a policy of processing "refund returns" first before all other types to keep interest costs at a minimum. The final figures for refunds in 1968 show substantial increases of 1967 and they set new records for number of refunds and dollar volume.

> The sharp increase in refunds is due primarily to the new graduated system of withholding taxes, first adopted in May, 1966, and now in full operation. The new system did away with collecting a flat 14% of all taxpayers' incomes. Instead, the withholding is graduated upward in six steps, from 14% to 30%, depending on the size of a taxpayer's income.
>
> Under the system formerly in use, it was common for a taxpayer to claim fewer exemptions than he

---

[40] "Now IRS Starts Paying Out," Business Week, April 27, 1968, p. 39.

[41] Ibid.

> was entitled to, in the hope of avoiding a big payment at filing time. This tactic was presumably made less attractive under the graduated system. But many taxpayers evidently kept to the old system of claiming fewer exemptions, and now they are getting refunds.
>
> There is also the rising cost of living. IRS officials point out that mortgage payments are larger, more taxpayers are itemizing deductions, and state taxes have gone up. All reduce taxable income.[42]

Despite widespread taxpayer awareness of the use of computers and greater taxpayer sophistication in filing returns, mistakes are still legion.

> . . . Of the 39 million returns already processed, about 3.4 million had some mistake that threw off IRS's totally computerized tax collection system. The system is geared to the use of Social Security numbers, and to date about 551,000 returns have contained the wrong number.
>
> Carelessness abounds. More than 1.2 million returns were figured on the wrong tax table, or data were filed on the wrong lines. More than 500,000 returns were filed with one or more forms missing. And 228,000 over-eager filers forgot to sign their returns.
>
> While the most mistakes were made by individuals, businesses are not immune. In fact, business mistakes had reached about 395,000 by mid-April, up from 370,000 last year. The most frequent mistake is failure to include the employers identification number--about 127,000 so far. And 106,000 business returns had mathematical errors.[43]

Another report made in April, 1968 close to the April 15 deadline for the filing of individual tax returns hold that income tax returns computations show a mixed pattern. It said,

---

[42] Ibid.

[43] Ibid.

> IRS computers, in their second year of full operation, detect that out of 31.9 million individual returns filed by the end of March, 607,000 contained mathematical errors, down from 842,000 last year. But while the individual taxpayer took more pains with his addition and subtraction, businesses became sloppier. Out of 5.8 million business returns processed, mathematical mistakes occurred in 95,000, up from 72,000 a year earlier.[44]

Past "austerity" programs within the Government have hit the IRS. Not long ago the following announcement was made:

> . . . The House Appropriations Committee lops $7.8 million off fiscal 1967 appropriations for IRS compliance activities. It expresses concern over rapid growth in the compliance area and advocates a moderation until the full impact of the ADP program on voluntary compliance can be determined. . . .[45]

Another report made public on this all-important topic of appropriations said,

> A bigger budget for the IRS is sought partly to reverse a decline in audits.
>
> President Johnson's budget that went to Congress Monday slates $760 million spending for the Revenue Service in the fiscal year starting next July 1, up $73 million from the current period despite the budget's general "austerity" emphasis. The increase is needed, officials argue, partly to "prevent a deterioration in the level of taxpayer compliance." The number of tax returns of all sorts is expected to rise some 3.3 million in the current fiscal year and another 2.8 million in the next to a total 111.5 million by mid-1969.

---

[44] "Income Tax Return Computations Show a Mixed Pattern," Wall Street Journal, Wed., April 10, 1968, p. 1, column 5.

[45] Journal of Accountancy, CXXI No. 5 (May, 1966), p. 3.

> Yet the actual number of returns audited has been falling, the budget shows, to 2,925,000 in the current fiscal year from 3,108,000 in the period ended last June 30. The aim is to step up the number of audits to 3,196,000 in the coming period. In addition, IRS Chief Sheldon Cohen wants to spend an added $1.5 million, or a total of $12.5 million, to keep closer tabs on tax agents themselves through "internal audit and security" measures.
>
> The IRS seeks a 2,700 increase in its staff in the new budget, the lion's share of a planned expansion of 3,500 jobs in the Treasury as a whole.[46]

Sylvia Porter's nationally syndicated column contained some very interesting information recently on the topic of the IRS's computerized tax system. Her column said,

> Now that you've filed your 1967 Federal income tax return, what are the chances that the Internal Revenue Service's mechanical brains will pick up even your slightest error?
>
> Not as great as you have been led to think.
>
> In the past couple of weeks, a flurry of scare stories have appeared in newspapers and magazines reporting that the IRS's computers are relentlessly whirling 24 hours a day, seven days a week and giving the impression that the computers will select millions of our just-filed returns for questioning--among them, of course, yours. The implication is that tons of returns are being automatically fed into the giant system and that never before has an audit of your return been so likely.
>
> Well. This being the season for stories such as this, I've done my own investigating. And the facts are quite different from what these stories seem to suggest.

---

[46] "A Bigger Budget for the IRS is Sought Partly To Reverse a Decline in Audits," Wall Street Journal, Wed., January 31, 1968, p. 1, column 5.

Despite the use of advanced data processing equipment, the IRS is "almost sinking in an ocean of paperwork," says the Research Institute of America in a report privately circulated to its subscribers. The Research Institute adds:

"The Computer system itself is in trouble. Because the demand for computer usage far exceeds the present IRS computer capability, individual returns with underpayments and overpayments of tax get processing priority. So-called "full-paid" individual returns received by the IRS in 1967 may not get properly entered in the IRS computer setup until 1969." (Bold face mine.)

The heart of the problem is that an overwhelming 105,000,000 returns were received and 49,000,000 refunds were made last year--a volume of paper the IRS didn't anticipate until 1970. This reflects the spectacular expansion of business and the upgrading of millions of workers to taxpaying levels.

On top of this, the IRS has been receiving tens of millions of information returns on dividends and interest--and also a soaring number of complex individual returns.

Then on top of all this in turn, the IRS computers have been uncovering more errors than ever before and thus its employees have been doing more corresponding with taxpayers than ever before.

This hardly adds up to the publicized picture of an efficient mechanical brain quickly ferreting out your new return and pouncing on your "little errors." Hardly. In fact, the IRS itself has calculated that your chances of an audit are as follows:

If you're filing as an individual about one in 25;

If you're filing as a corporation, about one in eight;

If you're filing as individual estate return, about one in four and a gift tax return, about one in 14.

But, cautions Leon Gold, chief tax expert of the Research Institute, your odds of an audit are much greater if your adjusted gross income is $25,000 or more; if you are in a trade or profession in which

payment in cash is widespread practice; if you claim any deductions which appear abnormally big against average deductions for your income bracket; if you have substantial unreimbursed entertainment expense. And expect your arithmetic to be checked.

Clincher: So scarce has IRS manpower become that the Service has "temporarily suspended" its Taxpayer Compliance Measurement Program. These TCMP audits were exhaustive, time-consuming examinations of a small cross-section of returns designed to help the Treasury improve its audit-collection procedures.

The IRS no longer has manpower for these A to Z audits; it needs all its personnel just to keep up with regular exams.[47]

Taxpayer errors were not the only kind of trouble that prevents the newly computerized Federal tax system from working smoothly. IRS errors, computer errors, or more correctly, human errors of individuals operating the computers, have come to the fore. One such public report said,

Computer errors in processing tax returns abound.

Many corporations in the New York area have been getting bills for taxes already paid or statements that they have overpaid their tax. One smaller firm says it recently received in a single day's mail a notice it had overpaid by about $1,000 and a bill for taxes due of almost $4,000. The company says its tax payments at the time actually were right up to snuff.

J. O. Tuescher, assistant regional commissioner of the Internal Revenue Service for data processing in the Northeast region, figures there are currently some 35,000 "adjustments" of this kind kicking around, but that this is down from a high of 55,000 a few months ago. He says a major cause of the foulups is

---

[47] Sylvia Porter, "Tax Auditing Still Lagging," The State Journal, (April 22, 1968) Lansing, Michigan, p. C-4, column 7.

that taxpayers frequently use incorrect identification numbers when estimating or paying taxes, with the result that the computer doesn't credit a payment to the right account. Inexperienced people feeding wrong information into IRS computers are another source of the problem, he concedes.

IRS officials in Washington maintain that computer errors of any magnitude aren't widespread.[48]

Another report, originating with the Associated Press, with a New York dateline said,

. . . Not only is the computer working faster and more smoothly now, but its human attendants, a very large number of them part-timers, are much better trained. Human errors, nevertheless, slow it down.

The problem with computers is people. When people make errors, the computer, contrary to reports about its ruthless efficiency, cannot always detect the inaccuracy. Mistaking error for fact, it often puts in motion events that humans can barely halt.

This, for example, is the sequence of events that followed the transposing of one digit in a Social Security number:

The numerical error caused the estimated tax payments made by Mr. Smith--only the names in this story are fictional--to be applied to the account of Mr. Jones.

Jones was expecting a refund of $215.04. He didn't receive it by last June, so he called up a local office of the IRS.

The answer rocked him. "All refunds of more than $5,000 are delayed," he was told. "I thought it was extremely laughable," Jones said at the time. It became even funnier.

---

[48] "Computer Errors in Processing Tax Returns Abound," Wall Street Journal, Wednesday, December 20, 1967, p. 1, column 5.

> Last November Jones received a check for $5,813.40. Brief elation turned to frustration, and Jones sent back the check along with a signed statement that he sought only $215.04.
>
> Early this year Jones finally thought he had it straightened out. His refund for the smaller amount came. In fact, 6 per cent interest was added because the government was late in payment.
>
> Shortly thereafter another envelope came from the Treasury. It contained a check for $1,646.90. This too was sent back to the government for the information of its computer, which can add billions of figures in the flash of an eye but cannot always spot an incorrect one.
>
> The moral, so far as the IRS is concerned is to be nice to the computer. Whether taking money from you or trying to hand it out to you, the computer can give you a hard time. Don't confuse it. Be accurate. You'll get your refund faster. And your patience won't be taxed.[49]

Another report found in the public prints discussing the Internal Revenue Service and its computerized system said,

> One way of checking on tax errors made by the IRS is to look over the "case file" of any Congressman.
>
> In large numbers of cases, it is the congressmen to whom a citizen complains when he feels he is getting a raw deal from the IRS or other federal agencies.
>
> The congressional district served by Rep. Garry Brown, R-Michigan, is an average midwestern district--partly urban, partly rural. Brown's office receives a half-dozen or more complaints about IRS activities each month. Most concern the slowness of paying refunds--which is generally the biggest problem citizens have with IRS.

---

[49]John Cunniff, "IRS 'Monster' Speeds Good News to Early Filers of Tax Returns," The State Journal, Lansing, Michigan, Thursday, April 4, 1968, p. H-6, column 6. Author is Business Analyst for Associated Press.

Brown says that his office receives generally satisfactory cooperation from IRS in working out problems for constituents. But he also feels that IRS relations with citizens leave much to be desired.

Many people, Brown says, complain to him that IRS takes months to acknowledge correspondence, or does not acknowledge it at all.

In the past several months, Brown estimates that about 10 per cent of the cases handled by his office concern complaints that returns of given individuals are audited in successive years, for questions that have already been settled. An example would be a taxpayer who claims a non-related person as a dependent. Having once established the legitmacy of the claim for a dependent's deduction, the taxpayer's return is audited in successive years for the same reason--and the proof must be filed each year.

The IRS, in this case, admits it has had problems like this in the past. Insufficient data available at district offices from past returns have been responsible for this type of complaint, according to a spokesman. But, the IRS says, the new computers have "memory banks" which in the future will stop this kind of practice. The computer will "remember" that the questionable deduction has been verified in past years as valid.

In other cases, Brown says, about 40 per cent involve simply "slow handling" of refunds . . . .

In general, Brown says, "our problems with the Internal Revenue Service are not out of proportion with other cases."[50]

Evaluation of the System

Evaluation of the ADP system in the IRS is possible, using three criteria. They are (1) results of

---

[50]Cleve Corlett, "Computers Tightening Income Tax Collections, Increasing Revenues," The State Journal, February 14, 1968, Lansing, Michigan, p. B-1, Column 1.

operations after a five-year installation period of phasing-in and two years of full operation on a national scale with computers, (2) effects of results on functional requirements for information, and (3) effects of results of operations on original objectives. In other words, attention is directed to operations, functional requirements for information, and objectives of the system. The officials of the IRS have done this, and what follows is largely an integration of their considered opinion and expert judgment plus some outside amplification and illustration.

Results of Operations: Improvements in the Form of Efficiency Factors that have Contributed Toward Success

Results of operations is a criterion by which to evaluate the ADP system. Have operations over a period of time achieved optimum utilization of resources, both human and material? Optimum utilization of resources is achieved through constant improvements in organization structure, systems, procedures, programs, and policies, and through the development and implementation of adequate machinery for efficient and effective operations. Increased efficiency is possible through improved methods, programs, techniques, and judgment criteria so that operations result in tangible savings and cost reductions wherever possible.

Efficiency factors considered here include the criteria of (1) man-years saved by adoption of ADP, (2) operating costs and volume factors including the "cost of collecting $100," and (3) other factors such as changes in the form of new programs, procedures, systems, and technical advances that have resulted in progressive improvements in operations.

Man Years Saved Through Automation.--Table 3-1 shows tax return processing and revenue accounting direct man years, costs, and related information covering the period of IRS automation which runs from 1954 to the present time. From 1954 to 1962, the automaticity of the ADP system was characterized as "mechanical." Centralization of the processing of returns was achieved to the extent that three centers were processing the nation's returns but there was no master file. From 1962 forward, the automaticity of the ADP system has been characterized as "electronic." Centralization of the processing of returns data has been achieved by the establishment of one center, the National Computer Center, where there is a master file. Therefore, there are two periods of IRS automation that are being considered here, (1) 1954 through 1961 and (2) 1962 through 1968. This table of figures, covering both these periods of automation, is the official IRS document submitted and used before a Subcommittee of the Committee on Appropriations--House of Representatives,

Table 1-1.--Costs and related information--covering the period of automation.

Table 3-1.--Costs and related information--covering the period of automation.

Fiscal Year	Man-Years Realized (In Thousands)	Total Costs (In Millions)	Returns Processed (In Millions)	Gross Receipts (In Billions)	Returns Processed Per Man-Year Realized (In Thousands)	Gross Receipts Per Man-Year Realized (In Millions)	Estimated Man-Years Required to Process Manually (In Thousands)	Estimated Man-Year Savings (In Thousands)
1954	16.3	a	88.9	$69.9	5.4	$4.3	16.3	--
1955	15.9	a	88.7	66.3	5.6	4.2	16.3	0.4
1956	16.0	a	90.2	75.1	5.6	4.7	16.6	0.6
1957	17.0	a	93.2	80.2	5.5	4.7	17.1	0.1
1958	16.2	$84.0	93.5	80.0	5.8	5.0	17.2	1.0
1959	15.7	87.2	92.8	79.8	5.9	5.1	17.0	1.3
1960	15.2	86.1	94.4	91.8	6.2	6.1	17.3	2.1
1961	15.4	94.9	95.9	94.4	6.2	6.1	17.6	2.2
1962	15.3	88.8	96.5	99.4	6.3	6.5	17.7	2.4
1963	16.1	107.8	97.8	105.9	6.1	6.6	19.4	3.3
1964	16.8	123.1	100.1	112.3	6.0	6.7	19.8	3.0
1965	17.8	138.2	102.5	114.4	5.7	6.4	21.6	3.8
1966[b]	19.2	147.2	104.1	128.9	5.4	6.7	24.8	5.6
1967[b]	19.9	159.5	106.6	148.1	5.4	7.4	30.9	11.0
1968[b]	20.2	162.3	109.1	161.4	5.4	8.0	31.5	11.3
Total	253.0						301.1	48.1

[a]Not available.

[b]Estimated.

90th Congress, 1st Session, which considered Appropriations for Fiscal Year 1968.

This table uses direct man years realized for the work performed in tax returns processing and revenue accounting functions as a criterion and basis for analysis and evaluation of the worth of the ADP system.

Prior to 1962, returns were processed in three area (West, South, and East) service centers with automatic equipment of the mechanical variety, but with no central master file or taxpayer identifying numbers. The IRS ADP Plan became effective in 1962 with the opening of the first of seven regional computerized service centers, the pilot center at Chamblee, Georgia, and the activation of the National Computer Center. These regional service centers tied in with the NCC and became feeders for it. The NCC operated under the new master file concept with all its implications.

Analysis of the figures in Table 3-1 show, first of all, that there has been a steady increase over the years in the volume of gross receipts, number of returns processed, total costs of returns processing and revenue accounting, and man years realized which reflects time of employees working on the job. The growth of all these four factors reflects the steady growth of the economy of the nation.

Returns processed per man year realized steadily increased from 5,400 in 1954 to 6,300 in 1962 and then declined back down to 5,400 again in 1968. After 1962, it steadily decreased during this period of "electronic" automation. This trend reflects the increased productivity of the returns processing operation due to automation with high-speed computers under the ADP Plan and is the reason for the decrease. Closer examination reveals gross receipts have gone up approximately two and one-half times during this period of automation. However, returns processed per man year has remained the same with automation--being 5,400 in 1954 and 5,400 in 1968. But, to keep it there, the automated system had to be improved and up-dated from mechanical to electronic automation during this period in order to handle the increasing workload. This conclusion results from the increasing trend of figures from 5,400 in 1954 to 6,300 in 1963 during the mechanical period and then the decreasing trend from 6,300 in 1963 to 5,400 in 1968 during the electronic period of automation. Efficiency at the IRS would not be what it is today without this shift from mechanical to electronic automation. Had this volume of returns, which increased from 88 to 109 million, been processed manually, it would have required twice as many people or man years to do the same job as the machines; this conclusion results from a comparison of the third column of figures on Table 3-1 entitled

"returns processed" with the next to last column of figures entitled "estimated man years to process manually"--which practically doubled from 16.3 to 31.5 during the total automated period.

Gross receipts per man year steadily increased. With full coverage of the nation by computers on January 1, 1967, the increase is the greatest in 1967 and thereafter.

The figures in the next to last column, estimated man-years required to process manually, have steadily increased over the years to a total of 301.1 thousands from 1954 to 1968, while actual man-years realized with automation totals 253.0 thousands, over the same period of time. These figures show that there has been an estimated man-year savings of 48.1 thousands by using the computerized systems over the period of time. Almost half, or 22,300 estimated man-years, of the 48,100 man years estimated to be saved by automation during this period of time, occurred in 1967 and 1968, the only two years during which there has been nation-wide coverage of computer systems.

Operating Costs and Volume Factors.--Table 3-2 Highlights of IRS Operations from 1958 to 1967 shows some major items for consideration and analysis in the evaluation of the ADP system. At the moment attention is directed to cost and volume factors. During this ten-year period, from 1958 to 1967, the volume of the major lines

Table 3-2.--Internal Revenue Service; report on operations, highlights 1958 to 1967.

Item	1967	1966	1965	1964	1963	1962	1961	1960	1959	1958
1. Gross Collections[1]	$148,374.8	$128,880.0	$114,435.0	$112,260.3	$105,925.4	$99,440.8	$94,401.1	$91,774.8	$79,797.9	$79,978.5
2. Refunds-Number	49.1	45.1	39.9	42.2	40.7	40.4	40.2	38.0	37.6	38.1
3. Refunds-Amount	$ 9,630.9	7,314.6	6,068.6	7,203.1	6,609.4	6,303.0	6,031.1	5,293.6	5,156.9	4,651.7
4. Returns Filed	105.4	104.1	102.5	100.1	97.8	96.5	95.8	94.4	92.9	93.8
5. Returns Examined	3.1	3.5	3.5	3.6	3.8	3.5	3.5	3.0	2.9	2.8
6. Additional Tax from Enforcement	$ 2,729.4	2,862.8	2,629.9	2,505.6	2,243.4	1,971.6	2,129.7	2,052.5	1,820.7	1,687.7
7. Delinquent taxes Collected, Total	$ 1,550.0	1,309.7	1,312.9	1,222.2	1,280.7	1,255.2	1,092.3	941.4	978.3	1,011.9
8. Operating Costs	$ 667.1	624.9	597.4	549.7	500.1	450.1	413.3	363.7	355.5	337.4
9. Cost of Collecting $100	$ .45	.48	.52	.59	.46	.45	.43	.40	.44	.41
10. Individual Income Tax Returns Filed	71.2	68.8	66.0	64.3	62.9	61.9	61.3	60.5	60.0	60.8
11. Individual Income Tax Returns Mathematically Verified	65.4	60.7	62.9	63.4	57.5	58.8	59.5	50.2	52.5	57.4

[1]All figures in millions of dollars except number 9.

Source: Annual Reports of the Commissioner of Internal Revenue.

of activity have all gone up. This activity includes gross collections, refunds, and returns filed. All three volumes have increased at a steady pace. It is only logical that operating costs should also increase at a steady pace, and they have. However, operating costs have increased at a slower rate than gross collections.

This relationship between operating costs and gross collections can be expressed as a ratio, called "cost of collecting $100." This ratio increased from .41 to .45 during the first period of automation which ran from 1958 to 1962 through 1964, if a time lag is allowed; this was the "mechanical" automation period which was permitting this ratio to increase. It took "electronic" automation to turn this trend down after 1964. This trend began to level out in 1968 at .45 which means the completely phased-in computer system was reaching its maximum "electronic" efficiency.

The "cost of collecting $100" from 1962 to 1967 has an interesting pattern or trend as depicted on Table 3-2. During this period of gradual installation of the new computer network, this ratio continued to rise from .46 in 1963 to .59 in 1964. After 1964, this ratio started to decline while the workload of returns filed and refunds processed continued to go up. The influence of the "electronically" automated system began to take effect. By 1967, which was the first year of full

nation-wide automation with "electronic" high-speed computers processing returns through a master file at the NCC, the "cost of collecting $100" went down to .45. This drop is attributed to efficiencies achieved in operating costs primarily through electronic data processing. Constant improvements were made each year in the operations as the system was phased-in to full national coverage.

IRS officials say that the dollar savings resulting from the system are more than enough to pay for the installation and operation of that system. Each year's savings are enough to pay for the EDP operation of that year. For instance, one official said, "We estimate that a net additional revenue yield of over $5 million was realized from the expanded mathematical verification of these returns in the Southeast Region alone. We believe that the yield from this single operation will pay for the increased cost of ADP.[51] The Commissioner of Internal Revenue said, "I recently stated to the Appropriations Committee that if we were to try to do the job we are doing today, without our present system, it would take

---

[51]Robert L. Jack, "ADP--An Analysis of Its Operation and Results," 1966 Proceedings of New York University 24th Annual Institute on Federal Taxation, p. 109. Mr. Jack is Assistant Commissioner for Data Processing in the National Office of the IRS.

12,000 additional people."[52] A report said,

> Roughly $5 billion of taxes collected in 1966 will be the result of what IRS, somewhat euphemistically, calls its "service activities"--the collection of taxes from individuals and businessmen who have understated their obligations or ignored them completely. IRS officials don't know precisely how much of this $5 billion will be attributed to the new hardware. But it's likely, judging from recent history that the equipment investment--which totals about $17 million so far--will pay a handsome dividend.[53]

A consideration of cost factors shows that automation is a labor-saving device. On this point a report said,

> Since 1960 when IRS began phasing-in the new system, about 6,200 of its employees have become redundant. By next year (1967), when the phase-in is complete, the workforce engaged in returns processing and tax collection will be down to 1,800. In 1960, it amounted to 12,000. An IRS official "guesstimate" that this reduction in force represents a saving of something like $50 million a year.[54]

Still another report said,

> . . . It was estimated that in past years the taxpayers neglected to report more than $20 million in income which resulted in a $5 billion loss to the Government. Some officials believe that the revenue yield from just one of the automatic operations,

---

[52] Sheldon S. Cohen, Proceedings of the 1967 Second Annual Conference on Computers and Taxes, "Current Developments in ADP and Tax Administration," Sponsored by the Computers-in-Law Institute, George Washington University in cooperation with the American Bar Association and the Federal Bar Association, held in Statler-Hilton Hotel, June 6-7, 1967, p. 2.

[53] P. Hirsh, "Computers and Tax Collection," Datamation, XII, No. 3 (March, 1966), p. 30.

[54] Ibid.

> that of mathematical verification, will eventually pay for the $50 million cost of the system.[55]

In the official IRS News Release IR-924 dated May 8, 1968, Commissioner of Internal Revenue Cohen, said,

> Additional revenues from computer operations more than tripled last year as the Internal Revenue Service completed its first full year of Automatic Data Processing (ADP) operations on a nationwide basis.
>
> The expanded capabilities of the ADP system produced additional tax revenues of $86 million in 1967, compared to $27 million in 1966. Since 1962 when IRS began the transition to ADP, operations, a total of $166 million has been realized from the system.[56]

Other Factors.--Many changes, technical improvements, new programs, and procedures made possible with computers can be identified. These improvements help mobilize the resources and capabilities of EDP in the IRS for increased efficiency and optimum utilization of resources. Many of these items are good examples of the direct impact computers are having on the administration of Federal income taxation. A survey of IRS operations as recorded in the Annual Reports of the Commissioner of

---

[55] Joe Alex Morris, "Meet The 'Monster' That Checks Your Taxes," Readers Digest, XC, No. 537 (January, 1967), p. 177. Condensed from Kiwanis Magazine, December 1966-January 1967 issue.

[56] Sheldon S. Cohen, "Automatic Data Processing: Progress for 1967," IRS News Release IR-924, May 8, 1968, reprinted in Standard Federal Tax Reporter, Commerce Clearing House, Incorporated, Volume 7, Paragraph 8750, p. 74,503.

Internal Revenue and the Annual Reports of the Secretary of the Treasury revealed some of the more important items in this category.

A rejuvenation of the Taxpayer Assistance Program has taken place since the computers have been installed. Many people became much more concerned about their taxes when they realized how much more efficient the tax collecting and tax enforcement activities of the IRS became with computers. They rushed for help to the offices of the IRS and to tax practitioners. As a result, the Taxpayer Assistance Program has been streamlined, revitalized, expanded, upgraded, innovated, and extended on a year-round basis to keep taxpayers better informed and supplied with technical assistance and to foster voluntary compliance. Changes in this area have been emphasized and some examples are upgrading of facilities, error reduction programs, increased use of television and radio to reach the American public, extended use of question-and-answer columns in newspapers, establishment of public reading rooms in each of the seven regions and in Washington, D. C. in order to carry out the Freedom of Information Act, Public Law 89-487, telephone assistance from central points known as Centiphone, improved forms and publications, published rulings, and letter rulings by National Office in response to the many inquires.

Other improvements in old programs or developments of new programs have been identified under the topics of (1) the taxpayer compliance measurement program (TCMP), (2) the master file of exempt organizations, (3) the statistics of income and tax models, (4) audit criteria development, and (5) the Federal-state cooperation program. All these programs have been influenced by or originated as a result of the new computer system. They are taken up in the next chapter.

Many technical changes have resulted in efficiency, cost reduction, and improvements in operations, as follows: (1) optical character recognition pilot study for computer input, (2) magnetic tape reporting for information returns, (3) direct entry for computer input, (4) pilot study to determine feasibility of transmitting data between service centers and National Computer Center through Federal Telecommunications System (voice network), (5) retention period for master file data reduced from three years to maximum of 27 months, (6) direct filing of returns with service centers legalized but being phased-in up to 1970, (7) purchase of equipment (computers) instead of lease policy now followed, (8) merger of New York and Northeast Regions into North-Atlantic Region, (9) a seven percent reduction in number of forms and letters, (10) revised procedures for collection of delinquent accounts, (11) use of microfilm to replace paper, (12)

magnetic tape replacement by hypertape, which was replaced in turn by superhypertape, (13) equipment changes such as H-200's replace IBM 1401's at service centers and installations of IBM Systems/360 Model 65 at National Computer Center, (14) preaddressed labels to expedite the processing of returns, (15) improved library to cut tape inventory at NCC and rehabilitation process for magnetic tape to save over $5 per reel, (16) simplified key punching of whole dollars only on certain forms to save time, manpower, and money, (17) computer generated follow-up notices of tax accounts, and (18) the new deposit system, instituted in 1967, which reduces teller workload of IRS, accelerates flow of money to the U. S. Treasurer, and permitted elimination of Form 1120ES.

Results of Operations: Difficulties Impeding the Operations of the System

Taxpayer Errors.--Taxpayer errors which computers are helping to catch can be classified into several categories. Among the 75.7 million tax returns on hand through November, 1967, IRS officials gave the following statistics on errors:

1. 2.1 million returns had incorrect or missing social security numbers;
2. 300,000 were filed with missing signatures;
3. 200,000 did not contain necessary W-2 forms;
4. 300,000 were missing necessary supporting statements of one form or another;
5. 1.1 million contained arithmetic errors;
6. 400,000 took wrong deductions;

7. 1 million used wrong tax tables;
8. 12,000 made errors in claiming exemptions;
9. 400,000 filed incomplete entries.[57]

Taxpayers are usually notified promptly and asked to make needed corrections by the IRS when such errors are detected.

Accurate taxpayer information encourages accurate returns filing. A self-assessment system like the American taxation system needs well-informed taxpayers the same as a democracy needs well-informed voters. The Taxpayer Assistance Program of the IRS has been extended to a year-round basis and has been upgraded and emphasized in recent years as the result of computer efficiency in detecting errors. An error reduction program was emphasized by the IRS in 1967. It was built around the tabulation, by regional service centers, of weekly totals in six major error categories for individuals and four for businesses as follows:

Individual Errors[58]	Business Errors
1. arithmetic	1. employer identification number
2. tax table	2. business code
3. social security number	3. depositary receipts
4. signature	4. arithmetic
5. Form W-2	
6. schedules	

---

[57]Cleve Corlett, "Computers Tightening Income Tax Collections, Increasing Revenues," The State Journal, East Lansing, Michigan, Wednesday, February 14, 1968, p. B-1. Mr. Corlett is the Washington Bureau correspondent for the State Journal.

[58]Sheldon S. Cohen, 1967 Annual Report, p. 4.

Widespread publication of this information for taxpayer consumption took place through mass communications media with the advice that refunds were needlessly being delayed because of such mistakes. Increased use of television and radio became a part of the expanded and streamlined information program by the IRS to better inform and assist the public.

This error prevention campaign was greatly expanded in 1968 by the IRS. Included in the publicity about the types of errors was the theme that errors on returns inevitably delay refunds. A secondary message warned taxpayers that the error frequency rate increases toward the close of the filing period, so early filing was advised as advantageous to both taxpayers and the IRS.

IRS Problems with the System.--The first full year of nationwide computerized operations in the IRS resulted in success and a relatively smooth operation. Two major reasons have been cited for the successful operations as follows: (1) the gradual installation approach and (2) the redeployment program for personnel whose jobs were affected. Computerized operations were first installed in the pilot Southeastern Region at Chamblee, Georgia. Each major phase of the system was pilot-tested in Chamblee before being adopted in the other six regions. This step-by-step approach made the shift from manual methods to automation a smoothly operating transition. Contributing

to this successful change was the training program and the redeployment of 9,000 employees.

The system has been successfully launched and has been operating smoothly for over two years now under the guiding influence of Mr. Robert L. Jack, Assistant Commissioner for Data Processing. Two major problems stood out in the first year's nationwide operation with computers, as follows: (1) incorrect or missing Social Security numbers and (2) billings for unprocessed payments. On these two points, Commissioner Cohen said,

> Some problems in the smooth operation of the system were traceable to incorrect or missing Social Security numbers. For example, the IRS encounters difficulty in crediting the proper account when a taxpayer's check does not show his Social Security number and becomes separated from the return.
>
> Also, there are still some instances of bills being sent out when payments have been received by the IRS but have not yet cleared through the system. The IRS is making every effort to design measures to prevent this problem.[59]

Other problems encountered in the ADP program have been discussed in more detail by the Deputy Commissioner of IRS.[60] Before getting into a detailed account

---

[59]Sheldon S. Cohen, "Automatic Data Processing: Progress for 1967," IRS News Release IR-924, May 8, 1968, Standard Federal Tax Reporter, Commerce Clearing House, Inc., Volume 7, 1968, Paragraph 8750, p. 74,503.

[60]William H. Smith, "Problems Encountered in the Automatic Data Processing Program in the Internal Revenue Service," Remarks by the Deputy Commissioner before the Section on Taxation 1968 Midyear Meeting in Phoenix,

of the kinds of problems the IRS has encountered in its transition from manual methods to automatic data processing with modern high-speed computers, the Deputy Commissioner pointed out three important impacts the system is having. They are (1) the magnitude of centralized operations, (2) increased opportunities for errors, and (3) increased taxpayer contacts. Deputy Commissioner William H. Smith is held in great regard and speaks with unimpeachable authority on the IRS's computerized tax system as he was, perhaps, its chief designer and interpreter at its inception and during many of the crucial years following its application in the first pilot center. He was Assistant Commissioner for Planning and Research in the National Office in Washington when the ADP Plan was conceived. In his present assignment as Deputy Commissioner, he has the opportunity to oversee its operation which has been under the expert guidance and stabilizing influence of Mr. Robert L. Jack, Assistant Commissioner for Data Processing. There are no better authorities to quote in this area of electronic data processing in the IRS than the two top veteran IRS career men, Mr. Smith and Mr. Jack. Mr. Smith is quoted extensively below.

Arizona, Standard Federal Tax Reporter, Commerce Clearing House, Incorporated, Volume 7, 1968, Paragraph 8751, pp. 74,503-74,507.

Regarding magnitude of operations, Mr. Smith said,

> First, in a nutshell, what do we mean by automatic data processing in the Internal Revenue Service? The heart of the system is the Master File concept where every taxpayer in the nation has his own individual tax account. These tape records are maintained in our National Computer Center in Martinsburg. Actually, this is not a particularly glamorous place to see. It is simply a low-slung modern building housing a number of large scale computers and several hundred technicians.
>
> The transaction tapes and the great bulk of our processing operations take place in our seven Service Centers. These have rather limited computer capability, relatively speaking, but employ thousands of people during peak operations. Every year, nationwide, we have to recruit and train about 13,000 temporary employees--mostly housewives--for work in these centers during the filing period.
>
> The Internal Revenue Service receives about 110 million returns every year and about 350 million information documents. Nor is this volume of paper staggered throughout the year. It tends to arrive in peaks and valleys. For example, two out of five American taxpayers file between April 1 and April 15th.
>
> About two out of every three people who file individual income tax returns get refunds. This year, we will probably issue around 52 million of them. Under the law, we have only 45 days after the due date of the return to schedule a refund. If we miss this deadline, we have to pay interest, so we have every incentive to move fast.
>
> Obviously, this peak load problem is without parallel anywhere else in the world--in government or in industry.[61]

Regarding opportunities for error, Mr. Smith said,

> A key fact to be grasped early is that ADP has not "caused problems" in the sense which this phrase

---

[61] Ibid., p. 74,504.

> is usually understood. Many of the problems we are facing now were with us before computers were even invented. What has happened is that the cold-blooded efficiency of the computer and the system places problems in bold relief; they simply cannot be overlooked or brushed under the rug.
>
> The new system is infinitely more comprehensive than its predecessors and has the ability to identify all sorts of errors and omissions that in the days of manual processing would have passed unacted upon. It has also increased the opportunity for error on the part of both the taxpayer and the Government.
>
> Perhaps the largest cause of error is traceable to our reliance on the social security number, or the employer identification number. We cannot administer the system without this common numerical denominator, and yet it is ironic that many problems arise when the number is not furnished or written incorrectly.[62]

In regard to increased taxpayer contacts, Mr. Smith said,

> To put it simply, the system is filling many gaps in tax administration and is generating many more public contacts than ever before.
>
> Taxpayers who do not appear to have filed all required returns are now receiving letters requesting explanations.
>
> For the first time in 25 years, taxpayers who do not appear to have made required payments of estimated tax receive an inquiry from us--without exception.
>
> Taxpayers who do not appear to have met the requirements for depositing withheld Federal taxes are being asked for explanations.
>
> Liabilities for back taxes are being offset by refunds which would otherwise be due these taxpayers.
>
> These are but a few examples of the additional contacts with the public which are growing out of the expanded capability the system gives us.

---

[62] Ibid.

> These additional contacts are part of the overall problem.[63]

Deputy Commissioner Smith has commented publically on the major problems encountered in the ADP processing program. These problems concerned full-paid returns, estimated tax returns, misapplication of payments--business returns, misapplication of payments--individual returns, computer notices and correspondence, split remittances, amended returns, and undelivered refunds. His comments on these problems are quoted here.

> Full-Paid Returns. The first problem I want to talk about concerns full-paid returns. Here we are faced with a dilemma that follows from our attempt to balance workload and work on first priority matters first.
>
> As I have suggested, our top priority is to issue refunds. Next comes the issuance of bills. All other returns--by definition, those that appear to be paid in full--are put on the shelf for processing later in the year. There are some 17 million of these.
>
> The problem arises when a taxpayer writes to us after filing one of these returns. Let's say he wants to file an amended return or wants to change something.

Estimated tax returns create a problem of identity because taxpayers often do not use the same information on the declarations as on returns filed later. Proper application of credits is often difficult, especially so in community property states where taxpayers often file joint declarations and separate returns.

---

[63] Ibid.

Complaints of misapplication of payments on business returns have been numerous. Many times the trouble arises from the separation of the depositary receipt from the return. The new Federal Tax Deposit System should eliminate this problem. Issuance of notices that apply a penalty for failure to make timely deposits has caused some problems in that some notices were issued that should not have been issued. Consolidated business returns have caused problems of correlation of the parent corporation with the accounts of each of its subsidiaries. Each entity has its own identification number which compounds the problem. Many erroneous bills to parents and improper refunds to subsidiaries have been issued "because of the time sequences in which these multiple, but related, transactions have been posted to the master file."[64] To solve this problem, consolidated returns and those of their subsidiaries are removed from the work flow and manually correlated before further processing. Therefore, estimated tax credits on consolidated returns are allocated among the parent and subsidiaries before posting takes place in the master file.

Misapplications of payments to individual returns very often occur. Two reasons can be cited. Trouble with

---

[64] Ibid.

numbers is the first reason. Wrong numbers are often supplied by taxpayers and also transcription errors in the form of misinterpretations of names or numbers on the part of IRS employees take place. The second reason arises from a time lag element. This gets into the second major problem cited earlier by Commissioner Cohen--billings for unprocessed payments. Deputy Commissioner Smith elaborated further on this sticky problem.

> Another problem occurs because of the time lag in recording payments on a bill on the master file before issuance of a followup notice. It takes us three weeks to cycle a payment from input to issuance of the credit advice. We are taking a close look at the possibility of lengthening our billing time table to see whether we can improve matters without unduly delaying receipt of revenue due the Government.
>
> Sometimes an individual taxpayer account will get so snarled up that the problem feeds on itself and error compounds error. We are seriously thinking of developing a procedure that would freeze problem accounts as soon as they are detected and until they are resolved.
>
> We are also considering placing communications between the Service and taxpayers under computer control. This would facilitate our access to taxpayer accounts and enable us to more easily dip into unsettled accounts and pull the information needed.
>
> You can appreciate that this would substantially improve our ability to answer inquiries and take prompt corrective action. But the cost would be substantial and in the interim we will have to rely on shorter term solutions.[65]

There have been taxpayer complaints of the cold, impersonal computer notices and correspondence. Deputy

---

[65] Ibid., p. 74,505.

Commissioner Smith gives a forthright evaluation of this problem.

> Perhaps the most vehement complaints we receive have to do with the unintelligibility and cold, impersonal nature of some of the notices generated from the computer system. Happily this is something that can be attacked and worked on, and we are making steady progress. Commissioner Cohen and I have an extensive program under way to instill in our written messages to taxpayers the same clarity and consideration that we expect Service employees to exhibit in their face-to-face contacts with taxpayers.
>
> We have brought in an outside consulting firm to help and have already improved several hundred notices and form letters.
>
> We are also sensitive to the fact that we have not been able to answer correspondence nearly as promptly as we should. This is most frustrating to the taxpayer, particularly when he has written repeatedly and still doesn't get an answer.
>
> Many people write in during the filing period asking when they will be getting their refund. Here, in fairness to the 50-odd million taxpayers who are due refunds, we do not interrupt our processing to try to answer these inquiries. We know that we get the overwhelming majority of refunds out within five or six weeks, so we consciously lay these inquiries aside and don't work on them unless 10 weeks have gone by from the time the taxpayer filed.
>
> The volume of correspondence in Service Centers is staggering. We receive about four million pieces of mail a year from taxpayers. Taking into account the mail received in response to our own letters and notices, the figure runs three times that, or about 12 millions.
>
> Frankly, we haven't yet found the one best way to control correspondence of this magnitude.

The Archivist of the United States recently told us that the Internal Revenue return files are unique, both in terms of size and frequency of use. They are three times as large as those of the Social Security Administration, four times the size of the enlisted men's files for the Army, Navy, and Air Force,

> altogether, almost six times as large as the Veterans Administration's claims files, and over nine times as large as the Selective Service files.
>
> You can appreciate that it is no simple matter to keep our files current during the filing period. We are studying the problem, however, and are installing a number of changes which should help us to be more responsive to taxpayer inquiries.[66]

Split remittances from taxpayers cause the IRS many headaches and they constitute a big problem.

> Practices that taxpayers followed in the days when returns were processed by hand have proved to be troublesome under automatic data processing. Something as simple as a taxpayer sending a single check in payment of more than one liability causes headaches. This is because mass-process workflows for different kinds of returns take different directions, and there is always the danger of error when payments are split and applied to different liabilities. It is a great help of course when taxpayers send a separate check in payment of each class of tax.
>
> Taxpayers have always sent in remittances of one kind or another without telling us what they are for. Our necessary reliance nowadays on temporary and inexperienced employees makes it even harder to get unidentified remittances matched up with the right account.
>
> It is also a great help to us when taxpayers record their social security numbers on all their checks. If the check should become detached from the return it can be processed as a separate document and a credit can be posted to the account. This means a bill will not be issued when the return is processed.[67]

Amended returns always were troublesome under the old system of manual techniques.

---

[66] Ibid., p. 74,506.

[67] Ibid.

> Now with the swiftness of ADP, an amended return sometimes gets processed before the original return (particularly if it is a full paid return), and you can imagine the errors this causes. We are considering the introduction of a distinctive, abreviated form for use in making amended returns. This should simplify things for taxpayers and enable us to process amended returns much more expeditiously.[68]

Undelivered refunds constitute a problem because of the mobility of the population.

> Strange as it may seem, large numbers of people entitled to refunds move without notifying the Post Office or Internal Revenue of their new address. Not surprisingly then, we have large numbers of undeliverable refund checks. Occasionally our employees may misread the taxpayer's address or make some other error which results in misdirection of the check but for the most part checks are sent to the best address we have.
>
> Despite the capability of the ADP system there are still about a quarter of a million undelivered refund checks each year. Only in about 50 per cent of the cases are we successful in getting the checks remailed to the proper address.[69]

A summary of the more prevalent problems, then, as indicated by Deputy Commissioner Smith and Commissioner Cohen can be listed as follows: (1) wrong or missing numbers, (2) retrieval of full-paid returns when needed, (3) correlation of estimated tax declaration with returns filed later, (4) misapplication of payments concerning business returns, (5) misapplication of payments concerning

---

[68] Ibid. Form 1040X Amended U.S. Individual Income Tax Return was issued in 1968.

[69] Ibid.

individual returns, (6) complaints of the cold, impersonal computer notices and correspondence, (7) split remittances from taxpayers, (8) amended returns often get processed before original, and (9) undelivered refund checks.

Are Functional Requirements for Information Being Met?

Any data network is required to meet the information needs of its user. While each of these five functions has its own particular demand, the information requirements of the group have been similar. The five functional information requirements of the IRS are as follows:

1. Returns processing and revenue accounting. This function includes determinations of correct amounts of tax liability, taxable balances, refunds, billings, tax credits, accounting adjustments, and other items involved in maintaining taxpayer accounts on a current basis.

2. Taxpayer assistance and services. The Service has an obligation to make it as simple as possible for taxpayers to fulfill their obligations under the taxing statutes. This function covers a broad range of activities, such as direct assistance to taxpayers in completing returns, simplification and clarification of forms and correspondence, response to inquiries, preparation of publicity information for mass communications media about filing and reporting requirements, and so on.

3. Compliance. This involves the collection function, dealing principally with delinquent returns and accounts, and the audit function, checking the correctness and completeness of the items of income and deductions reported on returns. The compliance function also includes the intelligence investigation of cases involving tax fraud.

4. Taxpayer appeals. Taxpayers have right to independent review of proposed determinations of tax

liability resulting from audit examination. The appeals function of the Service operates at two levels--the district and the region. If a taxpayer disagrees with the findings of an examining officer, he may request an informal conference at the district level; if no agreement is reached there, he may request that the Appellate Division consider his case at the regional level. The objective is to resolve tax controversies, without litigation, on a basis which is fair and impartial to both the Government and the taxpayer.

5. Technical. This is the interpretation of the taxing statutes. Many thousands of requests for technical information are received annually which require the issuance and publication of rulings, advisory statements, and other tax guide materials for the benefit of the public and Revenue officials.[70]

The ADP Plan which features the Master File System and the National Computer Center was designed primarily to serve only the first three of the above mentioned functional requirements for information. These three important functions are the returns processing and revenue accounting, taxpayer assistance and services, and compliance. "The Master File System was not structured to provide direct support to the other two important areas of taxpayer appeals, and the issuance of technical information."[71] In addition to these work-function requirements

---

[70]Lancelot W. Armstrong, "The Development and Operation of the Internal Revenue Service Network," The Computer: Tool for Management, Business Equipment Manufacturers Association/BEMA (Elmhurst, Illinois: The Business Press, 1968), p. 68. Mr. Armstrong is Director of Systems Development Division in the Washington Office of the Assistant Commissioner for Planning and Research.

[71]Ibid., p. 71.

for information in the IRS, there is also the vitally important administrative, or managerial, requirement for information. The administrative requirement for information would include the many management information reports. Among these management information reports would be those regarding financial status and operations and research reports. The Detroit Data Center was constructed to serve these needs for data not filled by the National Computer Center. The next chapter considers the application of computers to several important aspects in this area of management information systems.

Are the Original Objectives of the System and the Mission of the IRS Being Met?

One method of evaluation of the ADP system is through analysis of the effects of results of operations on original objectives. A system is worthwhile, has validity, and can be justified if it is meeting its objectives. The ADP system, according to a summary of its original objectives discussed in Chapter II was expected to (1) systematically check on failures to file returns, (2) mathematically verify the accuracy of returns filed, (3) offset tax liabilities against refunds, (4) detect duplicate filing for refunds, (5) provide a consolidated tax account for each taxpayer to reflect current status at any given point in time, (6) match data reported on

information returns (W-2, 1099, 1065, etc.) with corresponding data on tax returns (7) classify returns for audit, and (8) prepare management, operating, and statistical reports which includes research reports.

From the results of operations reported and discussed above, the conclusion can clearly be reached that all but the last objective is being met by the ADP system. On this point, an IRS administrator said,

> The first seven objectives are being met, either fully or in part. The eighth objective, considered less urgent than the others, has not been achieved in the ADP Master File System. Instead, a separate facility, the National Data Center, was established in Detroit to process the bulk of the management, operating, and statistical reports, as well as other "non-master file" operations.
>
> On the basis of achievement of objectives to date, it is fair to say that the present system was originally well conceived and that its operation has contributed significantly to the Service's ability to carry out its primary mission of strengthening the principle of voluntary compliance and achieving a more equitable distribution of the Federal tax burden.[72]

Granted, taxpayers have made mistakes; granted, the IRS has also made mistakes and has some real challenging problems with its new system; looking at the whole operation, it has been successful and smooth. Any new system has "bugs" to iron out. The IRS system is no exception to this point but the magnitude of its operations is exceptional.

---

[72] Ibid., p. 73.

The system is meeting three of the five functional requirements for information; the other two are being met at the Detroit Data Center. The system is meeting all objectives but one and this is being taken care of in the Detroit Data Center. The system was well conceived and its vast operations are contributing toward a realization of the IRS mission.

On these three points then, which have been used as criteria to evaluate the system, it can be concluded that the system is responding favorably in spite of its inherent limitations. There are certain inherent limitations to the system, however, which have been recognized and are discussed next.

Limitations of the System

There are certain limitations inherent within the present ADP system. Two weaknesses in the network have been detected. One concerns technology of the hardware; the other concerns locations and communication. On the technology side, "batch" processing or sequential processing as it is also called is a limitation. There are "time lags" due to the communications problems resulting from the separate locations of the National Computer Center and the seven service centers. A closer examination of these two weaknesses is in order.

"Batch" processing or sequential processing as it is sometimes called, is a technological limitation. On this point, the IRS Director of Systems Development Division said,

> . . . One of the serious limitations of our present ADP System results from the use of sequential or "batch" processing. By this is meant that transactions--these may be receipts of returns, payments, or claims, for example--are accumulated and run against the master files on a weekly cycle. These transactions, often running to several million each week, must be sorted into taxpayer identifying number sequence prior to this run in order to "match" them with master file accounts which are also maintained in sequence by identifying numbers. This means, of course, that the computer must process the entire file of master file tapes each week. It also means that it is necessary to anticipate, well in advance, the types of information likely to be needed to deal with day-to-day problems of tax administration and limit the output of data from the master file to those bodies of information having high priority and volume.[73]

"Time lags" are another limitation of the system. This weakness results from the locations of the seven Regional Service Centers in Atlanta (Chamblee), Philadelphia, Covington (Cincinnati), Austin, Kansas City, Lawrence, and Ogden--all in different states--while the National Computer Center is located in Martinsburg, West Virginia. On this point Lancelot W. Armstrong said,

> . . . Time delays also become an important factor, since the regional service centers, where input and output operations are located, are varying distances from our computer center where master file updating runs take place.[74]

---

[73] Ibid., pp. 73-74.

[74] Ibid., p. 74.

This limitation manifests itself also in another way. The Director or Assistant Director of a Regional Service Center, or any other qualified personnel out in the field, must often wait ten days to two weeks before his request for a transcript of a taxpayer's account at current status is answered from the National Computer Center.

What Does the Future Hold for the IRS ADP System?

It is possible to visualize a completely revised ADP system so that it is substantially modernized from a technology point of view. Imagine, for example, an IRS ADP system similar to the New York Stock Exchange computer system. This stock system is not nearly so massive as the IRS system as far as volume of data to be processed is concerned. Data for only a few thousand stocks is processed in that computer system while data for over 107 million taxpayer returns in about 88 million accounts needs to be processed in the IRS computer system so that the cost of the IRS system would be much more. In any event, go into any large stock broker's office in any large city and press a few buttons on the computer terminal to request from the computer located in New York City the current price data of a particular firm's stock. Before your eyes within a few seconds appears the required data on a terminal screen. The answer is almost instantenous. This is the modern technology of "random access"

with display terminals which the present IRS ADP system lacks due to cost factors. On this point Lancelot W. Armstrong said,

> . . . Visualize, for example, massive direct access files for all taxpayer accounts which can be tapped for information on an "as needed" basis, or from which cumulative reports to management at all levels can be generated as frequently as desired. Also, it is not unreasonable to look forward to an ability to respond within seconds or minutes to urgent inquiries from field offices through display terminals located strategically across the country. Also within reach is a communications network linking all key points of the Service's organizational structure and capable of handling all types of transmission--voice, message, and data.[75]

The Office of the Assistant Commissioner for Planning and Research in the IRS National Office at Washington is busy working on a more modern system. Future system development is not being neglected. Lancelot W. Armstrong, who directs the IRS systems development division, said,

> The Service's present major planning effort in the data processing area--the design of a conceptually new ADP system--will consume a large portion of the Service's systems planning resources over the next few years. There appears to be no alternative to complete replacement of our present system with a much more versatile and responsive one. (underscore, mine) This observation should not be construed as an indictment of the present ADP system. Indeed, it is producing very well and is satisfying most of the objectives which it was originally designed to achieve. It can continue to do so for several more years. However, while the system deals quite well with the conventional returns processing aspects of tax administration the

---

[75] Ibid.

> opportunities to improve on these processes and to introduce highly desirable system innovations are severely limited by the system itself. This is a roundabout way of saying that while the job is getting done, it is not being done as well as it should be.[76]

The Systems Development Division of the Office of the Assistant Commissioner for Planning and Research at the National Office in Washington is presently at work developing objectives for a new, modern system as the first step. These objectives can be classified into the following two categories: (1) technological task objectives which the new equipment should have the capability to perform and (2) program objectives which would include the original objectives of the present ADP Plan, plus additional ones. In short, these objectives amount to hardware objectives and software objectives. The IRS National Director of Systems Development has delineated very clearly what these objectives are. They are quoted below.

> The Service would expect our new system equipment to be capable of performing the following tasks:
>
> 1. Accelerate the introduction of data into the system and thereby improve the currency of information available to users. Improved input devices and techniques now being tested will help here, but other factors, such as high-speed communications networks, are also involved.
>
> 2. Provide direct and easy access by the end users to basic data stored in the master files. This

---

[76] Ibid., pp. 72-73.

provision is intended to suggest an inquiry capability and then only on a need-to-know basis. The user, say a Revenue Office or Agent, would generally have access only to the status of a particular account at a particular point in time. Hopefully, this objective, if realized, will reduce the time required to extract data from basic files from weeks or months to a matter of minutes.

3. Provide the facility to compile data from the basic file on a selective basis and in the final form desired. This implies an ability to provide promptly such summary information (on certain classes of accounts, for example) as management may require on a demand basis.

4. Provide an effective identification system which will make possible linkage and association of related data regardless of source. The present device for associating data is the social security or employer identification number. This objective suggests the development of an identification system which would permit ready association of information outside the tax system with information in the files. Any such system will, of course, have to use existing Social Security numbers.

5. Provide firm control and rapid retrieval of source documents or images thereof. In tax administration, trying to get one's hands on a particular return or other tax document in a hurry can be a frustrating experience. The new system would be expected to improve substantially the control over documents and access to them.

The program objectives for the new ADP System include those originally set forth for the present system, as well as some extremely desirable additional ones. Some of the more important of these are:

1. Integration into the tax account files additional indicators to show the current status of delinquent accounts, accounts under audit, appeal, investigation, or litigation, and accounts on which technical rulings have been issued. Access to information is now available only after a considerable time lag. Consequently, it is possible that a transaction may be posted to an account and an action taken even though the account theoretically is in a suspense status due to pending enforcement action of some kind. Situations like

this will be avoided if this objective can be incorporated into the new system.

2. Provision for prompt access to master file data as needed to carry out taxpayer service functions. At present only limited information about individual accounts is available in district and branch offices. As a result, there is often a delay in answering a written or personal inquiry by a taxpayer about the status of his account. The new system should eliminate, or at the very least, reduce such delay.

3. Application of the system to the problem of accounting reporting, and distribution of revenue receipts. This is a broad subject and one which will require a great deal of study and evaluation of the legal and operating requirements involved. It should be possible, however, to integrate many of the applications involved into the new system.

4. Development of a workable and efficient procedure to facilitate Federal-state data interchange programs. At present, the Internal Revenue Service has entered into agreements with more than 40 states under this program. We want to design a system which will provide for carrying out the Service's obligations under these programs as efficiently and completely as possible.

5. Provision, to the extent practicable, for "by-product" applications such as economic statistics and management information. This is regarded as a gray area which will be carefully studied without any prejudgment as to its ultimate inclusion or exclusion in the final system.[77]

Development of plans for the future ADP system, in the form of definition and scope of the project, was started in 1965.[78] Work on the project began in 1966. 1968 was the target date for a comprehensive report with

---

[77] Ibid., pp. 74-76.

[78] Sheldon S. Cohen, 1965 Annual Report, p. 59.

recommendations for a conceptually new fourth generation ADP system.[79] Progress was made in designing the new system for installation early in the 1970 decade, perhaps in 1972 or 1973. Plans were well into the first study phase--the definition of information requirements--in 1967. "Potential users (Collection, Audit, Intelligence, Data Processing, etc.) are defining and cataloguing their requirements with respect to such characteristics as significance, urgency, volumes, frequency of occurrences, and frequency of demand."[80] Such a catalogue will provide reliable information regarding total processing and storage requirements of the system.

> The final product of this phase of the plan will represent a statement of the major programs expected to be in effect in the period 1970-1975. For each program, objectives will be specifically defined and supporting information requirements developed in terms of detailed descriptions of inputs and outputs to be included in the system. These requirements will then be interrelated so that duplicative and conflicting elements may be reconciled.[81]

After this phase has been established, the Service will consider equipment, file maintenance, processing equipment requirements, content and frequency of output and

---

[79]The 1968 Annual Report of the Commissioner of Internal Revenue gave no additional information about the development of, or progress being made with, the new computer system, except to say that the planning work continues.

[80]Sheldon S. Cohen, 1967 Annual Report, p. 56.

[81]Lancelot W. Armstrong, The Computer: Tool for Management (Elmhurst, Illinois: The Business Press, 1968), p. 76.

other matters of actual design of the computer system.

Major benefits anticipated in the future system include

1. faster entry of new information into master files;
2. direct access to information on file by revenue officers, agents and other Service technicians in the field;
3. inclusion of more comprehensive data on file in terms of both historical and current information;
4. rapid, selective, and properly formatted retrieval of information, and
5. better management through improved allocation of resources.[82]

Plans at the present time indicate the new system will be installed within five years. "In the meantime, everything that can possibly be done to improve the operation of the present system will be done."[83]

---

[82]Sheldon S. Cohen, 1967 Annual Report, p. 56.

[83]Armstrong, The Computer: Tool for Management, p. 77

CHAPTER IV

THE APPLICATION OF COMPUTERS TO TAX RESEARCH

Orientation

The areas of tax research under consideration relate to IRS operations such as the functions of returns processing and compliance, and to the legal and technical functions. Two major programs pertaining to the functions of returns processing and compliance are (1) the Taxpayer Compliance Measurement Program (TCMP) and (2) the "Discriminant Function" Selection of Returns for Audit by Computer (DIF). Other important programs which pertain to the legal and technical functions of the IRS are (1) Tax Exempt Organizations Computerized Master File, (2) Statistics of Income and Computerized Tax Models, and (3) Reports and Information Retrieval Activity (RIRA). The ADP Master File System at Martinsburg, West Virginia was not structured to provide support to the preparation of management information reports or research reports; it has been taxed to capacity with returns processing. Therefore, the research programs considered here deal primarily with the computer configurations in the Detroit Data Center.

Taxpayer Compliance Measurement Program (TCMP)

The IRS inaugurated in 1962 a long-range research study on its operations which was called the Taxpayer Compliance Measurement Program (TCMP). This program was designed to provide administrators with scientifically collected data from which new knowledge would emerge concerning compliance levels, enforcement needs, and allocation of enforcement resources. It has developed into a reliable data base for use in other special studies which are an integral part of the Planning-Programming-Budgeting System (PPBS) of the IRS.[1]

TCMP involves the use of computers to measure the levels of compliance by taxpayers classed as individuals and as businesses. It also provides IRS policy-making officials with an objective yardstick for evaluating the adequacy of its operations and the effectiveness of its planning. This program was conceived as a long-range planning, coordinating, and control device. It has been developing over a period of years on a phase by phase basis in order to obtain valuable information presently lacking in several problem areas as follows:

---

[1] 1968 Annual Report of Commissioner of Internal Revenue, IRS Document No. 55, Treasury Department, Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., pp. 51-52.

1. the size and nature of the total tax administration workload;
2. the portion of the total tax administration job that is accounted for by current operations;
3. the portion of the total tax administration job that is left undone; or the gross tax administration gap;
4. the level of taxpayer compliance;
5. changes in the level of taxpayer compliance and whether compliance is increasing or decreasing under existing programs;
6. the effectiveness with which current operations are being conducted;
7. the net tax administration gap, or that portion of the gross tax administration gap that is worth closing.[2]

The highest ranking IRS career official said:

> The purpose of TCMP is to find answers to such questions as the following:
>
> How many and what kind of tax returns did we fail to get and why?
>
> What is the size, nature and tax significance of errors on tax returns?
>
> How much of the total taxes due did we fail to collect and why?
>
> Is the level of taxpayer compliance better or worse than in previous years? By how much? What seems to be the underlying causes of the change in the level of compliance?[3]

Group effort by computer experts, mathematicians, administrative specialists and statisticians characterizes

---

[2] 1964 Annual Report of Commissioner of Internal Revenue, p. 36.

[3] William H. Smith, "Impact of Automation Upon Enforcement of the Federal Tax Laws," 1965 Proceedings of the Seventeenth Tax Institute of University of California School of Law, p. 46.

the TCMP. It is really a management science or operations research project by a team of technical expects who have joined their specialized efforts to develop a bold administrative measurement program in the field of taxation. TCMP research began with the gathering of data in three separate phases--delinquent accounts, delinquent returns, and errors in returns filed. Later, in 1967, the third phase, "errors in returns filed," was divided into two groups, those of individuals and those of businesses. Since then the TCMP has been identified as composed of four parts or administrative areas as follows:

1. Deliquent Accounts
2. Deliquent Returns
3. Individual Returns Filed
4. Corporate Returns Filed[4]

The delinquent accounts part of TCMP was designed to alleviate tax collection problems of unpaid accounts. Past experience indicated that nearly half of the 6.5 million bills and notices issued became delinquent, and they involved about 1.5 billion dollars in revenue.

The delinquent returns part of TCMP was designed to detect nonfilers, taxpayers who were required, but failed, to file tax returns. Since the delinquency potential among salary and wage earners has been rendered nominal through the operation of the payroll withholding

---

[4]1967 Annual Report of Commissioner of Internal Revenue, p. 60.

system, the TCMP was designed to stress business and farm returns examination. It was also set up to focus attention on nonfilers of dividend and interest income. The program was designed to detect failure to file income, excise, and employment tax returns by individual proprietors, partnerships, and corporate taxpayer.

The returns-filed part of TCMP was designed to deal with the audit phase activity, especially with tax returns containing errors. First, returns filed by individuals were considered and then returns filed by corporations were added. "A computer analysis of audited results covering a random sample of the 64 million individual income tax returns filed in 1964 and subsequent years"[5] was made. These sample returns were representative of all Forms 1040 and 1040A filed in the nation. From them the IRS was able to obtain a statistical description of the behavior of the entire universe of taxpayers. These studies enabled the IRS to determine the number of returns with errors and the tax significance of the errors. The data also revealed the characteristics of the taxpayers who made errors. It also indicated the nature of the errors classified not only by types but also by sizes of tax and by the designated issues involved. The data became very valuable in helping to establish

---

[5]William H. Smith, 1965 Proceedings of the Seventeenth Tax Institute of University of California School of Law, p. 46.

audit criteria for electronic computer programming. Uniformity in selection of returns for audit was made possible.

Budget reductions in Fiscal Year 1968 curtailed TCMP development that year. A Delinquent Accounts survey had to be cancelled along with a Delinquent Returns Farm Business survey. Scheduled surveys of Individual and Corporation Returns filed were postponed. "However, during 1968, results of the initial Individual Returns Filed survey of 1963 individual returns filed in 1964 were used to develop a new computerized audit selection technique."[6] The audit criteria developed were based on rigorous mathematical analyses of audited results obtained by these representative and unbiased TCMP surveys. What became known as the "discriminant function" technique of selecting returns by computer for audit was developed from this TCMP research. This technique is discussed later in this chapter.

The primary uses of data from the TCMP have been

1. To develop cost-yield relationships (average and marginal) in delinquent accounts and returns and examination operations for Planning-Programming-Budgeting System inputs and requirements;
2. To measure the levels of compliance and tax administration gaps for determining the Service's long-term enforcement policies;
3. To determine changes in compliance levels over a period of time for proper direction of enforcement programs;

---

[6] 1968 Annual Report of Commissioner of Internal Revenue, p. 51.

4. To develop better selection procedures to improve the effectiveness of enforcement operations; and
5. To identify alternative methods of operations to achieve greater operating economies.[7]

The anticipated short-run benefits to be derived from TCMP from an operations point of view have been summarized as follows:

1. Establishing the extent of potential cost reduction from revised collection programs based on greater use of data processing procedures and lesser use of enforcement manpower;
2. Determining the Adequacy of the Business Master File as a delinquent returns check;
3. Disclosing pockets of delinquent returns and noncompliance for systematic follow-up by enforcement personnel, educational programs and other indicated tax administration methods; and
4. Developing an effective ADP selection procedure for more than 70 million individual returns filed annually.[8]

It is contemplated that TCMP will show, over the long range, trends of compliance. It will indicate whether the methods of tax administration are associated with increasing, decreasing, or constant levels of taxpayer compliance.

Discriminant Function Selection by Computer of Returns for IRS Audit

From the 75 million tax returns filed annually, in recent years, about three million, or four per cent,

---

[7] 1967 Annual Report of Commissioner of Internal Revenue, p. 60.

[8] Ibid.

are selected for detailed examination or audit.

> In 1967, of the 3,100,000 examined, 52 per cent were found to have misinterpreted the law and were required to pay an additional $3.3 billion in tax. But of the total examined, 40 per cent were able to substantiate all entries and were notified of "no change." Another 7.6 per cent or 200,000 were found to have overpaid and were refunded $362,000,000--which they had neither expected nor requested.[9]

In 1968 a reduced number of examinations were made because of the desire to have quality audits and to take into account the rising complexity of returns being filed. Interview audits were stressed as the primary means to achieve quality audits, and they have been effective in difficult office audit type returns. From the 2.9 million returns examined in 1968, $2.95 billion in additional taxes were recommended by auditors. Taxpayers in 1968 overassessed themselves $177.9 million, which was refunded.[10]

Before the use of electronic computers in 1962, individual income tax returns were classified for audit by the IRS exclusively on a manual basis. Experienced revenue agents, using guidelines established by the National Office, looked at the returns and then used

---

[9]Joseph S. Rosapepe, "How To Collect $155-Billion," Public Relations Journal, XXIV, No. 4 (April, 1968), pp. 32-33. The author is director of information for IRS, Washington, D. C.

[10]1968 Annual Report of Commissioner of Internal Revenue, pp. 20-21.

their individual judgment to screen and select returns for audit. This was known as the eyeball method.

A centralized machine selection method was introduced with the inception of the computerized system of returns processing in 1963. Both the old manual method in some regions and the new machine method in other regions were used until the computerized system was completely phased in and made operational on a national basis in 1967. Corporation and individual tax returns for all seven IRS regions are currently screened by audit selection criteria[11] programmed into the National Computer Center at Martinsburg. From tax returns selected by these criteria, audit selection tapes are prepared by Martinsburg computers and sent out to the seven service centers where lists are printed out and then sent to the 58 district offices. There in the districts further eyeball screening takes place by experienced agents who may remove returns from the audit stream if they judge them not worthy of audit. The number of returns selected centrally

---

[11]See Joel Foster and James Nolan, "IRS Computer Centers Are Concerned About People Too," Journal of Accountancy, CXXV, No. 5 (May, 1968), pp. 26-28; "A Warning to Taxpayers: Exclusive Interview With The Former Commissioner of Internal Revenue," U. S. News and World Report, LXVI, No. 5 (February 3, 1969), pp. 36-39; William H. Smith, "Developing a New Technique in Selecting Returns for Audit," Journal of Accountancy, CXXIII, No. 6 (June, 1967), pp. 22-23; William H. Smith, "What The IRS Is Now Doing To Improve Various Aspects of Tax Administration," The Journal of Taxation, XXV, No. 1 (January, 1967), pp. 56-58.

by the programmed audit criteria generally exceeds the audit capacity of the IRS. Therefore, the second stage of manual screening at the district level by experienced personnel cuts the number of computer selected returns to a managable audit workload. The level of the audit workload has settled to about three million returns in recent years.

A consideration of some of the audit criteria presently programmed into the National Computer Center is appropriate at this point. The present computer selection system uses a range of 36 to 50[12] different classification criteria. Different criteria are used for various types of returns. Any return selected by these programmed criteria is identified as a potential candidate for audit. In the past, IRS officials have refused to talk about or discuss how its computer system was programmed to catch the more common areas or types of error. Only recently has the IRS indicated broad areas of taxpayer error. Now it will identify at least a few of the more common areas of error but it still keeps exact figures and percentages secret. During the 1968 tax season, the IRS publicized four critical audit issues: dependency exemptions, interest payments, contributions, and medical expenses. On

---

[12]William H. Smith, "Developing a New Technique in Selecting Returns for Audit," Journal of Accountancy, CXXIII, No. 6 (June, 1967), pp. 22-23.

each issue information packages were prepared and distributed to regional offices for local release. By directing public attention on these issues of most frequent taxpayer error, misunderstanding, and uncertainty, the number of returns selected for audit had the greatest chance to be reduced. Some audit criteria as determined by the editors of Business Week have been identified as concerning (1) size of income, (2) multiple sources of income, (3) selected occupations, (4) deductions and contributions that exceed certain norms, and (5) any out-of-pattern personal or financial transaction.[13]

High income alone will cause a return to be selected for audit. Size of income is constantly watched by the computers on the theory that higher incomes have higher chance of error. The IRS computer system at the NCC is programmed to be alert to all possibilities of error. All returns above a certain figure of income are selected for audit. The IRS will not state what that figure is. Some tax specialists outside the IRS believe the "certain figure" is $30,000. Some say it is $20,000. Others say $25,000.

The computer system is programmed to select for audit tax returns with multiple sources of income.

---

[13]"Unhappy Returns From The IRS' Computers," Business Week, February 25, 1967, pp. 73-74.

Multiple sources of income are a prime source of tax error among individual taxpayers. Examples of income recipients whose income may come from several sources are manufacturers' representatives, some salesmen, the self-employed, those with large investments in stock and bond holdings or real estate holdings, and those whose incomes are derived largely from oil or gas royalties. Tax on some of these incomes are calculated by different tax rates, such as those found in short-term vs long-term capital gains. All these alternatives create possibilities for inadvertent errors.

Selected occupations are carefully watched by the computer system. Many professional or skilled people obtain most of their incomes from a wide base of clients, patients, or customers; many receive practically all of their income in cash. Examples of these taxpayers are lawyers, freelance writers, accountants, architects; doctors, waitresses, and cab drivers, to cite a few. The returns of the taxpayers in these occupations are programmed to be selected for audit.

Deductions and contributions that exceed certain norms are marked for audit. There are norms for certain deductions and contributions within each income bracket. These norms are expressed as percentages of adjusted gross income, and the IRS keeps these percentages secret. The norms are difficult to pinpoint as they differ sharply

from one region of the United States to another. Any sharp deviation in a return should be fully explained. Chances are the first agent who reviews a fully explained unusual deviation will approve it. Bunching items of contributions under "miscellaneous" is a positive way to attract audit examination. Property donations such as a painting or shares of stock should be explained as to how the value was determined. "If it's over $200, state clearly that there are no conditions attached to the gift, and clip to the 1040 a signed copy of any appraisals. Ignoring this will get you an audit."[14] A large interest deduction will be questioned unless an explanation is attached to the return indicating the cause, such as a sizeable house mortgage. Above normal deductions for state and local taxes need explanation. While it is possible to deduct more than amounts shown on the sales tax table in the 1040 instructions, clear explanations of excesses deducted will help avoid a call from the IRS. Purchases of large items like a car or a boat should be explained with details where sales tax is applicable. For businessmen, heavy travel and entertainment deductions, especially for mixed business-pleasure travel, get special attention. Form 2106 should be used to cover all "T & E" items to reduce the chances of audit.

---

[14]"Personal Business-Taxes," Business Week, No. 2012 (March 23, 1968), p. 141.

Any out-of-pattern personal or financial transaction on a return will cause the computer to select it for audit. For example, if a return suddenly drops dividend income, it should be explained that the stock had been sold or otherwise disposed of, so that the first agent who reviews it will approve. If a son were discharged from the military service during the year being filed and returned to college or school, the taxpayer can count him as a tax deduction. The computer is programmed to reject for audit a sudden deduction for a new child for a middle-aged man. If the new deduction is adequately explained, the agent who reviews the return will probably approve it. Other big abnormal items to report and explain properly are sizeable sales of securities or real estate and the use of income averaging. Casualty loss claims will bring an audit if they are not itemized and clearly explained; theft and vandalism losses should show dates and details of the police report. Claims for household accident losses, like dropping a ring into the garbage disposal unit, will bring an audit. Deductions of losses for termite damage will guarantee an audit.

To reduce chances of a tax audit under the new computer system, IRS men and tax practitioners have one major, pertinent piece of advice for all taxpayers; be more <u>complete</u> and <u>accurate</u> and <u>neat</u> with the information you file. Complete means brief and concise but to the

point. Long, detached, rambling explanations will cause your return to be tossed on the audit pile. Following this simple advice will help avoid inspection and sessions of questions with a revenue agent. When an agent finds these three elements present--completeness, accuracy, and neatness--he will be inclined to have more confidence in the return and pass it by.

The combined machine-manual method of selecting returns for audit had been successful and satisfactory but it lacked optimum efficiency desired by the IRS officials. To increase the efficiency of the machine selection method and to reduce, perhaps eliminate, the manual selection part, the IRS instituted a new research project that entertains the use of mathematical techniques along with the computer. It hoped this new research would produce the desired results of increased efficiency of machine selection of returns for audit. From this research, the new technique called "Discriminant Function" has emerged to identify returns for audit exclusively by computer. What is meant by "Discriminant Function" and how does it work?

Discriminant Function[15] is a process by which returns are scored and ranked by computer on the basis of

---

[15]See "Returns for Audit Chosen by ADP," Journal of Taxation, XXIV, No. 5 (May, 1966), p. 310; William H. Smith, "Developing a New Technique in Selecting Returns

likelihood of error. Highest scores indicate returns that are greatest candidates for audit. Essentially every line or entry on the individual tax return is given a "score." The score represents that line's or that entry's relative importance. The relative importance has been determined by the IRS through research and mathematical analysis. The formula to obtain the score is called the "discriminant function." The total score shows the comparative need for audit. Since details of this new method have not been revealed by the IRS, not much is known about the technique and the formula used is highly secret. The words of two IRS officials can be quoted to help describe this vaguely known technique. On this topic, the Deputy Commissioner of the IRS said,

> . . . The essence of this technique is to determine mathematically the weights (or relative importance) of various significant return characteristics. The capacity of the computer is then used to scrutinize all returns in the same uniform way by applying

---

For Audit," Journal of Accountancy, CXXIII, No. 6 (June, 1967), pp. 22-23; William H. Smith, "What The IRS Is Now Doing To Improve Various Aspects Of Tax Administration," The Journal of Taxation, XXV, No. 1 (January, 1967), pp. 56-58; "Selection of Tax Returns For Examination," Journal of Accountancy, CXXVI, No. 4 (October, 1968), pp. 72-74; "IRS Testing Machine Which Selects Returns for Audit," Taxation For Accountants, I, No. 4 (September-October, 1966), p. 219; "Computer Spotting of Income Tax Returns Gets Under Way," The Wall Street Journal, XLIX, No. 70 (Wed., January 22, 1969), p. 1, Col. 5; "Computer Selects Returns for Audit," 1968 Annual Report of Commissioner of Internal Revenue, p. 20.

these weighted criteria to any applicable characteristics that appear on the documents. In this connection, these weights are so determined as to maximize the separation of returns with potentially large errors from those with few or no errors of little consequence. Then each return is automatically classified and assigned or not assigned for audit examination according to these scores.

If our present expectations are realized, the computerized mathematical selection method will increase the effectiveness of a given level of audit manpower by (1) reducing the proportion of examined cases resulting in little or no tax change, (2) increasing the average tax change resulting from audit and (3) further reducing the manpower heretofore required in the classification process--manpower that can be more profitably engaged in examination work. In addition, all individual returns filed will be uniformly screened for audit by the same selection standards and with the same degree of intensity irrespective of the filing or examination district.[16]

On this Discriminant Function System, the Assistant District Director, Internal Revenue Service, Boston District, said,

. . . Basically, this is a system which uses a mathematical technique designed to select returns with a high probability of tax change. The technique is performed as the returns go through the data processing machines on tape. While I'm not a mathematician, its principle, I believe, works this way--relative importance (weights) of various selection criteria (both positive and negative) are determined mathematically. Each line of the tax return is given a weight and the values are added. The higher the score, the more likely the return will be audited further for error or deception. What's the formula? Actually, the formula, as Singleton Wolfe, Director of our National Audit Division, indicated at a recent Providence, Rhode Island meeting is "so closely

---

[16]William H. Smith, "Developing a New Technique In Selecting Returns For Audit," The Journal of Accountancy, CXXIII, No. 6 (June, 1967), pp. 23-25.

> guarded that even he does not know it." We are hopeful that this further extension of the use of computer technology will enable us to realize further gains from the same relative manpower.[17]

Test to validate this technique were completed in 1968. The Discriminant Function method has proved more effective than the present machine criteria selection method and it compares more than favorably in cost and value with ordinary visual screening methods.

The Discriminant Function technique is presently being used in the Fiscal 1969 tax season on 1968 income tax returns filed on 1040 and 1040A forms showing less than $10,000 adjusted gross incomes. In Fiscal 1970, it will be used to classify higher income returns for audit--those with over $10,000 of adjusted gross income. This Discriminant Function technique is now being referred to in the public prints by the acronyn "DIF" or the "DIF" System.[18]

The Discriminant Function System will provide uniform screening of individual tax returns and reduce

---

[17]Elmer H. Klinsman, "Some Recent Trends In Federal Tax Administration," Massachusetts CPA Review, XXXXII, No. 5 (February-March, 1969), pp. 169-70.

[18]See the column by Sylvia Porter, "Save On Taxes--II," The Saginaw News, Tuesday, February 18, 1969, Section B, Page 5, Column 5; "Computer Spotting of Income Tax Returns Gets Under Way," The Wall Street Journal, XLIX, No. 70 (Wednesday, January 22, 1969), p. 1, Column 5; "New Formula Classifies Returns For Audit," Journal of Taxation, XXX, No. 3 (March, 1969), p. 150.

both machine and manual selection costs. Simulation tests indicate that the DIF System will produce the following favorable results:

1. Higher tax change yields from returns examined,
2. Lower audit classification and related data processing costs,
3. Fewer tax returns audited with little or no tax change.[19]

Computerized Research in the Legal and Technical Areas

The ADP Master File System at Martinsburg, West Virginia was not fully structured to provide support to taxpayer appeals and the issuance of technical information. Consideration is now directed to the application of computers to these two functional areas--legal and technical--and to the computer configurations in the Detroit Data Center where these research programs are handled. An IRS official has given the following pertinent statistics in these two areas:

> Tax practitioners are keenly aware, I am sure, of the tremendous magnitude of our legal and technical workload. In a tax system encompassing almost 100 million tax returns each year, it is an unavoidable fact of life that differences of opinion or questions of interpretation in need of resolution will frequently arise. Although the overwhelming majority of tax returns fall into the non-controversial category, it is not surprising that every year we process 35,000 to 40,000 requests for rulings or

---

[19] 1968 Annual Report of Commissioner of Internal Revenue, p. 51.

> technical advice, that each year 50,000 cases reach the informal conference level, that our Appellate Division considers 15,000 cases annually, and that approximately 5,000 cases are docketed in the Tax Court each year. In addition, several thousand tax cases are tried by the District Courts, the Circuit Courts ofAppeal, the Court of Claims, and the Supreme Court.[20]

The legal area of work primarily involves taxpayer appeals. Each taxpayer has the right to an independent review of a proposed determination of his tax liability resulting from an official audit examination. The Service provides each taxpayer with two informal levels of appeal before going into the formal level of the Tax Court. He may appeal his case when in disagreement with an examining officer by requesting a district level conference. If he disagrees with the findings at that level, he may request that his case be heard in the Appellate Division at the regional level. The objectives of these appeal procedures is to resolve tax controversies with taxpayers without litigation on a basis that is considered mutually fair and impartial to both taxpayer and government. In the event an agreement is not reached at the Appellate Division, the taxpayer may file an appeal with the Tax Court of the United States. Taxpayers with unresolved cases at the district level or at the regional

---

[20]William H. Smith, "Impact of Automation Upon Enforcement of the Federal Tax Laws," 1965 Proceedings of the Seventeenth Tax Institute of University of Southern California School of Law, p. 56.

appellate level can avoid litigation before the Tax Court by directing their cases into options other than the Tax Court that are open to them. These options can be exercised on the part of the taxpayer by paying the deficiency and within two years from the date payment, filing a claim for refund of the amount in dispute. The taxpayer can file suit in either the U. S. district court or the U. S. Court of Claims when the claim is disallowed by the Service or within six months after the claim is filed if no action is taken.

The technical area of work involves primarily the interpretation of the taxing statutes. Published rulings play a vital role in tax administration. The compliance capability of the nation's taxpayers depends upon the timely development and dissemination of technical interpretations of the revenue statutes and regulations. Publication of administrative interpretations of tax law provides guidance to taxpayers and tax practitioners both in planning transactions and in preparing returns; they promote uniform treatment of issues in the examination of returns because they provide precedents to be cited and relied upon in the disposition of other cases. Many thousands of requests for this kind of technical information are received annually by the IRS, which necessitates the issuance and publication of numerous rulings, advisory statements, and other tax guide materials for

the benefit of both the public and IRS officials. An excellent example is the many tax determination letters issued by the district directors in recent years on pension plans and tax exempt organizations. The Deputy Commissioner of Internal Revenue spelled out clearly the difficult problem of achieving coordination and control of legal and technical information in order to achieve uniformity and consistency in the Service's enforcement, appellate, technical, and litigating positions. He said,

> The dimensions of this caseload have made it difficult to supply fingertip coordination among the hundreds of offices and thousands of individuals charged with the handling of these cases through conventional reporting and indexing techniques. Consequently, our conferees, technical advisors, and attorneys are frequently at a great disadvantage, since they often are unable to benefit from past precedents of an unpublished nature or to exchange views with technicians working in other offices on cases involving identical issues. Also, in many cases, lack of coordination produces a duplication of research effort, causing an unnecessary waste of skilled manpower.
>
> For the tax administrator, lack of coordination means absence of control, and for the tax practitioner it means uncertainty in the face of inconsistent positions being taken by the Government in the settlement and litigation of cases. Invariably, it also means delay in the identification of technical trouble areas, with corresponding delay in remedial action.[21]

Plans were begun in fiscal 1964 to establish an improved management information system with particular

---

[21]William H. Smith, 1965 Proceedings of the Seventeenth Tax Institute of University of Southern California School of Law, pp. 56-57.

emphasis on these two areas of work--legal and technical.[22] An IRS information, storage and retrieval system, based on the usage of computers, was sought to improve efficiency in the management of these areas and to be more readily responsive to Treasury Department and Congressional information needs. However, computer utilization progress and systems development in these areas has lagged behind that in the tax collecting areas. The problem in the legal and technical areas is one of storage and retrieval of pertinent legal documents and abstracts which are so voluminous and challenging for classification. Computer software technology (programming) needs further development in this area, particularly with respect to the indexing of material. In spite of the limited tools at hand, some progress has been made. It is traced and reported below under the topics of Reports and Information Retrieval Activity (RIRA), Computerized Master File of Tax Exempt Organizations and Pension Trust Funds, Statistics of Income and Computerized Tax Models, and Federal-State Cooperation in Exchange of Tax Information Program.

Reports and Information Retrieval Activity (RIRA)

Accountants and other tax practitioners taking cases to court, or contemplating such action, should

---

[22] 1964 Annual Report of the Commissioner of Internal Revenue, p. 39.

understand how the IRS handles litigation today. RIRA is a new computerized system that strengthens the IRS' hands and sharply improves the vigor of its tax collection.

RIRA is a new development in the National Office of the IRS. RIRA is a legal information retrieval system that operates for the benefit of Service attorneys in the Chief Counsel offices. More specifically, RIRA is a "magnetic tape computer-based system combined with microfilm and high speed microfilm reader-printers."[23] In short, computers are used to store, retrieve, process, and disseminate legal information for the following purposes:

1. To assist IRS attorneys in taking positions in litigation that are consistent with established IRS policy.
2. To help create uniformity of treatment of taxpayers throughout the country.
3. To provide accurate and complete statistics of pending technical and litigation matters.
4. To enable the IRS to perceive more quickly problem areas in the tax law.[24]

Objectives to be served by the Reports and Information Retrieval Activity (RIRA) System are concentrated primarily in the legal area of the Service's work and can be separated into two broad categories. In the first category are those objectives directed toward the

---

[23]David T. Link, "Micro Forum," The National Public Accountant, X, No. 5 (May, 1965), p. 15.

[25]R. P. Hertzog, "RIRA--The IRS' New Electronic Weapon in Litigating Tax Cases; How It Works," Taxation for Accountants, I, No. 6 (January-February, 1967), p. 363.

achievement of maximum consistency of positions taken by the IRS attorneys on legal issues. The second category consists of objectives directed toward improving the capacity of professional personnel to research case files, court decisions, administrative rulings and interpretations, technical memoranda and special studies.

Since 1913, when the first Federal income tax law passed, the proliferation of statutes, administrative rulings and regulations, case law, and learned articles has caused an information explosion which now only the computer can manipulate effectively. In the past, decided cases have been reported and have been fairly well indexed by the published tax services and other books available to tax practitioners, but numerous matters processed by the Chief Counsel's Office have not been and may never be published. The Associate Chief Counsel said,

> In the last fiscal year, the Chief Counsel's Office handled over 26,000 civil litigation matters of all kinds, as well as over 1,200 criminal cases. At the end of that year, there were over 11,000 cases pending in the Tax Court and over 3,300 refund suits in the Federal courts.[25]

Since cases are handled by some 650 Chief Counsel attorneys in 34 cities, there exists a serious physical problem of keeping all these attorneys in all these

---

[25]R. P. Hertzog, "How The Chief Counsel's Office Uses ADP in Litigation of Cases," The Journal of Taxation, XXIV, No. 5 (May, 1966), p. 309.

cities fully informed and up-to-date on the particular subject matter and issues of pending cases as well as with that in the closed internal file. In the past, before RIRA became effective, it was not unusual for an IRS attorney in New York or Washington to take a firm position on a particular issue which was exactly opposite of the position assumed by another IRS attorney on the same issue in, let us say, Texas or California. It is possible that both lawyers could have either won or lost. RIRA is a welcome change that is designed to overcome this weakness. It is necessary and desirable that positions taken in litigation in various parts of the country be consistent with established IRS positions. A four-man office of the Chief Counsel out in the field in a place like Buffalo, when equipped with RIRA service, has available to it the same information resources as does the 250-man National Office.[26] RIRA will permit the IRS to provide equal application of tax laws throughout the entire United States faster, more consistently, and much more efficiently.

How does RIRA work? The main features of the operation of RIRA are (1) the Uniform Issue List (UIL), (2) Microfilm, and (3) Counsel Legal Information Centers (CLIC).

---

[26]Mitchell Rogovin, "Impact of Computers on Tax Practice Today: What They Can Do For The IRS and Tax Men," The Journal of Taxation, XXV, No. 2 (August, 1966), p. 112.

For many years in the past, the big obstacle to legal communication for the IRS has been a lack of common language in taxation. For attorneys to research and coordinate properly their cases and issues, some kind of indexing system which uses uniform language is essential. Such an index was developed in 1962. It was called the Uniform Issue List (UIL) and was originated for implementation and installation into RIRA. "Keyed to the Internal Revenue Code, UIL is, basically, an index--an index in which a limited number of terms are used to designate appropriate legal issues.[27] An eight-digit number is assigned to each section of the Code. Within each section there are major classifications. A major classification often has sub-classifications. For example, under Section 162 of the Code, which concerns business expense deductions, 24 major classifications and 52 subclassifications appear. The number 0162.00-00 describes an issue concerning trade or business expense. The number 0162.02-00 is used if the business expense involves the question of whether the expense is an ordinary and necessary business expense. If the question concerns that of providing the amount deducted, the number 0162.03-00 is used, and so on. This list provides a uniform legal

---

[27]David T. Link, "Micro Forum," The National Public Accountant, X, No. 5 (May, 1965), pp. 14-15.

language in the field of taxation. It permits both the classifier and the researcher to use identical terms when referring to the same type of issue. It contains legal concepts or descriptors rather than broad issues. Descriptors are intended to portray the various problems within issues. Therefore, several indices might be necessary to describe some issues.

Both pending and closed cases are tied into the index, along with abstracts giving exact positions taken by both the Commissioner and the taxpayer. The 2,000 page index, which is issued monthly along with microfilmed abstracts, is forwarded to the 40 Counsel Legal Information Centers (CLIC) which are equipped with microfilm reader printers. By examining the one- or two-page abstracts, IRS attorneys can determine the exact position taken by both the taxpayer and the Commissioner. The index shows such things as the number of cases in a specific classification and geographic location. It also indicates docket number and status of each case, dates of most recent change in each case, name of each taxpayer involved, and the particular attorney handling each case.

Government attorneys are able to classify issues in the cases assigned to them with UIL. The procedure followed by attorneys in each new case is to (1) classify the issues involved and assign a UIL number on a computer-printed form, (2) prepare an abstract of pertinent facts

in the case which should be about one or two pages long, (3) forward abstract and computer-printed form to the RIRA computer processing center which is now centralized at the Detroit Data Center.

At the Detroit Data Center the case abstracts are microfilmed and periodically distributed to field offices. The computer-printed form is processed through transcription (keypunching) to computers which produce two types of monthly printouts showing an inventory of cases pending with the Chief Counsel's Office. These printouts become guides for all government tax lawyers to locate other pending cases in the office concerned with issues similar to their cases. The first monthly printout lists all cases in sequence by UIL number and shows pertinent information about each case. The second printout from the centralized computer lists inventories of cases according to the office handling them. A copy of the first monthly printout is distributed to all field offices where microfilm reader-printers permit full utilization of the information.

Focal points of the RIRA system are the Counsel Legal Information Centers (CLIC). There are 40 IRS Counsel Centers. The problem of circulating the abstracts to some 650 IRS attorneys spread throughout the United States in the 40 Counsel General Centers was solved by using microfilm on which to transfer the data.

These abstracts became somewhat equivalent to law books. The Filmac 400 reader-printer, developed by the Minnesota Manufacturing and Mining Company, supplied the required viewing equipment and rapid printer capability.

> Under the new system, an attorney simply checks the index, requests the cartridge containing the information he needs, inserts it in the reader-printer machine, then advances the microfilm to the desired image. By pressing a button, he can obtain--in five seconds--a print of the document appearing on the screen.[28]

What about the availability of the computerized RIRA index to private tax practitioners? Some insight into the government's position on this matter can be obtained from the following quote:

> As Chief Counsel, it was my hope to make the RIRA index available to private tax men insofar as possible without revealing confidential information. Privileged material exists within the system since ruling and technical advice requests handled by the Interpretative Division of the Chief Counsel's office are also indexed and abstracted . . . . While it would not be realistic to expect the Government to make this information available to the public, this does not mean that a modified index could not be worked out in time . . . .[29]

A chief difficulty since RIRA's inception in 1964 has been the inability of the Chief Counsel's Office to keep this legal information system current. Primary

---

[28]David T. Link, "Micro Forum" The National Public Accountant, X, No. 5 (May, 1965), p. 15.

[29]Mitchell Rogovin, "Impact of Computers on Tax Practice Today; What They Can Do For The IRS and Tax Men," Journal of Taxation, XXV, No. 2 (August 1966), p. 113.

cause of this difficulty was lack of a proper computer facility. Computer time and key punch operator time had to be purchased; microfilming facilities of other government agencies had to be used. This arrangement caused many delays and prevented the production of a list of pending cases with any degree of regularity. The problem was solved in July, 1967 when the IRS Data Center at Detroit began doing all RIRA processing. The computer facilities made available to RIRA at Detroit has permitted this legal information system to remain current. Up-to-date monthly listings are now produced of all civil cases, except collection suits, pending in the Tax Courts, District Courts, and Courts of Appeal.

Recently, the Assistant Commissioner for the Technical Division of the IRS stated that the IRS Chief Counsel pointed out that his office hoped to have very soon on 16mm microfilm a complete listing of all pending cases available for sale to practitioners on an annual subscription basis.[30] Details of this announcement and the microfilm listing of tax cases that have been made available appeared in the January, 1969 issue of the Journal of Taxation as follows:

> Microfilm listing of tax cases available--A monthly listing on 16mm microfilm of all tax cases, other

---

[30]Tax Analysis--Key Government Officials Give Informal Views on Timely Topics," Journal of Accountancy, CXXVI, No. 4 (October, 1968), p. 72.

than collection suits is now available on a subscription basis.

The listing contains all the tax cases pending in the Tax Court, district courts, Court of Claims, and the Appellate Courts.

Subscribers to the service, which costs $78 a year, will receive a uniform Issue List (IRM 1275). This is an index used to make broad identification of case issues. It consists of an eight-digit issue number and brief titles keyed to Code sections. Each case is listed by court docket number under the appropriate issue number. The listing contains the taxpayer's name, the court, city in which the case is docketed, the assigned Chief Counsel field office or division, the filing date of the petition.

Practitioners should not expect this service to provide more than a broad directional indication of the issue or issues involved. For example, under issue number 0061 15-00 which related to interest income under Section 61, the list might contain some 75 cases. The Uniform Issue List (IRM 1275) furnished the practitioner lists some 12 subdivisions under the 0061-15-00 category (accrued-01, principal v. interest-02, bond-03, capital recovery-04, etc.) but these finer shadings do not appear to have been made.

The listing is available from the Clearinghouse for Federal Scientific and Technical Information, U. S. Commerce Department.

TIR 993, 10/7/68, contains a sample application. Applications or requests for applications should be sent to Clearinghouse, Springfield, Va. 22151. Payment must accompany the application. The initial reel was mailed in November and contained docketed cases which were pending as of September 25, 1968.[31]

Tax Exempt Organizations and Pension Trust Fund Master File

Plans were initiated in the fiscal year of 1964 to construct and develop a computerized master file system

---

[31] "Microfilm Listing of Tax Cases Available," The Journal of Taxation, XXX, No. 1 (January, 1969), p. 56.

of tax exempt organizations in order that administration of the legal work might be improved and to be more readily responsive to Treasury Department and Congressional information needs.[32] The file was established in fiscal year 1965. There has been a persistent rise in the number of organizations and pension trusts seeking tax exemption. The organizations, in addition to private foundations, which may be granted exemption from income tax have been classified into six broad groups as follows:

1. Charitable or religious
2. Public (educational or scientific)
3. Business and professional (chambers of commerce, trade associations, etc.)
4. Civic (townships and cities)
5. Employee associations (labor units, pension trusts and insurance companies)
6. Private (social clubs, fraternal organizations and cemetery companies.)[33]

Closer examination of all these organizations was planned to make sure the activities of these organizations were confined to those for which they received tax exempt status.

In 1964 there were "well over a half million organizations exempt from tax under various provisions

---

[32] 1964 Annual Report of the Commissioner of Internal Revenue, IRS Document No. 55, Treasury Department, Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., p. 39.

[33] Norman H. Ginstling, "Permissable Activities of Exempt Organizations (Other Than Foundations)," 1965 Proceedings of the New York University 24th Annual Institute on Federal Taxation, p. 115.

of the Internal Revenue Code."[34] Information from these questionnaires regarding name, address, employer identification number, purpose of organization, and nature of activity was transcribed to magnetic tape and constituted the foundation for a consolidated file of exempt organizations. All transactions pertaining to their status are now posted to this file from returns submitted by these organizations. Pertinent information posted to these records include (1) the granting, denial, termination or revocation of exemption status; (2) compliance or non-compliance with annual filing requirements; (3) audit results; (4) recommendations for future audits.

This file provides a central and accurate listing of all tax exempt organizations. From this file is provided a directory of organizations to which contributions by taxpayers are deductible. A national roster of organizations whose exemptions have been denied or terminated is also provided. Together these lists make it more feasible for the IRS to determine those contributions which are deductible and to detect those contributions which do not qualify for deductibility.

Periodic screening of the Exempt Organizations File permits delinquency checks to be made in order to

---

[34]William H. Smith, "Impact of Automation Upon Enforcement of the Federal Tax Laws," 1965 Proceedings of the Seventeenth Tax Institute of University of Southern California School of Law, p. 53.

identify those organizations which are required to but did not file the annual information returns or the "unrelated business" income tax returns. It permits selection of returns for audit. In general, the relatively new Exempt Organizations Master File permits national supervision and administrative control over the universe of exempt organizations for the first time. Just as the Individual Master File (IMF) and the Business Master File (BMF) at the NCC permit closer control over the nation's taxpayers, this master file of exempt organizations enables the IRS to make sure that the classification of tax exemption attaches purely to those organizations which legally operate within the framework of the applicable exemption statutes.

The Tax Exempt Organizations Master File System is maintained on tape by the computers in the Detroit Data Center. The file was expanded in 1966 to include trusts established under pension plans. The number of individual organizations included in the master file went up during the 1968 fiscal year from 309,000 to 358,000. Exempt pension trusts included in the file increased from 89,000 to 106,000.[35] The system was upgraded in the

---

[35] 1968 Annual Report of the Commissioner of Internal Revenue, IRS Document No. 55, Treasury Department, Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., p. 9.

fiscal year of 1968 by redesigning many elements and redefining its objectives, as follows:

1. To use computers to generate mailing labels for returns,
2. Retrieve and provide information quickly by type, size and other significant characteristics of all tax exempt organizations,
3. Create a capacity for determining compliance with the filing requirements of the law,
4. Establish a more effective system for processing returns,
5. Assist in selecting exempt organization returns for examination.[36]

A proportionate share of the IRS' audit examination program is allocated to exempt organization returns. The main objective of this examination program is to verify the tax exempt status of organizations by attesting to the fact that these organizations confine their activities to those permitted by the exemption provisions of the law. In 1965 over 12,400 returns were examined in the program to detect and prevent tax abuses in this area. Examination of tax exempt organization returns increased in 1966 to 13,331. Almost $38 million in additional taxes and penalties resulted from these examinations. Recommendations to revoke the tax exempt status of 232 organizations were made by examining officers in 1966. From the 11,746 returns examined in 1967, 260 revocations were recommended. All the 12,128 returns examined in fiscal year 1968 were found to be operating as required

---

[36] Ibid.

by law, except 182 organizations. Examining officers recommended revocation of the tax exempt status of these organizations.[37]

The tax exempt organizations, especially private foundations, are now being watched very closely. Closer scrutiny has been made possible by the computerized master file. The Treasury Department has recommended to Congress a number of new rules to close loopholes, along with a report that there has been some abuses of the tax exempt privileges of private foundations.[38]

Congressmen now are being prodded by tax-paying businessmen and their spokesmen to deal with the problem of tax exempt organizations that engage in activities which compete with taxpaying businesses. A former Internal Revenue Commissioner, Mortimer M. Caplin, who now represents the National Tax Equity Association, cited many examples of unfair competition from churches, private foundations, trade associations, fraternal beneficiary societies and cooperative associations.[39] Private

---

[37] 1968 Annual Report of Commissioner of Internal Revenue, p. 22.

[38] "Tax-Free Foundations: Study Starts in Congress," U. S. News and World Report, LXVI, No. 6 (February 10, 1969), pp. 81-82.

[39] "Tax-Free Groups Studied Again," U. S. News and World Report, LXVI, No. 10 (March 10, 1969), p. 100.

foundations have been growing at the rapid rate of about 2,000 a year. They now control $20.5 billion in assets. "The Foundation Center, an association of philanthropical organizations, estimates there were 22,000 at latest count. The IRS by its broader definition lists 30,262 foundations."[40] The "big ten" among foundations are"

	Assets* (Millions)
Ford Foundation	3,580
Rockefeller Foundation	804
Duke Endowment	615
Mott Foundation	424
Lilly Endowment	390
Kellogg Foundation	375
Carnegie Corporation	336
Sloan Foundation	327
Pew Memorial Trust	303
Hartford Foundation	270

*At end of 1967, latest available.
Source: Foundation Center.[41]

Complaints are being made that a large number of foundations abuse their tax-exempt status. Many congressmen are determined to force broad changes in the way private foundations operate. Some want to tax all foundations.[42]

---

[40]"Tax-Free Funds Come Under Fire," U. S. News and World Report, LXVI, No. 9 (March 3, 1969), pp. 84-85.

[41]Ibid., p. 84.

[42]"Many in Congress Ready to Tax All Foundations, Curb Their Operations," The Wall Street Journal, XLIX, No. 97 (Friday, February 28, 1969), p. 1, Col 6; "Foundations Feel Heat of Tax Reform," Business Week, No. 2062 (March 8, 1969), pp. 72-76.

Statistics of Income and Computerized Tax Models

At the present time, the series is required by Section 6108 of the Internal Revenue Code of 1954. The first volume of Statistics of Income issued was for 1916; however, it contained tax data for individuals back to 1913 and for corporations back to 1909, the very first years of income taxation. The next fifty years saw the Statistics of Income program develop from the initial small report used for tax administration purposes to a set of volumes containing numerous complex analyses which provide important data needed for economic and financial research as well as for tax administration.

The IRS has been accelerating its use of Statistics of Income and tax models for tax research. The Statistics of Income Program has become a feature of the computers at the Detroit Data Center. Great improvements have been made in the type and quality of the data in the series. Computer technology has vastly contributed to improved data processing methods and speedier publication of the volumes. The Statistics of Income provide very valuable information about the operation of our tax system. New compilations made possible by centralized computerization of the data at the Detroit Data Center are now providing more sophisticated information for use in connection with Federal tax administration and tax research

of various kinds. The information is used (1) to analyze the tax or economic effects of specific provisions of the Code and (2) to measure taxpayer responses to the administration of the Federal tax system. It also supplies a financial profile of taxpayers.

The Statistics of Income series published in Fiscal 1967 included the following seven major reports:

1. Individual Income Tax Returns, 1964 (192 pp. $1.25);
2. Individual Income Tax Returns, 1965, Preliminary (25 pp., 20¢);
3. U. S. Business Tax Returns, 1963 (237 pp., $150);
4. U. S. Business Tax Returns, 1964, Preliminary (25 pp., 20¢);
5. Sale of Capital Assets Reported on Individual Income Tax Returns for 1962 (153 pp., $1.00);
6. Farmers' Cooperative Income Tax Returns for 1963 (58 pp. 40¢);
7. Foreign Tax Credit Claimed on Corporation Income Tax Returns, 1961 (73 pp., 50¢).[43]

The first four reports are examples of regular reports and the last three are supplemental reports.

The list of reports issued in the Statistics of Income series during the fiscal year of 1968 is as follows:

1. Individual Income Tax Returns, 1965 (224 pp., $2.00);
2. Individual Income Tax Returns, 1966 Preliminary (26 pp., 20¢);
3. U. S. Business Tax Returns, 1964 (213 pp., $1.25);

---

[43] 1967 Annual Report of Commissioner of Internal Revenue, IRS Document No. 55, Treasury Department, Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., p. 104. These publications in the Statistics of Income series can be ordered from the Superintendent of Documents, Government Printing Office, Washington, D. C. 20402.

4. U. S. Business Tax Returns, 1965, Preliminary (25 pp., 20¢);
5. Corporation Income Tax Returns, 1963, (429 pp. $2.25);
6. Corporation Income Tax Returns, 1964, Preliminary (41 pp., 25¢);
7. Corporation Income Tax Returns, 1965, Preliminary (31 pp., 25¢);
8. Fiduciary, Gift, and Estate Tax Returns, 1965 (114 pp., $1.25).[44]

The computerized information and statistical data included on the reports of the Statistics of Income series are very useful for

1. Revenue estimating;
2. Tax and financial research conducted by Government agencies, businesses, private research organizations, and universities; and for
3. Supplying financial and economic data used in the preparation of the National Income and Product Accounts which show all contributions to the Gross National Product.[45]

The IRS has developed and is making increased use of tax models for use in tax research to evaluate proposed changes in the tax law.[46] The IRS tax model consists of a statistical sample of approximately 100,000 individual income tax returns, which is weighted to represent the entire universe of taxpayers on Forms 1040 and 1040A filed

---

[44] 1968 Annual Report of Commissioner of Internal Revenue, p. 93.

[45] 1967 Annual Report of Commissioner of Internal Revenue, p. 57.

[46] E. J. Engquist, Jr., "Improved Statistics Resulting From the ADP System," Taxes, XXXX, No. 1 (January, 1963), pp. 39-44. The author is director of Statistics Division, IRS.

throughout the nation. The tax model was constructed by transcribing data from a selected sample of tax returns to magnetic tape and then manipulating the data by computer to simulate changes in the rules governing the computation of income tax due. A tax model using 1960 individual income tax returns was used to simulate the effects of reduced rates and a minimum standard deduction that were features incorporated in the provisions of the Revenue Act of 1964.

A new updated model based on a sample composed of 100,000 individual income tax returns for 1962 was constructed to provide fast and reliable forecasts of the revenue effect of changes in tax laws and their administration. This 1962 model consisted of a magnetic tape file of the selected sample of individual returns along with a computer program capable of simulating the results of a wide variety of possible changes in the tax law. This 1962 model was used extensively in predicting revenue that would be received under various proposals for graduated withholding rates on salaries and wages. The research based on this 1962 model laid the foundation for the Code changes legislated by the Tax Adjustment Act of 1966 (Public Law 89-368).

A revised 1964 model was designed to provide more up-to-date base data and more flexible computer manipulation and tabulation possibilities. This 1964 model of

individual returns was constructed with a sample of 95,000 Forms 1040 and 1040A tax returns, stratified by size of adjusted gross income. It was selected from the population of 66 million individual income tax returns filed for 1964 income. The 1964 model has been used extensively, for example, to evaluate proposed tax legislation in the area of taxpayers aged 65 or over and for the deduction for state income taxes that the Treasury Department was considering.

Three tax models were being used in 1967--the individual, the sole proprietorship and the corporation models. These computerized model files were maintained on magnetic tape at the Detroit Data Center. In addition to the 1964 individual tax model described above, the 1964 sole proprietorship tax model and the 1964 corporation tax model were used for tax research on contemplated legislative changes. The sole proprietorship model was used to indicate profiles of individuals with large business deductions and losses. It was based on receipt and disbursement amounts for a sample of 147,000 Schedules C and F of Form 1040 for 1964. The corporation model file contained the complete 1964 income statement, the balance sheet and other schedules for a sample of 51,000 returns in the Form 1120 series for accounting periods running from July, 1964 to June 30, 1965.

During the fiscal year 1968, three simulation models were developed--the 1966 individual tax model, the 1966 sole proprietorship model and the 1966 corporation tax model. The 1966 individual tax model contained about 80 income, deduction, and tax related items from each of 86,610 Form 1040 and 1040A tax returns. The other two models will contain the same number of data items for samples of about 130,000 tax returns concerning sole proprietorships and 49,000 tax returns concerning corporations. Duringl968, the IRS used the 1964 individual tax model to predict how various groups would be affected by the surcharge that became law that year. The tax models are not only predicting devices but they are also used to provide information regarding the characteristics, or profile, of groups of taxpayers. For example, the 1966 individual tax model is currently being used in the 1969 tax year to isolate the characteristics of the increasing number of taxpayers that are receiving large refunds. The number of individual income tax returns with refunds increased 26 per cent from 1964 to 1966 and an even sharper increase of 46 per cent in the dollar amount of refunds resulted for the same period. The information to be derived from the tax model will enable the Service to determine the reasons for these sharp increases in refunds and permit the development of appropriate operating plans to correct this developing trend.

Under the terms of Sections 7515 and 7809 of the Internal Revenue Code as amended by Public Law 87-870 (87th Congress, 2d session), the IRS has undertaken special tax research studies on a reimbursable basis. Under the provisions of the law, the IRS may receive payments for special studies and compilations furnished to private organizations and non-Federal government agencies. The IRS is permitted to use the payments to reimburse the Congressional appropriation which bears the cost of such work. The legal power to make these special tax studies and tabulations is clear evidence of Congressional recognition of the wealth of statistical information available on tax returns and related documents. Requests for data on a reimbursable basis fall into two categories, as follows: (1) copies of material from the Source Book of Statistics of Income and (2) special studies. Major users have been universities, private individuals, state and local government agencies, companies, research organizations, and other Federal Government agencies.

During 1965 the IRS opened its tax model tape files for the first time and made available for sale copies of its magnetic tape files. The tape file, for example, which shows the construction of the 1962 individual income tax return model can be purchased for about $300 by researchers in other Government agencies and non-government organizations. About sixty items of information

are included on each individual record in the file. From this data users can compute the tax liability and most of the income, deduction, exemption, and tax credit details for each individual taxpayer included in the file although all identifying data for each taxpayer entity has been deleted. In this manner the IRS makes available valuable data for statistical purposes while at the same time protecting the confidentiality of tax returns.

The announcement was made in the October, 1968 issue of the Journal of Accountancy,[48] that the 1966 IRS tax model is now available to researchers at cost. This model is a miniature of the entire U. S. taxpaying population. It is on magnetic tape and represents a random selection file of 86,000 returns with taxpayer names and other identification details deleted. The file can be fed into computers to measure the impact of any proposed changes in the tax Code. Any proposal tested with this 1966 Tax Model is calculated on each one of the 86,000 returns in the sample.[49]

---

[48]"IRS Tax Model Available To Researchers At Cost," Journal of Accountancy, CXXVI, No. 4 (October, 1968), pp. 14-16.

[49]Tax researchers desiring further details on the use of this model or others may write to Assistant Commissioner, Planning and Research, Internal Revenue Service, Washington, D. C. 20224.

Programs of Federal-State Cooperation in Exchange of Tax Information[50]

The Federal-state Cooperation in Exchange of Tax Information Program is still in the process of development. In at least one area of activity--the exchange of audit information--reports indicate the program has produced very valuable results for both the IRS and some states. For example, the IRS was able in 1964 to make $7 million in additional assessments of taxes, interest, and penalties due to the audit information received from the states in the program. For the same year 18 states and the District of Columbia made deficiency assessments totaling $25 million due to audit information received from the IRS.

The Federal-state cooperation program has been expanded through the use of computers. To develop leads to identify nonfilers and delinquents, the states tape file of income taxpayers was matched with the tape of the IRS to produce two separate files. The first file,

---

[50] Annual Reports of Commissioner of Internal Revenue: 1965, p. 36; 1966, p. 36; 1967, p. 35; 1968, p. 33-34. See also: "Tax Pitfalls to Avoid," Nation's Business, April, 1968, p. 16; James S. Currie, "Effects of Federal ADP on Federal-State Coordination Programs," 1963 Proceedings of 16th Annual Conference, National Tax Association, pp. 120-27; Henry B. Jordan, "Taxpayer Identify-Numbers," Lybrand Journal, XXXXIV, No. 1 (1963), p. 31; "For This Year's Tax Returns: The Closest Check Yet," U. S. News and World Report, LXIV, No. 10 (March 4, 1968), pp. 73-75.

for use by the states, listed taxpayers who filed a Federal return but not a state return. The second file, for use by the IRS, listed taxpayers who filed state returns but no Federal return.

The IRS presently has in effect "Tax Information Agreements" with 45 states and the District of Columbia. The six states which have not entered mutual formal exchange agreements with the IRS are Alabama, Connecticut, Louisiana, Nevada, Rhode Island, and Texas.

The IRS prepared and forwarded to the states 339,000 audit abstracts during the calendar year 1965. Working with the National Association of Tax Administrators, the IRS obtained a consensus from state tax administrators pertaining to a uniform set of data elements in tape mode from the Individual Master File (IMF) to be furnished routinely to cooperating states. At the end of 1967, a total of 25 states had indicated willingness to participate in a pilot tape program that covered individual income tax returns for the tax year 1966. By the end of Fiscal Year 1968 there were 28 states and the District of Columbia with computer systems signed up to exchange IMF tax information in tape mode with the Federal Government. Exchange of Business Master File (BMF) information in tape mode has not yet been developed. The IRS continues its longtime practice of exchanging audit abstracts on a manual basis and honors requests from states for BMF data on a case-by-case basis.

Computer-generated magnetic tape files are now being used. Magnetic tapes were made available to the states by the IRS in accordance with 5 U. S. C. 140 and sections 7515 and 7809 of the Federal tax laws, which permit the IRS to make a user charge for such service. Computerized magnetic tapes enable the Federal and state governments to provide each other tax returns information much more efficiently and economically than manual methods used in past years.

Confidentiality of information exchanged on tax returns is protected by law which makes unauthorized disclosures subject to prosecution. Congress has enacted laws authorizing the availability of Federal tax information to state tax officials. Since 1909 with the first excise tax on corporations, Congress permitted state tax officials legal access to corporation tax returns. This inspection right was extended in 1935 to individual income tax returns. The Federal law requires the information to be made available on a confidential basis to state tax officials, and state laws reciprocate by permitting the IRS to inspect tax returns on a confidential basis. Confidentiality of Federal tax returns is protected by section 7213 of the Internal Revenue Code by imposing a fine of $1,000 or imprisonment of not more than one year, or both, for unauthorized disclosures by any officer, employee, or agent of any state or political

subdivision. The confidential nature of income tax returns is not deemed to be changed by making the information available to the states and through them to political subdivisions, like cities. A joint IRS-state review of controls over the exchange of information program to insure confidentiality has resulted in the preparation of guidelines for states to follow. These guidelines are now included in all IRS-state contracts and revisions to update exchange agreements.

CHAPTER V

THE APPLICATION OF COMPUTERS TO THE PREPARATION OF TAX RETURNS

Orientation

The computerized efficiency of the tax collecting activity of the Internal Revenue Service was delineated in an earlier chapter. All individual and corporate income tax returns filed with the IRS have been processed through an elaborate electronic data processing network of computers on a nationwide basis since 1967.

The taxpayers of the nation can prepare themselves for the computerized efficiency of government computers by using computers to develop greater efficiency of their own. At least nine tax return preparation service companies have been identified as harnessing the speed and accuracy of the computer to prepare tax returns. They are Computax, Datatax, Autotax, Fast-Tax, Unitax, Computer Tax Service (CTS), Programmed Tax System (PTS), Systems and Taxes (SAT), and Digitax.[1] These services make available their systems to taxpayers through local

[1]For details of each company, see Appendix A.

tax practitioners such as certified public accountants, public accountants, lawyers, bankers, and tax specialists.

One man in the computerized tax return business estimated that half a million 1965 tax returns would be prepared by computers in 1966 and that one million 1966 tax returns would be prepared by computers in 1967.[2]

> By 1970, Computer Science Corporation estimates that over 10% of all individual returns filed each year will be processed by Computax and that in the foreseeable future income tax forms will be replaced by direct tape-to-tape tax return transmission from computer centers to Internal Revenue Service automatic data processing locations.[3]

Table 5-1, Selected Types of Tax Returns Filed with the Internal Revenue Service 1965 through 1968, shows that individual income tax returns filed on Form 1040 have been going up at the rate of two million each year during the period 1965 through 1968. The number of 1040 Forms filed in 1968's tax season was 54 million. This figure as well as all the other figures in Table 5-1 presents the trend of the potential demand for computerized tax return preparation services.

At the Federal level there is a strong potential demand for computerized tax return preparation service in

---

[2]"Electronic Ally For The Taxpayer," Business Week, March 26, 1966, p. 167.

[3]"Tax Returns By The Computer," The National Public Accountant, X, No. 1 (January, 1965), p. 7.

Table 5-1.--Selected types of tax returns filed with the Internal Revenue Service in 1965 through 1968.

	1965	1966	1967	1968
	(Figures in Thousands)			
Individual Federal Income Tax Returns:				
Form 1040	48,158	50,054	52,000	54,062
Form 1040A	17,774	18,578	19,080	18,617
Other 1040 Forms[a]	110	115	114	114
Form 1040 Fiduciary[b]	910	977	1,030	1,045
Declaration of Estimated Tax	6,166	6,322	6,202	6,450
Partnership Income Tax Returns	977	962	956	1,002
Corporation Income Tax Returns	1,420	1,502	1,526	1,623
Estate Tax Returns	94	103	113	119
Gift Tax Returns	122	134	137	139

[a]This category includes Forms 1040B, NB, NBA, PR which represent U. S. non-resident alien income tax returns and self-employed taxpayers in Puerto Rico.

[b]Form 1041--U. S. Fiduciary Income Tax Return for Estates and Trusts.

Source: Annual Reports of the Commissioner of Internal Revenue.

the areas of individual, fiduciary, partnership, and corporation income tax returns as well as estate and gift tax returns. Figures representing this latent demand are shown in Table 5-1.

Thirty-three of the fifty states now require income tax returns to be filed, and an ever growing number of cities in the United States are joining the list. Records show that 171 cities in eight states had a city income tax as of the end of 1967.[4]

Some of the computer returns services do only the Federal individual income tax return; some do the Federal and a few of the state returns; a few do Federal, some of the states and the city of New York; at least one does Federal individual, corporate, and partnership income returns as well as some of the state individual income tax returns; some of the services are presently doing research on and later hope to process fiduciary, partnership, and corporate income tax returns and estate and gift tax returns also. The point stressed here is that latent demand exists for computerized returns service for many types of returns at the Federal, state, and local levels.

---

[4]Avon M. Dreyer, "City Income Taxation in Michigan," The Michigan State Economic Record, X, No. 6 (June, 1968), p. 1, East Lansing; Bureau of Business and Economic Research, Graduate School of Business Administration, Michigan State University.

Major factors creating the demand for mechanized returns preparation have been the following: (1) increased complexity of tax regulations has forced taxpayers to seek professional help from tax consultants in such large numbers that tax practitioners have become inundated with work,[5] (2) the government's shift to a computerized tax collecting system. This system puts each tax return under a microscope which often boosts chances for a full-scale government audit when errors,

---

[5]The problem became so severe that the American Institute of Certified Public Accountants requested the Internal Revenue Service to grant time extensions for individual returns being prepared by overburdened tax consultants. See the following references: "Dangers inherent in Some Extensions," Journal of Accountancy, CXXI, No. 2 (February, 1966), p. 63; "What Factors Are Being Looked For In Extensions Requests," Journal of Taxation, XXIV, No. 4, (April, 1966), p. 246; "AICPA Urges IRS To Modify Extension Policy Based on Practitioners Workload," Journal of Accountancy, CXXI, No. 4 (April, 1966), pp. 18-20; "AICPA Pleads For Filing Extensions Based Solely On Workload of Practitioners," Journal of Taxation, XXIV, No. 5 (May, 1966), p. 316; "Practitioners Complain About Service's Increasingly Stricter Extension Policy," Journal of Taxation, XXV, No. 1 (July, 1966), p. 36; Irving Alten, "It Is Getting Quite Apparent That Some Relief Is Needed On The Federal Individual Income Tax Preparation Work Load," Journal of Accountancy, CXXIII, No. 1 (January, 1967), p. 23; "Favorable 1967 Extensions Experiences Can Be Continued," Journal of Accountancy, CXXV, No. 1 (January, 1968), p. 65; "Commissioner Sheldon S. Cohen's Views On Filing Time Extensions," Journal of Accountancy, CXXV, No. 1 (January, 1968), p. 66; "The Practical Approach to IRS Extensions," The National Public Accountant, XIII, No. 1 (January, 1968), p. 10; "Report On The NSPA Survey of IRS Extension Practices," The National Public Accountant, XIII, No. 1 (January, 1968), pp. 6-9.

omissions, or abnormal items are found.

The computerized tax return preparation service industry is growing rapidly. Usually a company first appears on the local scene, then serves a limited region before going national. Of the major companies identified in the field, most all of them are marketing their professional services on a national basis.

The initial investment required to enter the industry is quite large. One to two million dollars are required according to Mr. Hubert Hall, president of Tax Computer Associates, a Washington, D. C. service company. The setup cost of a computerized returns preparation service includes the programming and market development. Tax Computer Associates originally marketed the Autotax service which was originated by Mr. Hall.

Attention is invited in the remainder of this chapter to a consideration of the computer programming and processing of income tax returns in general. This consideration includes discussion and analysis of the following topics: (1) services presently offered, (2) definition of a computer-processing tax return service, (3) input forms, (4) processing operations which include steps in the process, classification of the services into completely computerized and partially computerized, turn-around time, equipment used, owners and managers, experience in the industry, (5) output of printed returns and other services,

(6) errors, (7) confidential nature of the information. Then price structure, problems of the industry that affect all firms, reaction and opinions of users, and effects or results of computerized returns are considered.

The Firms: Computer Processed Income Tax Return Services in General

Services Presently Offered

Nine firms have been identified as offering computerized tax return preparation services on a local, regional, and national basis. They are Computax, Autotax, Fast-Tax, Datatax, Unitax, Computer Tax Service (CTS), Programmed Tax System (PTS), Systems and Tax (SAT) and Digitax. Computax has emerged the leader in this rapidly growing industry. These firms and the services they offer are summarized on Table 5-2 Services Provided By Computer Processed Tax Return Firms. One firm, Systems and Taxes (SAT), went bankrupt so that only eight firms remain in operation today. One of these eight, Datatax, suspended operations in the 1968 tax season to update its equipment and forms. It resumed operations on a limited basis in the Manhattan area in the 1969 tax season and plans to make a comeback in 1970. The historical development of each firm along with other related details can be found in Appendix A.

Table 5-2.--Services provided by computer-processed tax return firms in the 1968 tax season.

	Computax (Form Number)	Autotax (Forms Provided)	Fast-Tax (Form No.)	Datatax (Answer Sheet)	Unitax (Work-Sheet)	CTS (Question-naire)	PTS (Interview Sheet No.)
FEDERAL RETURNS: Individual Income Tax							
Form 1040: Basic Form Including:	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Page 1 Wages and Salaries with Standard Deduction or Part IV	1 and 2	Yes	1	Yes	Yes	1	1
Page 2 Including Dependents and Part II Income Other than Wages	1	Yes	2	Yes	Yes	1	1
Including Dividends	3D	Yes	2	Yes		1	1
Including Interest	3I	Yes	2	Yes		1	1
Including Rents and Royalties	4	Yes	2	Yes		Supp. #3	1
Including Other: Partnerships, Estates, Trusts, Pensions, Other	7	Yes	2	Yes		Supp. #3	1
Part III Adjustments Including							
Form 2440 Sick Pay Exclusion	2	Yes[a]	8	Yes[a]		Supp. #3	2
Form 3903 Moving Expense	12	Yes[a]	8	Yes[a]		Supp. #3	2
Form 2106 Employee Business Exp.	12	Yes	8	Yes		Supp. #3	2
Form 2958SE Payments By Self-Employed Persons to Retirement Plan	8	None	8	None		Supp. #3	2
Part IV Itemized Deductions	12 and 14	Yes	3	Yes		2	2
Part V Credits, including:							
Form 1116 Foreign Tax Credit	15[a]	Yes[a]	10	Yes[a]		Supp. #3	Data Sheet #3
Form 3468 Computation of Investment Credit and Recapture Scdl.	15	Yes[a]	10	Yes[a]		Supp. #3	Data Sheet #3
Form 4136 Credit for Fed. Non-Highway Tax on Gasoline, Oil	15	None	10	None		Supp. #3	Data Sheet #3
Supplementary Schedules to Basic 1040 Form							
Schedule B: Income and Retirement Inc. Cr.	15	Yes[a]	5	Yes[a]	None	Supp. #3	Data Sheet #3
Schedule C: Profit (Loss) from Business or Profession	8 and 9	Yes[a]	7	Yes[a]	None	Supp. #3	Data Sheet #3
Schedule C-3: Computation of Social Security Self-Employment Tax	7 and 8	Yes	7	Yes	None	Supp. #3	Data Sheet #3
Schedule of Depletion for Scdl. B and/or C	None	Yes	4	Yes	None	Supp. #3	Data Sheet #3
Schedule of Depreciation for Scdl. D and C	11	Yes	5 and 7	Yes	None	None	None
Schedule D: Gains and Loses from Sale or Exchange of Property--Short Term and Long Term	5	Yes[a]	9	Yes[a]	None	Supp. #3	Data Sheet #3
Schedule F: Farm Income and Expense	10	Yes[a]	6	Yes[a]	None	Supp. #3	Data Sheet #3

Schedule F-1: Computation of Social Security Self-Employment Tax on Farm Earnings	10	Yes[a]	6	Yes[a]	None	Supp. #3	Data Sheet #3
Schedule G: Income Averaging	16	Yes[a]	10	Yes[a]	None	Supp. #3	Data Sheet #3
Form 1040A Short Form Individual Return	None	None	None	None	None	None	None
Form 1040ES Declaration of Estimated Income Tax	2	Yes	11	Yes	None	None	None
Form 2210 Statement Relating to Underpayment of Estimated Income Tax by Individuals	2	None	11	None	None	None	None
Form 1041 U. S. Fiduciary Income Tax Return (For Estates and Trusts)	None	None	None	None	None	None	None
PARTNERSHIP FEDERAL INCOME TAX RETURN:							
Form 1065 U. S. Partnership Return of Income--Information Return filed by partnerships	None	None	Yes	None	None	None	None
CORPORATE FEDERAL INCOME TAX RETURN:							
Form 1120 U. S. Corporate Income Tax Return	None	None	Yes	None	None	None	None
ESTATE TAX RETURN:							
Form 706 U. S. Estate Tax	None	None	None	None	None	None	None
GIFT TAX RETURN:							
Form 709 U. S. Gift Tax	None	None	None	None	None	None	None
STATE RETURNS:							
California	Yes	Yes	Yes	Yes	Yes	Yes	
Colorado			Yes				
Georgia		Yes					
Indiana					Yes	Yes	
Kansas			Yes				
Louisiana			Yes			Yes	
Massachusetts						Yes	
Michigan					Yes		
Missouri			Yes				
New Mexico			Yes	Yes			
New York	Yes	Yes		Yes		Yes	Yes
North Carolina			Yes				
Oklahoma			Yes				
South Carolina						Yes	
Utah			Yes				
CITY RETURNS - New York City	Yes						

[a]Prints out unofficial schedule, not on government forms, which have been approved for filing with IRS.

According to Table 5-2, service is offered for computerized tax returns, horizontally, by types of firms. and vertically, by levels and kinds of tax returns. The various types of firms offer a completely computerized service or a partially computerized service; the distinction between the two is discussed later. The various kinds of computer-prepared tax returns include individual income tax returns on basic Form 1040, corporate income tax returns on basic Form 1120, partnership information income tax returns on basic Form 1065. At least one firm, Fast-Tax of Dallas, offers service on the corporate and partnership returns in addition to the individual returns. Research for computerization is being conducted by some firms on fiduciary income tax returns, Form 1041, of estates and trusts. Some firms in the young industry which do not offer service on the corporate and partnership returns are studying the possibility of extending their services to these areas. Some firms are researching estate tax returns (basic Form 706) and gift tax returns (basic Form 709).

Vertically, the computer services are offered at three levels--Federal, state, and city income tax returns. All firms in the rapidly developing industry process the Federal income tax return, Form 1040. Some process complicated returns including basic Form 1040 with all possible supplemental schedules and supporting forms.

Others hold to the simplicity of the basic form, primarily, without any supplements. Most of the firms process some of the state income tax returns. New York and California are the two state returns most often served by the computer firms because of their large populations. Computerized state return service is now offered by one or another of the firms for the following states: California, Georgia, Indiana, Louisiana, Massachusetts, New York, North Carolina, South Carolina, Maryland, Virginia, Washington, D. C., Colorado, Kansas, Missouri, New Mexico, Utah, Oklahoma, Michigan. Programming of additional state returns is now in process by several of the firms. Thirty-three of the fifty states now require income tax returns to be filed. At least three of the services--Computax, PTS, and Digitax--have programmed the city of New York income tax return and now offer that service in their package. There were 171 city income taxes in eight states at the end of 1967 and this list continues to grow longer each year.

Definition of a Computer-Processing Tax Return Service

Computerized processing of tax returns can be defined as a sophisticated automated service offered by firms that (1) receive raw information on questionnaire-interview input sheets from their customers, who are practitioners; (2) compute final tax liability of each

client that is supported by calculations on basic forms, supplementary schedules and supporting forms; and (3) print out the return, including the basic forms supplementary schedules and supporting forms, and collate and assemble the returns for packing and shipping back to customers. The finished product is the printed out returns on the official forms or facsimilies thereof, ready for signature and filing with the government agencies.

Comparative operating data are shown on Table 5-3 for the various services regarding especially (1) input of tax data--interview forms; (2) processing of the tax data--steps in process, equipment used, years of experience, manager-owners, processing centers, turnaround time; and (3) output of finished product--printed tax returns and supplementary schedules and forms for Federal, state and city levels.

Input of Tax Data: Forms

The input forms are specially designed and vary greatly among the seven services. They have been labeled interview forms, comprehensive questionnaire, input forms, tax interview answer sheet, worksheets and schedules, questionnaire sheets and interview sheets. The number of input sheets required to be filled out varies among the services from one, to two, to three, to 11, to 19 to 27. Complexity of the return determines whether or not all

Table 5-3.--Comparative operating criteria of computer-processing tax return services.

Criteria	Computax	Autotax	Fast-Tax	Datatax	Unitax	CTS	PTS
1. Headquarters address	El Segundo California	New York New York	Dallas Texas	Greenwich Connecticut	Whittier California	Glendale California	Jamaica New York
2. President of firm of Manager of Service	D. R. Mason	George Kinnard	Francis W. Winn	Frank Hubert	Mr. Ferrell	A. W. Copeland	Ed. Horowitz
3. Parent company of owner	Commerce Clearing House	Research Institute of America	Computer Language Research	McBee Div. of Litton Industries	Skousen Tax Service	Private Owners	Ed. Horowitz
4. Year Operations Started	1964	1965	1966	1965	1965	1965	1968
5. Tax season Operating Nationally in 1968	Fifth	Fourth	Second	Fourth	Second	Second	First
6. Type of Equipment Used	Univac 1107	IBM 360 Model 30	IBM 360 32K	IBM 7330	IBM 1401 8K	IBM 360	IBM 360
7. Input Forms Called	Interview Forms	Comprehensive Questionnaire	Input Forms	Tax Interview Answer Sheet 1 page 1 checklist	Return Forms and Worksheets	Question-naire Sheets	Interview Sheets
Number of Sheets	19	27	11		3	3	2 1 Data Sheet
8. Turn-Around Time for Processing--number of days	5 (normal) 7 (peaks)	5	2	5	5	2	2
9. Processing Centers	Los Angeles Chicago New York	Washington, D.C.	Dallas	Los Angeles Chicago New York	Los Angeles Chicago	12 major cities throughout U.S.	Jamaica, New York

the many sheets are used. All the necessary data that go into the completed tax return are recorded by the preparer-practitioner on these specially prescribed input sheets. Each practitioner, after signing a contract, receives a set of input sheets on which to record his client's income tax information. At that time, he usually is required to estimate the number of returns to be filed monthly or seasonally, make a deposit which is applied against cost of first returns processed or pay a registration fee. An instruction book, manual, or letter is usually provided by the various services to subscribers to assist them with proper usage of input forms. Some of the larger services offer instructions at meetings they hold for practitioners and their staffs. Negative experience with and negative opinions of computer-processed tax returns is often caused by improper use of input forms. Therefore, correct usage of these forms is stressed by all services. Proper usage of input forms is required and stressed over and over in order to prevent a result that will be "GIGO"--garbage in, garbage out--as computer vernacular puts it. Success of the whole computer-processed operation and printed out return depends upon proper usage of input sheets which contain the crucial data.

Processing of Tax Data: Operations

The input forms, when completed by preparer, after an interview with his client, are forwarded to a processing

center where the information is computerized and a finished tax return printed out. At the processing center, the information from the input forms is keypunched on cards and verified. Then the information is transcribed by computer from cards to magnetic tape and stored in the memory component of the hardware equipment which is equipped with "random or direct access," which easily permits rapid updating of information in the memory component. The computer begins its analytical operations by reviewing the information received and making calculations according to programmed instructions. These programmed instructions direct the computer (1) to calculate the tax liability several times using the various alternatives permitted and (2) to select the computed alternative which gives the taxpayer the lowest legally obtained tax liability.

There is considerable variety in the processing operations among the services. Some services have elaborate input forms that number eleven pages or even as high as 27 pages on which tax details are recorded for the computer to make all calculations. These calculations made by the computer would include the tax liability and summary figures on all the supporting schedules and forms. The tax practitioner makes no calculations. Computax, Autotax, and Fast-Tax fit this category. Other services require fewer input forms--one, two, or three sheets--and require the preparer-practitioner to do some

of the calculating. The input forms of these services contain some summary figures representing supporting schedules and forms that the preparer-practitioner must compute. Datatax, Unitax, CTS, and PTS fit this category. Some input forms require the practitioner-preparer to make all necessary calculations except the computation of the liability for tax. Unitax has this packaged offering. The conclusion to be derived from the first two types of operations is that the first category of services can be characterized as completely computerized and the second category can be characterized as partially computerized. This classification of services has an influence on turn-around time, output, costs, manager-owners, experience in the field.

Turn-around time involves the number of days required for processing the data through the computer center and getting the completed printed out return back in the hands of the preparer-practitioner. The completely computerized systems usually commit themselves to a five-day turn-around period, except one--Fast-Tax, which has a two-day turn-around commitment. The partially computerized systems usually commit themselves to a two-day turn-around period, except one--Unitax, which has a five-day turn-around. Computax admits the turn-around time extends itself from a five-day to a seven-day period during the peak season period, March 20 to April 17.

Equipment used is mostly IBM. All the services use IBM 360/Systems, except Unitax which uses the IBM 1401 8K Model, Datatax which had been using the IBM 7330 Model, and Computax which uses Univac. Datatax suspended operations during the 1968 tax season in order to update its computer equipment and expects to be back in operation for the 1969 tax season.

All the completely computerized services are subsidiaries or divisions of a parent company. They originated primarily through the promotion skills of private operators-practitioners or other technicians and grew in operating expertese to the point where adequate financing and marketing of their systems was lacking without further backing. Backing was obtained from parent companies through acquisitions, mergers and combinations. These parent companies now supply necessary financing and provide their own previously established market outlets for distribution of the service to the national market. The partially computerized services are primarily privately owned, managed, and operated by individual outlets but seek to serve their customers on a national basis through franchises. They do not have powerful financial backing of parent companies but must depend on other private financial means.

The completely computerized services are older and more experienced than the partially computerized

firms. These older firms began operations in the early or mid-1960's in a local area like California, Washington, D.C., Dallas, or Albuquerque. They then grew in strength and served the region of their neighboring states before going to national market coverage. The partially computerized services are younger. They began operations in the mid and latter 1960's. These firms are strong in their local and regional areas like California and New York. They have been offering their services on a limited national basis for only one or two years and cater to the smaller, less complicated returns. They charge less, have simpler input forms, and shorter turn-around times than the fully computerized services.

Programming Computer-Prepared Tax Returns

Programming of the computer-prepared tax returns gets into the technical operations of computers. Inquiries made to firms about their programs were answered in vague generalities or were marked "confidential." The programs are regarded as secret information that is to be kept confidential from competitors. However, two firms, Computax and Autotax, did give some information regarding their programs.

All programming for Computax Corporation is done at the headquarters office in El Segundo, California. The actual computation of the tax return is done on Univac

1108 computer models which are rented in New York, Chicago, El Segundo, Washington, D. C., and San Francisco. The Univac 1108 program is written in Cobol at Computax and originally was developed by Computer Science Corporation in 1964. The program was enlarged in 1966 to include 75,000 instructions, including some 23,000 Cobol statements, which permitted the processing of a return in an average of six seconds. Today, the main 1108 program consists of about 100,000 Cobol statements, which when compiled, generate about 500,000 machine language instructions. In the course of computer-preparing an average Federal tax return, it has been estimated by the President of Computax Corporation that about 750,000 machine language instructions are executed.[6]

The programming for Autotax, where the IBM System 360 Model 30 is used, is done entirely in 360 Assembler Language developed by IBM. The same programs and subroutines are involved in producing a simple return as a complex return. The programs are selectively executed, as needed, according to the data submitted to the computer. Even a very simple tax return would involve a number of programs. The present Autotax system represents over 3,000 pages of programming and nearly 400 separate programs,

---

[6]Letter from Daniel R. Mason, President, Computax Corporation, December 20, 1968.

any or all of which may be automatically applied to a single batch of returns being processed through the computer. Federal returns and the five state returns (California, New York, North Carolina, Georgia and Michigan) processed may be randomly intermixed within the same batch.[7]

Output: Printed Tax Returns

Output of the computer systems consists primarily of neatly printed and accurately calculated tax returns in triplicate ready for signatures and filing with the government tax agencies. This printed output of tax returns includes the Federal, state, and city returns if all three levels are included in the package of service rendered. The services print out a completed Federal Form 1040 with just about all possible variations conceivable and furnish extra sets of schedules to enclose with state and city of New York returns. Variations depend upon the degree of complexity of the returns. Some outputs include only the basic Form 1040 pages one and two with no supplements. Other outputs would include the basic Form 1040 and practically all the possible supplementary schedules and forms. Variations in the complexity

[7]Letter from Maitland K. Flood, Chief Systems Engineer, Office of General Manager-Autotax, Tax Computer Associates, Falls Church, Virginia, December 10, 1968.

of forms are found in the spectrum between these two extremes. Illustrative examples of both simple and complex returns at all three levels of Federal, state, and city, are furnished by the firms upon request.

Complete returns with supporting schedules are furnished for some states like California and New York, and for the City of New York. The completely computerized services tend to cater to the more complex returns which are more readily accomodated by their complex and elaborate input forms, their usually longer turn-around times, and their longer experience in the industry.

Other output items of service in addition to the printed returns which most all the firms supply especially if they are completely computerized, are as follows: (1) extra copies of the Federal return for filing with a state or city return if the state and city returns are not included in the package of service; (2) a letter of filing instructions for the taxpayer-client; (3) a special audit report or "diagnostic report" for the customer-practitioner which points out possible problem areas on the computerized return; (4) pro forma worksheets for next year containing repetitive data needed for next year's return processing.

Price Structure

Cost was cited as the major deterrent to wider acceptance of computerized returns in the 1966 tax season.

> . . . Many accountants indicated that the cost made computers practical for only the more complex returns. For the simpler returns (for example, itemized deductions plus a Schedule D), the accountant could not pass on the cost of the computer to the client, and absorbing the cost would wipe out most, if not all, of his profit.[8]

Higher prices were a predominant feature of the 1967 tax season.[9] Substantial losses sustained by several firms in 1966 operations and the bankruptcy of one firm in 1966 induced higher prices in 1967.

The price structure varies among the services. Price determination for a tax return by computer is similar to the price determination of a new automobile. The price of a new car includes the cost of the basic model plus the charge for the various options that accompany it. The price of a computerized tax return includes the cost of the basic form 1040, which includes the determination of the tax liability on pages one and two, plus the charges for the supplementary schedules or forms, like Schedules B, C, C-3, D, F, G, etc.

The charges for the supplementary schedules may be on a flat-rate basis; that is, a flat amount for each

---

[8] "Computer-Prepared Tax Return Service Is Generally Satisfactory; Survey Outlines Pros, Cons, Problems," Taxation For Accountants, I, No. 5 (November-December, 1966), p. 279.

[9] "Computer Tax-Return Preparation: How The Several Services Shape Up This Year," Taxation For Accountants, I, No. 6 (January-February, 1967), p. 322.

supplementary schedule whether the schedule has many or few items thereon. Or the charges for a supplementary schedule may be on a per-item basis; that is, a fixed amount for each item appearing on a supplementary schedule or form. Sometimes a combination of a flat-rate charge and a per-item charge is found in the price structure for the supplementary forms and schedules. The computer figures and prints the invoice.

In addition to the basic charge and the supplementary charges, some firms have what might be called cover or minimum charges such as (1) a required deposit when the order is placed, or (2) a minimum fee, or (3) a down payment at time contract is signed, or (4) an office registration fee when service begins. These cover charges and minimum fees are offset against the cost of the returns; unused portions are not refunded. The basic rate of a return sometimes has an additional charge added to it for input cards, or for an excess amount of cards over and above a normal number.

The price structure for each individual service showing the breakdown of the basic charge, the supplementary fees, and any initial cover charge or minimum, is shown in Table 5-4 Price Structure.

The fees for average returns and complex returns in 1967 were estimated as follows:

Table 5-4.--Price structure--computerized tax return preparation services in 1967 and 1968.

	Computax 1967[a]	Autotax 1967	Fast-tax 1967	Datatax 1967	Computax 1968[d]	Autotax 1968	Fast-tax 1968	Unitax 1968	CTS 1968	PTS 1968
Basic Federal Form 1040 with										
Standard Deduction (or)	$4.00	$4.85[b]	$4.00	$5.00	$4.00	$8.76[e]	$1.00[f]	$2.00[g]	$3.00[h]	$5.00[i]
Itemized Deductions	1.50	.285*	1.00	1.85		.10*		(or)		
						1.50m		$2.90		
Dividend Income	1.00	.285*	1.00	.05*		.10*		(or)		
						1.50m		$4.15		
Interest Income	n/c	.285*		.05*[c]		n/c				
Schedule B	2.00	.285*	2.00		.65	n/c				
Rents and Royalties				1.50*						
Depreciation				.10*						
Pension or Annuity				.50*						
Partnership, Estate, Trust				.50*						
Retirement Income Credit										
Schedule C	2.50	.285*	2.50	2.00	.65	2.50				
Schedule C-3	1.00	.285*	1.00	1.00	.65	n/c				
Schedule D	2.50	.285*	2.50	.25*	.65	.10				
				1.00m		2.00m				
Schedule F	2.50				.65	2.50				
Schedule F-1	1.00				.65	n/c				
Schedule G	2.50	n/c	2.50	1.50	.65	2.50				
Calculations on G					1.00					
Adjustments to Income:										
Form 2106			2.50	1.50	n/c					
Form 2440				1.00						
Form 2950										
Form 3903				1.00						
Adjustments to Tax:										
Form 1116				1.00						
Form 3468	1.00	.285*	1.00	1.00	.65	1.00				
Form 4136										
Form 1040ES	1.00	n/c	1.00	1.00	.65	n/c				
Form 2210						1.00				
Notes Schedule						1.50				
Installment Sales Schedule										

Additional Services:						
Extra Copy Fed. Return	40% Initial Price		$1.50		n/c	
Chargeable Reruns	60% Initial Price				50% Base Price	
50/50 Split (2 returns)	40% Initial Price					
Pro Forma Worksheets	$1.00		1.00			
STATE RETURNS:		$5.00				
New York State Return				$3.00		n/c
Basic Form IT 201, 203, 208, or 209	30% Fed. return price		30% Fed. return price 2.00			
Form IT 202			.65			
Form IT 2105			.65			
California State Return			50% Fed. return price	4.00		
Basic Form 540	50% Fed. return price		2.00			
Schedules B,C,D,F,G			.65 each			
New Mexico - State			30% Fed.			
North Carolina				4.00		
Georgia				4.00		
Other States Returns	2.00		2.00	2.00		
CITY OF NEW YORK RETURNS						
Basic Form NYC 201,203,208			2.00			n/c
Form NYC 202			.65			
Form NYC 5			.65			

*per item; m = minimum; n/c - no charge

[a]All Computax prices below include cost for 65 keypunch cards. For returns requiring over this amount there is an additional charge of $.10 per card in excess of 65.

[b]7% discount is allowed for input forms submitted by February 26, 1967.

[c]First two items free.

[d]All Computax prices below include cost for 10 keypunch cards. For returns with additional cards there is a charge of $.12 per card in excess of 10.

[e]Autotax basic form charge includes pages 1 and 2 of 1040, 1040ES, Form 2440 (sick pay exclusion); Form 3903 (moving expenses), page 1 and 2 of Schedule B, Form 2119 (sale of residence), Form 2441 (child care deduction), Form 1116 (foreign tax credit), card overage on general and separate returns.

[f]Fast-Tax price includes $1.00 for computations plus 12¢ per card and 66¢ per printed page.

[g]Unitax has three price schedules: Budget Service, Standard Service, and Executive Service.

[h]The CTS basic price of $3.00 includes everything except New York state return for which there is $1 fee.

[i]PTS price of $5.00 includes everything: Federal, State, and City of New York returns as package. The price actually ranges from $3.50 to $5.00 per client, depending upon total number of returns processed during season.

	Average Return Estimated Fee 1967	Complex Return Estimated Fee 1967
Fully Computerized Firms:		
1. Autotax	$16 to $18	$25 to $30
2. Computax	$12	$25 to $30
3. Datatax	$ 8.33	$25 to $30
4. Fast-Tax	$ 8 to $10	$26
Partially Computerized Firms:		
5. Unitax	$ 4.30	$ 6 to $ 8

For the practitioner's returns which contain many supplementary schedules--and few items on each schedule, the per-item price structure would give the lowest cost. On the other hand, a practitioner's return which contains few schedules, but with numerous entries on each schedule, would obtain the lowest cost with the flat-rate price structure. To minimize cost in a large-volume office, multiple contracts could be entertained. Tax returns could be separated into groups according to degree of complexity. Each group would be placed under contract with the service firm that offers the lowest price structure for that type.

The services lowered prices in the 1968 tax season.[10] For the fully computerized firms like Computax and Autotax,

---

[10]"Computerized Tax Returns Still Have Growing Pains But Continue To Improve," Taxation For Accountants, II, No. 5 (November-December, 1967), p. 272.

the cost of an average return was about $15. Autotax shifted its price structure from per-item rates on the supplementary schedules in 1967 to flat rates per schedule in 1968. Datatax did not operate in 1968, but operations were partially[11] resumed in the 1969 tax season.

The 1968 fee for Fast-Tax was about $9 an average return. Fast-Tax shifted its price structure from flat rates per schedule in 1967 to $3.00 per basic form computation plus twelve cents per card punched plus fifty cents per page printed in 1968. For the 1969 tax season, Fast-Tax will charge $1.00 for basic form computations plus twelve cents per punched card plus sixty-six cents per printed page. The Form 1065 partnership return and the Form 1120 corporate return charges are the same as Form 1040 charges except for an additional computation charge of $2.00 per return. There is no registration fee for the Fast-Tax service. Fast-Tax added the computerization of the tax returns for the states of Nebraska, New York, and Minnesota in the 1969 tax season, in addition to the eight state returns already programmed in 1968. Processing of New York City income tax returns was included in the 1969 Fast-Tax System.

The fee in 1968 for a partially computerized system ranged from $2 to $6. This latter category of

---

[11] In Manhattan only.

partially computerized firms included Unitax, Computer Tax Service (CTS), and Programmed Tax Service (PTS). Unitax, in 1968, had three basic price options--the budget service, the standard service, and the executive service. CTS had one basic charge of $3 that included everything except New York State returns for which there was an additional $1.00 fee but this was refunded if over 200 returns were processed by a practitioner. The PTS fee ranged from $3.50 to $5.00 per client depending upon the total number of returns processed through the system during the tax season. This fee included a package of three returns per client--Federal, state, and city of New York.

Difficulties That Retard Progress

The application of electronic high-speed computers to the preparation of income tax returns has been difficult primarily because of the complexity of the Federal return and because of many clients' needs for service at the state level and the city level. Thirty-three of the fifty states now require income tax returns to be filed, and an ever growing number of cities in the United States are joining the list. There were 171 cities in eight states levying a city income tax at the end of 1967. The young computerized tax returns industry has been plagued with many problems and the emerging computer processing

systems have been busy getting rid of the "bugs" in their operations. The problems of the industry and the "bugs" in the systems of the firms have culminated in negative experiences for many practitioners. Most new industries have been faced with similar trouble. Eventually, the industry will solve its problems and the "bugs" will be eradicated so that computerized returns preparation services can flourish unhampered by technological and administrative deficiencies. First, the problems and "bugs" must be identified. Then solutions and fumigation can be applied. What are some of the major "bugs" in the systems of the firms that are preventing growth? What problems are retarding development of the industry? These questions are considered next.

Major "Bugs" in the Systems Impeding Growth

Three major deficiencies of the systems reported in the 1966 tax season that have prevented more widespread acceptance of the services have been (1) high cost, (2) excessive input forms, and (3) processing delays.[12]

---

[12]"Computer-Prepared Tax Return Service Is Generally Satisfactory; Survey Outlines Pros, Cons, Problems." Taxation For Accountants, I, 5 (November-December, 1966), p. 278.

In the 1967 tax season, turn-around time for fully computerized services continued to be a "bug."[13] The promised five-day turn-around was often not kept but a seven to thirteen-day turn-around time was experienced. The seasonal industry-wide April rush was a big problem here. It is during this rush that the turn-around time gets pushed higher. Solutions proposed have been the building of increased capacity and cyclical filing. Key-punching has been the biggest production bottleneck in computer-processed tax returns firms. This "bug" contributes to extended turn-around times. The technological solution to this transcription problem appears to be "optical scanning." Research on this improvement of technology is being carried on.

Transcription errors are a "bug" in the systems of the service firms. These errors are caused by human beings and not machines. Causes of these errors can be traced to two types of human beings--the preparer of input sheets and the keypunch operators. In many cases the quality of the handwriting of the preparer of the input sheets is low, and the data appear on the sheets in garbled and illegible form which makes accurate transcription

---

[13]Dominic A. Tarantino, "Computerized Tax Returns Still Have Growing Pains But Continue To Improve." Taxation For Accountants, II, No. 5 (November, December, 1967), p. 274.

difficult and time-consuming. In other cases, even though the handwriting on the input sheets is clear and legible, the preparer omits some important tax data, or "forgets" it. This is the preparer's side of the coin. On the other side is the keypunch operator. The transcriber sometimes punches wrong keys, misinterprets the reading of data, neglects to include some important data that appears on the input forms, or has some other difficulty. These keypunching errors result in errors on the final printed return. Reruns of the tax return due to errors become a necessity. Non-chargeable reruns are caused by errors on the part of the keypunch operators within the service firm, while the chargeable reruns are caused by errors on the part of the preparer. Reduced rates--about 60% of the original--are common for chargeable reruns. The solution to this problem of errors appears to be training of a higher quality for both preparer and keypunch operator and selection of the personnel to do the work with greater care and higher qualifications.

Another "bug" in some systems is the inability to process, along with the Federal return, the applicable state return and, in some cases, the city return, as a package. Services which do not do the particular state return prepare an extra Federal return to be filed with the state return which is prepared by hand. Manual preparation of the state return often cancels out the time

saved preparing the Federal return by computer in those cases where both are required. City returns carry this problem deeper. Additional programming and financing is needed to solve this problem. Think of the money it would take to finance the software in a particular service to program not only the Federal tax return but also the 33 state returns, and the 171 City returns known to be in existence. Perhaps a tax programming service would help.

High prices constitute a "bug." Although some services reduced their prices in 1967 to a level below that of 1966, prices were still high in 1968. Many practitioners who still operate under the manual method consider the cost prohibitive for them to enter into contracts for the service. They feel that the high cost makes computer services practical for the more complex returns only. Solution here appears to be increased efficiency and increased volume on the part of the services to permit them to decrease costs per unit of output. Resistance to change also enters into the picture here so that a selling effort is often needed on the part of the services to induce practitioners into trial runs of their service and to encourage several smaller operators to join with several other practitioners with the same price problem and submit all their returns as one subscriber. There appears to be no opposition on

ethical grounds to combining returns of several small operators into one order.[14]

Excessive input forms seems to be a perennial "bug" in the systems. "By the time that I fill in the input form, I could do the return itself,"[15] is a comment that is heard over and over every tax season. It is a major criticism. Points of dissatisfaction with and criticism of the input forms are as follows: trouble filling out some forms due to their questionable design, the length of some forms, small spaces allowed on many forms in which to record data, too many forms to fill out and keep inventory of. The completely computerized services do have long input forms because they completely eliminate calculations on the part of the preparer. Many forms are required in order to contain all the necessary tax data without making any summaries while recording. The partially computerized firms have shorter and fewer input forms but then calculations of summaries by the preparer are required which endangers accuracy. Complex returns require long and numerous input forms. Computer

---

[14]"Computer Tax-Return Preparation: How The Services Shape Up This Year," Taxation For Accountants, I, No. 6 (January-February, 1967), p. 325.

[15]"Computer-Prepared Tax Return Service Is Generally Satisfactory," Taxation For Accountants, I, No. 5 (November-December, 1966), p. 279.

calculations of all summaries and sub-totals are desired to support the overall calculation of the tax liability, all of which generates accuracy in the calculations and permits the services to make guarantees for it. The completely computerized firms, therefore, cannot eliminate the long and numerous forms that are required to do the job. The solution here appears to be training in the use of forms, increased experience in the use of the forms, and the additional service of pro forma input forms to contain repetitive data for next year. Many firms began offering the pro forma service in the 1968 tax season and found it helpful.

There is a communications problem between practitioner and the computer service. What services do the tax practitioner expect the computer firms to render? Are the computer firms expected to be the tax man's tax man or do the tax practitioners reserve this function for themselves? Can the computer firms afford to return to the tax practitioners "garbage" when what the practitioner-preparer submits is "garbage"? Can the practice of "GIGO"--garbage in, garbate out--be allowed in the young industry? Frank Hubert of Datatax discussed these points in an address before many practitioners in a 1967 Computers and Taxes Conference. He developed this communications problem further and said,

> . . . Are you ready for the overview that is indicated by the demands you place on us to send you back a perfect product, even though you have overlooked a valuable ingredient?
>
> Let me explain what I mean: A friend of mine sent in the data for a return without indicating the salvage value for an asset. The return was later questioned by IRS and the client incurred an additional liability. My former friend feels that our review staff should have called to determine if he'd entered the asset net. To me this would have been an insult to his intelligence, yet he expected it.
>
> We can plan in finite detail to handle some obvious oversights. However, there is no way to determine what is going on in the minds of our subscribers.
>
> A good example of our inability to read minds is our trying to decide what you mean when you indicate that you plan to send us 100 tax returns. Does this mean that you have 100 regular clients whose information you will collect and submit? Or does it mean that you have 10 but hope to increase by 1000%. You play hell with our forecasting every year. We don't dare not prepare for the maximum, especially since we don't have adequate history to draw upon.[16]

Major Industry-Wide Problems Affecting All Firms

There are several industry-wide problems that can be classified into four groups characterized as legal, seasonal, technical, and ethical. There are two legal problems which confront the industry and retard its growth

---

[16] Frank Hubert, "Remarks on Computerized Tax Returns," Proceedings of the 1967 Second Annual Conference on Computers and Taxes, Sponsored by The Computers-In-Law Institute of The George Washington University in cooperation with The American Bar Association and The Federal Bar Association, Held June 6-7, 1967, in Statler Hilton Hotel, Washington, D. C., p. 28. Frank Hubert is General Manager of Datatax.

and development toward maturity. The first legal problem is the differences in Federal, state, and city statutes for individual income taxes. These differences constitute a major deterrent to the industry.

> The complexities involved in programming for the differences between Federal and the 33 state income tax statutes will be a major obstacle to the successful marketing of computer processed tax returns on a truly national basis.[17]

One service reports, "We are breaking our backs to program all the state returns."[18] Very little attention yet has been devoted to the City income tax returns by the computer services, except for a few firms that program the New York City income tax. What about the other 170 City income tax returns known to be in existence at January 1, 1968? The City tax complicates this legal problem of differences in statutes and carries the problem deeper for the industry. Solution appears to be both increased programming effort and additional financing on the part of the services. Perhaps closer cooperation among the agencies of the three governments levels and the industry could be induced by working with the IRS, tax associations and other interested groups.

---

[17] Dominic A. Tarantino, "Computerized Tax Returns Still Have Growing Pains But Continue to Improve," Taxation For Accountants, II, No. 5 (November-December, 1967), p. 273.

[18] Frank Hubert, p. 29.

The second legal problem concerns new tax laws containing retroactive features which require changes in tax returns filing requirements. These changes without notice cause programming and workload problems for the industry. The solution appears to be the promotion of enabling legislation permitting a moratorium before new law becomes effective.

The seasonal industry-wide March 1 to April 15 rush to file returns creates the annual spring workload problems and processing bottleneck. About 85% of the 68 million individual returns in 1966 were filed between March 1 and April 15. The tax practitioners offer their service much like the manufacturers offer their products to the American consumers. Both groups are influenced by consumer preferences. In the case of the tax practitioners, consumer preferences cause two peak periods in each tax season. Taxpayers can be classified into two groups, as the Internal Revenue Service discovered in its computer setup, the early filers and the late filers. The early filers have been assembling data needed and have it all ready to file when the earliest time possible arrives. This time is January. So, tax practitioners and the IRS both have the first bottleneck in their operations, first peak of the new season, in the form of an avalanche of returns to deal with in January. The late filers let things go until they are forced by time

to act by the approaching deadline, April 15. So, tax practitioners and the IRS both have the second bottleneck or "rush" period to deal with--the April rush. Tax practitioners and the IRS have both found the April rush to be the greater. The April rush in recent years has plunged both groups into a sea of work that almost inundates them. The computer is the answer to processing these mountains of tax returns that suddenly appear in April but the transcription problem is the bottleneck at this peak period for both groups. This bottleneck, this April "rush" has not yet been solved. The solution appears to be cyclical filing as suggested by Mr. Frank Hubert of Datatax. This would spread the filing of returns out over the year. However, enabling legislation and help from the IRS to get the legislation approved is needed before this solution becomes effective. On this problem, Frank Hubert said:

> The final unresolved question in my mind is: How do you level the workload? I have two suggestions that have proven beneficial elsewhere in industry.
>
> 1. Enabling legislation which would permit cyclical filing throughout the year based on the taxpayer's last name.
>
> 2. Enabling legislation which would permit a moratorium before a new tax law would become effective.
>
> These proposals are not as far-fetched as they sound. Most charge accounts are set up for alphabetical billing, and we have recently passed legislation which permit auto manufacturers a breathing spell

before they have to meet all the safety standards. The Tax Law is certainly more dynamic, and warrants equal consideration.

Internal Revenue may prove an ally because they have the same problems except that they have three years to uncover any ambiguities. However, they haven't been checking 68 million tax returns in the past.

The groundwork needs to be laid over the next two years so that hopefully by 1970 we can realize this goal. In this connection it seems advisable that an ADP Advisory Committee should be appointed to assist IRS in building a case. Then perhaps we can all breath easier.[19]

The technical problems of the industry concern programming, research, errors, and standardization of filing requirements. Programming of the State returns constitute a technical problem and a financial hardship for the services. Most practitioners prefer not to use a particular computer service if it does not provide the state tax return as well. In the 1968 season about half the 33 states with income tax requirements had their returns programmed by one service or another. Some services planned to have all 33 states programmed in the 1969 tax season. At least three services--Digitax, Computax and PTS--have programmed the City of New York tax return. There are at least 170 other cities with income tax requirements. How many of these will the services program?

---

[19]Frank Hubert, p. 29.

Research to achieve computerization of corporate, fiduciary, and partnership information income tax returns is under way in several firms. One firm--Fast-Tax--already offers service on the corporation tax and the partnership information returns. Computax is investigating the fiduciary returns possibility. Can research be instituted for the computerization of employment tax returns, estate and gift tax returns?

Lack of standardization in filing requirements is a problem. Some firms process only the basic Form 1040 and no supplementary schedules. Other firms process basic Form 1040 and some of the supporting schedules. A few process everything possible. Sometimes official IRS forms are used, sometimes facsimilies are used, other times unofficial supporting schedules are used. Frank Hubert, on this problem, says

> . . . Where do we draw the line? I think we can start by at least standardizing the filing requirements of the Computer Services while the industry is still young and while there are only a few such services available.
>
> In order to do this, though, greater cooperation must exist between government and industry. . . .[20]

Another industry problem, related to forms, concerns the lateness each year in the release of tax forms by the state and Federal agencies. Daniel R. Mason,

---

[20]Frank Hubert, p. 28.

President of Computax Corporation, has pointed out this problem. He said:

> One of the problems that we have to look to the State and Federal Agencies for solution is the lateness each year in release of forms. For example, the Massachusetts return is not only complicated but I think it was the 16th day of February, the current year (1967), that the State of Massachusetts released forms. The State of New York, I think, it was around the 19th of December when they released their forms. We must get earlier release of forms. There is a problem here in our redesigning the forms and ordering them in continuous form paper. The forms paper people have 30 to 45 days lead time on this and it's kind of hard to do a State of Massachusetts return on the 3rd of January when we don't know what the hell the forms look like until February.[21]

Errors perpetrated by the services and by the preparers have been a technical "bug" of the systems. Errors by both tax practitioners and computer services have caused negative experiences for both groups. Chief source of errors on the tax returns has been traced to input sheets and transcription of data from these input sheets to cards and tape for the computers to use. Difficulty at this crucial point has been traced to both sides--practitioner-preparer's illegible handwriting and omission of data, on the one side, and key punching errors of transcription operations employed by the services

---

[21]Daniel R. Mason, "Remarks on Computerized Tax Returns," Proceedings of the 1967 Second Annual Conference on Computers and Taxes, Sponsored by The Computers-In-Law Institute of The George Washington University in cooperation with The American and Federal Bar Associations, Held June 6-7, 1967 in Statler-Hilton Hotel, Washington, D. C., p. 32.

on the other side. The services, therefore, have chargeable reruns of the tax return when errors are found due to the preparer's fault, and non-chargeable reruns when their key punch operators make the errors. Chargeable reruns have averaged, prior to the 1968 tax season, a fee of 60% of the initial price of the return, exclusive of any charge for extra cards. In the 1968 tax season, Computax began charging 100% of the initial price, exclusive of any charge for extra cards, for chargeable reruns per Change Request Form initiated by preparers. "Autotax requires that incorrect returns be resubmitted within two weeks of date of delivery to the accountant. If not, charge is 100% of initial cost."[22]

The computerized preparation of a tax return by a third party does not excuse the professional practitioner, accountant, or the client from legal responsibility for errors. The professional practitioner should adequately check the computer-prepared return when it comes back from the third party. He should examine it carefully in order to satisfy his professional responsibility that it is accurate. Most of the services have a limiting clause in their contracts restricting their liability to $100 in case of negligence or for misplacing as well as

---

[22]"Computer Tax-Return Preparation: How The Several Services Shape Up This Year," Taxation for Accountants, I, No. 6 (January-February, 1967), p. 324.

losing any data. Since final responsibility rests with the client and his professional adviser, the professional tax practitioner would do well to examine his liability insurance contract to make sure that it covers tax returns computer processed by a third party.

Other errors of the services that have disenchanted practitioners are collating errors resulting in mix-ups of forms and schedules in packages of returns sent back to preparers.[23] Practitioners received returns back that belonged to someone else. Some practitioners received back returns that belonged to them but some of the supporting schedules attached did not.

Practitioners have bothered the services with their sometimes unreliable predictions of when returns would be submitted to processing centers, causing bad forecasts, operating problems, and workload pileups.[24]

The concept of privileged information found in relationships between professional practitioners and their clients have been threatened by computerized tax returns. Third parties have been injected into the confidential relationship. Some professional tax practitioners reject computerized tax services on the basis of

---

[23]Daniel R. Mason, Proceedings of the 1967 Second Annual Conference on Computers and Taxes, p. 32.

ethical considerations. They object to the transfer of confidential tax information outside their offices and question the ethics of signing a return prepared by a third party outside their control.

All the computerized tax return systems permit input sheets to be sent to their processing centers without taxpayer names. Social Security numbers are used to identify taxpayers and their returns. The services will send back printed returns without the names. The practitioners can add the names by having them typed in. The audit sheet or "diagnostic" report will remind the practitioner to add the client's name.

The services call attention to the fact that their employees are conditioned to work with confidential information just as office employees of practitioners are. Also the services claim that their keypunch operators rarely see every item on a return because of the mass production techniques utilized such as speedy assembly-line production and division of labor. The processing of a return takes place to rapidly and the operators do only part of a return so that each return is fragmented. On the other hand, the computer services point out, the manual method of preparing a return in the practitioner's office permits the typists and clerks to see the whole return.

The computerized firms sell a professional service--a computer printed tax return. Professional accountants would not think of submitting a long-hand prepared certified financial statement to the bank. Professional lawyers would not think of submitting a long-hand prepared brief to the judge. Why should the professional accountant or lawyer be willing to submit a hand-written tax return? The rules laid down by codes of ethical conduct can be quoted to the professional accountant who objects to the computerized tax return on ethical grounds that he cannot have someone outside his organization handle a client's confidential data. The committee on professional ethics of the American Institute of Certified Public Accountants has considered this problem and has sought the answer to the question, "Does use of computer services pose a question of ethics?" In answer to this question as to whether or not it is ethical for an accountant who is a member of the Institute to utilize outside services to process confidential tax returns or other confidential information of clients, the official committee has issued the following statement:

> If a member utilizes outside services to process tax returns or other confidential client information, he may not in the opinion of the committee on professional ethics, delegate his responsibility to insure the confidentiality of such information. He must take all necessary precautions to be sure that the use of outside services does not result in the release of confidential information. He should also consider

the desirability of putting the client on notice when outside services are to be used.[25]

Some experience on this topic was brought to light in a dialogue between members of the New York State Society of CPA's and Computax in 1965 at the end of the tax season when Computax asked accountants for a critique of its service. Many accountants asked about the need to notify clients that an outside firm like Computax was being used to process their tax returns. The comments from two panel members are quoted below:

> We were concerned about the confidential nature of the data with which we were working. We felt the burden was upon us to know something about Computer Sciences Corporation. We learned that the input forms were split up among various key punch operators so that no one key punch operator would have full information as to what existed in a return. We had verbal assurances that the material would be treated in as confidential a nature as possible. We felt that it would not be advisable to contact our clients about this as there seemed to be little interest on the client's part as to whether his return was sent out of the office or not. When we dealt with people in the public eye, we processed our returns in our office. In one such instance we sent the input forms to Computax but we deleted the client's name from the input forms. When the return came back to our office, we type in the name.[26]

> We reached a somewhat different conclusion on this subject. We found that if we just told the clients we were running their returns through Computax, it eliminated

---

[25]"Tax Returns--By Computer," The Journal of Accountancy, CIX, No. 2 (February, 1965), p. 24.

[26]"C.P.A.'s Critique of Computerized Tax Returns," The Journal of Accountancy, CXX, No. 2 (August, 1965), p. 16. 1965, p. 16.

> a lot of questions. There were a few instances, however, where the client wanted his return to remain in the office.[27]

In answer to a question as to how Computax preserves the confidential nature of returns when they engage outside service bureaus for the key punching job, Mr. Alan A. Stern, project manager at Computax, said:

> We are dealing with a number of key punch operators rather than just one. One key punch operator sees a very small portion of each return. This is a very high-speed operation and the key punch operators are mainly interested in pushing the work through as quickly as possible and as accurately as possible. In all probability, you have some nonprofessional people on your clerical staff working on returns and these people see the entire return. At Computax, their operating people see only one form of the return.[28]

Development of the Industry and Opinion of the Service by Users

1965 Tax Season

Computax processed approximately 43,000 individual tax returns in 1964 which was the first season of use of computer-processed returns.[29] In the 1965 tax season, Computax was used by over one thousand accounting firms to process approximately 100,000 tax returns. Reaction

---

[27] Ibid.

[28] Ibid.

[29] "Tax Returns - By Computers," Journal of Accountancy, CIX, No. 2 (February, 1965), p. 23.

to the use of computerized tax returns was sought by Computax at the end of the tax season in 1965. A panel discussion with several accounting firms that used Computax to process returns was held by the New York State Society of C.P.A.'s on May 27, 1965. The dialogue which took place at that meeting was published in the Journal of Accountancy.[30] The overall evaluation of Computax by users was favorable. Most of the accountants who used the service found it valuable. Some of the major problems encountered by accountants in the initial use of computerized returns in their offices was staff resistance to change, Computax slowness during peak rush periods, and lack of additional schedules by Computax service. Other services were starting up in 1965 but had not yet received national recognition. They were Autotax, Datatax, Unitax, and Computer Tax Service (CTS), all of which began by serving regional areas.

1966 Tax Season

The use of computer-processed tax returns on a nationwide scale began in the 1966 tax season. Demand for the service was strong. 1966 was the year in which the national market developed in the new industry of

---

[30] "C.P.A.'s Critique of Computerized Tax Returns," Journal of Accountancy, CXX, No. 2 (August, 1965), p. 15.

computerized tax returns. Heavy demand was anticipated in the 1967 tax season.

> The 1966 tax season can be described as a "shakedown" year. It was the year the computer companies really began doing returns on a large scale, using extensive promotion campaigns to sign up accountants to use their services.
>
> As is usual in any new industry, many changes took place. Some of the companies sustained substantial losses; there were some changes in ownership; and one company was adjudicated a bankrupt and terminated its services.[31]

At least seven firms were in operation processing tax returns by computers in 1966. Most but not all were operating on a national basis. The list included Computax, Fast-Tax, Datatax, Unitax, Systems and Taxes (SAT), and Computer Tax Service (CTS). Computax emerged the leader in the field with three-fourths of the market.[32] Autotax and Datatax each had about 10 per cent of the market and the balance of 5 per cent was distributed over the remaining firms of Fast-Tax, Unitax, SAT, and CTS. Computax and Datatax were acquired in 1965 by parent companies with national distribution outlets already established. Autotax was purchased by a parent company with

---

[31] "Computer Tax-Return Preparation: How The Several Services Shape Up This Year," Taxation For Accountants, I, No. 6 (January-February, 1967), p. 322.

[32] "Computer Prepared Tax Return Service Is Generally Satisfactory; Survey Outlines Pros, Cons, Problems," Taxation For Accountants, I, No. 5 (November-December, 1966), p. 278.

national market outlets in 1966. SAT went bankrupt and its services were terminated in 1966. Fast-Tax and CTS were newcomers to the field in 1966.

Users of the new service were generally satisfied in 1966 and about three quarters of them indicated they intended to use the service again in 1967 at least as much and perhaps to a greater extent.[33] The overall favorable impressions of users with the service firms and their declared intentions to use the services again next year came in spite of the year's operations being plagued by "bugs" in the systems of the processing firms and problems of the newly developing industry.

1967 Tax Season

The use of computer services to prepare tax returns expanded in the 1967 tax season. The service firms increased their volumes. Not only did the services themselves improve but they were used more effectively by accountants and practitioners as they became more experienced. Two features dominated the 1967 tax season--higher prices and improved services.[34]

---

[33] Ibid.

[34] "Computer Tax-Return Preparation: How The Several Services Shape Up This Year," Taxation For Accountants, I, No. 6 (January-February, 1967), p. 322.

A survey of sixty-six CPA firms in Oklahoma was made in 1967 to determine the reaction of accountants to the use of computer-prepared returns.[35] In that state, client reaction was favorable, and the vast majority of firms using the services that year planned to use them again in 1967.

The experiences of attorneys with computerized income tax returns have been very similar to the accountants.[36] Greatest advantage of computer-processed tax returns to attorneys was found to be relief from repetitive chores--typing and proof-reading, and mathematical accuracy. The chief complaint concerned processing delays--time lags. Seven to ten days was the turnaround time experienced whereas five days or less was promised. Adverse comment also was made on the failure of the computerized services to provide state returns--especially the state of Massachusetts, which has an unusually complex return.

Robert P. Bigelow, a member of the Electronic-Data Retrieval Committee of the American Bar Association and a member of a Boston law firm, conducted an informal

---

[35]Nora Marie Vinyard, "Computerized Tax Returns," The Oklahoma CPA, VI, No. 3 (October, 1967), p. 18-26.

[36]"How Do Attorneys Like Computerized Returns?" Taxation For Accountants, III, No. 1 (March-April, 1968), p. 61.

survey of attorneys to obtain their reaction to the use of computer assisted tax return preparation.[37] He sent questionnaires to 130 law firms in Boston in the Fall of 1966. Sixty-three answers were received from small and large law firms. Some of these law firms did not handle tax returns while others had several hundred tax clients. Bigelow updated the survey in the Spring of 1967 by questioning the 1966 respondents--law firms--plus some accountants on their 1967 experiences with computer assisted tax returns. Most law respondents rated the services about the same as the previous year. Three law firms decided against using the services in 1968 for the following reasons: (1) lack of a state return, (2) manual system was faster, and (3) employee resistance. The major complaints of the 1967 respondents was the lack of a state of Massachusetts return and key punching errors at the input stage by service transcribers. A significant finding of Bigelow's survey was that every firm which made extensive use of the computer services--that is, processed over 50 returns or computerized more than 35% of their

---

[37]Robert P. Bigelow, "Remarks on Computer Assisted Tax Return Preparation," 1967 Proceedings of The Second Annual Conference On Computers and Taxes, Sponsored by the Computer-In-Law Institute of the George Washington University in cooperation with the American Bar Association and the Federal Bar Association, held in Statler-Hilton Hotel, Washington, D. C., June 6-7, 1967, p. 17.

volume--planned to use the services again in the future. "Bugs" in the systems of the computer services found in the 1967 tax season were time delays, key punching inaccuracy, and lack of state returns. More compatability between city, state and Federal returns is necessary. A summary of the comments from Bigelow's survey is as follows:

COMMENTS FROM LAW FIRMS SURVEYED[38]

Favorable

1. Less proofreading: relief from typing; mathematical accuracy.
2. Time saved; easier computations; legibility and good copies for client.
3. Corrections and changes did not require recomputation.
4. Inexpensive; elimination of preparation of detailed schedules; pro forma schedules for next year; consistent technical review.

Unfavorable

1. Delay in processing and machine breakdown.
2. No individual state return (Massachusetts).
3. Proofreading required, especially when service misinterpreted handwriting.
4. Cumbersome format.
5. Insufficient space for items; too many subsidiary schedules.
6. Difficulty of correcting data when additional information was received from taxpayer; time required to fit into present system; difficulty of reading print out; weak mailing envelopes.

How The Service Can Be Improved

1. Make format closer to Federal return format.
2. More consolidated schedules.

---

[38]"How Do Attorneys Like Computerized Returns?" Taxation for Accountants, III, No. 1 (March-April, 1968), p. 61.

3. There should be more space on the forms for the preparer's information.
4. Simplification of information forms. Increase speed of processing.

1968 Tax Season

In 1968 the computerized tax return service continued to improve but continued to have growing pains. The computer service firms lowered prices, simplified input forms, and worked hard to lower turn-around time.[39] Autotax, Computax, and Fast-tax were the three fully computerized firms operating in 1968. Datatax shut down completely to update its equipment and planned to resume operations in the 1969 tax season. Programmed Tax Systems was a newcomer to the field in 1968, joining CTS and Unitax as the group representing the partially computerized firms of the industry. PTS marketed a package including Federal, state, and city of New York returns, at a maximum price of $5 per package. These partially computerized firms are the industry's answer to the original criticisms of computerized services--high prices, excessive input forms, and processing delays. The partially computerized services offered lower prices, shorter input forms, and shorter turn around times.

---

[39]Dominic A. Tarantino, "Computerized Tax Returns Still Have Growing Pains But Continue To Improve, Taxation For Accountants, II, No. 5 (November-December, 1967), p. 272.

1969 Tax Season

The editor of "Practitioners Forum" in the Journal of Accountancy reports that the introduction of the topic of computer-prepared tax returns in a conversation group of accounting practitioners practically always stirs up a controversy with enthusiastic supporters on the one side and reluctant users and disappointed, critical users on the other side.[40] This controversy continued in 1969.

Computax and most other firms held prices for the 1969 season much the same as in 1968. The number of companies has increased to nine with the appearance of a new firm, Digitax.[41] Datatax, a division of Litton Industries, Incorporated, suspended service in the 1968 tax season in order to update its equipment and forms for input. Datatax attempted a come back this past season by operating in the Manhattan area only. If this pilot re-entry attempt is considered successful, Datatax plans to revive their services throughout the country on a gradually increasing basis over the next several years. The 1969 season saw additional programming of more state returns. Computax added five more state returns to its package of service--

---

[40]Richard C. Rea, "Computer-Prepared Tax Returns," Journal of Accountancy, CXXVII, No. 3 (March, 1969), pp. 82-83.

[41]See details of Digitax in Appendix A.

Michigan, Arizona, Colorado, Maryland, and Wisconsin. Pro forma input forms became popular and more widely used by most of the firms. These pro forma input forms are worksheets for next year's returns and they eliminate much of the routine copying of information which is repeated on returns from one year to the next. Turn around time continued to be a problem.

The line up of the nine known services breaks down into two classifications, the fully computerized services and the partially computerized services. Computax, Datatax, Fast-Tax, Autotax and Systems and Taxes constitute the fully computerized service classification but SAT went bankrupt and Datatax is faltering. CTS, Digitax, PTS, and Unitax constitute the partially computerized services. The completely computerized services print out Form 1040 and all the supporting schedules by computer. The partially computerized services print out by computer only pages one and two of Form 1040 with summary figures only but attach copies of input sheets or other manually prepared or typewritten supporting schedules when the return is filed. Some partially computerized services will print out by computer one or two of the supporting schedules such as the Income Averaging Schedule or the Retirement Income Credit Schedule. All the services continue to limit their services to professional tax practitioners; none deal directly with the public.

All the services guarantee confidentiality of returns and accuracy of their work; they all offer to pay any interest and penalties due to an error on their part but Computax negotiates the amount. Computax now prints out forms 1116, 2210, 3468, 4136.[42] It computes installment sales calculations; determines state sales tax deductions by using guidelines or amount submitted by preparer and has computer select the more advantageous if requested.

Computer Tax Service (CTS) raised its basic price from $3 to $4 a return, but this includes any applicable state return. Where no state return is required, the price is $3.50 for the Federal return. CTS charged these single fixed prices for returns regardless of the complexity of the return or quantity of schedules. A registration fee of $20 was required to provide all supplies needed during the tax season. The CTS now includes completely computer

---

[42]Form 1116 Statement in Support of Credit For Taxes Paid or Accrued to a Foreign Country or a Possession of the United States, used to support the amount of foreign tax credit claimed on individual, partnership or fiduciary income tax return; Foorm 2210 Statement Relating to Underpayment of Estimated Income Tax by Individuals, explanation of underpayment to avoid penalty on estimated tax; Form 3468 Computation of Investment Credit, used by individuals, estates, and trusts and corporations claiming an investment credit; Form 4136 Computation of Credit for Federal Tax on Gasoline and Lubricating Oil, used by individuals, estates, trusts or corporations, including small business corporations, claiming credit for Federal excise tax on the number of gallons of gasoline and lubricating oil used.

printed Income Averaging, Schedule G; Retirement Income Credit, Schedule B; Federal and State 1969 Estimated Taxes; calculations of all limitations, exclusions, and alternatives; comparison of all deductions to national averages. Computer-printed state returns for 31 of the 33 states with income tax laws were offered by CTS in the 1969 tax season. Four more CTS computer centers for processing returns were added to the sixteen already open. Processing of returns in the 1969 tax season for the state of Michigan was done in Detroit, within 12 to 24 hours after receipt of input forms.

It was originally reported that "CTS offers its services to the general public at a higher cost."[43] This original intention did not work out. CTS, like all the other services, sells its service to tax practitioners only.

At least one of the "big eight" CPA firms is presently considering setting up its own tax return preparation computerization.

> Studies are now under way in our firm to determine how and to what extent our Spectra 70 (RCA computer) system can be used not only for return preparation but in various aspects of tax planning as well. I have no doubt that we will be reading about

---

[43]Dominic A. Tarantino, "Computerized Tax Returns Still Have Growing Pains But Continue to Improve," Taxation for Accountants, II, No. 5 (November-December, 1967), p. 273.

the results of these studies in some future issue of this journal.[44]

The consensus of tax accountants is that it takes about twenty-five returns that should be processed before an accountant can adequately judge whether he should use a computer service.[45] Mr. R. C. Rea of Rea and Associates CPA firm of New Philadelphia, Ohio, believes a tax practitioner should try at least twenty-five before deciding against computer-prepared returns. This conclusion and recommendation agrees with the results of a survey made in 1967 by the New Jersey Society of CPA's of firms and practitioners who used computer-prepared returns for 1966.[46]

George H. Webb, Jr., partner of Webb & Webb, CPA firm of San Francisco said that his firm has used Computax service since its inception in 1964 and has found it satisfactory. They used it again in 1969 and found the service much improved--fewer errors in preparation of the return and in collating, computer printed return is cleaner than the duplicated copies of pencil drafts, additional information submitted by clients or their errors can be

---

[44]Ira S. Sheinfeld, "Computers and Taxes," The Arthur Young Journal, (Winter, 1968), p. 21.

[45]"Should You Use a Computer Service to Prepare Tax Returns? If So, What Kind?" Taxation for Accountants, III, No. 5 (November-December), 1968, p. 277.

[46]Richard C. Rea, Journal of Accountancy, p. 83.

corrected by a phone call to Computax and computer program makes all corrections automatically, pro forma sheets save preparation time, and recap sheet is helpful. His firm believes the costs are an expensive overhead item but that they are warranted under the circumstances, as they permit more efficient use of the professional staff in the preparation of returns by enabling them to use their time making professional decisions rather than spending it on detailed clerical work. Webb and Webb reported their costs for computer-prepared returns varied from $7.00 to $65.00 with the average at $17.50 per return. Rea and Associates reported their costs ranged from $5.20 to $27.62 with an average of $12.05.[47] These costs were reported for the 1968 tax season and prices in 1969 changed little or none at all.

Effects of Computer Application to Tax Returns

The greatest effect of the application of computers to the preparation of income tax returns is the impact on tax practitioners. It takes the drudgery out of the practitioner's tax season (January through April) by providing relief from costly, burdensome, repetitive, nondiscretionary duties that are connected with tax returns preparation, such as recording, calculating, checking and

---

[47] Ibid., p. 86.

proof-reading, typing and reproducing. Recording involves the entry of repetitive data on tax forms and worksheets. Calculating involves the computing of summaries, subtotals on the various forms and worksheets as well as finally, the tax liability. Checking involves proof-reading data to make certain figures have been entered and calculated correctly. Typing involves transferring all the data from hand forms to printed pages. Reproducing involves duplicating original into required number of copies, usually three--one for files of practitioner's office, one for client-taxpayer to keep and one for client-taxpayer to file with the government. Many times an additional copy or two may be required to file with state or city returns.

Accountants, lawyers and other tax practitioners have found that the preparation of income tax returns is progressively becoming each year more complex, more difficult, more time-consuming and, therefore, less profitable. Tax practitioners agree that each tax season means enormous pressures. The tax season has always meant long hours--nights and weekends, extra help, interruptions of more important fiscal work, and heavy overtime costs. Utilizing the services of the new computerized tax returns preparation industry brings relief to the practitioner. It eliminates clerical duties and saves, therefore, time and the cost of that time.

The lower cost of the return as prepared by the services in addition to the savings in operations realized makes profitable the use of computer prepared returns by practitioners. The time saved permits practitioners to accept more tax clients, more consulting work, or other income-producing work. Tax practitioners also have the complexity of tax returns preparation reduced to simplicity by the computer services. Speed and accuracy are achieved. All possibilities of options are considered mechanically by the computer if it is so programmed. Examples are itemized deductions vs. standard deduction, joint vs. separate returns, etc.

Other possibilities in tax practice are opened by computers for tax practitioners such as preparation of corporate, estate, and partnership returns; determining tax advantages of corporate vs. partnership form of doing business; estate planning; year-end tax review.

There is an effect on the client-taxpayer. The computerized efficiency of the services matches that of the IRS and constitutes a defense for the taxpayer against government computers. The completeness and the accuracy of computer-processed tax returns results in the filing of better returns by taxpayers. The Federal government's shift to a computerized tax collecting system has put each taxpayer's return under a microscope which often increases chances for a full-scale government audit when

errors, omissions, or abnormalities are found. The new services help taxpayers overcome errors, omissions, and abnormalities in their returns before they are filed. The diagnostic report to the practitioner is a valuable item in this respect.

There is an effect on the government. Computer printed returns are more legible than those written by hand. The clearly printed returns will help IRS key-punch operators to make fewer interpretative mistakes. Computerized returns filed by taxpayers will help government increase its accuracy and reduce the necessity of full scale auditing of many returns.

A general impact of computer prepared returns is the creation of a new, highly technical, service-type industry which serves tax practitioners of all types.

A general result of computer processed returns is the creation of the possibility of tax forms replacement by direct tape-to-tape tax return transmission from computer centers of the services like Computax to the Internal Revenue Service automatic data processing centers.

CHAPTER VI

SUMMARY, CONCLUSIONS AND IMPLICATIONS

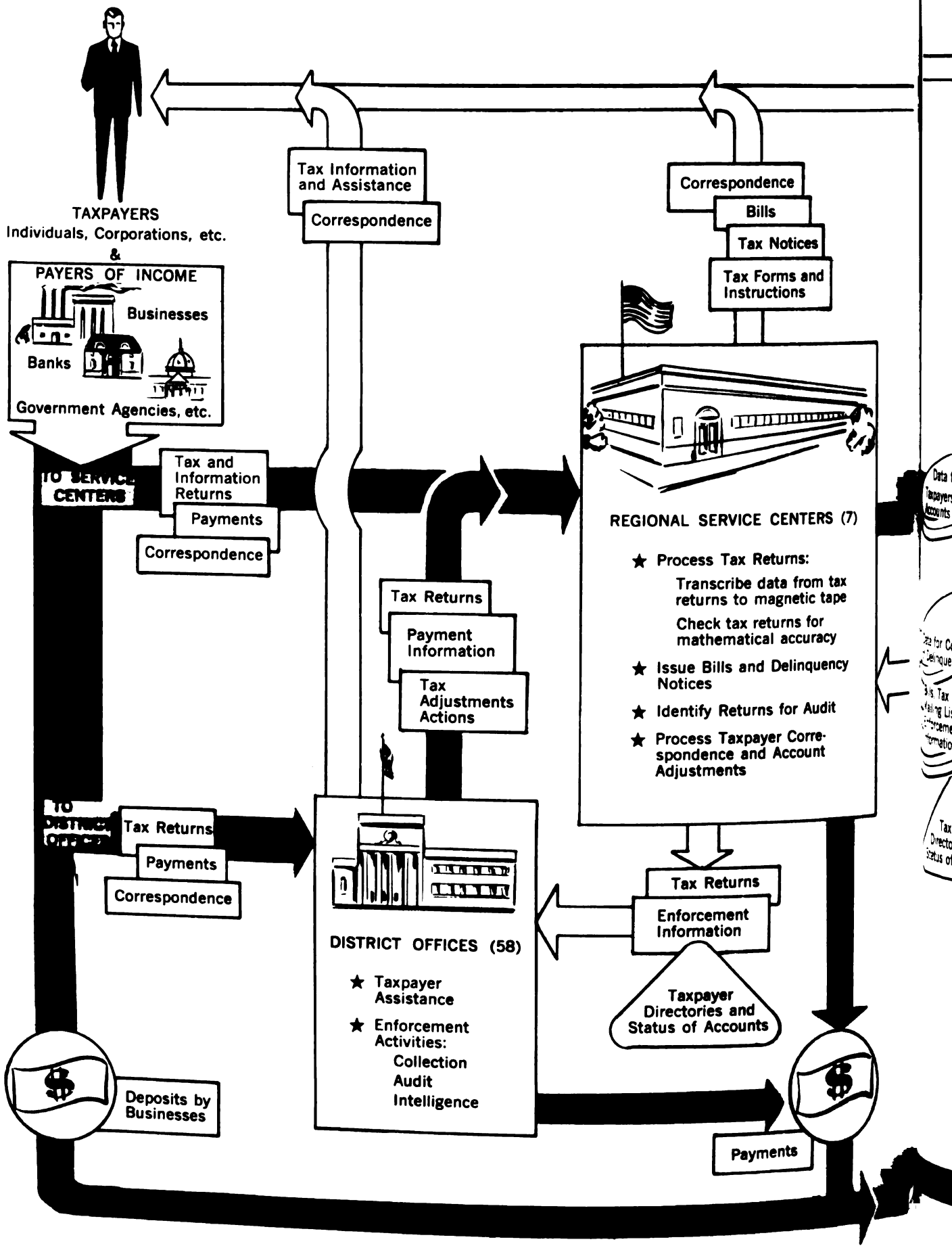
Summary

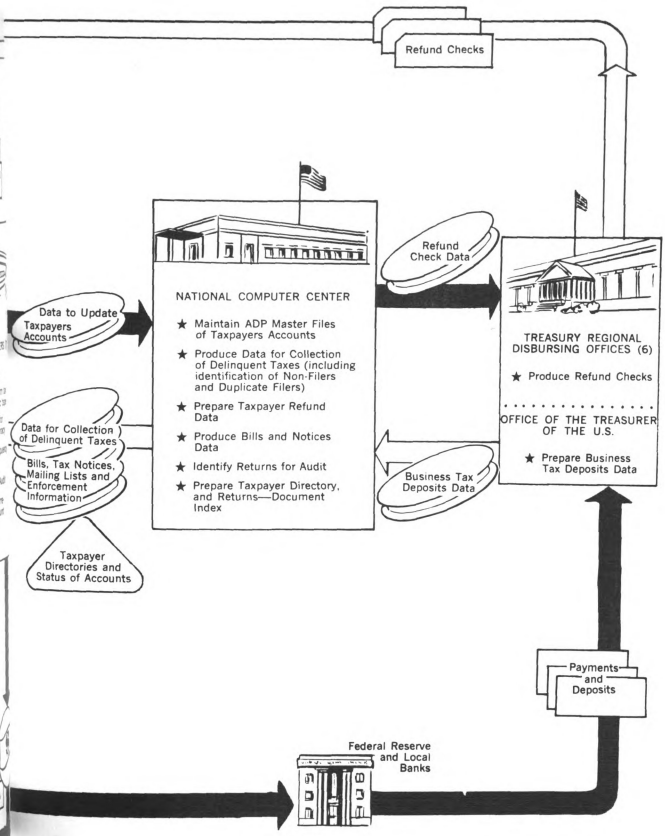
The computer is having considerable influence on Federal income taxation. This influence is particularly noticeable in three activities which have become significantly modified, as follows: (1) tax collecting which has improved in efficiency and has become more centralized, (2) tax research which has expanded into new areas, and (3) tax returns preparation which has developed into a newly emerging industry of computerized tax returns preparation firms. Figure 6-1, Automated Federal Tax System--Internal Revenue Service, is a flowchart which depicts a complete view of the vast computer network now operating throughout the United States to collect taxes and process returns and related documents.

Conclusions and Implications

Conclusions and implications emerging from this study can be classified into three major categories which follow the organization of the study and are summarized

Figure 6-1. Automated Federal Tax System--Internal Revenue




Refund Checks
Refund Check Data
NATIONAL COMPUTER CENTER
★ Maintain ADP Master Files of Taxpayers Accounts
★ Produce Data for Collection of Delinquent Taxes (including identification of Non-Filers and Duplicate Filers)
★ Prepare Taxpayer Refund Data
★ Produce Bills and Notices Data
★ Identify Returns for Audit
★ Prepare Taxpayer Directory, and Returns—Document Index
TREASURY REGIONAL DISBURSING OFFICES (6)
★ Produce Refund Checks
OFFICE OF THE TREASURER OF THE U.S.
★ Prepare Business Tax Deposits Data
Business Tax Deposits Data
Data to Update Taxpayers Accounts
Data for Collection of Delinquent Taxes
Bills, Tax Notices, Mailing Lists and Enforcement Information
Taxpayer Directories and Status of Accounts
Payments and Deposits
Federal Reserve and Local Banks

above. The first two categories, tax collecting and tax research, are combined and considered below.

Regarding Tax Collecting and Tax Research

The conclusions and implications in this category can be divided into three sections: those concerning governmental tax administrators, those concerning taxpayers, and those related to professional tax services.

Those concerning governmental tax administrators.--Returns processing activity of the IRS has been centralized from the local level of 58 District Offices to the 7 Regional Offices which supply data to one centralized point, the National Computer Center. The vast magnitude of the centralized operations at the NCC is almost incomprehensible--data from approximately half a billion source documents converge into a Master File containing eighty-eight million accounts by a computer configuration which operates perpetually around the clock. The administrative control function of the IRS has been significantly improved as a result of this centralization. Efficient operations and efficient allocation of resources have resulted by keeping costs of collecting $100 of revenue below $.50 while the volume of returns (workload) has steadily increased. Also, 48,100 man-years have been saved by ADP from 1954 to 1968 and it would take an estimated 12,000 more people to do the present job without computers. Other non-quantitative improvements

and new programs have been made possible by centralized mechanization. Therefore, efficiency has increased. Improved control and increased efficiency has inspired confidence of the public in tax laws and integrity of the IRS to the extent that increased voluntary compliance has resulted. Therefore, the mission of the IRS has been achieved. Voluntary compliance has been maximized and tax evasion has been minimized to the extent that the objectives of the system have been achieved. The American computerized tax system has become a model for the other nations of the world to follow.

The computer system has increased the opportunity for error on the part of both the Government and the taxpayers. Many of the present problems previously overlooked under the old manual methods are now identified and acted upon by the cold-blooded efficiency of the computer. Incorrectly written numbers or numbers not furnished by taxpayers create many problems and render the system less operative. The new system has increased Government-taxpayer contacts by means of computer-generated notices. Omissions, errors, abnormalities found by the relentlessly searching computers are printed out for computer conversation with taxpayers who complain of the cold, impersonal nature of the contacts. Taxpayer errors need to be decreased, especially wrong and missing numbers, and the Government's computer contacts need to be improved.

The IRS computer system has its limitations. The third generation hardware technology is growing old and its "batch-processing" is outdated. There are problems of communication among the district, regional, and national levels; time lags result. The computer can do only what it is told to do; the program instructs the computer and the program is created by human beings. The computer can not audit tax returns.

A conceptually new computer system with modern technology of the fourth generation is being planned for installation early in the 1970's, as the present system is satisfactory for the short-run but inadequate for future long-run needs and growth.

The application of computers to processing of tax data at the NCC and the Detroit Data Center has enhanced tax research; created many changes, technical improvements and new programs the major ones of which concern Taxpayer Compliance Measurement Program, Taxpayer Assistance Program, Master File of Exempt Organizations and Pension Trust Funds, Statistics of Income, Tax Models, Audit Criteria (DIF), and Federal-State Cooperation.

Many implications emerge, or can be detected, in the computer application to tax returns processing and tax research as follows:

1. Computer applications in business and industry will require Government auditors to audit "through"

rather than "around" the computer as the audit trail disappears into the computer.

2. With "discriminant function" selection of returns for audit, the Government may employ the CPA of the taxpayer business involved to do the auditing for the Government.
3. The possibility exists that one combined tax return might be research and developed and used for Federal, state, and local levels with the Federal government collecting and processing returns and then reimbursing lower levels. Closer cooperation has been emerging. While state income tax laws vary, many states do pattern the preparation, calculation, and filing of state returns after that of the Federal tax.
4. The new Federal Reserve Bank deposit procedure instituted in 1967 for direct payment of corporate estimated income tax has potential for expansion and extension to all other levels, especially individuals, thus eliminating teller operations of the IRS which would get them out of the banking business and reduce some of the paper handling.
5. The computer system provides the capability to the Federal Government for calculating, preparing and sending its citizens their tax bills. With the Master File identifying all taxpayers whose incomes

> are reported on information returns, with "normal" or "standard" deductions allowed, it is possible for the Federal Government to issue tax bills to the vast majority of individual taxpayers. This is conceivable for individuals but less so for businesses. The chief barrier to bringing this possibility into reality is the American political philosophy of democratic self-government, which when applied to taxes means "taxpayer self-assessment." This tax philosophy of "self-assessment" flourishes strongly in the United States today, and modification of it would be difficult but necessary to realize this potential change.

Those concerning taxpayers.--Taxpayers have become more concerned about their tax responsibilities as computerized review and examination of returns has become sharper and more comprehensive and taxpayer compliance measurement has been boosted by computer operations. Computers verify the taxpayer's arithmetic on the return and examine the contents, notably deductions for abnormalities, omissions, or inconsistencies according to scientifically determined audit criteria called "discriminant function" (DIF), and then send out notices to taxpayers for corrections when necessary, or if necessary classify a return for more detailed audit by the District Office. This microscopic examination of each taxpayer's return by computers, along

with the complexity of the return, together with its technical and legal nature, have caused taxpayers in large numbers to seek help and advice from the Federal Government's Taxpayer Assistance Offices or from professional tax practitioners. Increased individual taxpayer reliance on professional tax services has been the result.

All U. S. taxpayers are now identified and listed in the Master File at the NCC with a consolidated account that contains considerable personal information to constitute a tax dossier.

Taxpayer errors need to be minimized, especially wrong numbers and missing numbers, in order to improve the operating efficiency of the system.

Those concerning professional tax services.--The professional tax services have become inundated with clients. Both Federal Governmental Taxpayer Assistance Offices and the practitioners offices of CPA's, PA's, lawyers, banks, and tax specialists have expanded their services to fulfill the increased need for help to taxpayers. To obtain relief from the increased workload, private tax practitioners seek, increasingly, help from the computerized tax return preparation services.

A new industry has been emerging--the computerized tax returns preparation industry. Certain accountants collaborated with computer specialists to program tax returns. They organized proprietorships or partnerships

to sell their service first on a local basis then regionally before being finally absorbed or merged with a parent corporation which provides national distribution. Eight firms now flourish and now constitute the computerized tax return preparation services industry, which is expected to grow rapidly in the future. The vast majority of tax returns in the future are expected to be computer calculated and printed by these emerging services.

Regarding Computerized Tax Returns Preparation

The greatest effect of the application of computers to the preparation and printing of tax returns is that on the tax practitioner.--It takes the drudgery out of the practitioner's tax season. The computer eliminates the practitioner's need to perform simple clerical work and frees his time for more complex work. The computer helps increase the practitioner's income primarily by providing low cost service and releasing his time for other higher-level work. The computer will enhance the prestige of the tax practitioner by requiring his services on an advisory basis concerning tax implications involved in client computerized programs because computerization of programs mean they are difficult or impossible to change after getting data into the computer.

Will the service firms deal directly with the public and thus eliminate the services required from tax

practitioners? Hardly. Computer Tax Service (CTS) tried it with a testing of the public market in Los Angeles and found it unsatisfactory and impractical. Tax returns are too technical, and the technical knowledge and service of the tax practitioner are required to facilitate efficiency in the usage of the input forms of the computerized services.

There is an effect on the client-taxpayer.--The computerized efficiency of the services matches that of the IRS and constitutes a defense for the taxpayer against the efficiency of government computers. The completeness and accuracy of computer-processed returns results in the filing of better returns by taxpayers. The Federal Government's shift to a computerized tax-collecting system has put each taxpayer's return under a microscope which often increases chances for a full-scale audit by the government when errors, omissions, or abnormalities are found. The new services help taxpayers overcome errors, omissions, and abnormalities in their returns before they are filed. The diagnostic report to the practitioner is a valuable item in this respect.

Effects concerning government tax administrators.--Computer printed returns are more legible than those written by hand which helps the Government reduce errors of transcription and interpretation and helps reduce the need for audits.

Computer printed returns create the possibility of tax forms replacement, for individual income tax returns, by direct tape-to-tape tax return transmission from computer centers of the services (like Computax) to the IRS automatic data processing service centers. The simplified input forms of the service firms would replace the complex Government forms.

Standardization of state tax return forms becomes possible through the computerized service firms. Computer Tax Service (CTS) has convinced the state of Massachusetts and others to simplify their complex forms which is a step in this direction. Perhaps the state and city forms will standardize into a form like the Federal. This possibility exists. Computers promote it.

APPENDICES

APPENDIX A

THE COMPUTERIZED TAX RETURN SERVICES AVAILABLE

Computax

Computax Corporation, 910 North Sepulveda Boulevard, El Segundo, California 90245, is the leading computerized tax return preparation service in the United States. It was developed by Computer Sciences Corporation, a company widely known for the research and development of programming systems for scientific, military, and commercial uses.

The Federal income tax returns, state tax returns of California, Maryland, Michigan, Wisconsin, Colorado, Arizona, and New York, and the New York City tax returns are included in the Computax service. Computax was designed specifically to relieve the tax practitioner of the burdensome, repetitive, nondiscretionary duties connected with tax return preparation. Computax performs such functions as entering repetitive data, calculating, checking, typing, reproducing and assembling returns. Forms prepared and printed by this method carry the assurance that data has undergone numerous electronic checks to verify that the minimum allowable tax liability has been established.

While the Internal Revenue Service does not endorse any particular service or product, the reports and schedules prepared by Computax have been approved and accepted by the IRS for filing Federal returns.

Computax has been the trail-blazer in the field of the new computerized tax return preparation services. It has maintained its leadership in the industry through six tax seasons.

The concept of automatic preparation of income tax returns became a reality in 1963. Computer Science Corporation of El Segundo, California, programmed in that year a Univac 1107 computer to prepare individual Federal income tax returns and individual California state income tax returns.[1] The C.P.A.-scientist who was the designer-implementer of the original automated tax return preparation system was Alan A. Stern, employed since 1962 as a research and development scientist at Computer Science Corporation. On the conception of Computax, it has been reported that

> The idea for Computax originated with William Fahy, CSC data processing supervisor. In 1963 while preparing his Form 1040 just before the April 15th deadline, the thought occurred to him that data processing equipment might be the answer to tax preparation for everyone. When he sought the opinion of accountants, he received varying answers: from 'Impossible' and 'Couldn't possibly work' to 'Very feasible' and 'Terrific.' At this point CSC agreed to begin research.

---

[1] Howard M. London, "Automation and Tax Practice," Taxes, XLIV, No. 1 (January, 1966), p. 22.

> Sample computer-oriented tax returns were shown to several accountants. They expressed interest. A pilot program was initiated and, during 1964, 43,000 returns were prepared by Computax. According to CSC, the number of returns that can be processed under the system 'is virtually unlimited.'[2]

The Skousen Tax Service of Montrose, California supplied the original taxpayer interview forms around which Computer Science Corporation developed its first program for the automated preparation of tax returns. The pilot test run of 43,000 returns was processed the first year using this original program. New and greatly expanded interview forms and computer programs were then developed by CSC computer analysts for their Univac 1107 in 1965.

After local California accountants expressed much interest in the computer approach to income tax returns, Computer Science Corporation engaged the marketing division of Dun and Bradstreet to conduct a survey in order to determine the potential use of computer techniques in preparing individual returns.[3] Accounting firms of all sizes were surveyed in Los Angeles, San Francisco, Chicago, and New York. The majority of accountants interviewed expressed interest and concern mainly with input schedules, processing capabilities for tax problems, appearance of the final

---

[2]"Tax Returns By The Computer," The National Public Accountant, X, No. 1 (January, 1965), p. 7.

[3]"Tax Returns--By Computer," The Journal of Accountancy, CXIX, No. 2 (February, 1965), p. 23.

printed return, and costs. Mr. Stern reported that the potential lower cost and time savings impressed them most but that their chief reservation was the complexity of the tax return for computerization. This reservation led to a consideration of what the computer can do for the accountant and what it can't do.

The computer can do many things to assist the accountant. Some of the areas in which this help has been manifested have been the following:

1. Performing all calculations for:
   a. F.I.C.A. tax overwithheld
   b. Dividends received exclusion
   c. Retirement income credit
   d. Foreign tax credit
   e. Investment tax credit
   f. Lowest tax, including alternative tax method for capital gains
   g. Tax reduction due to income averaging
2. Checking returns for missing information--such as name, address, social security number, occupation--and for any unanswered questions regarding travel reimbursement, previously filed returns, etc.
3. Checking for inconsistency of information. The computer will immediately catch such inconsistencies as a single taxpayer's return showing a social security number for a wife, or a rent schedule filed with no depreciation schedule attached, etc.
4. Revealing areas for potential tax reduction, such as retirement income eligibility, the comparative advantage of filing separate or joint returns, etc.
5. Relieving the accountant of many clerical procedures involved in preparing returns.

Other areas for computer application have emerged. This type of programming treatment might be extended to such other tax activities as:

1. Preparation of corporate, estate, or partnership returns;
2. Checking of dividend income and security transactions;
3. Year-end tax review;

4. Determining tax advantages of corporate vs. partnership form of doing business;
5. Estate planning;
6. Information retrieval of tax court decisions.[4]

What can the computer not do? The computer cannot make judgmental decisions. It can do only what it is told to do. Therefore, tax accounting operations requiring judgmental decisions will remain for the accountant or tax practitioner. Most calculations should be performed by the computer, as this function is what it can do accurately and very rapidly. Mr. Stern studied this situation in collaboration with tax specialists of the C.P.A. firm of Touche, Ross, Bailey & Smart so that the Computax system would harness the speed and accuracy of the computer to the needs of tax practitioners.

There are several by-product benefits of the computerized processing of Federal income tax returns as in the Computax system. Some of these benefits are the preparation of (1) a state or city return, (2) filing instructions to the client, (3) time and cost data which the accountant normally keeps with each return, and (4) a pro forma work sheet for use as a checklist and to eliminate rewriting the same descriptions when preparing another year's tax return.

---

[4] Ibid.

Cost considerations of computerized tax returns have been a major concern of accountants. Computer Science Corporation's study of costs, based on figures obtained from the Dun & Bradstreet survey about time spent in specific functions performed in preparing a return, revealed that reductions were possible with the computer approach. When an average accountant prepares an average individual tax return, he goes through the following functions which take the following amounts of time:[5]

Function	Time Spent, In Hours	
	Accountant	Clerk
1. Gathering and assembling all data on work sheets, excluding the actual preparation of the return itself	1.7	.1
2. Preparing return from all information available	1.1	.1
3. Reviewing for theory	.5	.1
4. Reviewing calculations	.3	.1
5. Preparing, reproducing and collating final returns	.7	1.1
Total Hours Per Average Return	4.3	1.5

Computax found that the computer program, on the average, makes it possible to eliminate steps (2), (4) and (5), which results in a savings of 2.1 hours of the accountant's time, and 1.3 hours of clerical time. A time study of a typical return of a dentist, included below, that was prepared by a typical C.P.A. firm illustrates by the following

---

[5] Ibid., p. 24.

figures how Computax can save time for practitioners to do more returns or other profitable work during the busy tax season:

	COMPUTAX	Manually
Preparation	28 minutes	107 minutes
Checking	10 minutes	24 minutes
Review	7 minutes	12 minutes
TOTAL Professional Time	45 minutes	143 minutes

These figures show that there is a saving of 98 minutes in professional time, or 1.6 more hours that is available for working on more 1040's or doing other profitable work. For the 1965 tax season, Computer Science Corporation established a price for its Computax system that averaged $7.25 for individual Federal returns and about $8.75 for the Federal plus the state return.

Much time and consideration was devoted by Computer Science Corporation to the original design of the input forms which practitioners use on which to submit the necessary tax data of their clients. A tax partner of Touche, Ross, Bailey & Smart was consulted by Computer Science Corporation to insure that due consideration had been given to the many varied types of complex transactions that can arise on tax returns. There are twenty separate input pages that might be used in the Computax system for a complex Federal income tax return. About one-half of this total might be used on an average return. The input sheets

for the Computax system, which have been designed to accept only those data which are required on the tax return itself are as follows:

Interview Form 1:	Taxpayer Identification Data
Interview Form 2:	Estimated Tax Information--Form 2210--Wages and Salaries
Interview Form 3D:	Dividend Income
Interview Form 3I:	Interest Income
Interview Form 4:	Income from Rent and Royalties
Interview Form 5:	Gains and Losses from Sales or Exchanges of Property (This includes Long-Term and Short-Term items)
Interview Form 6:	Gains and Losses from Sales or Exchanges of Property (Property other than capital assets, Sections 1245 (1231) assets, and Sections 1250 (1231) assets)
Interview Form 6S:	Gain on Installment Sales
Interview Form 7:	Partnerships, Estates or Trusts, Other Sources, and Pension and Annuity Income
Interview Form 8:	Profit or Loss from Business or Profession and Schedule C-3 Information
Interview Form 9:	Profits or Loss from Business or Profession
Interview Form 10:	Farm Income and Expenses
Interview Form 11:	Depreciation
Interview Form 12:	Business Expense (Employee and Partnership)
Interview Form 13:	Itemized Deductions
Interview Form 14:	Itemized Deductions (Continued)
Interview Form 15:	Tax Credit Schedule and Additional Tax Due
Interview Form 16:	Income Averaging
Interview Form 17:	Footnote Schedule
Interview Form 21:	Recap (Optional)

A growing number of practitioners have expressed a desire to learn the proper preparation of the many input forms in the Computax system of computerized returns. This interest was reflected in the fact that in December of 1967 over 1,000 practitioners accepted invitations to attend a

Staff Training Seminar held in New York on the use of Computax computerized returns.[6]

Instruction guides on the use of the input forms are furnished as a matter of policy by Computax to each practitioner. Review procedures of the input forms should be developed by each tax practitioner to insure accuracy before the returns are forwarded to the processing centers. This is the purpose of the recapitulation sheets on which it is possible to summarize the taxable income figure. Most services have developed such a procedure or checklist of items to be covered properly. One practitioner said,

> . . . We have learned from our own experience and from other users of Computax that a major safeguard is the calculation of taxable income for ourselves by filling in the recap sheet (Computax Form No. 21). This requires footing and recording totals in the input forms. The same review procedures covering correctness and completeness of the raw data used for hand-prepared returns apply to the Computax schedules. There is one big difference, however--we do not verify footings. Computers handle that for us.[7]

The program was enlarged in 1966 to include 75,000 instructions, consisting of some 23,000 Cobol statements, which processed a return in an average of six seconds.[8]

---

[6]"Staff Training to Take Advantage of Computerized Tax Return Service," Taxation for Accountants, II, No. 6 (January-February, 1968), p. 376.

[7]Donald Chapman, "A Procedure For Review Of Computerized Returns," Taxation for Accountants, II, No. 2 (May-June, 1967), p. 125.

[8]Edward K. Yasaki, "Computing and Tax Accounting," Datamation, XII, No. 3 (March, 1966), p. 33.

And yet the turn-around time, from receipt of interview forms submitted by accountants and practitioners to the mailing of completed tax forms was and still is five days. Key-punching has been the bottleneck.

In September of 1965, Computer Science Corporation sold a fifty-one per cent interest in the Computax Corporation service to Commerce Clearing House, the huge Chicago based tax and law information dispensing firm. Together they formed a new venture, the Computax Corporation, to pioneer and to carry on the enterprise of automated tax returns with a policy of serving only tax practitioners such as certified public accountants, lawyers, public accountants, tax counselors, bankers. Then Computax Corporation became a public corporation by offering 60,000 shares of the 1.2 million shares outstanding. On December 29, 1965, it was announced in the public prints that the Computax Corporation "registered with the Securities and Exchange Commission a secondary offering of 100,000 capital shares . . . to be offered for public sale by Computer Science Corporation."[9] This secondary offering was subsequently withdrawn in favor of the 60,000 share primary offering.

---

[9] Wall Street Journal, December 29, 1965, p. 13, column 1.

At its inception, Computax service was available through the CSC in the states of New York, New Jersey, Connecticut, California, Texas, Oregon, Washington, Nevada, and Arizona. After CCH acquired control of Computax, Computax Corporation began marketing its service through the already established Commerce Clearing House sales organization. A much wider distribution of the service through the Commerce Clearing House marketing force made Computax service available in 1966 in 34 states covering most of the country except part of the South and Midwest, Alaska, and Hawaii.

More than 100,000 returns were processed by Computax during its first two years of operation--in 1964 and 1965.[10] Competitors estimated in 1966 that Computax had about 2,000 clients throughout the nation with a volume of 200,000 returns.[11] Another report said that Computax Corporation in 1966 was geared and set up to handle the computerized processing of 575,000 tax returns.[12] This volume would amount to a sales income of $6.6 million considering the average charge per return by Computax was $11.50 in 1966.

---

[10]Alan A. Stern, "Computer Tax Returns," The National Public Accountant, X, No. 12 (December, 1965), p. 8.

[11]"Electronic Ally For The Taxpayer," Business Week, March 26, 1966, p. 168.

[12]Edward K. Yasaki, "Computing and Tax Accounting," Datamation, XII, No. 3 (March, 1966), p. 33.

However, Computax remained silent about its business while its application to go public was pending before the Securities and Exchange Commission.

The president of Computax Corporation gave some statistics on 1967 operations of his firm. He said:

> This past tax season we had processing centers in Los Angeles, Chicago and New York. We processed 170,000 Federal returns, 55,000 state of California returns, 21,000 state of New York returns, and 7,500 what we call chargeable reruns. Incidentally, the re-run rate is 4-1/2 per cent. In other words, 4-1/2 per cent of the returns sent to us nationally, had to be re-run because of either preparer error or omissions or error on the part of the taxpayer. Average prices for this past tax season were: our Los Angeles Center, the returns processed there averaged $16.50. Incidentally, these prices would include the applicable state returns, but do not include the chargeable re-runs. So, Los Angeles $16.50; Chicago $12.57; and New York $13.58 for a grand national average of $14.50 for the returns we prepared for 170,000 taxpayers.[13]

Speed and accuracy are the two major criteria by which to evaluate computerized operations of tax return preparation. The factor of speed is often expressed in terms of "turn-around time." Accuracy is often indicated by chargeable and non-chargeable re-runs. Some statistics on these two points at Computax in the 1967 season are as follows:

---

[13] Daniel R. Mason, "Remarks on Computerized Tax Returns," 1967 Proceedings of the Second Annual Conference on Computers and Taxes, Sponsored by the Computers-In-Law Institute of the George Washington University in cooperation with the American Bar Association and the Federal Bar Association, Statler-Hilton Hotel, Washington, D. C., June 6-7, 1967, p. 30.

> Timely enough, we've heard comments today about turn-around time, etc. I'll break my statistics into two pieces; First, from January 3rd to March 20th, by which time we had processed half our volume for the year. Up until March 20th, out of 85,000 returns processed, just about 500 returns were in our hands longer than five working days or seven calendar days. For March 20th to April 17, there's another story. I might back up for a moment and say that up until March 20th, we had received from 20 to 50 per cent of the number of returns that our customers had predicted and in the course of about three days following March 20th, we suddenly found ourselves at 200 per cent of what customers had predicted they would send us. But anyway, from March 20th to April 17th, 75 per cent of the returns were done within seven calendar days, 5 per cent --nine days, 3 per cent--10 days, and one per cent--11 or more days.
>
> Accuracy: Again, I'm talking about this tax season just finished. Preparer error, which I've already mentioned, ran 4-1/2 per cent. Computax error, and I break this into two categories: first, Computax error which was detected by our customers ran about 1.4 per cent; second, Computax error which was detected by us was about 5 per cent.[14]

Computax processed a total of 240,000 returns in the 1968 tax season and 400,000 in the 1969 tax season. Since its inception, it has processed over 1,000,000 returns and has about 80 per cent of the C.P.A. market. Lawyers, bankers and trust companies have been heavy users of the system.

How The Computax System Works.[15]--The Tax practitioner records his clients' tax data on professionally

---

[14] Ibid., pp. 30-31.

[15] Alan A. Stern, "Computer Tax Returns," The National Public Accountant, X, No. 12 (December, 1965), pp. 8-9; 25. Also, see: "Tax Returns By The Computer," The National Public Accountant, X, No. 1 (January, 1965), pp. 6-7; 23.

designed "input" forms called Interview Forms. The tax practitioner then forwards the Interview Forms to one of the five Computax processing centers in Los Angeles, Chicago, New York, San Francisco, or Washington, D. C.

Computax makes all calculations and computations electronically from the Interview Forms. First, the information is keypunched and verified, then fed at the rate of 800 input cards a minute onto tape, using IBM 360 Model 20's; the tape is then fed into the Univac 1108 computer system. A portion of a single reel of magnetic tape can store enough basic taxpayer information needed for the preparation of 400 Federal and state tax returns. The computer begins its analytical operation by reviewing the information it has received, computing the tax liability several times by the various programmed methods, then selecting the most favorably computed alternative which gives the taxpayer his lowest legally obtained tax liability. Some examples of the alternative calculations and selections which the computer makes, in less than three seconds, are: (1) itemized deductions vs. 10% standard deduction vs. the minimum standard deduction, (2) short-term vs. long term capital gain calculation, (3) income averaging method, etc.

Computax prints out on IRS-approved income tax forms three completed and fully verified copies of each return including required supporting detail schedules. These copies are returned to the tax practitioners, who

review and then forward them to their clients for their signatures and timely filing with the IRS. One copy is retained in the files of the practitioner and one copy in the files of the client-taxpayer.

Computax also includes a filing letter of instructions for the taxpayer-client and a special "diagnostic" or audit report for the tax practitioner. The audit report indicates any problem areas that the computer found which need further consideration by the practitioner.

> The computer's diagnosis of the taxpayer's return is based on a library of current tax laws. The machine has over 45,000 programmed instructions stored in its memory, and, in preparing its report, checks the return against current law to determine whether or not there are any inconsistencies or omissions or if deductions exceed limitations. The computer can relay to the tax preparer over 400 different diagnostic checks. If, for example, a tax preparer indicates that a return should be calculated as joint income and the computer estimates a lower tax for separate returns, it will indicate this fact, together with the potential saving. Similarly, if the taxpayer is shown as being single, yet a social security number is listed under the wife's name, such an inconsistency will be reported. Another special feature of Computax is the income averaging ability of the program.[16]

Computax caters to the more complex returns that often include the declaration of estimated tax and even the farm schedule or the income averaging schedule. Computax service has been programmed to handle practically any individual tax return regardless of its complexity. Prices for

---

[16]"Tax Returns By The Computer," The National Public Accountant, X, No. 1 (January, 1965), p. 23.

the service, therefore, vary accordingly. The price is correlated to the amount of information that must be submitted to the computer.

Autotax

Autotax of Tax Computer Associates, Professional Building, 200 Little Falls Street, Falls Church, Virginia 22046 became operational in October, 1965 and is presently owned by Research Institute of America, 589 Fifth Avenue, New York, N. Y. 10017.

> The Autotax program that computes the Federal Form 1040 for individuals was originally developed in 1964 and is the result of the pooled knowledge of highly skilled technicians and qualified tax advisers. Over 10,000 man hours have been used to develop the program.
>
> The program prepares tax returns in great detail and is very comprehensive. It can handle amounts up to $21,000,000 and turns out a return in exact dollars and cents. The Autotax program will prepare supporting schedules of any kind, which are printed on the official form in a format which is accepted by the government.[17]

Since the computer used at Autotax is the IBM System 360, Model 30, the programming is done entirely in 360 Assembler Language. The same programs and sub-routines are involved in producing a simple tax return as a complex one. The programs are selectively executed, as needed,

---

[17]George Kinnard, "The Computer versus The Fifth Season," Law and Computer Technology, I, No. 3 (March, 1968), p. 15. George Kinnard is the General Manager of Research Institute Autotax. Mr. Kinnard was formerly a Manager in the Marketing Staff of the Research Institute of America, and is a past President of the Ohio Consumer Loan Association.

depending on the data submitted to the computer. Even a very simple tax return would involve a number of programs. The current Autotax system, in total, represents over three thousand pages of programming and nearly 400 separate programs, any or all of which may be automatically applied to a single batch of returns being processed through the computer. Furthermore, the Federal returns and the several state returns may be randomly inter-mixed within the same batch.[18]

At its inception, Autotax was under the management of three CPA firms: Buchanan & Company; Bobys, Noble & Brothman, both of Washington, D. C.; and Garbelman, Winslow & Company of District Heights, Maryland.[19]

> This system is marketed by Tax Computer Associates, which is owned by three certified public accounting firms, in the Washington, D. C. area. Built around an IBM 360-model 30 computer, Autotax currently (March, 1966) services about 200 tax consultants from 'almost every state.'[20]

Mr. Hubert Hall became President of Tax Computer Associates and directed the first year of operations at Autotax. During this first year of processing tax returns in the

---

[18] Maitland K. Flood, Chief Systems Engineer, Tax Computer Associates in a letter to the author dated December 10, 1968.

[19] Hope Chamberlain, "Next Year Is Now," National Public Accountant, XI, No. 10 (October, 1965), p. 9.

[20] "Electronic Ally For The Taxpayer," Business Week, March 26, 1966, p. 168.

1966 tax season, Autotax service included the Federal return and the state returns of Maryland, Virginia, and the District of Columbia.

> Last July (1966) the controlling interest of Autotax was acquired by the Research Institute of America. The advantage to all concerned was the nationwide marketing staff of the Institute. As you all know, we have a sales force that has been calling on the lawyers and accountants of the nation since 1935. In presenting our Tax Coordinator we have been in close contact with the professionals who were involved in Federal taxation, so Autotax is a compatible product.
>
> Despite the fact that we did not start our sales effort until September of 1966, it was gratifying to find at the end of this tax filing season (1967) that we had processed returns from all but two of the fifty states, plus the District of Columbia.[21]

The sales and advertising promotion of Autotax stresses several points. Tax practitioners agree that the preparation of income tax returns is becoming each year more complex, more difficult, more time consuming, and less profitable. Tax practitioners find that each tax season means tremendous pressure, long hours--nights and week-ends, extra help, disrupting more important work, and heavy overtime costs. Autotax eliminates typing, duplicating, computing, math verifying, proofing, recording. These functions are performed automatically by Autotax computers.

---

[21] George Kinnard, "Remarks on Computerized Tax Returns," 1967 Proceedings of the Second Annual Conference on Computers and Taxes, Sponsored by the Computers-In-Law Institute of The George Washington University in cooperation with The American Bar Association and The Federal Bar Association, Held in the Statler Hilton Hotel, Washington, D. C., June 6-7, 1967, p. 33.

How does Autotax work? The practitioner follows two steps: (1) he assembles information on a detailed set of 17 basic "tax control forms" according to the instructions given for each firm, and (2) he mails the completed tax control forms to the Autotax processing center in the suburb of Washington, D. C. at Falls Church, Virginia.

Autotax takes over from this point, following these steps:

1. Upon arrival at the processing center, the "tax control forms" are assigned a unique identification number.

2. The information on the forms are reviewed by competent people who are trained for this job.

3. All data inserted on the forms by the practitioner is keypunched on to cards.

4. All alphabetic and numeric data keypunched on cards is key-verified to insure accurate transcription of information.

5. The cards are then screened by Autotax's unique pre-edit program. (This separate program, designed by Autotax technicians, is designed to assure additional accuracy by eliminating practitioner errors as well as keypunch errors. The cards are programmed through a 360 computer to catch such errors as card omitted, card duplicated, various practitioner errors which do not conform to the program, numeric information appearing in an alphabetic field and vice versa, etc.)

6. The cards are then processed by the tax program on a 360 computer which automatically selects the method of filing which produces the lowest lawful tax.

7. Pertinent data concerning each return is stored on a disk under the taxpayer's social security number, and this information is directly accessible to the computer should a program seek it directly at random.

8. The 1040 return and the four state returns that have been programmed with all accompanying schedules are printed in four copies along with a schedule of fees.

9. Each Form 1040 and any programmed state return along with supporting schedules are collated and stapled.

10. Detailed schedules for any unprogrammed state returns are produced in quadruplicate if needed.

11. A diagnostic report accompanies each return to the practitioner and it indicates errors or omissions that the computer observed, the need to file a particular schedule or form, or any other pertinent data.

12. The completed returns, with all necessary supporting schedules and the original "tax control forms" are returned to the practitioner within five days after being received by Autotax.

13. The practitioner, after the first year, receives in the last quarter of each year a pre-printed input set of "pro forma" tax control forms for the coming year which contains repetitive information for the next tax season's return. (Updating this data on the pro forma makes the next season's tax return easier and quicker to prepare.)[22]

The tax practitioner need not perform a single computation. All he is required to do is fill out the tax control forms. The same item is rarely entered twice because the IBM 360 computer used by Autotax has "random access capability" (see step number seven, above).

> Autotax contains three built-in checks for accuracy. It includes a separate computer program called 'pre-edit.' The pre-edit searches out errors and omissions before tax computation starts.[23]

---

[22]George Kinnard, op. cit., pp. 14-17.

[23]"Our Computer Is After Your Tax Jobs," The Journal of Accountancy, CXXIV, No. 4 (October, 1967), p. 81.

From the time of its inception Autotax has provided a complete diagnostic audit report with each printed tax return. This report is a valuable aid to the practitioner in his final interview with his client, as it contains the following data pertinent to the return.

1. Losses on a Schedule C, D or F.
2. Comparison of tax liability with and without income averaging.
3. Explanation of certain assumptions made by the computer.
4. Errors or omissions that were observed by the computer.
5. Warning to the practitioner to attach a certain schedule when necessary.[24]

Future Autotax plans call for the writing of a master estate-tax program, and maintaining and updating it in accordance with pertinent court decisions or changes in tax law and regulations.[25]

With accountants and tax practitioners slowly accepting the computer as a new partner in their profession, the sticky problem of ethics has been raised. How to preserve the confidential nature of tax returns when using the computer as a new tool in its operations has become a real challenge to the ethically minded practitioner. Tax

---

[24]George Kinnard, op. cit., p. 16.

[25]Hope Chamberlin, "Next Year Is Now," National Public Accountant, XI, No. 10 (October, 1965), p. 9.

practitioners who use the computerized services must bear the responsibility of guaranteeing that client information will remain confidential. Autotax, conceived and developed by three CPA firms, made a special effort to incorporate safeguards in their system to protect accountant-client confidence. Some safeguards, or internal control devices, to preserve the confidential nature of tax returns when processed through Autotax are the following:

1. Identity of taxpayer by social security number rather than by name puts the return on an impersonal basis.

2. Speedy, mass-production-line techniques for key-punching operators and other processing personnel make highly unlikely the possibility of gleaning significant information from any one return even if the employee had the time or interest.

3. Only a professional reviewer of the input data at the beginning of the process and a professional reviewer at the end of the process have the opportunity of taking an overview of any taxpayer's complete affairs.

4. Information passing through key punching and verifying operations are maintained in a raw state. Typists, in the old non-computerized method, see far more significant and meaningful information on tax returns than keypunch operators under the new automated method.

Autotax had its second national tax season in 1967.[26] However, the 1967 tax season was the first year for Autotax to be operated by Research Institute of America. The

---

[26]"Computer Tax-Return Preparation: How The Several Services Shape Up This Year," Taxation for Accountants (January-February, 1967), p. 322.

General Manager of Autotax under the new ownership said at the end of their first year:

> The results of our first nationwide season of processing returns have produced the following conclusions:
>
> 1. Since those who have used the system in large quantities have indicated a desire to continue and increase, we are convinced that there will be an increasing acceptance of the system, and we are expanding our scope accordingly.
>
> 2. Many lawyers who have refrained from preparing tax returns in the recent past are finding it economically sound to give clients their thinking and knowledge of the law in this area.
>
> 3. The completeness of the computer processed return will result in the filing of better and more detailed returns.
>
> On the other side of the coin we still have some operational problems, but they do not appear as formidable as they did a year ago. . . .
>
> Our commitments to the future are many in the areas of more programming. We are making a number of changes in the Federal program, which will result in more simplified input forms. We have immediate plans to program several more of the state returns. Our long-range plans include both the corporate and fiduciary returns.[27]

A notable improvement in the Autotax service in the 1968 tax season was a reduction in the number of input forms and a change in the name--from a comprehensive questionnaire input of 27 pages to 17 basic "tax control forms" with eight additional possible forms, if needed. The 17 basic "tax control forms" are as follows:

---

[27]George Kinnard, "Remarks on Computerized Tax Returns," 1967 Second Annual Proceedings of the Conference on Computers and Taxes, Sponsored by the Computers-In-Law Institute of George Washington University in cooperation with the American Bar Association and the Federal Bar Association, Held in Statler-Hilton Hotel, Washington, D. C., June 6-7, 1967, pp. 33-34.

1. Identification Data, Dependents and Estimated Tax Information

2. Salaries, Wages, Tax Withheld and Sick Pay Exclusion

3. Dividend Income

4. Interest Income, Income From Estates and Trusts and Other Sources

5. Partnerships, Small Business Corps., Investment Credit and Recapture of Investment Credit

6. Gain or Loss From Sale or Exchange of Non-Depreciable Assets and Carry Forwards

7. Medical and Dental Expense

8. Contributions and Contribution Carry Forwards

9. Interest Expense and Taxes

10. Other Deductions and Sale of Property Other Than Capital Assets

11. Rental Income and Rental Expenses

12. Profit or Loss From Business or Profession

13. Expense Account and Additional Information

14. Pensions and Annuities, Payments by Self-Employed Persons to Retirement Plans and Retirement Income Credit

15. Income Averaging--Federal Return Only

16. Note Schedule

17. Depreciation Schedule and Gain or Loss on Sale or Exchange of Depreciable Property

Other possible forms available if required are as follows:

18. Business Expenses (Incurred as an employee or in connection with partnership income)

19. Royalty Income and Expenses

20. Installment Sales

21. Schedule of Farm Income and Expenses

22. Farm Income for Taxable Year--Accrual Method

23. Sale or Exchange of Personal Residence

24. Child Care Deduction

25. Net Operating Losses, Foreign Taxes and Investment Credit Carry Forwards Foreign Tax Credit and Other Credits

The cost of an average return at Autotax amounts to approximately $15. A contract is required to be signed along with a minimum deposit of $250. A main disadvantage of Autotax is the fact that it does not print all schedules and forms on government facsimiles whereas the other two fully computerized services do; that is Computax and Fast-Tax. Instead, it prints the schedule on computer-paper lists, which are government approved and accepted, but they are not so neat as the government facsimiles.

Fast-Tax

Fast-Tax, Computer Language Research, 2501 Cedar Springs Road, Dallas, Texas 75201 is offered by Computer Language Research, Inc., a company founded to develop and market the Cleartran compiler for the IBM 1620 computer of the second generation. Some details of the first processing year (1966) were as follows:

> . . . The standard five-day turn-around time is offered (one-day service if punched cards are submitted), but only individual Federal returns are handled, and the average charge is $8-10. Processing is by a

> 40K/1620 with disc pac. Anticipating 360-processing next year (1967), Fast-Tax is still in the throes of its first year.[28]

Fast-Tax has developed into America's most advanced computerized income tax program package as corporate and partnership information income tax returns as well as individual returns are now included in its service.[29] None of the other firms in the young industry have yet offered service on the corporate and partnership returns.

Fast-Tax, which can be classified as a completely computerized service as contrasted with the partially computerized services, prints items of a list directly on tax form facsimilies. All items of a list such as dividends, depreciation entries, and other items, are printed directly on the facsimilies rather than on attachments, space permitting. Up to 40 transactions can be shown on Schedule D. Returns can be computed in either whole dollars or with penny amounts. Eight digit accuracy is maintained for Form 1040 and related schedules. Ten digit accuracy is maintained for Forms 1120 (corporations) and 1065 (partnerships). Generation of investment credit, carry of depreciation to schedule D, and recapture of investment credit is

---

[28]Edward K. Yasaki, "Computing and Tax Accounting," Datamation, XII, No. 3 (March, 1966), p. 34.

[29]"Fast-Tax," The Journal of Accountancy, CXXV, No. 6 (June, 1968), p. 75.

automatic. The turn-around time is 24 to 48 hours during the peak-load portion of the season, or even less if required.

Eleven state tax returns were processed in the 1969 tax season for the 1968 returns as follows: California, Colorado, Kansas, Louisiana, Minnesota, Missouri, Nebraska, New Mexico, New York, Oklahoma, and Utah. The New York City tax return was included in the 1969 season. Only Fast-Tax has a completely integrated highly versatile cost depletion program for oil and gas properties. Fast-Tax does pro forma all the way on every item which is likely to be used the following year. This includes such items as dividends, interest, depletion, farm operations and schedules B, C, C-3, F-1, G, and others. Depreciation pro forma includes incrementing the depreciation reserve and indicating what the depreciation will be the following year. Retired properties do not show on pro forma.

Fast-Tax is available on a royalty basis; that is the program can be rented. Fast-Tax will also process tax practitioners cards. Or, Fast-Tax will do the entire job itself in 24 hours or less, if required. The Fast-Tax program is available to interested parties wishing to operate their own centers on a royalty basis of 10% of the base price. The computer configuration required is an IBM 1620/40K or IBM 360/32K with 1620 emulator. Computer clock time will average about one minute per return on the IBM

360 model. The number of cards per return will vary from an average of 65 for smaller accounting offices to 100 for large offices. Experienced operators can punch 200 cards per hour.

For the 1968 tax season reporting 1967 income, Fast-Tax charged $3.00 per return for computation, 12 cents per card punched, and fifty cents per page printed. For the 1969 tax season reporting 1968 income, the base charge for Fast-Tax service was $1.00 for Federal Form 1040 or state computation, plus 12 cents per card punched and 66 cents per page printed. Extra sets were priced at fifty cents per page printed. There was no card charge for reruns and the rerun charge did not exceed 45% of the base price. Fast-Tax prints and collates returns from cards punched by others at 50% of the base price. The 1065 (partnership) and the 1120 (corporations) charges were the same as the Federal 1040 for individuals, except for an additional computation charge of $2.00 per return. There is no registration fee for the Fast-Tax service.

Fast-Tax has eleven input forms that were designed by Computer Language Research, Inc., for the individual income tax return 1040 and its related schedules. They are as follows:

Fast-Tax Form	Federal 1040 Form and Related Schedules or Forms
Form 1	Page 1 of 1040 Form and Recapitulation of Return

Form 2 Page 2 of 1040 Form - Part II Income Other Than Wages

Form 3 Page 2 of 1040 Form - Part IV Itemized Deductions

Form 4 Depletion for Schedule B and/or C

Form 5 Schedule B Income and Retirement Income Credit

Form 6 Schedule F Farm Income

Form 7 Schedule C Profit (or Loss) From Business or Profession

Form 8 Page 2 of 1040 Form - Part III Adjustments Including:

- Form 2240 Sick Pay
- Form 3903 Travel Expenses
- Form 2106 Employee Business Expense
- Form 2950SE Payments By Self Employed Persons to Retirement Plans

Form 9 Schedule D Gains and Losses From Sales or Exchanges of Property

Form 10 Schedule G Income Averaging and Credits, including:

- Form 3468 Computation of Investment Credit
- Form 4136 Credit for Federal Tax on Non-highway Gasoline, etc.
- Form 1116 Foreign Tax Credit

Recapture of Investment Credit

Form 11 Form 1040ES Declaration of Estimated Income Tax
Form 2210 Statement Relating to Underpayment of Estimated Income Tax by Individuals
Letter of Transmittal
Footnotes

Fast-Tax is set up, equipped, and programmed to process complex individual income tax returns on the 1040 Forms. It also processes corporate income tax returns on

Form 1120 and partnership information returns on Form 1065. Tax practitioners who elect to use the Fast-Tax service fill out the input forms and forward them to the Fast-Tax headquarters and processing center in Dallas, Texas. The input forms are processed, printed out returns are collated, and neatly printed out returns are mailed back to the practitioner within one or two days.

Datatax

Datatax[30] was one of the major of several fully-computerized tax return preparation services available to tax practitioners during recent tax seasons. It is not offered to the general public. Datatax, a well-known pioneer in the field, began operations in 1964 with a trial run on 2,000 1963 returns in Albuquerque, Nex Mexico. Frank Hubert & Associates of Albuquerque originated and developed Datatax service which was originally offered to practitioners in the Southwest, primarily in the states of New Mexico, Texas, Arizona, Utah, and Colorado.[31] Mr. Frank Hubert, President of Datatax, indicated that the trial run in 1963 fulfilled their expectations. The steps in the operating procedure of the Datatax system were originally listed as follows:

---

[30]Address in McBee Systems, Litton Industries, Incorporated, 80 Greenwich Avenue, Greenwich, Connecticut 06830.

[31]"New Computer-Prepared Tax Service Announced in Five Western States," Management Services, II, No. 5 (September-October, 1965), p. 9.

1. The tax return preparer interviews the client.
2. The preparer sends the information to Datatax.
3. Datatax keypunches and verifies each item, then
4. Calculates and prints the information on the printed forms.[32]

The fee charged for the service was $4 for a Federal tax return that used the standard deduction. An additional charge of $1.50 was made for itemizing deductions, for providing additional schedules, or for income tax averaging. The fee charged for state income tax returns was $1.50 additional. The cycle time for each return was 72 hours. This time included the span between the interview and the receipt of the tax return back in the hands of the preparer.

Monroe Data Processing Division of Litton Industries, Incorporated, acquired Datatax Corporation in December, 1965.[33] After this purchase, Datatax service, originally offered in only five Southwestern states, became available nationwide.

About 6,000 returns[34] were prepared in 1965 by Datatax, when the service was operating in the Southwest

---

[32]"Tax Returns By Computers Is A Growing Business," Journal of Accountancy, CXX, No. 3 (September, 1965), pp. 16-18.

[33]"Computers Play a Growing Role in Helping Accountants Figure Their Clients Annual Tax Returns," Wall Street Journal, December 15, 1965, p. 1, column 5.

[34]"Monroe Will Offer Nationwide Computerized Tax Service," Journal of Accountancy, CXXL, No. 1 (January, 1966), p. 14; See also: "Computer Tax Service," The National Public Accountant, XL, No. 1 (January, 1966), p. 16.

only. At Litton's Monroe Division, Datatax tooled up for 175,000 returns in 1966 but expected to process less[35]--about 100,000[36] personal returns.

At Litton Industries, Datatax was absorbed by McBee Systems, the division which handles all automated office procedures. McBee Systems, with its national distribution organization that had been calling on accountants across the United States for many years, was a perfect outlet for Datatax. Also, Datatax filled out the McBee product line. According to one of their advertisements, Datatax makes the following appeal to tax practitioners:

> Several thousand accounting practitioners came through the tax season this year without strain or overtime work. They used DATATAX, the computerized tax return preparation service offered by McBee Systems.
>
> Datatax solves the 'peak load' clerical problem during the tax season, eliminating the need for temporary help and/or overtime. It provides a uniform cycle time for tax return preparation at a predictably low unit cost. Most important--you gain time--to enable you to accept more tax clients--provide more consulting and other year-round income-producing work. This is in addition to the clerical savings.
>
> Your clients benefit too, because of the speed, and accuracy and impressive appearance of computer-prepared DATATAX returns. And also because you are able to give them the full range of accounting and consulting services on a year-round basis.[37]

---

[35] E. K. Yasaki, "Computing and Tax Accounting," Datamation, XII, No. 3 (March, 1966), p. 34.

[36] "Electronic Ally For The Taxpayer," Business Week, March 26, 1966, p. 168.

[37] "Were You A Relaxed Datatax User This Tax Season?" The Journal of Accountancy, 123, No. 5 (May, 1967), p. 77.

In the 1967 tax season, the basic charge for the Datatax service was $5.00 with additional charges depending on the complexity of the return. Additional schedules and calculations resulted in additional costs.

How the Datatax service worked in the 1967 season was spelled out in a step-by-step procedure as follows:

1. You record data collected in the interview with your client on a simplified DATATAX Answer Sheet. One copy is retained, and the other is sent to your nearest DATATAX Processing Center.

2. Upon receipt of the Answer Sheet, we record the date; assign a processing number; and send it on to Review.

3. Trained reviewers check your Answer Sheet for oversights and, if none are found, forward it to the Data Processing Supervisor. Otherwise, you are contacted.

4. Data contained on the Answer Sheet are converted to machine-language media and verified. It is then fed into an electronic computer, which has been especially programmed to handle virtually any tax computation.

5. The computer accurately makes hundreds of arithmetical computations including

    a. ascertaining whether income averaging applies
    b. computing limitations on medical expenses, contributions, etc.
    c. determining income and self-employment taxes
    d. making all depreciation computations
    e. figuring the amount of capital gains and losses, determining short-term or long-term status, and computing the alternative tax
    f. determining reportable profit on installment sales (both ordinary and capital gain portions)
    g. computing retirement income credit and investment credit
    h. figuring Section 1245 and Section 1250 recap
    i. performing any or all of these steps a second time if a change in a completed return is required.

6. Finally, the return and related schedules are computer-printed on official forms and other forms acceptable to the government.

7. We forward completed returns in triplicate within five working days after they are received. You review, sign, date and deliver to your client.[38]

Datatax suspended operations in the 1968 tax season. Competitors say their troubles concerned old computer equipment that Datatax was using, inadequate input forms, and lack of acceptance by the certified public accountants. Datatax reentered the market and attempted to make a comeback in the 1969 tax season by operating in the Manhattan district of New York only.

Unitax

Unitax[39] is a partially computerized tax return preparation service that was originally developed by the Skousen Tax Service, Montrose, California. It's service is aimed at the smaller taxpayers, the computer run being used only for pages one and two of the Federal 1040 Form, its California income tax equivalent, Form 540, and the Indiana income tax equivalent, Form IT-40.[40] Unitax expected to

---

[38]"McBee Systems, DATATAX, Data Processed Tax Returns," Brochure S-551, McBee Systems, Royal Typewriter Company, Inc., A Division of Litton Industries, Incorporated, Greenwich, Connecticut, 1966; See also: "Don't Tax Yourself This Coming Tax Season," Taxation for Accountants, November-December, 1966, p. 318.

[39]Address is Unitax, Incorporated, 12222 East Philadelphia Street, Whittier, California 90601.

[40]Edward K. Yasaki, "Computing and Tax Accounting," Datamation, Xii, No. 3 (March, 1966), p. 33.

process 120,000 returns in 1966 on an IBM 8K 1401 computer at a service bureau. The average charge to practitioners was $3.20 per return.

The sales promotion effort made by Unitax to tax practitioners in a 1967 advertisement included the following elements:

> Computerized tax returns service is offered for $2. This service gives you beautiful, accurate computer printed pages 1 and 2 of Federal and state returns. 36 hours is the processing time. Additional services are available. If you want all supporting schedules computed, checked, duplicated and assembled, the charge is only slightly more. As one of the Nation's oldest and largest computerized tax services, Unitax guarantees accuracy. Federal returns are processed from practitioners in all states. State returns are processed currently for California and Indiana. Processing centers are located in Los Angeles and Chicago areas.[41]

Most of the computerized tax return preparation services key punch all information of a taxpayer into the computer. The computer makes all calculations. The computer then prints out a completed tax return ready for signature and filing with the Internal Revenue Service. Unitax operates quite differently since it is only partially computerized. It manually performs the necessary calculations from figures and information which the practitioner records on worksheets. Unitax checks all calculations if they have made by the practitioner. An audit of the return is made for completeness. Examples of the other key items

---

[41]"Computerized Tax Returns," Journal of Accountancy, CXXIII, No. 2 (August, 1967), p. 75.

checked would be (1) posting of W-2's, (2) head of household status, (3) F.I.C.A. overpayments, (4) over age 65 medical expenses and deductions, (5) retirement income, (6) investment credits.

Summary figures such as subtotals of income and deductions are injected into the computer. The high speed computer calculates the tax independently, selects the proper method where there is a choice and then prints out page one and page two of the Federal and state returns. Worksheets of the practitioners are reproduced and are attached to Pages 1 and 2 to make up the return package. Unitax supplies its clients with three computer printed forms of the tax return--one original and two carbon copies and a limited pro forma for use in the following year.

Turn-around time has been five days. Deadline for accepting returns is April 13th. Chief advantage of Unitax has been its low cost. Basic charge has been $2.80[42] per return when practitioner does the calculations, $3.80 if Unitax does the calculations. There is an additional charge of twenty-five cents for each worksheet exceeding three. No deposit is required, nor is there a minimum number of returns to be under contract. An average return ran about $4.30, including computations. Complex returns

---

[42]"Computer Tax Return Preparation: How The Several Services Shape Up This Year," Taxation For Accountants, I, No. 6 (January-February, 1967), p. 327.

ran from $6 to $8 each. Reruns were charged at the rate of 50% of the original cost. These costs pertained to 1967 operations.

Unitax has three types of service available for each return and three corresponding price schedules. This arrangement was offered in the 1968 and 1969 tax seasons. The practitioner chooses the service desired for each return with no minimum number required. The three types of service extended to tax practitioners by Unitax include (1) Executive Service ($4.30 and up), (2) Standard Service ($3.10 and up), (3) Budget Service ($2.25 flat). The prices quoted here are the 1969 tax season prices which are much the same as the 1968 prices.

Executive Service No. 1: The assumption made in the executive service is that the practitioner makes no computations except for depreciation, if any. Unitax performs all other computations, performs a complete math check of those computations and the depreciation, performs a tax review, makes photocopies. Computer prints out Pages 1 and 2 of the 1040 and California 540 (or Indiana IT 40), and Schedule G if applicable. Unitax assembles print-outs with supporting schedules. Returns are signature-ready when mailed back to the tax practitioner. The Basic Processing Fee (three input worksheets) is $4.30; additional worksheets have a charge of $.40 each; more than five items on Capital Gains Schedule D cost $.10 per item over five.

Standard Service No. 2: The assumption made in the standard service is that the practitioner lists information and performs all computations on three input worksheets. Unitax performs complete math check, tax review, makes photocopies. Computer prints out Pages 1 and 2 of the 1040 and 540 (or IT-40), and Schedule G if applicable. Unitax assembles print-outs with supporting schedules. Returns are signature-ready when mailed back to practitioners. The Basic Processing Fee (three input worksheets) is $3.10; additional worksheets have a charge of $.30 each; more than five items on Capital Gains Schedule D have an extra fee of $.05 per item. The error fee is $.40 per return.

Additional charges for Services 1 (Executive) and 2 (Standard) are as follows: Schedule G (Income Averaging) has an extra charge, in addition to worksheet charges, of $.50; W-2's over five total cost $.05 each; extra procedure fee (pennies on worksheets, if desired, instead of rounding off to whole dollars) costs $.30; Schedule not submitted thus requiring Unitax to write it up costs a fee of $.75; SDI Refund (California only)--Unitax prepares claim form and furnishes envelope, $.25; extra copies of returns requested at time of processing, $.50.

Budget Service No. 3: The assumption made in the budget service is that the subtotals submitted by tax practitioner are accepted on the worksheets. Unitax verifies totals on worksheets. Computer prints out Pages 1 and 2

of the Federal and state returns and Schedule G; there is no tax review, no photocopies, no collating or assembling. The Basic Processing Fee is $2.25 flat; Schedule G costs $.90, if photocopies of worksheets are desired they cost $.08 each copy; extra procedure fee such as pennies on worksheets instead of rounded dollars, etc., costs $.30; SID Refund (California only)--Unitax prepares claim form and furnishes envelope, $.25.

There is a registration fee which applies to all three types of services of $18.00. This fee includes enough forms for 50 tax returns, the $5.00 Reference Guide, special stamp and other supplies. Reruns are charged at the rate of 60% of original fee if all changes are made by the practitioner; if all changes are not made by practitioner, full fee.

The following steps illustrate how Unitax works:

1. Practitioner interviews client and records all pertinent data in pencil on special time-saving Unitax worksheets which are available at a nominal cost. These forms are so complete and streamlined that many long form tax returns can be handled on a total of only three worksheets.

2. Worksheets are mailed to Unitax in the large envelopes furnished free for practitioner's convenience.

3. At Unitax, skilled tax technicians complete and review worksheets and accompanying schedules for accuracy and completeness according to the service selected.

4. Summary figures are keypunched into our specially programmed electronic computer.

5. The computer automatically tests for allowable limitations on contributions and makes other tests, correcting practitioner's figures if necessary.

6. The computer selects the proper filing method, computes the lowest possible tax and prints out pages one and two of both Federal and state returns, and Schedule G if applicable.

7. Worksheets are reproduced on top quality Xerox equipment to provide supporting schedules (for services 1 and 2 only).

8. All schedules and printouts are collated in proper order, stapled and rushed back to practitioner ready for signature (for services 1 and 2 only).

Systems and Taxes (SAT)

Systems and Taxes[43] was originated by Robert Philipson and Company, a Certified Public Accounting firm in Washington, D. C. It claimed to have been the first to send computer-prepared tax returns to the Internal Revenue

---

[43]Former address was Systems and Taxes, Division of Computers for Industry and Business, 25 West 43rd Street, New York, N. Y. 10036.

Service--these being the 1962 tax returns prepared in 1963.[44] Philipson sold the service in 1966 to Computers for Industry and Business, a New York firm.[45] CIB expected to process 25,000 returns in 1966 and 100,000 in 1967. Computers for Industry and Business failed to make a profit and went bankrupt so that the service is no longer offered.[46]

Computer Tax Service

Computer Tax Service (CTS)[47] was founded in 1965 by an accountant, a computer systems engineer, and a computer programmer. The purpose of this organized venture was to develop a computerized tax return preparation system. The intent was to market the program along with a small in-office computer as a package for professional accountants, tax specialists and lawyers at the price of about $26,500.

This computerized tax return preparation system was thoroughly tested and in operation in the 1965 tax

---

[44]E. K. Yasaki, "Computing and Tax Accounting," Datamation, XII, No. 3 (March, 1966), p. 34.

[45]"Electronic Ally For The Taxpayer," Business Week (March 26, 1966), p. 168.

[46]"Computer Tax-Return Preparation: How The Several Services Shape Up This Year," Taxation for Accountants, I, No. 6 (January-February, 1967), p. 322.

[47]Address is Computer Tax Service, Incorporated, 3535 North Verduga Road, Glendale, California 91208. Mr. A. W. Copland became its first President.

season. It was used by hundreds of professionals in many states during the 1966 tax season. Service became nation-wide in the 1967 tax season and advertisements began to appear in the national professional journals like the Journal of Accountancy.[48] CTS is offered by local tax professionals in local IBM 360 computer centers where the powerful specifically programmed IBM 360 model 30 is used. The computer language used at CTS for the program is the IBM Autocoder.

CTS concentrated on the elimination of the drawbacks of the older, fully computerized tax return preparation services in the development of its system. The three main drawbacks which formerly made computer tax returns services prohibitive were cost, turn-around time, and complicated input forms.[49] CTS charged only $3.00 per client for both 1967 Federal and most state returns. It operates on a two day turn-around which is fast service. A simple three-page income tax questionnaire is used for computer input. Low cost, fast service, and simplicity are the three keynotes emphasized by CTS in marketing their system. Accuracy is, of course, assumed with a computer. CTS goes a step

---

[48]"The Most Revolutionary Tax Return Ever Offered Is Now Available To You," The Journal of Accountancy, CXXIV, No. 3 (September, 1967), p. 11.

[49]"Computer Processed Income Tax Forms," Data System News (February 26, 1968), p. 7.

further by guaranteeing accuracy or they will pay any IRS penalty and interest.

Mr. Abner W. Copeland, President of Computer Tax Services, Inc., spoke at the 1967 Second Annual Conference on Computers and Taxes held in Washington, D. C. In that speech he gave a short history of his firm as follows:

> Computer Tax Service, Inc. was organized in 1965 by a team which encompassed the disciplines of accounting, data processing systems and computer programming. The purpose of the venture was to develop a data processing system to market as a package with a small in-office computer for professional accountants. Successful programs were developed for operation on Control Data LPG-21 computer. Five systems were installed.
>
> One of the programs developed for the LPG-21 was the preparation of Federal and State income tax returns. The success of this program stimulated a survey of tax practitioners. The survey revealed basic requirements that could be realized only on a larger system. After two years of effort, the system was successfully developed on an IBM 360 computer. The breakthrough that was accomplished has had extremely enthusiastic response. CTS has introduced a new phase to computer-prepared tax returns--SIMPLICITY.[50]

Points stressed by Mr. Copeland about the CTS concerned simple input, easy adaptation to practitioners' existing procedures, rapid processing turn-around, flexibility, and economical cost with a simple structure. All tax returns are prepared at CTS with a maximum of only

---

[50]Abner W. Copeland, "Remarks on Computerized Tax Returns," 1967 Second Annual Conference on Computers and Taxes Proceedings, Sponsored by Computers-In-Law Institute of the George Washington University in cooperation with The American Bar Association and The Federal Bar Association, Held at Statler-Hilton Hotel, Washington, D. C., June 6-7, 1967, p. 34.

three 8-1/2 x 11 input sheets which are completed at the time of the client interview. The first sheet shows data on earned income. The second sheet gives data on deductions. The third sheet gives supplemental data on additional income from Schedules B, C, D, F, partnerships, estate; final schedule totals for adjustments to income from moving or travel expense, sick pay and retirement plan; final totals for adjustments to tax form, investment credit, etc.

In 1967's tax season during which 1966 returns were processed, CTS handled Federal returns from every state in the Union and also state income tax returns in eight states as follows: California, Georgia, Indiana, Louisiana, Massachusetts, New York, North Carolina, and South Carolina. The processing of ten more state income tax returns was added to the service in 1968 as follows: District of Columbia, Hawaii, Iowa, Kansas, Maryland, Michigan, Minnesota, Missouri, Virginia, and Wisconsin. A total of 31 states were included in the 1969 season.[51] City returns of New York and Detroit were added to the package of service at CTS. The price structure was changed and expanded. The $4.00 basic charge for CTS includes Federal and state returns, applicable city returns (New York or Detroit),

---

[51]"CTS Puts The States Together!" The National Public Accountant, XIII, No. 10 (October, 1968), p. 11.

Income Averaging Schedule, Retirement Income Credit Schedule, Declarations of Estimated Tax for Federal, state and city levels. There is a $20 office registration fee. The charge is $3.50 for Federal return only.

CTS has listed the following seventeen local computer centers for processing returns during the 1969 tax season.

Atlanta, Georgia	Minneapolis, Minnesota
Boston, Massachusetts	Munster, Indiana
Detroit, Michigan	New Orleans, Louisiana
District of Columbia	New York, N. Y.
Glendale, California	Philadelphia, Pennsylvania
Honolulu, Hawaii	San Francisco, California
Houston, Texas	Seattle, Washington
Kansas City, Missouri	St. Louis, Missouri
Miami, Florida	

Returns prepared by CTS are only partially prepared by computers; the accountant or practitioner makes the necessary calculations for the supporting schedules but CTS makes the computation of tax liability.[52] In the CTS system supporting schedules to the 1040 Form are obtained from nearly IRS offices and the calculations on them are made by the accountant or tax practitioner and then entered as summary figures on the CTS input forms.

In 1967 CTS ran an advertisement in the Los Angeles Times offering its service directly to the public at prices

---

[52]Dominic A. Tarantino, "Computerized Tax Returns Still Have Growing Pains But Continue To Improve," Taxation for Accountants, II, No. 5 (November-December, 1967), p. 273.

slightly higher than those charged practitioners.[53] This test of the public market was found to be unsatisfactory.[54] CTS, like all the other firms in the industry, now limits its services to the tax practitioners.

A successful program was developed for operation on the Control Data LGP-21 computer. One thousand tax returns were prepared during the 1965 tax season; about 5,000 returns were prepared in the 1966 tax season. Five CTS systems are now installed and operating in accounting offices in Southern California. A large computer program was developed in 1966 in order to supply the major share of the market with a service system. The objectives projected for this undertaking were to establish the base for a national service operation which would cover the largest share of the professional market not available to competitors who offered the fully computerized service with their long and detailed multiplicity of input forms, high cost, and long turn-around times. A detailed one year study of the competitive systems in the industry revealed the following important data: (1) costs averaged $20 per tax client, (2) the fully-computerized systems were too complex for the average tax man to use without extensive training

---

[53] Ibid., p. 272.

[54] "Erratum," Taxation for Accountants, II, No. 6 (January-February, 1968), p. 339.

on unfamiliar forms, (3) in-office costs for preparation of input data to the computer and terminal checkout of the computer printout averaged $5 per client, (4) computer processing required five to seven days due to extensive keypunching and clerical collating. A simultaneous study of the professional market by CTS indicated the following points: (1) professional reluctance to incur the cost and time loss in learning a new system was in evidence, (2) little savings of professional time was experienced in not doing the simple arithmetic associated with most schedules, (3) a need existed to minimize professional time in computation of schedules which were complicated, such as Income Averaging and Retirement Income Credit, (4) outside services must not require increased in-office costs and original interview work sheets should be input to computer systems, (5) computer processing time (turn-around) had to be less than two days, (6) total cost of outside service and in-office cost should be about $5.00, and (7) the real need was evident for a simple system to prepare pages one and two of the Federal 1040 Form, and any state or city form, and a simple method of inputing schedule data without the expense of computer-preparation of schedules. As a result of researching, developing, testing and establishing a unique technical achievement to meet the above requirements, Computer Tax Service, Incorporated was incorporated in 1966.

CTS is privately owned and operated by the original members of the venture.

Objectives were then established for the CTS system for the 1966 tax season as follows: (1) improve the capacity of programs and provide for operation on both IBM 1401 and 360 computers, (2) add an exclusive feature ("Comparo") which would compare deduction items on a return to national Internal Revenue Service statistical averages, (3) secure IRS approval of the improved system, (4) market the system to professionals in California via direct mail, (5) establish remote computer service centers and develop specific processing methods for use under national franchising, (6) establish simplified, controlled handling methods for use under national franchising. All of these 1966 objectives were achieved by CTS and the feasibility for marketing nationally in 1967 was justified. All other competitive services experienced large financial losses in 1966. Computer Tax Service broke even financially.

In 1967 eight franchises were established by CTS as follows: California, Florida (including Georgia), Indiana, Louisiana, New Jersey, Massachusetts (including Connecticut and Rhode Island), New York, and South Carolina (including North Carolina). These franchises covered twenty-eight million taxpayers. Direct marketing by CTS was established in the states of Illinois, Ohio, Pennsylvania, Texas and Washington. This direct marketing covered

sixteen and one-half million taxpayers. All franchises except for New York were established under contract in force for a number of years. New York State was established as a one year franchise at the request of the franchisee.

Computer Tax Service undertook an unprecedented approach and received excellent cooperation from the eight state tax authorities for which it provided the state income tax return in the 1967 tax season. CTS proposed a complete revision of the complicated Massachusetts state tax return. This proposal was accepted by the state authorities and became the official 1967 tax form. In cooperation with the New York State tax authorities, CTS established a new standard for computerized tax returns which consolidated four two-page returns into one single computer page.

Marketing in all areas started in October, 1967. Free test cases were offered prior to the tax season. Only a California state return was provided as typical of other state returns. National advertising consisted of full page two-color ads in the Journal of Accountancy, National Public Accountant, Practical Accountant, Taxation for Accountants, and Journal of Taxation. The response from national and local advertising was very gratifying. Pilot demonstration sessions for tax practitioners were tried in California late in the year. The favorable reaction proved that this would be a very beneficial technique to use in subsequent years.

The CTS system was built on the basic concept of simplicity. The short tax interview sheet reflects this concept. The fact sheet first developed in 1965 proved to be a useful source to record data at the time of interview with the client. In 1966 this form was refined and developed as a document for direct input to the computer service. A simple sheet was developed for submitting supplementary schedule totals for adjustments to income and to tax. The simplicity of the CTS Interview Sheets (customized to meet each state's requirements) has been received with enthusiasm by tax practitioners. The use of these forms as attached schedules for income and deductions has been given approval by Internal Revenue Service and state taxation authorities.

Schedule G for income averaging is included in the CTS package of service. A survey of tax specialists showed that the complex calculation of Schedule G deterred many practitioners from testing the advantage of income averaging except in the obvious cases. In order to bring the advantages of tax savings to all, a computer method was devised that required submitting only the taxable income and long-term gains data from the four previous years. With this data and other current year data already provided, the computation of income averaging is made automatically. If averaging is advantageous, it is applied in the determination of the tax liability. In 1967, Internal Revenue Service approved submitting Schedule G with only entry of the

calculations provided to the practitioners by CTS. In 1968, CTS expanded on its system and now provides a complete computer-printed Schedule G--officially approved by IRS.

Schedule B Retirement Income Credit is included in the CTS package. A survey showed that a large proportion of the retired population used the services of practitioners. In order to aid the practitioners, CTS included the calculation of Retirement Income Credit in 1967. In 1968, CTS expanded on its system and now provides a complete computer-printed Schedule B, Part 5--officially approved by IRS.

In 1968, CTS expanded on its system and now provides a computer-printed Federal 1040 ES (Declaration of Estimated Taxes) and, where applicable a state declaration. The accountant has complete flexibility to have the declaration prepared based on (1) current year's return data, (2) a specific precalculated amount, or, he may elect to have CTS fill in name and address of the taxpayer only, so the amount of estimate may be determined after he reviews the return.

Deductions receive careful scrutiny in the CTS system. A feature which is exclusive to CTS was added in 1966 to aid taxpayers in determining whether items of deduction were abnormal and thus subjecting the return to possible audit. This feature is a CTS copyrighted Trade Mark name called "Comparo." It is included as part of the

"diagnostic report," sometimes called the "audit report." Other competitive services have audit or diagnostic reports but nothing like "Comparo." Each return processed by CTS is compared on the basis of income and marital status to the IRS statistical average of thirteen deduction categories. The taxpayer is notified whether these deductions are less than 20% of average, 20-49% above, 50-74% above, or 75% or more above the average. This comparison is similar to that made by IRS in their computer system audit check of all returns. Instead of a narrative "audit report," which competitors use, CTS features the use of codes. On the bottom margin of every tax return processed by Computer Tax Service, one or more of the "Comparo" codes may appear. By use of these codes, CTS directs attention to items which may require review before filing the tax return with the IRS. These "red flags" are very beneficial, as IRS audit criteria are based on abnormalities or excesses above certain research-determined averages for a particular item in its class, group or industry. "Potential IRS audit" is what these "red flags" of the Comparo codes of the CTS are warning when they appear on the bottom of a tax return. It is an ingenious service provided exclusively by CTS. Proper substantiation of any such items identified by these codes should be instigated so that evidence is available if needed. Some examples of these "Comparo" codes are:

C O M P A R O	20% Below Average	20%-49% Above Average	50%-74% Above Average	75%-or More Above Average
Adjustments (Moving, Travel, Sick Pay) . . .	A-1	A-2	A-3	A-4
Business or Professional Loss	B-1	B-2	B-3	B-4
Contributions	C-1	C-2	C-3	C-4
Total Deductions	D-1	D-2	D-3	D-4
Farm Loss	F-1	F-2	F-3	F-4
Medical Expenses	M-1	M-2	M-3	M-4
Interest Paid	N-1	N-2	N-3	N-4
Other Deductions	O-1	O-2	O-3	O-4
Partnership Loss	P-1	P-2	P-3	P-4
Rent Loss	R-1	R-2	R-3	R-4
Sales of Assets Loss . .	S-1	S-2	S-3	S-4
Taxes Paid	T-1	T-2	T-3	T-4

Other numerical reference codes found on the returns as part of the "diagnostic report" indicate that certain inconsistencies have been detected in the data submitted and that action has been taken to prepare the return on the basis of an assumption. These reference codes must be reviewed by the practitioner before the return is given to the taxpayer for filing. If the action taken by CTS is correct, the practitioner changes the data sheet to agree with the assumption before assembling the return for filing. If the action taken by CTS is not correct, the practitioner changes the data as required and resubmits the entire set of data sheets for the return with $3.00 for reprocessing. Some examples of these reference codes with conditions found and the action taken are as follows:

Code	Condition	Action
2	Filing status is given as SINGLE, HEAD OF HOUSEHOLD or WIDOW (ER). Both self and spouse's names are given.	Return prepared with filing status as given. First name is assumed to be taxpayer. Spouse's name is ignored.
3	Filing status given is not MARRIED, FILING JOINTLY. Extra exemptions are given for spouse.	Return prepared with filing status as given. Extra exemptions for spouse are ignored.
4	Filing status given is not MARRIED, FILING JOINTLY. Retirement income is given for spouse.	Return prepared with filing status as given. Retirement income for spouse is ignored.
5	Filing status given is not MARRIED, FILING JOINTLY. Dividend income is given for spouse.	Return prepared with filing status as given. Dividend income for spouse is ignored.
6	Filing status is not given. Spouse's name is given.	Return prepared as MARRIED, FILING JOINTLY.
7	Filing status is not given. Spouse's name is not given.	Return prepared as SINGLE filing status.
8	Filing status given is WIDOW(ER) WITH DEPENDENT CHILD. Dependent children are not given.	Return prepared as HEAD OF HOUSEHOLD filing status. No dependent exemption is taken.
9	Filing status given is MARRIED, FILING SPLIT RETURNS. Income averaging data is given.	Return prepared with filing status as given. Income averaging cannot be used.

Code letters are used for special notations. A feature, exclusive with CTS, directs taxpayer attention by letter code to any of twenty-four items which may require review before filing the return. Examples of these items would be (1) data omitted, (2) limits exceeded and carry-overs, (3) possible credits not taken, (4) aids in preparing

next year's return. Some specific citations of these code letters and what they mean are as follows:

Code	Notes
A	A refund of overpaid Federal tax is due to you. Do not submit any payment when you file this return. Enter on Federal form 1040, page 1, lines 24 or 25 how you wish this refund applied.
B	Your withholding plus your estimated tax is less than 70% of the total tax calculated. You may be subject to a penalty this year.
C	Federal medical expenses were greater than allowable limit. Limit was used.
D	Federal contributions were greater than allowable limit. Limit was used. You may apply excess contributions to future year's returns.
E	Federal Standard Deductions were used to obtain minimum tax.
F	Federal Income Averaging was used to obtain minimum tax.
G	Federal Income Averaging was tried but was not beneficial.
H	Federal Alternative Capital Gains tax was used to obtain minimum tax.
I	Total Federal tax credits were greater than total tax. Tax credits equal to total tax were used.
J	State contributions were greater than allowable limit. Limit was used.
K	State medical expenses were greater than allowable limit. Limit was used.
L	State Standard Deductions were used to obtain minimum tax.
N	State income averaging was used to obtain minimum tax.
O	State income averaging was tried but was not beneficial.
P	Tax table used on Federal return.

Code	Notes
Q	Business or professional loss exceeded your income. This excess may be carried over to prior or future year's returns.
T	Wages were given. No withholding was given. Is this correct? If not, correct withholding information on data sheet. Mail corrected data sheets with $3.00 to COMPUTER TAX SERVICE, INC. and we will prepare a new return.
U	You may be subject to a possible retirement tax credit.
V	You filed as Head of Household. Please complete the qualifying information if required on your State form.
W	Your Social Security number was omitted. Please refer to your Social Security card for the correct number. Write in your number before you file this return.
X	You file as "Married, Filing Jointly," but do not give your wife's name or Social Security number. If the filing status is correct, write in spouse's name and Social Security number before filing this return.

CTS guarantees computer-perfect returns. Accurate tax computation based on data submitted is assured by the strict controls which are maintained in the system. Clerical checks are confirmed by computer processing. Keypunching is fully verified. Computer programs are thoroughly proven. Mathematical accuracy is guaranteed by CTS. Should IRS penalty or interest be assessed due to mathematical error, CTS will pay them.

The following steps are taken by CTS in preparing returns for the professional tax practitioner:

1. Professional tax practitioners are provided input data sheets as masters for reproduction on Xerox, Thermofax or Brunning equipment or equivalent.

2. Data sheets are submitted to the local processing center in batches with transmittal sheet and payment.

3. Clerical control verifies submittal, deposits payment and identifies each submittal with control number.

4. Data sheet totals are verified.

5. The processing center (Franchisee) submits the day's batch of data sheets, under control, to the local CTS Computer Center with payment.

6. Data sheets are keypunched and key-verified.

7. Computer audits all input for completeness and accuracy of totals. An audit report is prepared which provides notations of input inaccuracies or incompleteness and full accounting for the batch.

8. Computer prepares pages 1 and 2 of Federal return and, where required, prepares state return. Also, where applicable, the computer prepares income averaging schedule, retirement income credit schedule, Federal and State Declarations of Estimated Tax.

9. All computer output is delivered to the processing center.

10. Returns are collated with the data sheets submitted.

11. Returns, in triplicate, original data sheets, and transmittal sheet are sent to client within twelve to twenty-four hours after receipt.

12. Client reproduces the data sheets, attaches his supplemental schedules and assembles the return package for the taxpayer.

CTS made careful plans in regard to obtaining its share of the market of computer-prepared tax returns. In 1966, four thousand certified public accounting and public accounting firms in California were contacted by direct mail. Without any additional sales effort, some two hundred tax practitioners used the service. The quantity of returns varied from a minimum of six returns to a maximum of four hundred returns per registrant. Numerous unsolicited inquiries from outside California were encouraging. In 1967, some 40,000 brochures were distributed to tax practitioners in eighteen states by direct mail. In response to CTS national advertising, requests for information were received from tax practitioners in forty-eight states and five foreign countries. Over a thousand practitioners in thirty-eight states registered for the CTS service. California registrants increased 111%. National registrants increased 592%. California returns processed increased 389%. National returns processed increased 985%. Practitioners were offered processing of test cases prior to the tax season without charge. Thirty per cent of those submitting test cases registered for the service. The registrants who were second-year users or had submitted test cases processed 51% more returns than the first-time users who did not submit test cases. The quantity of registrants in the eight states most actively marketed constituted from 5% to 7% of all licenses tax professionals.

As part of their sales promotion, CTS made available to practitioners who registered for their service a free subscription to Computers and Taxes.[55]

CTS is optimistic about the future. The quantity of returns submitted to IRS and state tax authorities increases each year. The quantity of taxpayers using the services of tax practitioners increases at even a more rapid rate. In 1967, fifty-two million long forms (1040) were submitted to IRS; in 1968, fifty-four million. About one third (18,000,000) were prepared by tax practitioners. Within about eight years, it is estimated that practitioners will prepare thirty-two to thirty-five million returns. It is CTS's objective to process 20% of this market, or 7,000,000 returns.

CTS has a national franchising plan. Final evaluation of the marketing and processing indicated that a local area management is absolutely required to service the professional tax practitioners. One office could adequately handle an area of approximately two to three million taxpayers. The franchised areas are growing in number. CTS established eight area franchises in 1967 and contracted with eleven data processing centers to support the franchises. Additional data processing centers were added in

---

[55]See New York Certified Public Accountant, XXXVIII, No. 1 (January, 1968), pp. 4-5. Computers and Taxes is a newsletter.

1968 and 1969 to support the additional franchises that were established. The franchise areas are defined by state boundaries and are based on groupings to service major portions of taxpayers. Data processing center locations are selected for best logistics in each area. In several areas a license agreement may be made between the Franchisee and other parties within guidelines established by CTS. All license plans must be approved by CTS. In general, the Franchisee will service an area of one or two million taxpayers. Licensees will be established for smaller areas normally with county or city boundaries. Complete national coverage is planned for 1969.

The franchise marketing program is required to be followed by each franchisee. This simple marketing program, effective in 1968, takes the following steps:

1. Employ a full-time salesman or equivalent, with tax background from September through February.

2. Advertise in state and area professional journals.

3. Distribute on a scheduled basis the direct-mail package to all C.P.A.'s, P.A.'s and Tax Specialists in the area.

4. Conduct scheduled local demonstrations of the CTS system based on marketing plan provided by CTS. Where computer facilities are available locally, the test cases prepared by the attendees at the demonstration will be viewed as they are prepared by the computer. Otherwise,

test cases will be run weekly and mailed to attendees. Actual experience shows that 30 to 50% of those submitting test cases register. Registrants who have submitted test cases submit twice as many returns during the season as those registrants who did not have a test case.

5. Provide free test of any prior return for each respondent of advertising.

The objective of CTS's professional marketing program per two-million taxpayer franchise area is 20% of the available market. This objective means (1) the registration of a minimum of 500 professionals at a fee of $20 each, (2) preparation of 100,000 tax returns, (3) gross sales of $400,000, and (4) net profit of from $80,000 to $100,000.

Programmed Tax Systems, Incorporated (PTS)

Programmed Tax Systems (PTS)[56] is a computerized tax return preparation service organized by Edward C. Horowitz, C.P.A., in 1968. It is independently owned. PTS is in the business of computer-processing tax returns on the IBM 360-30 for professionals only. It is staffed by accountants for accountants. This newly formed service caters to accountants with clients in the $20,000 to $30,000 income bracket.[57]

---

[56]Address is 150-09 Hillside Avenue, Jamaica, N. Y. 11432.

[57]Leroy Pope, "Computers Take Over Tax Chore," The State Journal (Lansing, Michigan), Wednesday, July 24, 1968, p. F-8, Column 6.

Horowitz franchises his computerized tax service to practitioners who are accustomed to getting $25 to $50 for hand-preparing each return. These practitioners fill out forms and Horowitz charges them a flat $5 each to run them through the computer. Franchises available have an investment requirement of $2,000 to $3,500. The services received for the $5 fee includes a Federal, a state, and a city tax return.[58] Prices actually range between $3.50 and $5.00 per client, depending upon the total number of returns processed through PTS during the tax season. The price is total; that is, it is a package price which includes the tax returns at all three levels--Federal, state, and city--for a particular client. If a practitioner submits less than 100 returns, the charge amounts to $5.00 per return. When returns submitted range between 100 and 300, the price is reduced to $4.50 each; from 301 to 500, the price is reduced to $4.00. Practitioners who submit over 500 returns get the bottom price of $3.50. These base charges include pages one and two of the Federal Form 1040 and the state and city returns. Additional charges include $.50 for preparation of the retirement income schedule, $.50 for estimated returns, a $.25 charge for making the income average computations, and $.50 for preparing Schedule G.[59]

---

[58] Journal of Accountancy, CXXVI, No. 2 (August, 1968), p. 96.

[59] "Should You Use a Computer Service to Prepare Tax Returns? If So, What Kind?", Taxation for Accountants, III, No. 5 (November-December, 1968), pp. 275-76.

The minimum number of returns required in order to obtain a contract with PTS is 30 returns.

The PTS is a completely tested tax program that works according to the following steps:

1. PTS provides subscribing accountants with a special two-page sheet on which to record the client's tax information.
2. While interviewing his client, the professional accountant fills in the pertinent information on the data sheet. This form is so complete and streamlined that most tax returns can be completed in fifteen to twenty minutes. The data sheet is then mailed to PTS in a pre-addressed envelope furnished at no additional cost.
3. At PTS the skilled tax specialists audit and review the data sheet for accuracy and completeness. The audited figures are keypunched, verified, and fed into the specially programmed IBM 360 computer.
4. The computer automatically selects the proper filing method, computes the lowest possible tax, and prints out three copies of each client's Federal, state, and city returns.
5. The completed returns are rushed back to the subscribing accountant, ready for the signature of his client and filing, within 48 hours of receipt of the data sheets at PTS.

Taxes are calculated at PTS by every allowable computation (alternative capital gains tax, income averaging, returement income credit, etc.), and the lowest possible Federal, state, and city filing methods are selected. The computer automatically tests for allowable limitations on contributions and medical expenses and corrects any figures given if they are over the limitations.

PTS guarantees accuracy or it will pay the penalty and interest. Strict confidential processing of all information is assured. PTS operates on a 48 hour turn-around, regardless of price. Within two days, PTS will process and return three copies of each client's tax returns, computer-perfect and ready for signature and filing. So, when the client leaves the office of the professional accountant after providing information for the data sheets, the accountant's work is done.

The 1969 tax season was PTS's first large scale effort at providing computerized tax return preparation service. Coverage of the service, therefore, was limited to New York and the neighboring states of Connecticut, New Jersey, and Pennsylvania. PTS expects to expand across the nation for the 1970 tax season after it has arranged public financing for franchises.

Digitax

Digitax, Division of COAP Systems, Incorporated, 14 Plaza Road, Greenvale, L. I., N. Y. 11548, is the

newest firm to appear for business in the computer-prepared income tax return industry which is relatively young and has less than a dozen concerns in the field. It has been advertising its service during the 1968 and 1969 tax seasons in the New York Times, The New York Certified Public Accountant, CPA, and Journal of Accountancy, inviting tax practitioners to send for additional information, input forms, and a free test of any 1967 tax return.

Digitax's operation classifies it as a partially computerized firm in the industry, like Unitax, CTS, and PTS. Digitax was designed to offer the tax practitioner significant advantages over the more expensive fully-computerized tax services like Computax, Autotax, and Fast-Tax. Digitax charges the low, single price of $7.50 per client which includes computer printed schedules and free pro formas. From a set of only four simple input forms, Digitax prints and collates three copies of the Federal, New York State, and New York City official income tax forms together with schedules of dependency exemption, wages, dividends, interest, miscellaneous income, medical expenses, contributions, interest expense, miscellaneous deductions, and income averaging. A unique feature of Digitax is the use of only four single input sheets, all of which have the identical format of four working columns. These four input sheets can serve as original work papers. They are also expandable; that is, should there be insufficient space on

any designed sheet, such overflow data can be entered on a similarly designed blank sheet. Digitax guarantees a maximum of 48 hours in-house processing time during the tax season.

Digitax required users to sign a service agreement for the processing of 1968 income tax returns from January 1, 1969 through May 15, 1969. An estimate of the number of tax returns was required at billing price of $7.50 for each return processed which included the package of Federal, state, and local New York City levels. Digitax charged a minimum fee of $150 which covered the processing of the first 20 tax returns. Supplies were issued at no additional cost. Regarding liability, the Digitax contract states the following:

> Digitax shall incur no liability to client, or to any person, firm, or corporation for whom or which client may be acting, for any error or for any performance failure of any kind; however, Digitax will process any return containing an error due to Digitax processing without charge to client, and Digitax in its sole discretion may reimburse client for his losses, to a maximum of $100.

Digitax is headed by Gary D. Ritter, its developer and director. Ritter is a young man, just past thirty years of age, who began as a tax accountant after earning his Bachelor of Science degree in accountancy at Queens College. Ritter worked at several accounting firms where he labored through mountains of paperwork during each tax season. His mind was quickly challenged by the excessive

input forms and seven to nine processings that were required by the completely computerized firms. The big challenge to him was to design a new system, a simpler one. He experimented, reworked and refined his experiments until the present Datatax system emerged, requiring only four input sheets and 48 hours for processing. Ritter took his system to Carl Paffendorf, president of COAP Systems, a publicly-held organization of business systems. Digitax became a Division of COAP Systems, Incorporated.

APPENDIX B

GLOSSARY

ASSEMBLER LANGUAGE: Refers to assembler or assembly program or assembly routine. A computer program which translates computer instructions written in symbolic coding into machine language instructions. The assembler translates symbolic operation codes into absolute codes and assigns absolute addresses to the symbolic addresses. One symbolic instruction usually results in one absolute instruction.

BATCH PROCESSING: A systems approach to processing where a number of similar input items are grouped for processing during the same machine run. Sometimes called sequential processing.

BMF: Business Master File at the National Computer Center.

BUG: Any mechanical electrical, or electronic defect that interferes with computer operation including a defect in programming. Correcting this defect is usually called debugging.

CENTIPHONE: Telephone tax assistance from IRS central points in large cities.

CHAMBLEE: A suburb of Atlanta, Georgia which became the original processing center of the IRS's new computer system. Commonly known as the pilot center.

CLIC: Counsel Legal Information Centers.

COBOL: An acronym for COmmon Business Oriented Language--instruction language oriented toward commercial data-processing problems.

COLLATE: To take two or more sets of related information already in the same sequence and merge them in sequence into a single group.

COMPARO: Trade Mark name for part of diagnostic report codes which indicate percentages above and below normal averages for certain tax deductions. Used by Computer Tax Service.

COMMON LANGUAGE: A language in machine-sensible form which is common to a group of computers and associated equipment.

COMPILER: A computer program to compile a source language into an object language. The compiler translates the source statements, provides linkage to subroutines, selects the required subroutines from a library of routines, and assembles these parts into an object program.

CSC: Computer Science Corporation.

CTS: Computer Tax Service.

DIF: Discriminant function method of selecting returns by computer for audit.

DIRECT ACCESS: (see random access)

DISK STORAGE DRIVE: Refers to disk storage which is a storage device that uses magnetic recording on flat rotating disks.

DOSSIER: Bundle of papers containing a detailed report or detailed information.

FORTRAN: An acronym for FORmula TRANslation, a programming language designed for writing programs to solve problems which can be stated in terms of arithmetic procedures. This is the most popular of the algebraic procedure-oriented languages. There are several versions of FORTRAN.

GIGO: Garbage in, garbage out.

HYPERTAPE: Magnetic tape that is wider than the regular kind. Widest possible kind and yet go through the computer is called Super-hypertape.

INFORMATION UTILITIES: Companies that provide public with computerized information much in the same fashion as a power utility supplies electrical power to consumers.

IMF: Individual Master File at the National Computer Center.

INTERPRETERS: Refers to interpretive routine which is a routine that decodes instructions written as pseudocodes and immediately executes those instructions, as contrasted with a compiler which decodes the pseudocodes and produces a machine-language routine to be executed at a later time.

JULIAN DATE OF THE YEAR: Julian Calendar: calendar introduced in Rome in 46 B.C. establishing the 12-month year of 365 days with each fourth year having 366 days and the months each having 31 or 30 days except for February which has 28 or in leap year 29 days--Compare Gregorian Calendar.

MACHINE LANGUAGE: The set of symbols, characters, or signs, and the rules for combining them, which conveys to the computer instructions or information to be processed.

MEMORY: Any device into which units of information can be copied, which holds this information and from which it can be obtained at a later time (interchangeable with storage).

MILLISECOND: One thousandth of a second.

NCC: National Computer Center at Martinsburg, West Virginia.

OFF-LINE: Not connected with the main processor of the central computer. Detroit Data Center is known as an off-line center; it is not connected with the main processor at the NCC.

ON-LINE: Pertains to operating devices under the direct control of the central processing unit.

PERIPHERAL EQUIPMENT: Units or devices that are part of an entire data processing system, but not actually part of a computer; i.e., a Flexowriter functioning off-line, card sorter, reproducer, a forms burster, forms encoder, etc.

PPBS: Planning-Programming-Budgeting System of the Federal government.

PRINTER: An output device for printing out computer results as numbers, words, or symbols. They can be anything from electric typewriters to high speed printers operating at thousands of lines a minute.

PRO FORMAS: Input forms of computer-prepared tax returns firms on which the information from last year's season is printed, ready for next year as the information is repetitive.

PL 1: Programming Language 1.

PSEUDO-CODE; An arbitrary code, which must be translated into computer code.

PTS: Programmed Tax System.

RANDOM ACCESS STORAGE: A storage device wherein access to the next position from which information is to be obtained is in no way dependent on the position from which information was previously secured. Also called Direct Access Storage.

REAL-TIME: A method of processing data so fast that there is virtually no passage of time between inquiry and result.

RIRA: Reports and Information Retrieval Activity.

SAT: Systems and Taxes, Inc.

TCMP: Taxpayer Compliance Measurement Program of the IRS.

TIME SHARING: The use of a device for two or more purposes during the same overall time interval.

TIR: Treasury Information Release.

TRANSCRIPTION: Keypunching data from paper into cards.

UIL: Uniform Issue List which is part of the Reports and Information Retrieval Activity of the Chief Counsel's Office of the IRS.

BIBLIOGRAPHY OF LITERATURE CONSULTED

BIBLIOGRAPHY OF LITERATURE CONSULTED

Books, Monographs, and Proceedings

Armstrong, Lancelot W. "The Development and Operation of the Internal Revenue Service Network," The Computer: Tool For Management. Elmhurst, Illinois: The Business Press, 1968.

Awad, Elias M. Business Data Processing. 2nd ed. Prentice-Hall, Inc., 1968.

Berkeley, Edmund C. The Computer Revolution. Garden City, New York: Doubleday & Co., 1962.

Bigelow, Robert P. "Remarks on Computer Assisted Tax Return Preparation," 1967 Proceedings of the Second Annual Conference on Computers and Taxes. Computer-In-Law Institute, The George Washington University, 1967.

Burck, Gilbert and Editors of Fortune. The Computer Age. New York: Harper and Row, Publishers, 1965.

Cohen, Sheldon S. "Current Developments in ADP and Tax Administration," 1967 Proceedings of the Second Annual Conference on Computers and Taxes. Computers-In-Law Institute, The George Washington University, 1967.

The National Law Center of The George Washington University and the American and Federal Bar Associations. Outline of the 1966 Proceedings of the First Annual Conference on the Impact of Computers on the Tax Practice. Washington, D. C., 1966.

Internal Revenue Service, Department of the U. S. Treasury. Proceedings of Conference on Automatic Data Processing and Its Use By IRS published in The Tax Executive, XIV, No. 2 (January, 1962), pp. 115-73.

Copeland, Abner W. "Remarks on Computerized Tax Returns," 1967 Proceedings of the Second Annual Conference on Computers and Taxes. Computers-In-Law Institute, The George Washington University, 1967.

Crawford, F. Robert. Introduction to Data Processing. Englewood Cliffs: Prentice-Hall, Inc., 1968.

Cross, Hershner. "A General Management View of Computers," Computers and Management: The 1967 Leatherbee Lectures. Boston: Graduate School of Business Administration, Harvard University, 1967.

Currie, James S. "Effect of Federal ADP on Federal-State Coordination Programs," 1963 Proceedings of Fifty-Sixth Annual Conference, National Tax Association, 1963.

Doris, Lillian, ed. "Greatest Change in a Century of Tax Collection--Automatic Data Processing (ADP)," in her American Way in Taxation: Internal Revenue, 1962-1963. Englewood Cliffs: Prentice-Hall, Inc., 1963.

Ginstling, Norman J. "Permissable Activities of Exempt Organizations (Other Than Foundations)," 1965 Proceedings of the New York University Twenty-Fourth Annual Institute on Federal Taxation, 1965.

Hubert, Frank. "Remarks on Computerized Tax Returns," 1967 Proceedings of the Second Annual Conference on Computers and Taxes. Computers-In-Law Institute, The George Washington University, Washington, D. C., 1967.

Jack, Robert L. "ADP--An Analysis of Its Operation and Results," 1966 Proceedings of New York University Twenty-Fourth Annual Institute on Federal Taxation, 1966.

_____. "The IRS Automatic Data Processing System," Remarks delivered at First Annual Conference on the Impact of Computers on the Tax Practice held by The National Law Center of the George Washington University and the American and Federal Bar Associations, Washington, D. C., 1966.

Kinnard, George. "Computerized Tax Returns," 1967 Proceedings of the Second Annual Conference on Computers and Taxes. Computers-In-Law Institute, The George Washington University, Washington, D. C., 1967.

Li, David H. Accounting, Computers, Management Information Systems. New York: McGraw-Hill Book Company, 1968.

Mason, Daniel R. "Remarks on Computerized Tax Returns," 1967 Proceedings of the Second Annual Conference on Computers and Taxes. Computers-In-Law Institute, The George Washington University, Washington, D. C., 1967.

Sanders, Donald H. Computers in Business. New York: McGraw-Hill Book Company, 1968.

Smith, William H. "Computers and The Taxpayer," Tulane University Tax Institute Proceedings, 1966.

_____. "Enlarged Use of Automation in Tax Administration," 1963 Proceedings of Fifty-Sixth Annual Conference, National Tax Association, 1963.

_____. "Impact of Automation Upon Enforcement of The Federal Tax Laws," 1965 Proceedings of the Seventeenth Tax Institute of University of Southern California School of Law, 1965.

_____. "IRS Processing of Tax Returns in the Pre-Audit Stage," New York University Proceedings of the Twenty-Fifth Annual Institute on Federal Taxation, 1966.

Stein, Marvin L. and Murno, William D. Computer Programming. New York: Academic Press, 1964.

Van Ness, Robert G. Principles of Data Processing with Computers. Elmhurst, Illinois: The Business Press, 1966.

Government Documents

Caplin, Mortimer M. Annual Report of the Commissioner of Internal Revenue, Internal Revenue Service, United States Treasury Department, Publication Number 55. Washington, D. C.: Government Printing Office, 1961, 1962, 1963, 1964.

Cohen, Sheldon S. Annual Report of the Commissioner of Internal Revenue, Internal Revenue Service, United States Treasury Department, Publication Number 55. Washington, D. C.: Government Printing Office, 1965, 1966, 1967, 1968.

Description of Principal Federal Tax Returns, Related Forms, and Publications, Internal Revenue Service, United States Treasury Department, Publication Number 481 (7-67). Washington, D. C.: Government Printing Office, July, 1967. Pamphlet of 39 pages.

Fowler, Henry H. Annual Report of the Secretary of the Treasury, Treasury Department, Document No. 3236. Washington, D. C.: Government Printing Office, 1963, 1964, 1965, 1966, 1967, 1968.

Latham, Dana. Annual Report of the Commissioner of Internal Revenue, Internal Revenue Service, United States Treasury Department, Publication Number 55, Washington, D. C.: Government Printing Office, 1959, 1960.

Articles and Periodicals

"AICPA Urges IRS To Modify Extension Policy Based on Practitioners Workload," Journal of Accountancy, CXXI, No. 4 (April, 1966), pp. 18-20.

Barron, Dean J. "The Processing Cycle: What Happens From Filing Date To Action Date?" The Journal of Taxation, XXIV, No. 5 (May, 1966), pp. 306-07.

_____. "Why Computers?" The National Public Accountant, XI, No. 5 (May, 1965), pp. 8-11.

Bates, Warren A. "Internal Revenue: Automated Watchdog," The National Public Accountant, IV, No. 5 (May, 1964), pp. 7-10.

Bean, Arlene. "EDP--The Taxes," The Tax Digest," XXXXII, No. 2 (Second Quarter, 1964), pp. 53-55, 69-71.

Bigelow, Robert P. "Computers and Taxes," Datamation, XIII, No. 8 (August, 1967), pp. 60-61.

Brisbin, Albert W. "The Expanding Effort To Get Taxpayer Identifying Numbers," Banking, LIX, No. 10 (April, 1967), pp. 48-49, 114.

Brown, Richard C. "The Impact of the Computer on Tax Practice," Journal of Accountancy, CXXII, No. 1 (July, 1966), pp. 23-24.

Bubula, John S. "Tax Administration by Computer: How It Works, What Is Coming Next," The Journal of Taxation, XXV, No. 4 (October, 1966), pp. 205-09.

Caplin, Mortimer M. "One Hundred Years of Internal Revenue," The Federal Accountant, XII, No. 3 (March, 1963), pp. 13-27.

_____. "The Taxpayer-Identifying Number System: The Key To Modern Tax Administration," American Bar Association Journal, XXXXIX, No. 12 (December, 1963), pp. 1161-65.

_____. "What New Tax Law Will Mean," Nation's Business, LII, No. 2 (February, 1964), pp. 38-39, 90-96.

Chapman, Donald. "A Procedure For Review of Computerized Returns," Taxation for Accountants, II, No. 2 (May-June, 1967), p. 125.

Chamberlin, Hope. "Next Year is Now," The National Public Accountant, XI, No. 10 (October, 1965), pp. 8-11.

Cohen, Sheldon S. "A Backstage Look At The IRS Audit Program," The National Public Accountant, XIII, No. 10 (October, 1968), pp. 18-21.

_____. "The Internal Revenue Service Today," The National Public Accountant, XII, No. 5 (May, 1967), pp. 4-8.

_____. "New Tax Collector Tells His Goals," Nation's Business, LIII, No. 4 (April, 1965), pp. 31, 68-78.

_____. "The Information Explosion: The Computer In Society--Government Services," The General Electric Forum: A Journal of Leadership Opinion, X, No. 4 (Winter, 1967-68), pp. 21-25.

_____. "A Warning to Taxpayers: Exclusive Interview With the Former Commissioner of Internal Revenue," U. S. News and World Report, LXVI, No. 5 (February 3, 1969), pp. 36-39.

"Computer-Prepared Tax Returns, Journal of Accountancy, CXXVII, No. 3 (March, 1969), pp. 82-83.

"Computer-Prepared Tax Return Service Is Generally Satisfactory: Survey Outlines Pros, Cons, Problems," Taxation for Accountants, I, No. 5 (November, December, 1966), pp. 278-80.

"Computer-Processing Income Tax Forms," Data System News, IX, No. 7 (February 26, 1968), p. 7.

"Computers Rescue Taxmen From Paperwork Flow," Systems, VIII, No. 1 (January, 1967), pp. 24-26.

"Computer Tax Return Preparation: How The Several Services Shape Up This Year," Taxation For Accountants, I, No. 6 (January-February, 1967), pp. 322-27.

"Computer Tax Service, National Public Accountant, XI, No. 1 (January, 1966), pp. 16-17.

"Computerized Tax Returns Still Have Growing Pains But Continue To Improve," Taxation for Accountants, II, No. 5 (November-December, 1967), pp. 272-73.

Dellorfano, Frederick M. Jr. "New Federal Estimated Tax Requirements For Corporations and Individuals," Massachusetts CPA Review, XXXXII, No. 4 (December, 1968-January, 1969), pp. 117-20.

Dreyer, Avon M. "City Income Taxation in Michigan," The Michigan State Economic Record, X, No. 6 (June, 1968). East Lansing: Bureau of Business and Economic Research, Graduate School of Business Administration, Michigan State University.

Elsberry, Donald D. "ADP: Its Significance To The Tax Practitioner," The National Public Accountant, X, No. 1 (January, 1965), pp. 5, 19.

Engquist, E. J. "Improved Statistics Resulting From ADP System," Taxes, XXXXI, No. 1 (January, 1963), pp. 39-44.

"Exclusive Interview: Caplin Surveys Computer Scene," Data Systems News, IX, No. 13 (August, 1968), pp. 1, 38.

Fano, Robert M. "The World At Our Fingertips?" The General Electric Forum, X, No. 4 (Winter, 1967-68), pp. 5-8.

Foster, Joel and Nolan, James. "IRS Computer Centers Are Concerned About People, Too," Journal of Accountancy, CXXV, No. 5 (May, 1968), pp. 26-27.

Hirsch, P. "Computers and Tax Collection," Datamation, XII, No. 3 (March, 1966), pp. 28-31.

Hertzog, R. P. "How The Chief Counsel's Office Uses ADP in Litigation of Cases," The Journal of Taxation, XXIV, No. 5 (May, 1966), pp. 309-10.

_____. "RIRA--The IRS' New Electronic Weapon In Litigation Cases: How It Works," Taxation for Accountants, I, No. 6 (January-February, 1967), pp. 362-63.

"The Information Explosion: The Computer in Society," The General Electric Forum, X, No. 4 (Winter, 1967-68), p. 3.

"IRS Computers Now Nationwide: ADP Demands More Care, Accuracy in Return Preparation," Taxation for Accountants, XX, No. 1 (March-April, 1967), pp. 11-13.

"The IRS Computer System: How It Works and How To Talk To It," Journal of Taxation, XXX, No. 3 (March, 1969), p. 150.

Irwin, Theodore. "Electronic Eyes Are Watching Your Tax Returns," Popular Mechanics, CXXV, No. 3 (March, 1966), pp. 94-98.

Jack, Robert L. "Man v. Machine: Routine Correspondence Now Carried On By IRS Computers," The Journal of Taxation, XXIV, No. 5 (May, 1966), pp. 307-09.

_____. "Reducing Erroneous Computer Notices," Journal of Accountancy, CXXV, No. 3 (March, 1968), pp. 65-66.

Johnson, Howard P. "Triple-Entry Bookkeeping; An Answer to IRS's ADP," Taxes, XXXXI, No. 3 (March, 1963), pp. 168-74.

Jordan, Henry B. "Taxpayer Identifying Numbers and Their Use by IRS," Lybrand Journal, XXXXIV, No. 1 (1963), pp. 25-32.

Kelly, Thomas J. ed. "EDP International," The Arthur Young Journal, Winter, 1968.

Kinnard, George. "The Computer versus the Fifth Season," Law and Computer Technology, I, No. 3 (March, 1968), pp. 14-17.

Klinsman, Elmer H. "Some Recent Trends in Federal Tax Administration," Massachusetts CPA Review, XXXXII, No. 5 (February-March, 1969), pp. 168-72.

Klotz, Arthur H. "Role of the IRS Appellate Conferee," The National Public Accountant, VII, No. 8 (August, 1967), pp. 12-13.

Leibowitz, George J. "The Use of Taxpayer Identifying Numbers by Individuals, Businesses and the Government," Taxes, XXXXI, No. 1 (January, 1963), pp. 31-38.

Linowes, David F. "Challenges of The Future--Can The Professional Accountant Meet Them?" The New York CPA, August, 1967.

London, Howard M. "Automation and Tax Practice, Taxes, XXXXIV, No. 1 (January, 1966), pp. 22-23.

E. L. Meek, "ADP's Tax Administration Revolution: Its Advantages, Effects, and Problems," The Journal of Taxation, XXIV, No. 5 (May, 1966), pp. 304-05.

Morrill, Norman E. "Income Tax Filing Procedures and ADP," Massachusetts CPA Review, XLII, No. 4 (December, 1968--January, 1969), pp. 117-120.

Morris, Joe Alex. "Meet The 'Monster' That Checks Your Taxes," Readers Digest, XC, No. 537 (January, 1967), pp. 177-79.

Rea, Richard C. "Computer-Prepared Tax Returns," Journal Of Accountancy, CXXVII, No. 3 (March, 1969), pp. 82-83.

"Report on the NSPA Survey of IRS Extension Practices," The National Public Accountant, XIII, No. 1 (January, 1968), pp. 6-9.

Rogovin, Mitchell. "Impact of Computers on Tax Practice Today: What They Can Do For The IRS and Tax Men," Journal of Taxation, XXV, No. 2 (August, 1966), pp. 112-14.

Rosapepe, Joseph S. "How To Collect $155 Billion," Public Relations Journal, XXIV, No. 4 (April, 1968), pp. 31-33.

Seib, Charles B. "The Martinsburg Monster," Harper's Magazine, CCXXIV, No. 1343 (April, 1962), pp. 33-36.

Seidman, J. S. "Automatic Data Processing Opens Doors For Income Averaging," Controller, XXX, No. 9 (September, 1962), pp. 438-39.

"Selection of Tax Returns for Examination," Journal of Accountancy, CXXVI, No. 4 (October, 1968), pp. 72-74.

Sheinfeld, Ira S. "Computers and Taxes," The Arthur Young Journal, Winter, 1968, pp. 16-21.

_____. "Computers and Taxes," The Michigan C. P. A., XX, No. 1 (July-August, 1968), pp. 9-17.

"Should You Use a Computer Service to Prepare Tax Returns? If So, What Kind?" Taxation for Accountants, III, No. 5 (November-December, 1968), pp. 277-80.

Smith, Sanford. "Man and Computer: The New Partnership," The General Electric Forum, X, No. 4 (Winter, 1967-68).

Smith, William H. "Automatic Data Processing of Tax Returns," Federal Accountant, XIII, No. 9 (September, 1962), pp. 178-87.

_____. "ADP in the IRS," Taxes, XXXXI, No. 1 (January, 1963), pp. 26-31.

_____. "The Adoption of Computer Technology to Tax Administration," The Tax Executive, XVIII, No. 1 (October, 1965), pp. 74-80.

_____. "Developing A New Technique in Selecting Returns for Audit," Journal of Accountancy, CXXIII, No. 6 (June, 1967), pp. 22-23.

_____. "Electronic Data Processing In The Internal Revenue Service," National Tax Journal, XIV, No. 3 (September, 1961), pp. 210-22.

_____. "The IRS Position on Auditing 'Around' Computer Records Rather Than 'Through' Them," The Journal of Taxation, XXVI, No. 5 (May, 1967), pp. 294-96.

_____. "What the IRS Is Now Doing To Improve Various Aspects of Tax Administration," The Journal of Taxation, XXVI, No. 1 (January, 1967), pp. 56-58.

Stern, Alan A. "Computer Tax Returns," The National Public Accountant, X, No. 12 (December, 1965), pp. 8-9, 25.

Surry, Stanley S. "Automatic Data Processing and Tax Administration," The Monthly Digest of Tax Articles, XII, No. 11 (August, 1962), pp. 1-15.

Surry, Stanley S. "Automatic Data Processing and Tax Administration," Tax Law Review, XVII, No. 2 (January, 1962), pp. 165-67.

Tarantino, Dominic A. "Computerized Tax Returns Still Have Growing Pains But Continue To Improve," Taxation for Accountants, II, No. 5 (November-December, 1967), pp. 274-75.

Taylor, Howard D. "Automatic Data Processing In The Internal Revenue Service," Journal of Accountancy, CXVIIII, No. 3 (March, 1965), pp. 56- .

"Tomorrow's Management," Fortune, LXXIV, No. 1 (July 1, 1966), pp. 2-8, 88.

"Unhappy Returns From The IRS' Computers, Business Week, February 25, 1967, pp. 73-74, 76.

Vinyard, Nora Marie. "Computerized Tax Returns," Oklahoma CPA, VI, No. 3 (October, 1967), pp. 18-22, 26.

Walsh, Clinton L. "Automatic Data Processing of Federal Corporation Income Tax Returns by IRS," The New York CPA, XXXVI, No. 10 (October, 1966), pp. 769-72.

Wise, T. A. "IBM's $5,000,000 Gamble," Fortune, LXXIV, No. 4 (September, 1966), pp. 119-22.

Yasaki, E. K. "Computing and Tax Accounting," Datamation, XII, No. 3 (March, 1966), pp. 33-34.

"You Can't Beat The System At Martinsburg," Business Automation, XVI, No. 3 (March, 1969), pp. 56-59.

News Items and Short Accounts

"Automatic Data Processing: Operations Discussed--The IRS Discusses Its Automatic Data Processing Operations and How Successful The System Has Been Since 1962," IRS Release 959, January 29, 1969, Standard Federal Tax Reporter, VII, 1969, Commerce Clearing House, Incorporated, pp. 76003-76004, paragraph 8750.

"AICPA Pleade For Filing Extensions Based Solely On Workload of the Practitioners," Journal of Taxation, XXIV, No. 5 (May, 1966), p. 316.

Alten, Irving. "It Is Getting Quite Apparent That Some Relief Is Needed On The Federal Individual Income Tax Preparation Work Load," Journal of Accountancy, CXXIII, No. 1 (January, 1967), p. 23.

"A Bigger Budget For The IRS is Sought Partly To Reverse a Decline in Audits," Wall Street Journal, January 31, 1968, p. 1.

Cohen, Sheldon S. "Automatic Data Processing: Progress for 1967," IRS News Releast IR-924, May 8, 1968, re printed in Standard Federal Tax Reporter, Commerce Clearing House, Incorporated, VII, pp. 74-503-05, Paragraph 8750.

"Commissioner Sheldon S. Cohen's Views on Filing Time Extensions," Journal of Accountancy, CXXV, No. 1 (January, 1968), p. 66.

"Computax Files Secondary of 100,000 Capital Shares," Wall Street Journal, December 29, 1965, p. 13.

"Computer Errors in Processing Tax Returns Abound," Wall Street Journal, December 20, 1967, p. 1.

"Computers Get Results on Taxes," U. S. News and World Report, LX, No. 6 (February 7, 1966), pp. 81-82.

"Computers Play a Growing Role in Helping Accountants Figure Their Clients Annual Tax Returns," Wall Street Journal, December 15, 1965, p. 1.

"Computers Spotting False Tax Returns," U. S. News and World Report, LX, No. 14 (April 4, 1966), p. 99.

"Computer Spotting of Income Tax Returns Gets Under Way," Wall Street Journal, XLIX, No. 70 (January 22, 1969), p. 1.

"Computer Tapes Now Acceptable As Information Returns," Journal of Taxation, XXIV, No. 4 (April, 1966), p. 247.

"Computerized Tape Filing of Tax Information Returns Grows," Wall Street Journal, XLVI, No. 177 (June 22, 1966), p. 1.

Corlett, Cleve. "Computers Tightening Income Tax Collections, Increasing Revenues," The State Journal, Lansing, Michigan, p. B-1.

"CPA's Critique of Computerized Tax Returns," Journal of Accountancy, CXX, No. 2 (August, 1965), pp. 15-18.

Cunniff, John. "IRS 'Monster' Speeds Good News To Early Filers of Tax Returns," The State Journal, Lansing, Michigan, April 4, 1968, p. H-6.

"Dangers Inherent In Some Extensions," Journal of Accountancy, CXXI, No. 2 (February, 1966), p. 63.

"Direct Filing of Tax Returns," The Tax Executive, XVIII, No. 1 (October, 1965), pp. 4-5.

"Electronic Ally For the Taxpayer," Business Week, Number 1908, March 26, 1966, pp. 167-68.

"Foundations Feel Heat of Tax Reform," Business Week, No. 2062, March 8, 1969, pp. 72-76.

"Favorable 1967 Extension Experiences Can Be Continued," Journal of Accountancy, CXXV, No. 1 (January, 1968), p. 65.

"Fewer IRS Audits Could Result From The Income Tax Increase," Wall Street Journal, XLVIII, No. 217 (August 21, 1968), p. 1.

"First Use By Court of IRS Retrieval System," Journal of Taxation, XXIV, No. 7 (July, 1966), p. 37.

"For This Year's Tax Returns: The Closest Check Yet," U. S. News and World Report, LXIV, No. 10 (March 4, 1968), p. 73.

"A Government Watch on 200 Million Americans?" U. S. News and World Report, LX, No. 20 (May 16, 1966).

"How Do Attorneys Like Computerized Returns?" Taxation For Accountants, III, No. 1 (March-April, 1968), p. 61.

"Income Tax Return Computations Show a Mixed Pattern," Wall Street Journal, April 10, 1968, p. 1.

"Internal Revenue Service Orders IBM System 360 For National Computer Center," Computers and Automation, XIV, No. 3 (March, 1965), p. 42.

"Internal Revenue Commissioner Caplin Praises Computers For Bringing In Money That Mere Humans Would Have Missed," Wall Street Journal, January 30, 1964, p. 1.

"IRS Announced J. E. Stewart's Appointment As Director of Martinsburg, West Virginia Tax Computer Headquarters," Wall Street Journal, July 10, 1961, p. 12.

"IRS Asking For More Money, Mainly For Tax Return Audits," Journal of Taxation, XXVI, No. 5 (May, 1967), p. 296.

"IRS Computers Find Taxpayers Essentially Honest, Often Careless; Spot Only One 'Cheat' in Seven Million Dixie Returns; Bad Arithmetic Common," Wall Street Journal, September 5, 1963, p. 1.

"IRS Computers To Keep Track of Legal Issues Being Set Up," Wall Street Journal, September 30, 1964, p. 1.

"IRS Examining Fewer Returns and Collecting More Tax," Journal of Taxation, XXIV, No. 5 (May, 1966), p. 310.

"The IRS Glows Over The Success of The Relentless Computer," Wall Street Journal, XLIX, No. 80 (February 5, 1969), p. 1.

"IRS Hopes Computers Will Spot Tax Evasion Trends," Wall Street Journal, January 18, 1963, p. 15.

"IRS Officials Discuss Data Processing and Compliance Procedures," CXXI, No. 1 (January, 1966), p. 19, Journal of Accountancy.

"IRS Provides Practitioners With Booklets on ADP System," Journal of Accountancy, CXXI, No. 1 (January, 1966), pp. 14-15.

"IRS Says Its Computers Rounded Up $52.5 Million in Unpaid Taxes in 1964," Wall Street Journal, March 12, 1965, p. 6.

"IRS Streamlines Procedure For Amending Returns," Journal of Accountancy, CXXVI, No. 1 (July, 1968), pp. 69-70.

"IRS Tax Model Available To Researchers at Cost," Journal of Accountancy, CXXVI, No. 4 (October, 1968), pp. 14-15.

"IRS Testing Machine Which Selects Returns For Audit," Taxation for Accountants, I, No. 4 (September-October, 1966), p. 219.

"Legislation is Sought To File The Nationwide IRS Computer System," Wall Street Journal, April 7, 1965, p. 1.

"Many In Congress Ready To Tax All Foundations, Curb Their Operations," The Wall Street Journal, XLIX, No. 97 (February 28, 1969), p. 1.

"Microfilm Listing of Tax Cases Available," The Journal of Taxation, XXX, No. 1 (January, 1969), p. 56.

"Monroe Will Offer Nationwide Computerized Tax Service," Journal of Accountancy, CXXI, No. 1 (January, 1966), p. 14.

"New Formula Classifies Returns For Audit," Journal of Taxation, XXX, No. 3 (March, 1969), p. 150.

"New Company Formed For Tax Return Processing," Computers and Automation, XIV, No. 10 (October, 1965), p. 41.

"New Computer-Prepared Tax Service Announced in Five Western States," Management Services, II, No. 5 (September-October, 1965), p. 9.

"1964 Tax Returns Being Prepared By New CSC Computer System," Computers and Automation, XIV, No. 2 (February, 1965), p. 29.

"Now IRS Starts Paying Out," Business Week, No. 2017, April 27, 1968, p. 39.

"Number of Audits Drop But Assessments by IRS Increase," Taxation For Accountants, II, No. 1 (March-April, 1967), p. 19.

"One Return For All Taxes?" U. S. News and World Report, LXI, No. 6 (August 8, 1966), pp. 87-88.

"Our Computer Is After Your Tax Jobs," Journal of Accountancy, CXXIV, No. 4 (October, 1967), p. 81.

"Personal Business--Taxes," Business Week, March 23, 1968, pp. 141-42.

Pope Leroy. "Computers Take Over Tax Chore," The State Journal, Lansing, Michigan, July 24, 1968, p. F-8.

Porter, Sylvia. "Save On Taxes--II," The Saginaw News, Saginaw, Michigan, February 18, 1969, Section B, Page 5.

"The Practical Approach to IRS Extensions," The National Public Accountant, XIII, No. 1 (January, 1968), p. 10.

Porter, Sylvia. "Tax Auditing Still Lagging," The State Journal, Lansing, Michigan, April 22, 1968, p. C-4.

"Practitioners Complain About Service's Increasingly Stricter Extension Policy," Journal of Taxation, XXV, No. 1 (July, 1966), p. 36.

"Returns For Audit Chosen By ADP," The Journal of Taxation, XXIV, No. 5 (May, 1966), p. 310.

Smith, William H. "Problems Encountered in the ADP Program in the IRS," Remarks By The Deputy Commissioner Before the Section on Taxation 1968 Midyear Meeting in Phoenix, Arizona, Standard Federal Tax Reporter, Commerce Clearing House, Incorporated, VII, 1968, Paragraph 8751, pp. 74503-07.

"Staff Training To Take Advantage of Computerized Tax Return Service," Taxation for Accountants, II, No. 6 (January-February, 1968), p. 376.

"Tax Analysis--Key Government Officials Give Informal Views on Timely Topics," Journal of Accountancy, CXXVI, No. 4 (October, 1968), pp. 71-74.

"Tax-Free Foundations: Study Starts in Congress," U. S. News and World Report, LXVI, No. 6 (February 10, 1969), pp. 81-82.

"Tax-Free Funds Come Under Fire," U. S. News and World Report," LXVI, No. 9 (March 3, 1969), pp. 84-85.

"Tax-Free Groups Studies Again," U. S. News and World Report, LXVI, No. 10 (March 10, 1969), pp. 100-01.

"Tax Pitfalls To Avoid," National Business, April, 1968, p. 16.

"Tax Processing--IRS Orders 10-H-200's for Tax Processing," Computers and Automation, XIII, No. 12 (December, 1964), p. 58.

"Tax Returns--By Computers," Journal of Accountancy, CXIX, No. 2 (February, 1965), pp. 23-27.

"Tax Returns By The Computer," The National Public Accountant, X, No. 1 (January, 1965), pp. 6-7, 23.

"Tax Returns By Computer is a Growing Business," Journal of Accountancy, CXX, No. 3 (September, 1965), pp. 16-18.

"Tax Record Standards for Electronic Accounting Systems Near Completion," The Wall Street Journal, March 13, 1963, p. 1.

"Tax Sleuths Are Watching," Business Week, No. 1878, August 28, 1965, p. 100.

"Thank You! Computax Has Completed Its Fifth and Most Successful Tax Return Season," Journal of Accountancy, CXXV, No. 5 (May, 1968), p. 4.

"Uncle Sam's Electronic Tax Collector," Forbes, CXCV, No. 4 (February 15, 1965), pp. 38, 40.

"What Factors Are Being Looked For in Extension Requests," Journal of Taxation, XXIV, No. 4 (April, 1966), p. 246.

"When Machines Check on Taxes," U. S. News and World Report, LVIII, No. 16 (April 19, 1965), pp. 103-04.

"When The Machines Get Your Tax Return," U. S. News and World Report, LVIII, No. 16 (April 26, 1965), pp. 110-11.

"Will The New Tax Computer Get After You?" Farm Journal, LXXXX, No. 2 (February, 1966), pp. 28,30.

"Your Tax Return May Be Questioned This Year," Changing Time: The Kiplinger Magazine, XX, No. 3 (March, 1966), pp. 21-23.