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American Institute of Certified Public Accountants. Not-for-Profit Organizations Committee

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American Institute of Certified Public Accountants

AUDIT GUIDE

**AUDITS OF
SERVICE-
CENTER-
PRODUCED
RECORDS**

ISSUED BY THE
AUDITING STANDARDS DIVISION

NOTICE TO READERS

This audit guide is published for the guidance of members of the Institute in examining and reporting on the financial statements of entities whose records are produced by a computer service center. It represents the considered opinion of the Committee on Computer Auditing and as such contains the best thoughts of the profession as to the best practices in this area of auditing. Members should be aware that they may be called upon to justify departures from the Committee's recommendations.

Committee on Computer Auditing (1972-73)

RICHARD J. GUILTINAN, *Chairman*
RICHARD C. BLUESTINE
WALTER R. BOGAN
BARRY R. CHAIKEN
RICHARD W. CUTTING
GORDON B. DAVIS
KEAGLE W. DAVIS
JOSEPH DiGIORGIO
RICHARD GNOSPELUS
STEPHEN D. HARLAN, JR.
EVERETT C. JOHNSON, JR.
FRED L. LILLY, JR.
WILLIAM E. PERRY

THOMAS F. SAMSON
STEPHEN L. SIEGEL

Auditing Standards Division Staff:

JACK SCHWERSENZ, *Director*
JOHN MULLARKEY

Computer Services Division Staff:

DONALD L. ADAMS, *Director*
NOEL K. ZAKIN
FREDERICK S. SCHIFF

AUDITS OF SERVICE- CENTER- PRODUCED RECORDS

**ISSUED BY THE
AUDITING STANDARDS DIVISION**

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Preface

Because of the increasing number of companies using service centers, many auditors find themselves confronted for the first time with the problem of auditing financial data processed by a computer. To the usual problems of auditing EDP systems, the service center adds the complicated aspect of a distinct and separate entity which may nevertheless be an integral part of the client's data processing and accounting control system.

The objective of this guide is to supply the auditor with sufficient information and reference sources to allow him to effectively serve clients who use a service center. Attention is given to the special problems inherent in auditing a client using a service center, and additional guidance is offered on particularly relevant aspects of auditing EDP systems.

Some of the questions this audit guide addresses are these: What types of controls is the auditor likely to encounter at a service center? When should he review and test these controls? How should the auditor approach his review of controls at the service center? How can he effectively utilize the services provided by the service center in his own audit?

The guide explains the application of familiar auditing methods to a new environment and introduces new methods particularly suited to this environment. One of the audit approaches explained in the guide is a third-party review of controls at the service center. This approach demonstrates how one auditor might utilize the report of another independent auditor on the control system of the service center as a source of information

in performing his evaluation of accounting control as it relates to his client's system.

Although this guide is being issued by the 1972-73 Computer Auditing Committee, a number of other individuals contributed to its development. The Committee acknowledges the outstanding contributions of the members of predecessor committees and, in particular, of Mr. Richard W. Cutting who served as chairman of the Auditing EDP Systems Advisory Committee during 1970-72.

Computer Auditing Committee

November 1, 1973

Introduction

This audit guide has been prepared to assist the independent auditor in serving clients who use a service center to process financial information, and to offer guidelines for determining the effect, if any, that service center processing may have on the scope of an audit. It is not intended to limit or supplant individual judgment or initiative. Programs for each audit should be designed to meet the requirements of the particular situation, including the size and type of organization and the evaluation of those controls affecting the reliability of financial statements. Specific audit programs should be determined by the exercise of professional judgment in the light of circumstances present in particular cases.

This guide does not address the topics of (1) advising on the selection of a service center, (2) operating a service center and furnishing data processing services, or (3) consulting on system design for applications processed by a service center.

When a client uses a service center for processing significant financial data, a legally separate organization is introduced into the audit which may maintain controls and perform services directly affecting the scope of the auditor's examination. The auditor should have some familiarity with the types of service centers, as well as how service centers are organized and operated, how they develop programs and systems, what documentation should be available, and what agreements usually exist between service centers and their customers. Chapter 1 of the guide pro-

vides some background information on these aspects of service center processing.

When a client uses a service center, much of the processing may be performed by a system that is external—physically, operationally, and legally—to the client organization. In addition, client files and records are normally maintained at the service center. The effects of these two characteristics are discussed in Chapters 2 and 3.

In Chapter 2 it is suggested that the introduction and use of a computer does not obviate the need to perform an evaluation of internal accounting control that includes both a review of the system of internal accounting control and tests of compliance with the system. Chapter 2 also discusses the elements of control to be considered in evaluating both the client's system of internal accounting control and the service center's controls. In addition, Appendix B includes a case study that illustrates an audit approach to be used when a service center processes payroll records.

Chapter 3 discusses the use of the computer in accumulating evidential matter and evaluating financial records processed by service centers. Historically, the records evaluated have consisted of printed reports, listings, and documents—all of which can be read by the auditor. In most audit situations involving service centers, these visible records are still available and may be evaluated by the auditor using traditional auditing techniques. Since the client's printed output is prepared from machine-readable files, the auditor may have the opportunity to use the computer for evaluating the records by developing or obtaining computer audit programs and processing machine-readable records with such programs. Chapter 3 discusses how these computer audit programs are used and how they may be obtained by the auditor.

A service center may use standardized programs for a large number of users, with little or no variation in processing for each. Such a situation suggests the possibility of selecting an independent auditor as a third party to review the service center's controls and processing. Third-party review is considered in Chapter 4. A case study illustrating the problems and procedures of conducting a review of a service center using standardized programs to process financial data for many users is included in Appendix C.

Chapter I

Nature of Service Centers

Service centers are now available to serve companies that do not have enough data processing activity to justify a computer for their sole use, or that do not wish to invest the time and resources necessary to establish their own computer center, or that wish to have limited use of a computer for applications not suited to their own computer.

Definition

A service center is any organization that provides data processing functions for other organizations, including the actual processing function itself.¹ Service centers offer a wide range of services including equipment-time rental, information processing, and systems and programming assistance. These services generally require skilled personnel and data processing equipment, both of which are available to customers on an "as-needed" basis and are priced accordingly.

Such services are now provided by many types of organizations, such as equipment manufacturers, banks, and CPA firms as well as by organizations formed exclusively to provide data processing services. Some organizations employ few people and

¹ John L. Roy, "The Changing Role of the Service Bureau," *Data-mation* (March 1970) pp. 52-54.

provide services limited to information processing or equipment-time rental. Others, offering more sophisticated services, maintain large staffs consisting of systems designers, programmers, mathematicians, statisticians, and engineers, in addition to equipment operators.

Service centers also differ in that some operate tabulating equipment while others operate electronic computers only; some centers offer a combination of both. Capabilities will vary, especially among those service centers operating electronic computers. Their effectiveness is dependent upon the computer's design, its age, the peripheral equipment available, and upon qualifications of the center's personnel.

Types of Services Provided

Although service centers provide many types of services, the independent auditor is most likely to be concerned with these five types:

1. Renting of computer time.
2. Providing time-shared computer services.
3. Providing computer facilities management.
4. Processing standard program packages.
5. Designing and processing of tailored systems.

The first three of these are discussed primarily as an overview. The last two are the services expected to be encountered most frequently by the independent auditor and, therefore, are treated in greater depth in this guide.

Renting of Computer Time. Some service centers, and some installations not normally considered service centers, try to sell their unused computer time to help defray the cost of maintaining the computer installation. Usually the only service available is the computer itself; however, some organizations will provide operator, systems, or programming services for an additional fee.

The renting of computer time by a client may not pose any audit problems different from those encountered when the client has his own in-house computer. The client may have designed the system, written the programs, and may be maintaining the files. In fact, a client renting computer time from a service center may

have his own computer installation and may use outside time only during peak periods or for certain applications.

Providing Time-Shared Computer Services. Time-sharing services have become an important segment of the service center industry. Basically, these services utilize the disparity between the relatively high central processor speeds and relatively low input/output speeds by allowing one central processor to serve input/output demands of many different users. By sharing the central processor, the users are able to obtain the advantages of a powerful computer at relatively low cost. The individual user only pays for the time he actually uses the computer and for the communication facilities involved when solving his particular problem.

Most time-sharing services have a library of standardized programs that are developed by the center and are available to all their users, who, in turn, may also write their own programs and store them in a reserved library within the system. These user-written programs are the exclusive property of the user and should only be used by their authorized personnel. A variety of programming languages is available: BASIC and FORTRAN are most commonly used; ALGOL and COBOL are also available on many systems, as are other, more specialized languages. It is possible for the user to create and store data files in whatever format he requires.

Providing Computer Facilities Management. Under a facilities management arrangement, a company will contract with a facilities manager to operate and manage the company's internal data processing function. A company usually makes such an arrangement when it considers its data processing costs are too high or too difficult to control, when it is having problems with its operating personnel, when it is coping with poor systems design, or when it is unable to maintain the necessary technical expertise required to expand the system. The agreement may include consulting services on system design and implementation. It will always include operational responsibility for day-to-day management of the data processing function.

The ultimate objective of the facilities manager may be to combine several users into a single computer facility in order to gain

economic advantages. When this occurs, the user company will, in effect, be dealing with a service center.

The audit implications of facilities management agreements (where no other users are involved) are generally no different than for an in-house installation—the one exception being the degree of independent control which the facilities manager can exercise over the operation. The auditor should consider participating with the client in the development of such facilities management agreements to assure that the facilities manager's degree of control is reasonable in the circumstances. As a minimum, the auditor should review and be familiar with the proposed agreement and any changes thereto to assure himself that he will have proper access to required data. Where the facilities manager subsequently brings outside users into the installation, the client and the auditor should also be concerned with the effect such outsiders will have on security over the installation, the installation's programs, data, and so forth.

Processing Standard Program Packages. Many service centers specialize in the processing of one or more standard program packages (the use of the same program for several users). In some cases, the specialization is based upon a particular application, such as payroll or inventory; in other instances, operations are dedicated to an industry such as securities brokerage or savings and loan. Standard programs are usually designed to provide all of the normal requirements for a particular job. Some service centers with standard program packages provide flexibility to the users by developing standard program modules² or common subroutines. Various standard program modules are assembled into "customized" programs according to customer specifications. Standard programs may also provide options to the customer such as report formats and computational techniques.

The service center ordinarily retains ownership of these programs and any "customizing" is limited to choices built into the original programs.

Designing and Processing of Tailored Systems. If the user has no program and if standard program packages will not fill his

² A program module is a subprogram or subroutine that can be attached to or included in an existing program.

needs, he may employ a service center to design a tailored system. Subsequently, the same center may process his data with that new system. The new system design process requires that the *user* clearly establish the basic description of the proposed system and *then* adequately communicate his requirements to the service center.

The service center will normally be requested to submit a proposal for, and a firm cost quotation on, designing the system before the work is authorized. Upon acceptance of the design project and related quote, the service center implements the system according to the detail system specification in the proposal, tests it, and submits it to the user for acceptance. After acceptance, processing may begin.

User participation during the design, programming, and testing processes is *essential*. Internal or external audit participation in reviewing controls is also generally advisable. The primary objectives of this participation are these:

1. Ascertain that the basic requirements for the system are, in fact, proper and are adequately communicated to the service center.
2. See that changes in design specifications during programming are kept to a minimum, since changes can significantly increase the complexity and cost of the project.
3. Closely monitor the testing phase to verify that the system is functioning properly.
4. Verify that, where a file conversion is involved (e.g., setting up opening accounts-receivable balances), appropriate control is established and maintained by both the user and the service center throughout the conversion.

Upon completion, the user may, depending on the terms of his service center agreement, obtain title to, and a copy of, the programs and supporting documentation. The "Documentation and Service Center Agreements" section of this chapter provides background to aid in determining documentation requirements for a specific system.

Organization and Operations of Service Centers

Service centers that process standardized or tailored programs are usually organized along functional lines. Certain functions such as sales, systems and programming, and operations are usually performed by service centers to achieve satisfactory operating results.³

Exhibit 1, opposite, represents the organization of a service center with revenues slightly in excess of \$1 million. Smaller service centers may combine the systems analysis and programming functions; in fact, they may be performed by the same individuals. In smaller service centers, sales and customer service may be handled by the chief executive or incorporated in another function. Some service centers also use the account executive approach, by which each client is assigned to an account executive who is responsible for developing a system for the client and maintaining a working relationship with him.

The functions and duties of systems development (design and programming) are usually separate from operations (daily processing). In such cases programmers are normally not allowed to operate the computer for regular processing.

The control group is usually responsible for receiving and controlling input data, reconciling control information, and correcting and reprocessing service center errors. Service centers do not normally accept responsibility for user errors.

Operations. The cycle starts with the user providing input data to the service center for processing. The input data may be either in the form of hard copy documents or in a machine-readable form, e.g., punched cards prepared by the user. Although usually delivered to the service center manually or by mail, it may also be forwarded by a telecommunication system.⁴

³ For a more detailed discussion of the organization and operation of service bureaus, see Constantine Konstans, *The Effect of Data Processing Service Bureaus on the Practice of Public Accounting* (East Lansing: Michigan State University Press, 1968), pp. 50-55.

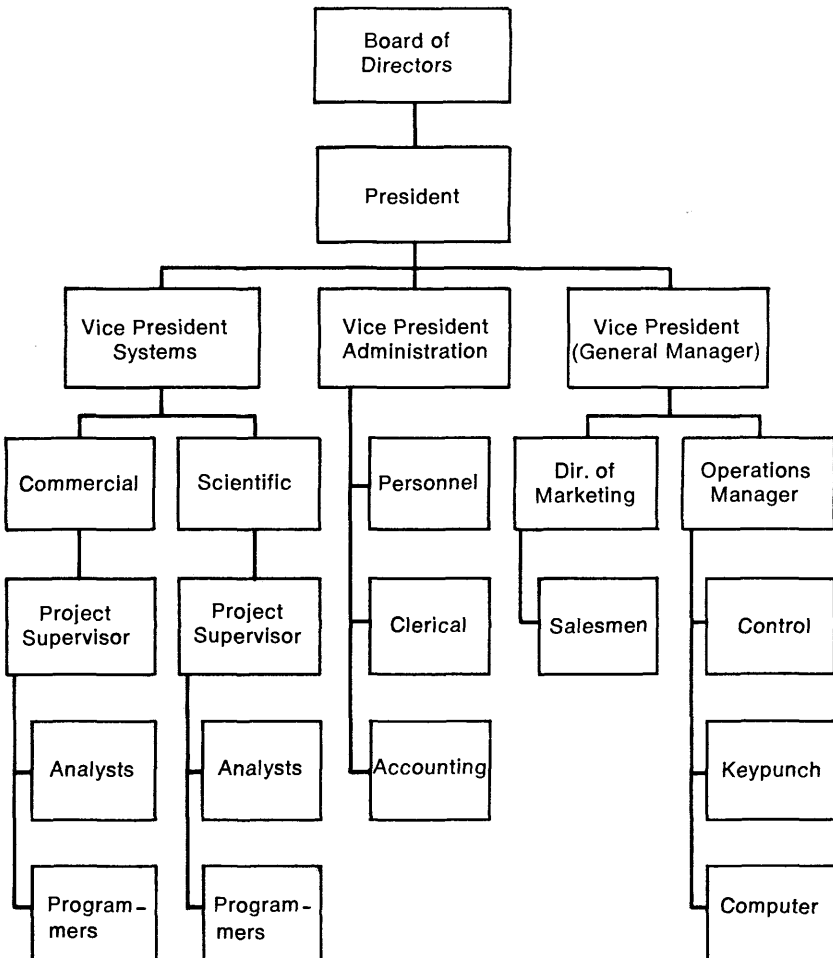
⁴ This section and the next two sections are adapted from a previous AICPA study by Gordon B. Davis, *Auditing & EDP* (New York: AICPA, 1968), pp. 216-218.

The permanent (master) files against which the input is to be processed are usually retained at the service center. A master file may be retained in tape, disc, or card form depending on the system and equipment being used. Changes in the master file data are often submitted as file maintenance and are normally processed before the processing of the transactions.

Most systems processed by service centers are designed to provide the user with the final output document (invoice, payroll check, etc.) together with appropriate listings or registers. Occa-

EXHIBIT I

Service Center Organization



sionally, the end-product of the processing consists of punched cards or other machine-readable records which must be processed further or printed at the user's office. Most service centers require an advance schedule of all processing to be performed and reports to be prepared. Upon request, and for a fee, service centers can usually provide special purpose reports, but these are generally on a delayed basis. The data stored in the master files is not commonly reproduced except on special request.

The responsibility for record retention usually rests with the user. Therefore, the reports obtained from the service center should contain all necessary historical data, and the user should arrange for them to be stored. The service center usually retains only those records that are necessary for the reconstruction of files in the event of loss, destruction, or significant error unless the user has made other data retention arrangements.

Responsibilities and Controls. The role of the service center may vary from one of simply operating a program prepared by the user to one of providing many additional data processing services. The trend is toward the latter arrangement because the user is required to have fewer EDP skills. In this case, the service center participates (and often takes the initiative) in the design of the system and the programming and program testing as well as the operation of the system. The user's participation is limited to establishing the requirements of the system, contributing toward its design and determining testing and acceptance criteria. The user should acquire a sufficient knowledge of the system to enable him to provide the necessary input, to react to exceptions and differences reported, and to understand the output records.

In keeping with the service concept, the service center usually assumes full responsibility for hiring, training, and supervising the personnel who program and operate the system. The user seldom has any voice in these matters; in fact, he is often uninformed about the qualifications of the personnel at the service center and has contact only with the account executive or other liaison personnel.

The user of a service center should be concerned about the security measures taken to protect the information held at the center. A few users are so sensitive in this regard that they furnish the service center with code numbers instead of names for cus-

tomers or employees, and retain responsibility for inserting the names on the output.

Another important aspect of security concerns the service center's provision for master file reconstruction in the event of loss or destruction. Methods used for in-house installations (fireproof vaults, off-premises storage, etc.) apply equally well in service centers. The user should also be concerned about these provisions and about the arrangements the center has made for back-up facilities. The question of back-up may be critical in cases where the service center obtains its computer time by off-shift rental of computers belonging to other organizations.

Printouts and other data retained by the user should be sufficient for the reconstruction of processing in the event of a service center failure and should provide a satisfactory audit trail.⁵

User Controls. The controls that ensure the orderly and supervised processing of properly submitted user data are the responsibility of the management of the service center. To check the completeness and accuracy of the service center's processing, the user generally establishes some overall input data controls, such as control totals, document counts, number of accounts, prenumbered documents, etc. He may also review the output documents and records completely or on a sampling basis, depending upon the nature and volume of the processing. The user may also undertake to manually test-check some of the processing performed by the service center and periodically review the processing procedure at the service center.

The user should make provisions to protect against a loss of source documents in transit to and from the service center and to protect against transactions being processed more than once. For example, if a bank's paid but unposted checks are transported to a service center for processing, a microfilm copy should be kept at the sending bank. Another approach is to use a copy of the source documents for data processing input purposes.

To ensure the timely and complete processing of all transactions, both the user and service center usually review and screen

⁵ The "audit trail" may be defined as the underlying network of documents, journals, ledgers, and worksheets that enable an auditor to trace an original transaction forward to a summarized total or from a summarized total backward to the original transaction.

the input data. The user corrects any errors or omissions he detects before the data is sent. Any erroneous data items detected by the service center's review or computer input validation (editing) routines are left unprocessed; they should be listed and returned to the user.

The user should establish control over the data items, correct them, and resubmit them with the next batch or, as in the case of payroll, he may have to process them manually if it is not practicable to wait until the next cycle of processing. If processing is performed manually, an appropriate adjustment must be prepared to correct the master records during the next processing cycle.

Documentation and Service Center Agreements

Documentation of an entire system consists of two segments:

1. Documentation of the computer processing aspects. These are almost always the sole responsibility of the service center.
2. Documentation of the manual data preparation procedures. These are generally the responsibility of the user but may also be prepared jointly with the service center.

Source of Documentation Specifications. The level of documentation to be maintained by the service center may be specified in one or all of the following:

1. The basic operating agreement between the service center and the user in respect to documentation on user systems in general.
2. The detail system specifications proposal submitted by the service center to the user on the design of tailored systems.
3. The service center's normal systems and procedures manual used in regard to any given application.

The level of documentation to be maintained by the user on those areas that are his responsibility is the same as in any manual system.

Necessity of Documentation. Complete and current documentation of the entire systems cycle—from user preparation and sub-

mission of input through processing, error edit, and re-entry at the service center to receipt, review, and reconciliation of output by the user—is necessary for a variety of reasons. Documentation allows both client and auditors to

1. Understand fully the requirements and objectives of the system (its procedures and output) as a basis for determining the extent to which the objectives of client management are fulfilled.
2. Evaluate the importance of and the use to which specific reports may be employed by the user to control the processing performed.
3. Review and establish controls and determine the presence and nature of compensating controls.
4. Determine the nature and extent of control elements that have been delegated to the service center as well as those control elements maintained by the client.

Documentation is also important as a reference for systems analysts and programmers responsible for maintaining and modifying existing systems and programs.

Documentation Provided by Service Center. Provision for maintenance of adequate documentation of the service center's portions of a user's system may be incorporated in the basic operating agreement between the user and the service center. A copy of a sample service center agreement is included in Appendix D. (Appendix D also covers considerations in selecting a service center.)

In addition, documentation requirements are often set forth in detail in the systems specification section of proposals for design of tailored applications by a service center. These may include the following:

1. Purpose of the processing.
2. Layouts or samples of the final reports and/or records, if the format is important, or a complete description of content, if the format itself is not vital.

3. A copy of the input documents (blanks as well as filled-in samples) with a description of the information fields, or a layout of the input data if machine-readable media will be furnished by the user. If the size of a data item is variable, a range of size should be given.
4. Number of records to be included in the master file and the expected growth factor. The estimate should give a range if there is a considerable difference in activity for different periods.
5. Definition of and responsibility for handling of exceptions.
6. Frequency of processing.
7. Timeliness.
8. Special requirements.
 - (a) Extra copies.
 - (b) Special reports required.
 - (c) Conversion specifications, including time limits, problems, etc.
 - (d) Accuracy specifications.
 - (e) Special security and control specifications.
 - (f) Alternative methods allowed.
9. Acceptance testing requirements, such as a test run.

In the proposal request submitted to the service center by the client, the level of detail describing the client's system requirements will depend on the capabilities of the client's staff and the outside professional advisers he may use. The request could also serve to indicate the documentation required.

Documentation should include the systems flowcharts, programming documentation, operating procedures, and control procedures. A copy of the current documentation of each tailored client program should be retained at the service center. Such documentation will be prepared in accordance with the service center's systems and procedures manual.

System and program documentation should be kept current as modifications are made. A sample Table of Contents for an extensive application manual is shown in Exhibit 2, pages 15-16. Standardized programs should be supported by similar documentation, even though it is not normally available to the user.

Application Manual

(Client Name)
(Application Name)

Table of Contents

- 1. Administration**
 - 1.1 Table of Contents
 - 1.2 Systems Correspondence
 - 1.3 List of Systems Problems
 - 1.4 Changes
 - 1.4.1 List of Changes
 - 1.4.2 Change Authorization
- 2. Existing System Review**
 - 2.1 General Flow Chart
 - 2.2 Document and Volume Analysis
 - 2.3 Cost Analysis
 - 2.4 General Notes
- 3. General Specifications of System**
 - 3.1 Purpose and Capabilities of the System
 - 3.2 System Configuration and Programming Language
 - 3.3 System Flowchart
 - 3.4 Narrative Description of Flowchart
 - 3.5 Management Report Layouts
 - 3.6 List of Programs
 - 3.6.1 Estimated Run Times
 - 3.6.2 Estimated Time for Programming
 - 3.7 Narrative Description of Controls
 - 3.7.1 Error Detection
 - 3.7.2 Error Correction
 - 3.8 List of Master File Requirements
 - 3.9 List of Source Activity
 - 3.10 List of Transactions
 - 3.11 Decision Tables
- 4. Program Specifications for New System**
 - 4.1 Individual Specifications for Each Program
 - 4.1.1 General Program Description
 - 4.1.2 Narrative Description of Program Functions
 - 4.1.3 Report Layouts
 - 4.1.4 File Layouts
 - 4.1.5 List of Applicable Transactions

EXHIBIT 2, cont'd

- 4.1.6 Appropriate Decision Tables or Block Diagrams
- 4.1.7 Items Useful for Clarifying Programming Requirements
- 4.1.8 Schedule/Performance Worksheet
- 4.2 System Test Data
 - 4.2.1 Input Data
 - 4.2.2 Expected Output
- 5. Programs**
 - 5.1 List of Programming Problems
 - 5.2 Programming Correspondence
 - 5.3 Program Listings
- 6. Manual Procedures (Client's Procedure Manual)**
 - 6.1 Data Processing Schedule
 - 6.2 Data Preparation Procedures
 - 6.3 Data Correction Procedures
 - 6.4 Report Handling Procedures
 - 6.5 Controls and Audit Procedures
 - 6.6 Maintaining Master Files and Tables
 - 6.7 Data Retention and Destruction
- 7. Data Processing Operations**
 - 7.1 Receiving (I/O Manual)
 - 7.1.1 Operational Flowchart
 - 7.1.2 Schedule
 - 7.1.3 Data Transmittal Letter
 - 7.1.4 Receiving Logs
 - 7.2 Data Preparation Instructions
 - 7.3 Computer Operations (Console Run Book)
 - 7.3.1 System Flowchart
 - 7.3.2 Run Sheets
 - 7.3.3 Parameter Card Layouts
 - 7.3.4 Operational Checks
 - 7.3.5 Sort Parameters
 - 7.3.6 Program Error Messages and Required Operator Action
 - 7.4 Quality Control (I/O Manual)
 - 7.4.1 Sample Reports
 - 7.4.2 Quality Control Checklist
 - 7.4.3 Distribution Instructions
- 8. System Conversion**
 - 8.1 Conversion Plan
 - 8.2 Conversion of Master Files
 - 8.3 Conversion Controls
 - 8.4 Personnel Training
 - 8.5 Parallel Operation
 - 8.6 Final Conversion
 - 8.7 Conversion Correspondence

User Documentation. The client should have a copy of appropriate documentation, as outlined in Exhibit 2, which may be less extensive than at the service center. The auditor should advise his client to obtain such documentation as the following:

1. Problem statement—purpose and capabilities of the system.
2. System flowchart.
3. Record and report layouts.
4. Program listings.
5. Program narratives.
6. Program flowcharts.
7. Operating instructions.
8. System configuration and programming language.
9. Conversion plan.

Documentation for standardized programs is often not available to users. The client should have reasonable assurance that such documentation exists at the service center. In addition to documentation produced by the service center, there should also be documentation in the user's files regarding

1. Procedures for preparing, submitting, and controlling input.
2. Procedures for error handling, correction, re-entry, and control.
3. Procedures for controlling receipt of output, review of output, reconciliation of output to input or other control totals, and distribution of output.

Summary

Service centers have assumed a major share of data processing activities for many companies. There is a high probability that service centers will be used increasingly in the 1970s. To determine the impact on auditing client records processed by service centers, auditors should be familiar with the types of service centers, as well as their organization and operation.

Information about service centers is available from a variety of sources. One important source of information is the ADAPSO Directory, a biennial listing of members, issued by the Association of Data Processing Service Organizations.

Chapter 2

Evaluating Controls at Service Centers

The presence of a service center does not in any way affect the auditor's objective—to *perform an audit in accordance with generally accepted auditing standards for the purpose of expressing an opinion on financial statements*. Nevertheless, the application of auditing *procedures* may be affected when financial information is processed by a service center.

Audit procedures to be applied are dependent upon the review and evaluation of the system of internal accounting control maintained by the user organization. Similarly, when the controls that are the responsibility of the service center are significant in regard to the user applications, audit procedures may also be dependent upon the review and evaluation of those controls at the service center. Thus, an evaluation of internal accounting controls, whether those of the user organization or service center, is basically performed within the same framework: "The purpose of the auditor's study and evaluation of internal control . . . statements is to establish a basis for reliance thereon in determining the nature, timing, and extent of audit tests to be applied."¹

This chapter addresses three questions concerning the auditor whose client utilizes a service center:

¹ AICPA, Statement on Auditing Standards No. 1 (New York: AICPA, 1973), section 320.06, p. 14.

1. When should the auditor consider a review of the controls at the service center?
2. What types of controls is he likely to encounter at the service center?
3. How should he approach his review of controls at the service center?

When to Review

A review of controls at the service center should be considered when the financial data processed by the service center has a material effect on the client's financial statements, unless the user controls relied upon, which are external to the service center, are adequate to provide assurance that errors and irregularities may be discovered with reasonable promptness, thus assuring the reliability and integrity of the financial records.

Before reaching a decision in regard to a review of the controls at the service center, the auditor must know what data the center is to process, what reports it is to produce, and how that data is to be reflected in such reports in order to be able to evaluate whether his client's control procedures are adequate to provide reasonable assurance that material errors or irregularities in the financial statements would be prevented or detected. Ordinarily, the auditor can gain this knowledge without visiting the service center. If the auditor decides to review the controls at the service center, he should consider the types of controls that may be used and be able to assess the relative importance of each.

Types of Controls

Controls are classified as either "accounting controls" or "administrative controls." In a computer system, it is often difficult to state whether a specific control is either an accounting control that "comprises the plan of organization and the procedures and records that are concerned with the safeguarding of assets and the reliability of financial records . . .,"² or an administrative control that "includes, but is not limited to, the plan of organ-

² Statement on Auditing Standards No. 1, section 320.28, p. 20.

ization and the procedures and records that are concerned with the decision process leading to management's authorization of transactions."³ However, "the overriding criterion inherent . . . is the bearing which particular controls have on the reliability of financial statements, regardless of their classification as accounting or administrative controls."⁴ This chapter reviews the *elements of control* in a computer system, but makes no attempt to classify these elements as either accounting or administrative controls as these relate to the relative importance of the controls in a specific situation.

Many of the specific controls presented in this chapter are similar to those that should be evaluated when a client has an in-house computer center. Because of these similarities, the reader is directed to the AICPA publication *Auditing & EDP* (Chapters 2 and 7) and to *Computer Control Guidelines*, published by the Canadian Institute of Chartered Accountants, for more complete description of these controls.

Controls

The controls over computer processing, although interrelated, can be categorized into those controls that generally affect all processing performed (General Controls) and those which affect a specific application (Application Controls).

<u>General</u>	<u>Application</u>
Plan of Organization	Input
Hardware	Programmed
Security	Output
Controls over Data and Programs	
Controls over Program Changes	

General System Controls. To obtain a knowledge and understanding of the procedures and methods prescribed for a data processing system at the service center, the auditor should in-

³ Statement on Auditing Standards No. 1, section 320.26, p. 20.

⁴ Statement on Auditing Standards No. 1, section 320.12, p. 16.

investigate the general aspects of control that apply to the computer system as a whole.

Plan of organization—A plan of organization provides appropriate segregation of duties so that the functions of authorizing and processing transactions and of maintaining custody of assets are effectively separated.

One of the most significant elements introduced when a client uses a service center is the presence of a processing system external—physically, operationally, and legally—to the client organization. Since a service center takes the place of the client's own data processing center, the auditor should be concerned with a proper segregation of duties among all persons involved. The auditor should therefore review the plan of organization and assignment of functional responsibilities in regard to both service center and client personnel involved in data processing.

The service center facilities may provide a better segregation of duties than may be found in many in-house operations. Even so, the auditor should determine specifically the effect on accounting control resulting from the access that programmers and operators may have to critical files, programs, and computer equipment. The auditor should also determine what procedures have been instituted by the service center to safeguard the client's assets.

Hardware controls—Use of the high degree of reliability of modern computer equipment to detect machine-based errors if they occur involves hardware controls.

Except where difficulties in processing are found to be a result of machine errors, the auditor can usually rely on the effectiveness of hardware controls. Some of these are operable, however, only if program instructions test the equipment indicators.⁵ Thus, it is advisable that the auditor have a general understanding of built-in hardware control features in order to evaluate the effectiveness of such machine checks when there are problems.

Another important element to be considered in a center's hardware controls is whether the computer is located at a different

⁵ See Davis, *Auditing & EDP*, p. 37.

organization. The hardware controls incorporated into a computer are usually not dependent on human stewardship; that is, the controls will continue to operate, having once been either designed into the machine or into the program. A review of error listings generated by computer processing will often display a malfunction of a hardware control when it occurs. Therefore, if the auditor finds it necessary to review controls at the service center, he may decide to review these listings for the possibility of hardware control malfunctions. He should also confirm the adequacy of the center's follow-up procedures regarding errors by testing the operation of those procedures.

Security controls—The procedures and physical characteristics of techniques safeguarding programs, data, and equipment to ensure continuity of computer processing in accordance with management's objectives constitute security controls.

The auditor should be concerned with the control techniques used to ensure the security of client programs, files, and data. When processing client data, the service center usually maintains the client files and records; this makes possible either deliberate or accidental manipulation of the programs, files, and records by unauthorized personnel. Locations of the files and records may also limit the auditor's access to the records and cause problems with regard to the timing of his evaluation of the records produced by the service center.

To ensure effective security of client programs, data, records, and reports, the following control techniques may be used:

1. Limit access to the service center to authorized personnel.
2. Employ codes instead of detailed descriptions in dealing with confidential information. (Confidential data may include payroll information, prices, customer account balances, etc.)
3. Have client employees in attendance for confidential processing.
4. Place documents, reports, and files in secure storage facilities when they are not in use.

Controls over data and programs—When the processing at the service center has been completed, reports and original docu-

ments should be returned to the client without delay. Confidential reports should be packaged as soon as they are released and then stored in locked containers while awaiting pick-up. Master files should be returned to the service center library.⁶

The auditor should determine the client's control over *master-file changes*. Lack of control over these changes could lead to operating problems and errors. The service center should provide the client with control totals of master-file records processed in each run so that he can check for loss or nonprocessing of master records. The center should also provide the client with a transaction list of all master-file changes so that he can determine that these changes have been authorized and properly made.

The service center should have procedures to provide security against accidental destruction of records and to ensure continuity of processing. Such provisions as back-up files, off-premises storage, operating instructions, and fire protection procedures should be reviewed. The client should also have sufficient insurance to cover loss of data and file reconstruction costs. It is advisable for the client to consider such insurance even though the service center may carry its own, since the client has no direct control over the amount or nature of the center's coverage. The reliability, dependability, and financial stability of a service center can also be important factors in the center's ability to ensure continuity of processing.

Controls over program changes—The auditor should also identify the procedures and documentation for controlling program revisions involved in processing client data. The auditor should evaluate

1. The process of authorizing revisions and the persons responsible for authorizing and approving the changes.
2. The documentation of program changes that should provide an accurate chronological record of the system.
3. The procedures used to test the program changes.

⁶ The Canadian Institute of Chartered Accountants, *Computer Control Guidelines* (Toronto: CICA, 1970), pp. 107-109.

Application controls—Application controls consist of techniques encompassing input, processing, and output controls to ensure the complete and accurate processing of data.⁷ In the auditor's review of the client's system of internal control, he should be concerned with the ability of the data processing system to generate accurate, complete, and authorized financial and accounting data. The application controls established at the service center are mainly to ensure accurate processing of data received from the client. It is normally the client's responsibility to establish the necessary input/output controls for the data submitted for processing and to ensure that the output received from the service center agrees with the input submitted.

Input controls—Procedures established to ascertain that all input data is complete, accurate, and authorized when sent for processing are input controls.

The service center is responsible for the orderly, supervised, accurate, and reliable processing of data transmitted from the client. To ensure this, service centers usually perform editing functions on the incoming client data. The editing function of the computer examines each element of information and accepts or rejects transactions according to the validity or reasonableness of quantities, amounts, codes, and other data contained in the input record. Computer editing can detect errors in input preparation that have not been detected by human review and inspection.

Input control may also be established by keeping copies of all source documents sent to the service center, by developing control totals (documents counts, dollar total, etc.) on data sent or transmitted for processing, and by reconciling these input control totals with control totals furnished by the service center upon the completion of the processing. The auditor may review these controls by examining the procedures which govern the preparation and coding of input, the input forms, and other means employed by the client to establish control over data sent or transmitted to the service center for processing.

⁷ See Davis, *Auditing & EDP*, Chapters 2 through 7; Canadian Institute of Chartered Accountants, *Computer Control Guidelines*, Chapter V.

Programmed controls—Procedures established to ensure that all data is accurately processed are known as programmed controls.

The auditor may review the types of controls used to detect and correct errors in processing. The client might be able to provide such information since he should be aware of what types of errors can occur, what responsibilities he has to prevent and detect errors, and what types of errors will be detected by the computerized portion of the processing. The auditor most likely will need to interview service center personnel to understand the controls built into the service center's computer program to detect input errors and errors in processing. The auditor also will want to check the effectiveness of procedures for recording errors and controlling corrections and resubmissions.

Computerized editing as a programming control is achieved by installing checks in the service center's program of instructions or editing routines for detecting errors—hence the term “programmed controls.” Types of programmed controls include valid code tests, incomplete data tests, sequence tests, and tests of reasonableness.

Output controls—Procedures instituted to ensure that output is reconciled to input, that all errors are properly corrected and re-entered on a timely basis, and that output is produced and distributed on a scheduled basis are output controls.

The auditor should review the effectiveness of output controls to determine that the processed data is correct and does not include any unauthorized alterations. The most basic output control is the client's comparison of the control totals established on input data with the control totals developed by the service center during the processing of the data. Periodic sampling of individual items processed affords another output control. And the reports, obviously, should be reviewed by the client for reasonableness.

Audit Trail

The ability to (1) trace any transaction or source document forward to a final total and (2) trace any final total back to component transactions or source documents forms the audit trail.

The auditor should determine whether the records maintained by the client and at the service center provide an audit trail. The

audit trail may be traced by the service center's listing of all input data processed, by periodic printouts of ledger balances and contents of master files, or by retaining machine-readable data.

Audit Approach

The auditor whose client uses a service center should determine the extent to which the service center is used in processing the client's accounting and financial data. If the auditor finds that the data being processed has audit significance, he must decide whether a review of the controls at the service center will be necessary. Service center processing can be divided into two categories:

1. The processing of a client's statistical data.
2. The processing of a client's financial data.

Service Center Processing of Statistical Data. In those cases where only statistical data is processed, the auditor would not be directly concerned with the processing if such processing had little or no effect on his examination of the financial statements. For example, after developing a sales control total, a client may send copies of invoices to a service center that prepares sales summaries by customer, salesmen, and product groupings. Such statistical data may sometimes influence the way the client plans and conducts business operations. The sales summaries might be used in developing marketing plans, profit plans within product groups, and inventory control models.

Service Center Processing of Financial Data. When a service center processes client financial data, the auditor's first step is to evaluate the significance of the application(s) processed. The auditor must then determine, where significant, the nature and extent of the system of internal control maintained by the client organization over these applications. The auditor may then determine whether or not a review at the service center is required for any application, basing his decision on these factors:

1. The materiality of the application.
2. The nature of controls maintained by the client organization.

3. The nature of the controls at the service center and their bearing on the reliability of the financial records.

The results of this review and evaluation process will be used in determining the nature and extent of audit procedures to be applied.

Consider this example of a bank processing payroll applications for many customers and also performing on-line accounting for several savings and loan associations in the area. In the auditor's judgment, the nature of the payroll processing did not require a review of the service center's controls, but rather an evaluation of the client's input and output controls and a test of data in the payroll records. However, in his judgment, the nature and extent of controls maintained at both the client location and the service center for the savings and loan application were significant in determining the reliability of the financial records and therefore required review.

System Evaluation

To evaluate the controls, the auditor requires

. . . (a) knowledge and understanding of the procedures and methods prescribed and (b) a reasonable degree of assurance that they are in use and are operating as planned.⁸

These two phases of evaluation are referred to hereafter as "review of the system" and "tests of compliance" with the system. Once the auditor has decided to evaluate the controls at the service center, he might consider using an approach similar to the one outlined in the following paragraphs.

Review of the System. A review of the system would encompass an understanding of the general systems controls and the application controls. A useful starting point for the auditor in reviewing the system is the client's documentation of the application, which may give information about the procedures and methods involved. The written information supporting and defining the tasks delegated to computer processing is known as documentation.

⁸ Statement on Auditing Standards No. 1, section 320.50, p. 27.

Reviewing documentation is of great assistance to the auditor's understanding of how client information is processed. Documentation reviews generally involve information provided both by user and service center; thus, a coordinated review of documentation at both locations is often necessary. Coordination of review procedures is required because changes—in personnel, in duties, in authorized program instructions, etc.—may not be fully documented at either location, whether by design or through lack of specific reporting criteria. The mere absence of documentation, while it may expose the service center and/or the client to operating problems, may not necessitate additional audit steps when other controls are satisfactory.

The auditor will have several purposes in reviewing the different elements of documentation. For example, the auditor could review sufficient documentation to build an understanding of both management objectives (problem statement) and the manner in which these objectives will be attained (system flowcharts, narratives, program listings). The computer file and record and report layouts describing the organization of computer-readable data may also serve these objectives. In addition, documentation could provide the auditor with the information necessary for the use of computer-assisted audit techniques.

The auditor's review of the client's documentation should be supplemented with inquiries of client and service center personnel as to the overall control aspects of the data processing center. Questions such as those listed in Appendix A, Part I, can assist the auditor in obtaining information about the controls. Part I covers some of these aspects, such as organization, documentation, program change procedures, and file protection and security.

Once the auditor has gained an understanding of the general systems controls, his next step is to obtain information on the details of the application controls. The questions in Appendix A, Part II, provide guidance in reviewing input, processing and output controls, master file change procedures, and error correction and resubmission procedures for each application.

Ordinarily, the information obtained through the auditor's initial investigation of the system can be supplemented by tracing a few of the different types of transactions involved through the related documents and records maintained. The purpose of these

limited tests is to clarify the auditor's understanding of information obtained through discussions with client personnel and reference to systems documentation. There are sometimes difficulties, however, in the process of tracing transactions through a computerized system; the auditor should be aware of these in the process of testing.⁹

Upon completion of the review process, including limited testing, the auditor should have a sufficient understanding of the system to make a preliminary evaluation of its strengths and weaknesses and to determine the nature and extent of additional tests required.

Tests of Compliance. A second step in the evaluation consists of tests of compliance to see if the system described does exist and operate effectively. The nature and extent of testing for compliance will depend upon (1) the initial review of accounting control, (2) the nature of the application, and (3) the availability of data. If the application being evaluated is documented and a hard copy audit trail exists, the auditor may test the client's compliance in performing prescribed controls and procedures by checking source data, control reports, error listings, transaction listings, and management reports.

Most service center processing consists of batch-processing systems or batch-controlled systems having detailed audit trails. This type of processing is characterized by the following:

1. The collection of transactions in batches processed against a master file. This process normally involves the development of batch totals to control the movement of data within the system.
2. The recording of transactions manually, followed by conversion to machine-readable form.
3. The production of reports, often at each processing run.¹⁰

In batch-oriented systems, the auditor performs tests on available source documents, transaction listings, and output records

⁹ See Davis, *Auditing & EDP*, Chapters 10 and 11.

¹⁰ See Davis, *Auditing & EDP*, p. 134.

in essentially the same manner as he would for a noncomputer system. A typical audit approach in a batch-oriented system is outlined in the payroll case study in Appendix B. It illustrates the audit approach in a payroll application processed by a service center, the auditor's testing of the system without use of the computer, and the evaluation of output produced by the system.

Another method of testing compliance is to use the computer by introducing test data through the service center processing system. For example, in the payroll case study, test data could have been prepared by the auditor and processed by the service center program to test payroll computations and preparation of paychecks, check register, and payroll register. Such data normally consists of transactions illustrating valid and invalid conditions that the auditor wishes to test, such as wrong pay-rate, abnormal number of hours worked, and employee for which there is no master payroll record.

The test data approach is not often used by auditors because of the availability of a visible audit trail in most systems and because of the problems and technical requirements involved in the test data approach. Some of these problems and requirements follow:

1. Test data are difficult and time-consuming to prepare if all potential situations are to be tested. Preparation of test data requires an extensive knowledge of the system in order to determine what controls are in existence so that the auditor knows what should be tested.
2. Processing requires testing of all runs, often consuming considerable computer time. Processing of test data can also distort master files, often forcing the auditor to create dummy master files.
3. The auditor must confirm that the program he tested is the actual program used for processing normal data during the period under audit. This may require detailed comparison of the program currently used with the program previously tested; this, in turn, requires maintaining a separate, independent control copy of the program. The auditor may also have to make a surprise visit to the service center to observe processing of the program and to retest the program being run to verify that the center is using the tested program.

Some of the auditor's tests of compliance with internal control procedures may be performed on the same sample items simultaneously with tests of the validity, classification, and other substantive aspects of transactions and balances—tests that are sometimes called dual-purpose tests.¹¹ A test such as aging of accounts receivable is sometimes performed at the same time and on the same sample items used to validate the existence of the item selected.

Evaluation of Controls. Before beginning evaluation of controls, the auditor should have completed the following steps:

1. Gained an understanding of the system, including processing and controls performed by the service center.
2. Performed compliance tests to ascertain that the controls function as designed.
3. Obtained the information needed to evaluate his client's control over the data processed at the service center.

The evaluation of the system is achieved through an understanding and testing of the client's system of internal control, including the processing performed by the service center. This evaluation should be made, in most cases, by discussions with client and service center personnel and may include testing at the service center.

When this has been completed, the auditor is in a position to make an evaluation of the effectiveness of the client's internal control system and to determine what additional audit procedures are required. These procedures may take the form of tests of the system and/or tests of the account balances resulting from the system.

¹¹ See D. R. Carmichael, "Tests of Transactions—Statistical and Otherwise," *The Journal of Accountancy*, February 1968, pp. 36-40.

Chapter 3

Accumulation of Evidential Matter

The review and evaluation of controls at a service center was described in Chapter 2. This evaluation is performed within the following framework:

Since the purpose of the evaluation required by the second standard of field work is to provide a basis “for the determination of the resultant extent of the tests to which auditing procedures are to be restricted,” it is clear that its ultimate purpose is to contribute to the “reasonable basis for an opinion” comprehended in the third standard . . . :

Sufficient competent evidential matter is to be obtained through inspection, observation, inquiries and confirmations to afford a reasonable basis for an opinion regarding the financial statements under examination.¹

The auditor should consider whether some of his procedures for the accumulation of competent evidential matter should be performed at the service center. In developing this evidential matter the auditor may use the techniques discussed in this chapter.

Much of the output from the service center processing may take the form of visible records such as aged trial balances for accounts receivable, inventory listings, sales and cash receipts registers, and payroll registers. Such records may be evaluated

¹ Statement on Auditing Standards No. 1, section 320.69, p. 33.

by using traditional auditing methods, such as performing arithmetical calculations and tests, selecting samples from printed listings, tracing selected items to supporting records and authoritative documents, and/or confirming directly with outsiders. For example, in the payroll case study, Appendix B, the auditor was able to perform audit procedures using printed records produced from machine-readable records.

Normally, the client's printed output is prepared from machine-readable output such as magnetic tapes and magnetic discs. Hence the auditor may use the computer for evaluating records by developing or obtaining computer audit programs and processing machine-readable records with them. For example, a CPA firm might request the client's service center to provide magnetic tape files or copies containing the client's accounts receivable records. The CPA firm could then process these tape files with computer audit programs to select accounts for confirmation purposes and to perform tests of clerical accuracy. In the payroll case study, the auditor might use computer audit programs to select samples from the payroll master file for tracing to supporting personnel records, as well as for other audit tests of payroll records.

Use of Computer Audit Programs

A computer program can be of great assistance in performing audit techniques since it can be used for any computational or comparative task for which quantitative criteria can be established. Examples of these types of tasks in auditing include the following:

1. Examining records for quality, completeness, consistency, incorrect items, and so forth.
2. Selecting and printing audit samples.
3. Testing calculations and making computations.
4. Summarizing data and performing analyses useful to the auditor.
5. Comparing the same data maintained in separate files for correctness and consistency.
6. Comparing audit data with company records.

Examining Records for Quality. The quality and condition of visible records can be readily observed as the auditor makes use of them in his audit examination. If the auditor obtains a complete printout for use in his evaluation, the records can be tested for evidence of unsatisfactory record-keeping. If the records are in machine-readable form, the auditor has the option of using the computer for testing and examining the records. In the payroll example, a computer program could examine the payroll master file to detect employees with an unreasonable pay rate. Accounts receivable files might be examined to determine the number of records in which there is no credit limit specified.

Selecting and Printing Audit Samples. A computer can be programmed to select audit samples in several ways, including statistical sampling techniques. The samples selected can be used for conventional audit tests such as confirmation, price test of inventory items, physical observation, and tracing to supporting documents. Multiple criteria—as in random sampling of items under a certain dollar amount—may be used in the selection, plus all items having certain characteristics such as high dollar values.

Testing Calculations and Making Computations. The computer can be used to test the accuracy of computations and to perform the quantitative analyses necessary to evaluate the reasonableness of client representations. The speed and low cost per computation of the computer means that only a small amount of extra time and expense is required to perform the test on all records rather than a sample. This does not mean that validation of all records is required, but in some cases less time is needed than in a sample approach. It may be more efficient, for example, to verify all inventory extensions in a file than to test extensions of a sample drawn from the file.

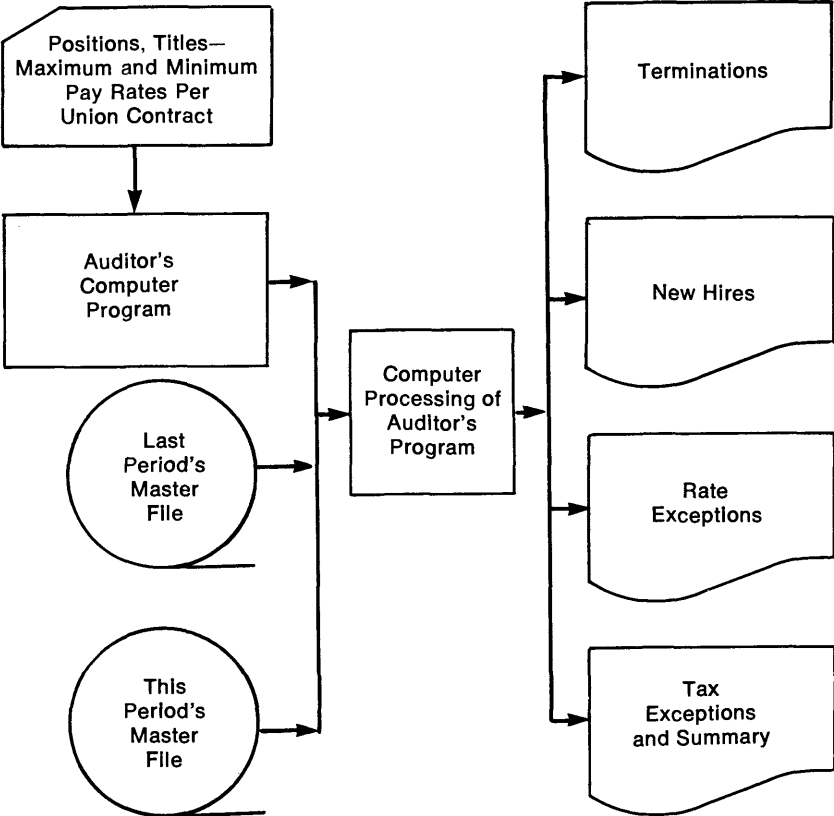
Summarizing Data and Performing Analyses Useful to the Auditor. The auditor frequently needs to have the client's data presented in different ways so that they may be analyzed and summarized. Examples are aging of accounts receivable and preparation of reports on the annual usage of inventory compared with the number of items on hand. As a result, it may be necessary to make special arrangements with the service center to obtain the reports that the auditor needs.

Comparing the Same Data Maintained in Separate Files for Correctness and Consistency. Where separate records should contain identical information, the computer can be used to determine if the information agrees. For example, the pay rates on a payroll master tape might be compared with the pay rates used in computing the payroll as shown on a transaction tape.

In our payroll case study, two payroll master files prepared at different periods during the year could be selected and processed with computer audit programs as shown in Exhibit 3, below.

EXHIBIT 3

Computer Audit Program



The computer audit program could perform the following:

1. Identify all terminations during the period—employees appearing on the prior master file but not on the current file.
2. Identify all hires—employees on the current file but not on the prior file.
3. Compare pay rates in the two files and print out all changes other than standard increases called for by union contract. (Rates in the union contract would be built into the audit program.)
4. Calculate and summarize social security and federal income taxes withheld.

Listings of the foregoing data could then be traced to personnel and other records and those records could then be traced to the listings.

Comparing Audit Data With Company Records. Audit data can be compared with the client's records by using computer programs. This audit data should first be converted to machine-readable records. Inventory test counts, for example, can be key-punched and compared with the physical inventory records. Based on this comparison, a list of exceptions is printed.

Obtaining a Computer Audit Program

Three approaches have been used to obtain suitable computer programs for use in evaluating and testing machine-readable records:

1. Programs written by the service center.
2. Programs written by or under supervision of the auditor.
3. Generalized computer audit programs.

Programs Written by Service Center. Sometimes the analysis desired by the auditor can be made by programs or routines in programs developed by the service center. The payroll example in Appendix B illustrates the availability of a program to print the payroll master file.

Frequently, a service center will have a program designed to select samples from files; for example, a service center, in cooperation with an auditing firm, could write programs and make them available to other auditors whose clients use the service center. These programs could make it possible to

1. Balance and analyze account files.
2. Select and print confirmation requests.
3. Prepare listings of confirmations requested.

If the auditor is to use a program prepared by the service center, he should assure himself that the program is functioning both correctly and according to his requirements. To confirm its accuracy he *may* perform such validation procedures as these:

1. Reviewing and evaluating the source program.
2. Obtaining a copy of the source program deck and having it compiled under his control and supervision.
3. Preparing and using test data to determine if the program is performing the desired audit tasks.
4. Manually testing the output report by reference to supporting records.

Programs Written by or Under Supervision of the Auditor. The steps involved in preparing a computer program to perform audit functions are only briefly described here, since a computer audit program is written in the same way as any other computer program.² In developing these programs, there are essentially five phases: (1) determining audit objectives and procedures, (2) developing systems flowcharts, (3) developing program flowcharts, (4) coding, assembling, and testing programs, (5) controlling the processing of the programs. The extent to which the auditor should perform each of these tasks depends upon the requirements of the particular audit engagement.

Generalized Computer Audit Programs. Equipment manufacturers and other organizations involved in supplying computer

² See Davis, *Auditing & EDP*, Appendix B.

programs to clients have been developing generalized programs, or software, for a number of years. The availability of such programs is a great aid to personnel using the computer, since these programs may eliminate the need for developing original programming flowcharts, source language instructions, and assembly and test of programs. Generalized computer audit programs—if developed, designed, and tested properly—are available for use in performing audit functions with a minimum of preparation on the part of the auditor.

Generalized computer audit programs typically consist of a set of audit routines that can be employed for a variety of audit and management purposes. These routines can be used on a wide variety of records and applications without requiring special programs for each type of application processed. A number of generalized audit programs have been developed by public accounting firms and software companies and are available to the public accounting profession.

Planning the Review

Because of the nature of service center operations, which includes servicing many customers, the initial planning should be performed well in advance of the audit date.

Arrangements should be made for the retention of files needed by the auditor. Machine-readable files are usually not retained for more than several processing cycles—two to five days if the cycle is daily. To the extent the auditor wishes to obtain files in machine-readable form, or even to have printouts of the files, he will need to coordinate his planning and needs with the client and service center in order to have the data available. The auditor should review the adequacy of the service center's file back-up procedures before processing data files.

The auditor should also arrange for computer time to process the machine-readable files. If time is not available at the client's service center, or if he wishes to use other processing facilities, the auditor may make other arrangements that would include the duplication of the applicable computer files with the approval of the client and service center.

Chapter 4

Third-Party Review of Service Centers

As discussed in Chapter 2, a review of controls at a service center should be considered when the financial data processed by the service center has a material effect on the client's financial statements, unless the user controls relied upon, which are external to the service center, are adequate to provide assurance that errors and irregularities may be discovered with reasonable promptness, thus assuring the reliability and integrity of the financial records.

An auditor (referred to as the "user auditor") could make use of a description of the system and the controls at a service center in evaluating his client's system of accounting control if that description has been examined and tested by another independent auditor (referred to as the "third-party auditor"). This chapter discusses such an examination by a third-party auditor to be employed as a source of information by a user auditor. The third-party auditor takes responsibility for the description of the system and its controls. The user auditor is responsible for evaluating the controls in his client's system, including the elements of control at the service center.

The Rationale for Third-Party Review

A service center that processes, for different customers, similar applications using the same computer programs, which have a significant impact on the financial data of each of its users, could be the subject of a third-party review. The review and evaluation of controls at a service center by many auditors may present

problems if the management of the service center is frequently requested to participate in the examination of their controls, procedures, etc. When a service center has standardized processing for clients, each auditor would ask comparable questions. In addition, each auditor would be performing his work in a similar manner and often at approximately the same time of year—a potentially significant burden for service center management.

The duplication of reviews and the complexities of a service center computer application may justify, as one practical alternative, the use of a third party to review the system and controls at the service center. If independent auditors are to use this review, it should be performed by another independent auditor.

Third-party reviews have been performed by independent auditors in service center processing. The savings and loan case study in Appendix C provides an example in which a third-party review was conducted. The Committee on Auditing Procedure in Statement on Auditing Procedure No. 49 specifically identified the usefulness of a report on internal accounting control between two independent auditors.¹ The auditors of one organization may delegate to other auditors the activity of reviewing those aspects of internal control in another organization that are relevant to the delegating auditors' examination. However, the user auditor retains the *responsibility* for evaluating internal control as it affects his examination even though he may use the report of another auditor as a source of information in performing his evaluation.

¹ Statement on Auditing Standards No. 1, section 640.04, states

Management is responsible for establishing and maintaining internal accounting control. Regulatory agencies may be concerned with such control because it is relevant to their primary regulatory purpose or to the scope of their examination functions. Independent auditors of one entity or organization unit may be concerned with internal accounting control of another because it is relevant to the scope of their examination. It may be presumed that these groups include persons whose training and experience or intimate knowledge of the organization should provide a reasonable basis for understanding the nature and effectiveness of internal accounting control and the auditor's evaluation of it. Consequently, it is evident that reports on internal accounting control can serve a useful purpose for management, regulatory agencies, and other independent auditors.

Therefore, when a review of the system and controls maintained by the service center is judged necessary or desirable by the independent auditor, either he or another independent auditor may perform the review.

Scope and Use of Third-Party Review

The third-party auditor may be engaged by either the user, the user auditor(s) or by the service center. The cost of the review may be borne by the user auditors, users of the service center, or the service center itself, as agreed to by the parties involved. In accepting such an engagement, the third-party auditor should recognize that, although the nature of his service may be substantially different from that required for an examination of financial statements in accordance with generally accepted auditing standards, his services should be performed in accordance with those standards which are applicable—specifically, the general standards and the first and third standards of field work.

Scope of Third-Party Review. When the third-party auditor is engaged by the service center, he is responsible for defining the scope of his work. His report would be addressed to the center. If the user auditor is able to satisfy himself as to the independence and professional reputation of the other auditor, he may utilize the third-party auditor's report as a source of information in performing his evaluation of accounting control. Additionally, the user auditor may want to perform one or more of the following procedures:

1. Visit the third-party auditor and discuss the audit procedures followed and results thereof.
2. Review the audit programs of the third-party auditor. In some cases, it may be appropriate for the user auditor to request the performance of additional audit steps by the third-party auditor.
3. Review the working papers of the other auditor.

If the third-party auditor is directly engaged by the user auditor, then the user auditor is responsible for defining the objectives

and the third-party auditor must determine the scope of the review. The third-party auditor's work would be performed under the user auditor's guidance and control. In this instance, the third-party auditor's report would be addressed to the user auditor. Although the source of the engagement may differ, the resulting report can serve the same objective, namely, to provide a reasonable basis for allowing the user auditor to evaluate the control over that portion of his client's accounting system maintained by the service center.

A third-party review of a service center that uses standardized programs for many users is ordinarily limited to reviewing and testing the service center's processing and the related controls; it would not include consideration of the user's procedures and controls external to the service center operations. The supporting workpapers and report of the third-party auditor would generally be made available to the user auditor. Such support would ordinarily include the following:

1. Operational, administrative, and programmed controls in effect at the service center.
2. A sufficiently detailed description of the system.
3. The nature and extent of the tests performed at the service center by the third-party reviewer.
4. The results of the tests.

The report of the third-party auditor could be used by the auditors of the various users as a part of the evaluations of their client's entire system of accounting control. The user auditor should consider the third-party auditor's report in conjunction with his review of his client's procedures in evaluating his client's accounting control. A third-party auditor's review will generally follow the procedures discussed elsewhere in this guide.

Time Period of the Report. The third-party auditor's report should cover the time period during which the review of the activities of the service center was conducted. If the user auditor does not consider that period satisfactory for his purposes, he should take those steps he considers necessary, including requesting additional review by the third-party auditor, or visiting the

service center himself to perform additional review. It may be appropriate for the third-party auditor to review the service center several times during the year as a part of the arrangement.

Content of Third-Party Report on Service Center Processing and Accounting Control. The report² of the third-party auditor should include the following:

1. A statement as to the scope of the examination and as to whether both a review of the system and tests of compliance were included.
2. The service center's system description, including the controls. This should either be included or incorporated by reference in the report.
3. The time period covered by the examination.
4. An opinion as to whether or not the system and system controls conform to the service center's system description during the period under review.
5. A disclaimer of opinion as to the adequacy of accounting control with respect to each user's application and with respect to the accounting controls of the service center itself. (Conclusions concerning these matters can be formulated only by the user auditor upon consideration of both his clients' internal accounting controls and those at the service center.)
6. Comments concerning unsatisfactory conditions in the accounting controls in the system and recommendations for correction. This would include reporting the absence or non-operation of controls in the following categories:
 - a. Controls which the service center's management have represented are in existence but which are either not in existence or not in operation.
 - b. Controls which the service center's management have not represented are in existence but which, in the judgment of the third-party reviewer, are desirable.

² Guidelines for this form of report are contained in Statement on Auditing Standards No. 1, sections 640.17-640.18, pp. 180-181.

Use of Third-Party Review. Even with third-party reviews, cases will arise when in the user auditor's judgment it is appropriate for him to make some direct examination of the service center's system of control and to apply additional auditing procedures. The determination of the extent of additional procedures to be applied in such circumstances rests with the user auditor alone in the exercise of his professional judgment. Accordingly, the user auditor should not make reference in his report to the report of the third-party auditor.

Regardless of the user auditor's decision concerning the need to apply additional procedures, the third-party auditor remains responsible for the performance of his examination as defined in his report and documented in his workpapers.

Third-Party Reviewer's Report. Exhibit 4, pages 45-46, is an example of a third-party reviewer's report. The auditor may use this report as a part of his evaluation of accounting control when setting the scope of his examination. Before completion of his audit, the auditor should inquire of the service center management and the third-party auditor as to whether any changes have been made in the system that would have a significant impact on continued operation in conformity with the system description; the auditor also should consider obtaining written representations concerning such matters.

In cases where there are exceptions to be reported or additional controls that are considered to be desirable, the third-party auditor should employ the specific guidelines contained in sections 640.12 through 640.14 of Statement on Auditing Standards No. 1.

A Sample Report for A Third-Party Auditor's Review

XYZ Service Center, Inc.
123 Main Street
Anyplace, New York 10315

We have reviewed and tested to the extent we considered necessary the accompanying descriptions of the system, procedures, and controls for the on-line savings and mortgage loan system of the XYZ Service Center, Inc. during the period from January 15, 197X through March 31, 197X.

Our review and tests were limited to activities at the XYZ Service Center, Inc., and did not include consideration of procedures performed by customers of the service center.

In connection with our review and tests, as discussed in further detail in our attached supplemental report, we performed the following procedures:

1. We reviewed the organization and the procedures for documenting program changes, file protection, and security of user records.
2. We reviewed program documentation.
3. We reviewed controls related to the input, processing, and output phases of the applications.
4. We observed, on a test basis, operations on each shift.
5. We tested processing under normal operating conditions.

Our attached supplemental report includes the descriptions of the system, procedures, and controls for the on-line savings and mortgage loan system, a description of the scope of our review, and a description of the tests performed and the results of these tests.

In our opinion, the on-line savings and loan mortgage system and system controls of the XYZ Service Center, Inc. during the period January 15, 197X, through March 31, 197X conformed with the accompanying system description.

Because our review and tests were limited to the attached system description and related procedures performed by the XYZ Service Center, Inc., and did not extend to procedures performed by customers or to other procedures performed by the Center, we express no opinion on the adequacy of internal accounting controls as they apply to either a specific customer of the XYZ Service Center, Inc., or to the Center itself.

This report is intended solely for distribution to auditors of customers served by the XYZ Service Center, Inc. Distribution to other parties is not authorized.

Signature

March 31, 197X

EXHIBIT 4, cont'd

Alternative Wording for Opinion Paragraph When System Does Not Conform to Description

In our opinion, the on-line savings and mortgage loan system and system controls of the XYZ Service Center, Inc. during the period January 15, 197X through March 31, 197X conformed with the accompanying system description except as set forth below:

1. On page XX, the system description states, "The system is designed to ensure that correct files are always processed." During our review of the system, we noted a number of instances in which files did not have external labels. Also, we noted that the internal file labels were not, in all cases, prepared in a form that would enable the operating system to accurately test and verify the content of the file to be processed. This could contribute to the processing of the wrong file for a particular application.
2. On page XX, the system description states, "Complete backup is provided for all files at an off-premises facility." On a weekly basis, the service center duplicates all files and stores them at an off-premises location. During our review, we noted that no backup of daily transactions was maintained in computer readable form. If, during the week, the transaction files were destroyed, all transactions for the week would have to be reprocessed to create a replacement file.

Alternative Wording for Opinion Paragraph When Essential Controls Are Lacking

In our opinion, the on-line savings and mortgage loan system and system controls of the XYZ Service Center, Inc. during the period January 15, 197X through March 31, 197X conformed with the accompanying system description. However, it came to our attention that documentation is either incomplete or missing in a number of instances. The lack of documentation may make it difficult to revise or amend client accounting applications.

Statement of Committee Member Who Qualifies His Assent to the Publication of This Audit Guide

Mr. DiGiorgio assents to the publication of this guide with the following qualifications:

He believes the guide should be more specific to help auditors avoid placing undue reliance on the processing controls in a computerized system. It is his view that undue reliance may result when tests of computer output, undertaken to establish compliance with the system or, alternatively, to satisfy audit objectives through other auditing procedures, are not sufficiently comprehensive to disclose that significant computer program processes perform as intended.

He believes that the guide should emphasize that the second standard of field work requires that the auditor auditing a computerized system needs to confirm his understanding of what the computer program does. Further, he believes that the auditor's compliance tests of the system of controls over data processing will need to disclose that any significant decision rule in the computer application program functions as intended if he is to rely on these controls in determining the nature, timing, or extent of substantive tests.

This emphasis would be consistent with the generally held view that the most critical problem facing the auditor auditing a computerized system is that of obtaining assurance that the proper decision rules were designed and implemented and are functioning within the system. The emphasis would also appear to be consistent with the conceptual logic in the approach to an auditor's evaluation of controls (SAS No. 1, section 320.65) and should help to reduce the risk that material errors could occur from the computer process by which the financial statements are developed or that such errors would not be detected in the auditor's examination.

It is also his view that, where tests of the system of processing controls are judged to be impractical, and other auditing procedures are undertaken instead of compliance tests, the auditor will need to

1. Determine the cumulative effect of any errors caused by weaknesses in the computer program design, since all similar transactions processed will also result in errors.
2. Assure that the tests of transactions that were undertaken are sufficient to disclose that each significant decision rule in the computer application programs that produce the financial data being audited functions as intended.

Typical Accounting Control Questions

This appendix contains a list of typical questions for use in obtaining information on internal control where financial applications are processed by a service center. The control categories below should be reviewed for each significant financial application processed by the service center. The review of the application should be carried out in the context of the entire processing cycle, including both computer and noncomputer processing and controls and both client and service center controls.

The number of questions to be included in a review program and the extent to which each control area is evaluated depends somewhat on (1) the audit significance of the application being processed and (2) to some extent, the auditor's desire to offer constructive suggestions to the client.

Part I includes areas relating to the overall operation of the data processing service center; Part II includes questions relating to an individual data processing application. This division reflects the fact that the organization, the policies, and the procedures of the installation provide an overall control environment in which individual applications are run. This environment should be understood before the controls associated with individual applications can be evaluated.

The questions are so worded as to require a description by the client of control procedures rather than a "yes" or "no" answer. The auditor, after determining what the procedures are, must then evaluate the effectiveness of the controls to establish a basis for reliance thereon and to determine the extent of his audit tests.

Part I

This part refers to the overall operation of the service center and applications processed.

Equipment Configuration and Application Summary

1. Determine manufacturer and model number of computer, internal memory size, and operating system used.

2. List input/output devices, e.g.,
 - Magnetic tape.
 - Disc.
 - Card reader and punch.
 - Paper tape reader.
 - Printer.
 - Communication terminals.
 - Other.
3. Obtain or prepare a list of the applications processed for the client by the service center indicating
 - Processing frequency.
 - Tailored or packaged system.
 - Cost of processing.
 - Method of converting source documents to machine-readable form.
 - Manner in which data is transmitted to and from the service center.

Organization

1. Obtain or prepare a brief description of the service center organization and an organization chart, if available.
2. Determine what consideration has been given to the reliability, dependability, and financial stability of the service center.
3. Obtain a copy of and review the client's formal agreement with the service center and determine if it has been reviewed with client's legal counsel.
4. Determine what independent person or group is charged with responsibility for the control function in the service center, which includes
 - (a) Control over receipt of input data and recording of control information.
 - (b) Reconciliation of control information (batch-control with computer control totals, run-to-run controls, etc.).
 - (c) Control over distribution of output.
 - (d) Control over errors to insure that they are reported, corrected, and reprocessed.
 - (e) Review of console logs, error listings, and other evidence of error detection and control.
5. How does the person or group responsible for control over

- processing maintain independence from the person or group responsible for the operation of the equipment?
6. How are duties segregated so that the functions and duties of system design and programming are separate from computer operation?
 7. What controls exist to prevent programmers from operating the computer during regular processing runs?
 8. How are computer operators restricted from access to data and program information not necessary for performing their assigned task?
 9. How are employees in data processing separated from all duties relating to the initiation of transactions and requests for master-file changes?
 10. How are the operators assigned to individual application runs rotated periodically?
 11. How does the management determine that the operators are adhering to prescribed operating procedures?
 12. Determine if all employees take vacations regularly.

Documentation

1. How is test data documented and kept up to date?
2. How current and complete is the run manual prepared for each computer run?
3. What operator instructions are prepared for each run?
4. What are the documentation practices of both the client and service center on each application?
Does the normal documentation for an application include—
 - (a) Problem statement.
 - (b) Systems flowchart.
 - (c) Record layouts.
 - (d) Data editing requirements.
 - (e) Program flowcharts.
 - (f) Program source listing.
 - (g) Test data.
 - (h) Operator instructions.
 - (i) Summary of controls.
 - (j) Approval and change record.
5. What supervisory review is made of the documentation to determine that it is in accordance with documentation standards and that it is current?

Program Change Procedures

1. How are program revisions authorized?
2. How are program changes documented to preserve an accurate chronological record of the system?
3. How are program revisions tested?
4. How are superseded programs prevented from being used?

File Protection and Security

1. What are service center's provisions for file reconstruction?
2. What provisions does the client have for "worst case" file reconstruction (that is, if all files at service center are destroyed)?
3. What documentation does the client have for all programs written specifically for him and for which full payment has been made (client ownership)?
4. What provisions exist, both in the client's procedures and in the service center's procedures, to insure that data files are properly labeled and that only authorized persons have access to the client's data, records, and reports?
5. How are service center personnel prevented from having access to client assets (charge accounts and bank accounts)?
6. How are computer programs, documentation, records, and files protected from fire and theft?
7. What provisions does the client have for back-up equipment to handle his processing requirements in the event of equipment failure in the service center or in the event of fire or other lengthy interruption?
8. What is the extent of data processing insurance and fidelity bonds?

Part II

This part may be used to determine general policies on all applications or may be used to review individual applications.

Control Over Input

1. What supporting copies are kept by the client on source documents transmitted to the service center?
2. What controls are established for data sent for processing?
 - (a) Document numbering.
 - (b) Document count.

- (c) Transaction count.
 - (d) Control totals (list).
3. Can the client's input control figures be reconciled with control figures furnished by the service center? How are differences treated?
 4. Are control totals reconciled by someone who does not prepare source documents or deliver them to the service center?

Processing Controls

1. How is input data tested for validity, correctness, and sequence?
 - (a) Validity tests for labels, codes, characters, fields, transactions, data combinations and missing data.
 - (b) Sequence tests.
 - (c) Limit tests.
2. What control totals are used to check for completeness of processing? These may include trailer file labels, run-to-run totals, etc.
3. How are programmed controls used to test processing of significant items?
 - (a) Limit and reasonableness tests.
 - (b) Crossfooting tests.
4. What are the provisions to prevent unauthorized entry of program changes and data through the console? The following questions reflect the types of controls that may be used:
 - (a) Are machine operation logs being maintained? For each run, these should include information covering the run identification, operator start and stop time, error halts and delays, and details of reruns.
 - (b) Is there an independent examination of computer logs, and console output? How often and by whom is this done?
 - (c) How does the system determine operator problems and unauthorized intervention by the operator?
5. What controls exist to identify, correct, and reprocess data rejected by the program?

Control Over Master File Changes

1. What control procedures exist to insure that master file changes are made properly?

2. How does the system provide control to the client on loss or nonprocessing of master file records?
3. How are master file changes or changes in program data factors authorized?
4. How are departments that initiate changes in master file data or program data definitions furnished with notices or a register showing changes actually made? (Examples of such changes are changes in pay rates, selling prices, credit limits, and commission tables.)
5. How are changes to master file data reviewed by initiating or authorizing departments?
6. What provisions exist for periodically checking master file changes?
 - (a) Periodic printout and review.
 - (b) Periodic test against physical count.
 - (c) Other.

Control Over Error Corrections and Resubmissions

1. How are errors identified?
2. What are the client's procedures for recording errors and controlling correction and resubmission?
3. What error procedures exist for handling (1) unmatched transactions and (2) control total or control count differences?

Control Over Output

1. What are the client's procedures for reviewing or testing output prior to distribution?
2. What are the client's procedures for controlling distribution of output?

Adequacy of Audit Trail

1. Does the audit trail identify transactions processed by the service center?
2. What printed information is available about the controls over important accounting files maintained in machine-readable forms—i.e., inventory records, accounts receivable records, payroll records, general ledger accounts?

Payroll Case Study

This case study presents a common financial application using service center processing. As an illustration it is not intended to be a detailed documentation of payroll processing, but a description of the audit approach involved. The payroll process described is one used by a group of grocery stores (part of a national chain) located in a metropolitan area. The system is primarily described in terms of computer runs.

Included in the study is a discussion of satisfactory and unsatisfactory controls in the various steps of the processing. In a subsequent part of the case are analyses of the appropriate audit procedures to evaluate the system when controls are satisfactory and those to use when controls are unsatisfactory.

The processes described below are performed weekly. A systems flowchart of these processes, including satisfactory controls, is shown on pages 59-61.

System Description

Conventional source documents, such as time cards and payroll record changes, are prepared initially by client personnel. The time cards show employee numbers, number of hours worked, job number, and so forth. The payroll record changes are prepared to change data in the payroll master records. Change records would be prepared for a change in payroll rate, deductions, employee's name, employee's address, number of dependents, adjustments to year-to-date totals, terminations, and additions of new employees.

These source records are sent to the service center for a series of processing operations. The first operation is the keypunching and verification of the information on the source documents into punched cards.

The client's control objectives over input should be to determine that all transactions recorded are transmitted to, and received by, the service center. *Satisfactory* internal control is achieved by the client's grouping the time cards and record changes into batches and preparing control totals, such as hours

worked and record counts for each batch. The punched cards prepared at the service center can then be run through proof runs as in Run 1; totals can be accumulated by batch and compared with the client's pre-established amounts. A proof transaction listing can be prepared and returned to the client. Out-of-balance batches can be printed for clerical review, correction, and re-entry.

Internal control would be *unsatisfactory* for the data transmission and conversion process if there were no batch totals and no proof listing of the transactions processed.

Processing. After the proof runs, the punched cards are converted to magnetic disc in Run 2 and sorted by employee number in Run 3. In this conversion run, the control objectives would be attained if the data received were complete, accurate, and reasonable and if the control totals agreed with pre-established totals. *Satisfactory* control is achieved by installing checks in the computer programs to detect errors (programmed controls). These can include controls to detect invalid transaction codes, incomplete transactions, nonstandard pay rates, and an abnormal number of hours worked. Program instructions may also accumulate batch totals and compare them against previously established totals. Invalid data and control discrepancies may be printed on error listings that should be sent to the client. The sorted payroll transactions can then be listed showing the weekly payroll transactions for each employee. A copy of the list would be sent to the client in Run 4.

The processing would have *unsatisfactory* control if there were no listing showing the payroll transactions for each employee or if there were no programmed controls and error listings to detect and reprint errors in the transaction data. The payroll transaction listing could be reviewed by client personnel to determine invalid transactions, but this would not be as efficient as having the transactions checked as they are processed.

Updating Payroll Files. The payroll master files, maintained on magnetic tape, are then updated in Run 5 with the valid transactions for any changes and payroll computations. Gross and net are calculated; year-to-date and period-to-date payroll data are accumulated and written on the new payroll master file. Current

payroll information—name, employee number, store number, hours worked, deductions, and gross and net pay—is written on magnetic disc. Payroll totals by store location are printed along with update errors (e.g., a missing master record for an employee).

In Run 6, the current payroll data is sorted by employee number for each store; paychecks are printed in Run 7. Run 8 results in the printing of the check register which, together with the payroll checks, is sent to the client for signature and distribution. Store and division payroll totals are printed for the client in Run 9.

The current payroll information on magnetic disc is then sorted into employee number order in Run 10, and a payroll register is printed for distribution to the client in Run 11.

The service center prepares, on client request, a current list of all employees in the payroll master file. Payroll tax returns are prepared quarterly; W-2 forms are prepared annually.

The objectives of control in the update process are to detect loss or nonprocessing of data, to determine that the payroll computations are performed correctly, to determine that all transactions are posted to the proper record, and to ensure that errors are detected in the updating process. *Satisfactory* control may be achieved by such procedures as (1) printing out and reviewing the payroll register, (2) periodically printing out and reviewing the payroll master file, and (3) having programmed controls in the update programs. Any or all of these could detect unreasonable payroll amounts and transactions for which there are no master records. In addition, it would allow the accumulation of file totals for comparison against previously established totals, i.e., record counts, gross pay, and so forth.

Controls may be *unsatisfactory* if there are no payroll register and master file printouts or if these printouts are not reviewed for reasonableness, accuracy, and completeness; control may also be unsatisfactory if the data in the files is not periodically validated by comparison with documents supporting such items as new employees, terminations, pay rate increases, time cards, etc.

Audit of System

In the audit of a payroll system, the auditor reviews the performance of, and control over, activities such as these:

1. Hiring of employees and development of personnel records.
2. Termination of employees.
3. Time recording and reporting.
4. Payroll processing including
 - (a) Preparation of gross and net payroll.
 - (b) Preparation and distribution of payroll checks or cash pay envelopes.
 - (c) Preparation of employees' earnings records.
 - (d) Calculation of incentives, bonuses, commissions, over-time, and so forth.
5. Distribution of payroll, including the determination of overhead labor rates and methods of distributing wages and salaries to inventory and expense accounts.

The review is directed toward an evaluation of the system of internal control; most of the foregoing activities can be reviewed in the same manner, even though a service center is involved in processing much of the data.

Hiring and Termination Procedures. When reviewing hiring and termination procedures, the auditor usually works with a list of employees that includes rates of pay and other information that he uses as a basis for selecting an audit sample. In this case study, a current listing of the payroll master file, available from the service center on request, would be used for this purpose. By selecting employees and tracing information on the payroll to his client's personnel records, the auditor can satisfy himself that employment records and payroll records are in agreement. In his review of termination practices, the auditor may compare the change listings prepared in Run 4 with the personnel department's records of termination to satisfy himself that ex-employees are not maintained on the payroll.

Payroll Processing. A representative number of employees can be selected from the payroll register (Run 11). Using this register, the auditor can make the following tests:

1. Check of number of hours worked against time sheets.
2. Comparison of name, store location, and pay rate with supporting records.

3. Computation of gross and net pay and comparison with printed pay checks from Run 7 and check register from Run 8.
4. Test of payroll deductions by examination of W-4 forms and withholding tax tables, examination of authorization forms for other payroll deductions; review of change listings in Run 4 and corresponding payroll registers to determine that changes are properly reflected in the payroll.

In his review of processing, the auditor is concerned with the input and processing controls. Selecting weekly payrolls, he could then perform the following:

1. Reconcile control totals established by the client with control totals developed in Run 1.
2. Review error reports generated in Run 2, and evaluate error correction procedures and control over re-entry of corrected transactions. The reports from these runs indicate the reasons for record rejection and provide evidence that programmed controls do exist.
3. Determine effectiveness of run-to-run control totals. Once the record counts and hash totals are established in Run 1, they are carried forward to succeeding runs with adjustments for rejected records.
4. Determine effectiveness of audit trail. The proof and transaction listings in Runs 1 and 4 provide information on input transactions. Run 8 provides a check register. Run 11 provides the payroll register. A listing of employees on the payroll master file is available upon request.

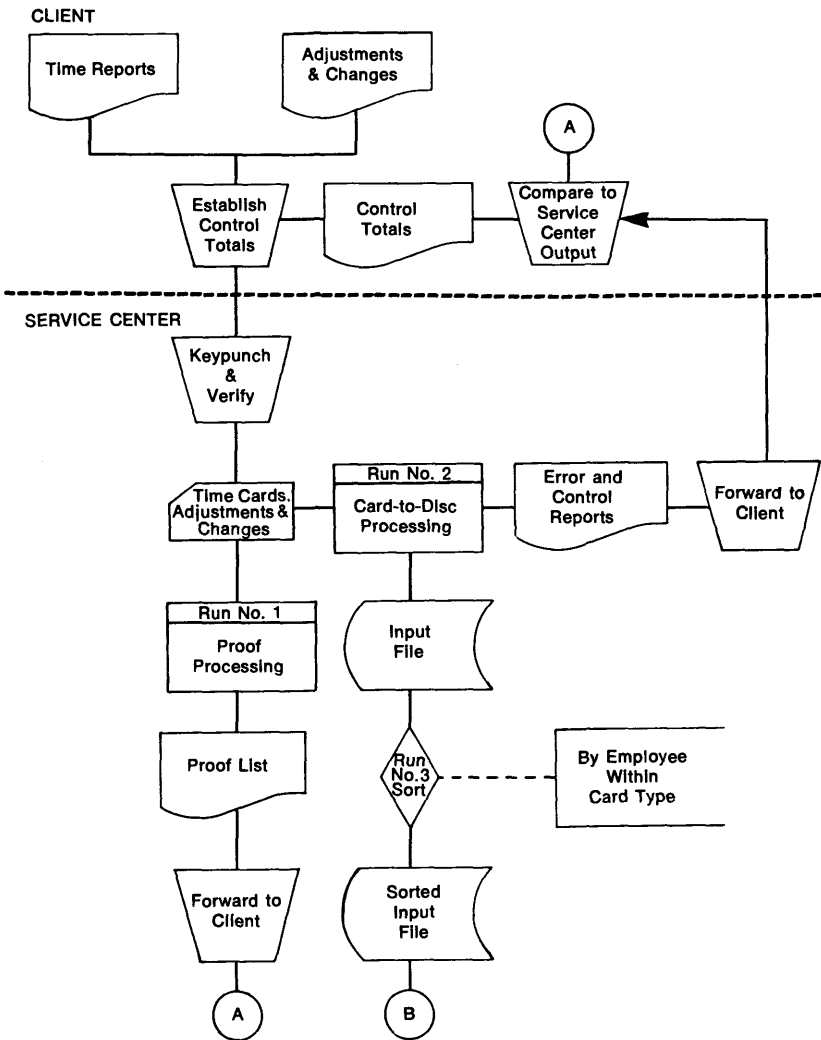
Evaluation of Output

After the system has been reviewed and the processing tested, the listings and registers prepared by the service center can be used to perform audit steps such as the following:

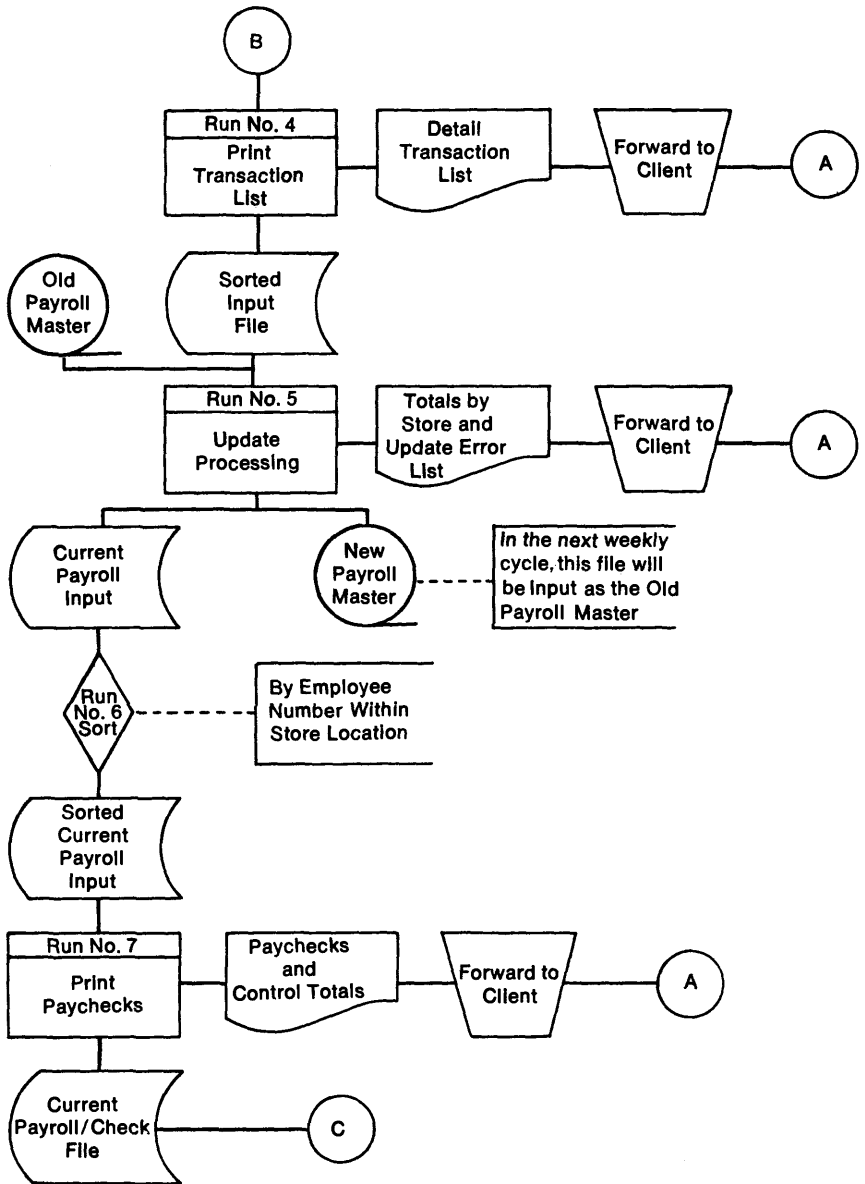
1. Examination of summary of payroll totals by pay periods and by store location (Runs 11 and 9) and investigation of unusual variations.

2. Check of footings and crossfootings on payroll register (Run 11) and trace to general ledger totals.
3. Review of payroll register for unusual entries.
4. Examination of paid and endorsed payroll checks for agreement with data in payroll register.

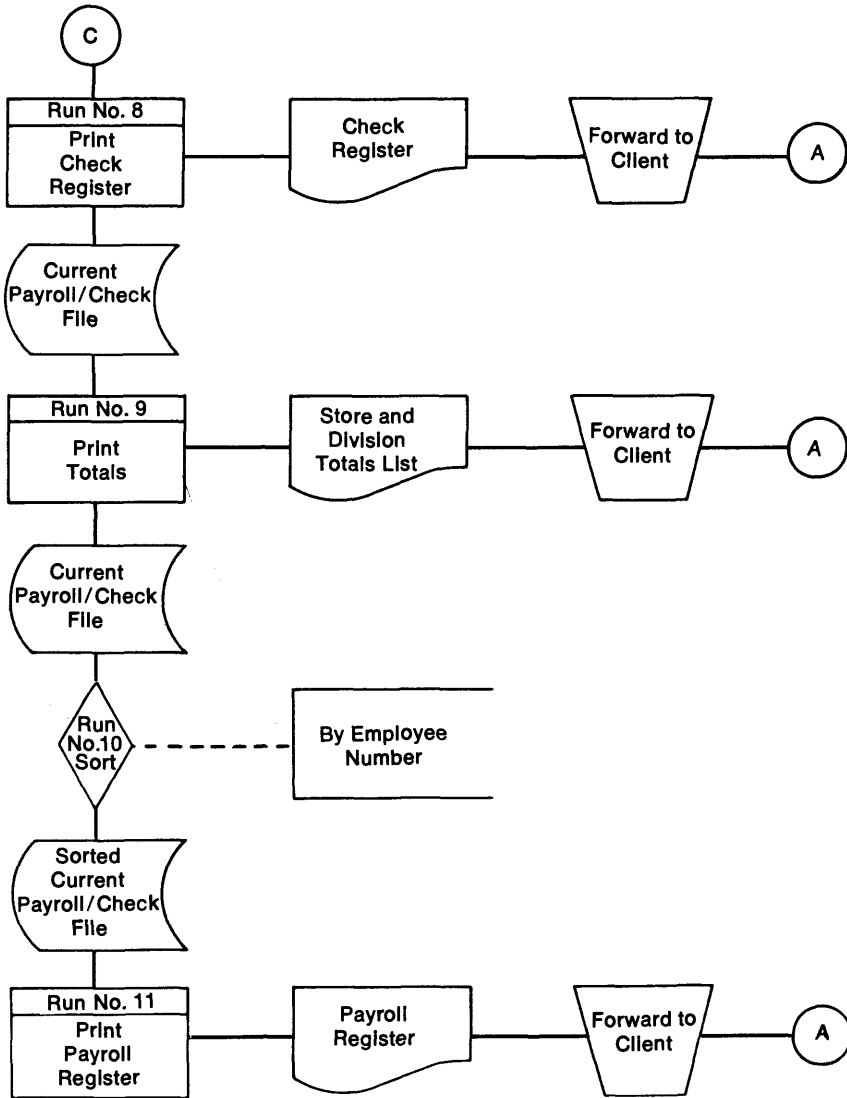
System Flowchart Payroll Processing



System Flowchart, cont'd



System Flowchart, cont'd



Savings and Loan Case Study

This case illustrates the problems and procedures of conducting a review of a service center where financial data for many savings and loan associations are processed with standardized programs. The case study describes the nature of the data processing service provided and the audit procedures performed in the review of the service center. The procedures described are those that were performed to review and evaluate the service center processing and control; additional audit procedures were necessary (and were in fact performed) to validate data of the individual user organizations.

Description of the Data Processing System

The service center provides on-line processing and inquiry service for approximately 30 savings and loan associations in the region. The applications include the processing of all savings accounts as well as mortgage, collection, and passbook loan accounts. The processing results in the following reports by the association branch office and/or in summary for the association.

Savings account processing

1. A daily transaction listing, in account number sequence or by sequence of entry for each teller, summary control balances, and exception listings including new and closed accounts, hold data, and transferred accounts.
2. Weekly listings of name and address file changes.
3. Monthly trial balance in account number sequence, including anticipated dividends.
4. Quarterly trial balance and printouts of account histories and dividends paid.
5. Confirmation requests.
6. Annual proxy listings and 1099 reports.

Mortgage loan, collection loan, and passbook loan processing

1. Daily transaction listing in account number sequence or by sequence of entry for each teller, summary control balances, and exception reports including payments other than contractual amounts, prepaid and paid-off loans, additions, and assumptions.
2. Weekly listing of name and address file changes.
3. Semi-monthly delinquency reports and notices.
4. Monthly reporting as follows:
 - (a) Notices of contract collections.
 - (b) Participation or serviced loan reports.
 - (c) Borrowers' statements or bills and receipts.
 - (d) Account trial balance.
 - (e) New loans.
 - (f) Scheduled items.
 - (g) Statistical analysis including average portfolio yield, dwelling types, geographic areas, and loan classes.
5. Quarterly trial balance and account history listing.
6. Semiannual listings of employee accounts.
7. Confirmation requests.
8. Annual borrowers' summary statements, 1099 reports, and escrow analyses.

The cost of the above services is levied according to the number of accounts involved and based on an annual charge specified in the contract.

Planning and Conducting the Audit

The following general audit procedures are of importance when a savings and loan association is being serviced by a computer service center:¹

1. Count and reconciliation with the association's records of all cash on hand—teller cash, vault cash, and other cash items.

¹ For additional information on auditing of savings and loan associations, see the AICPA Industry Audit Guide, *Audits of Savings and Loan Associations* (New York: AICPA, 1973).

2. Trial balancing and proof to control accounts of subsidiary accounts covering loans, savings, and related reserves.
3. Direct mail confirmation of selected loan and savings accounts with the borrowers and savers.

The foregoing three types of procedures are frequently performed on an unannounced basis at an interim date, which may be different from the date of preparation of audited financial statements. It normally is not necessary that the date of performance of these procedures coincides with the end of a month or accounting period of the association. All of these procedures should be performed using the data of the individual savings and loan associations, even though the data was processed by a centralized service center using standardized computer programs.

In addition, the examination should include a review of the association's system of control: The review should satisfy the auditor that there is a plan of organization providing appropriate segregation of functional responsibilities, in conjunction with a system of authorization and record procedures sufficient to provide reasonable control. The auditor should make sufficient tests of the system to determine that it was functioning effectively throughout the audit period and he should review the elements of control that the service center maintains over subsidiary accounting records. This review may be important in an on-line system where the initial recording of transactions is normally not fully documented.

In this case, the service center processed work for several savings and loan associations who engaged different auditing firms to perform their annual examinations. One auditing firm performed the examinations on ten of those associations. Rather than visit the center ten times, each time reviewing one client's records, the auditor decided to conduct an overall system review that would cover all ten clients. Because processing was standardized, this approach was considered logical and effective. In addition, it seemed likely that auditors who handled the other associations processed at the center could make use of the review conducted by the first firm in evaluating their own clients' internal control system. The audit firm that conducted the review made the working papers available to the auditors of the other savings and loan associations using the system. After the review

of the audit working papers on the system, the user auditors could have, and did, perform additional procedures to evaluate the controls and validate the data of their clients.

The audit objectives in the review of the service center were (1) to accomplish the internal control review requirements of the savings and loan association audit engagements, (2) to maximize the use of automation in performing other audit procedures, and (3) generally to appraise the quality and reliability of the computing service received by the associations.

The auditor involved in performing a review of the service center developed and performed the following audit program:

1. Review of the overall controls of the service center including organizational controls, input controls, processing controls, output controls, documentation practices, program change procedures, and file protection and security procedures.
2. Review of the savings and mortgage loan system.
3. Processing of test data to determine the existence and effectiveness of the programmed controls.
4. Preparation of a report for other CPAs describing the control existing within the service center's on-line system over individual associations' programs and data.

Testing Approach

Steps 1 and 2, above, were carried out as outlined in Chapter 2. Step 3, above, indicated that the auditor tested the system to determine that it was operating as it was represented to operate. Several methods exist for testing an on-line system, as is the case with most other mechanized systems. The auditor decided in favor of a test data approach as opposed to (1) selecting sample transactions and tracing them through the system or (2) analyzing the processing of transactions selected by a special program prepared for that purpose.

The auditor indicated the following:

Conventional manual testing methods of tracing selected sample transactions through the system could have been utilized. Normally, however, the auditor uses a sample he

considers representative. Because the system allows many types of transactions to be processed and because about 10 percent of the transaction types account for about 90 percent of the volume, it appeared probable that a very large sample would be required if it were to include all or most of the transaction types.

The number of transactions in the sample could have been greatly reduced by using a computer program to scan the history files and select test transactions; however, this method could not be economically justified because definition of the sample selection program specifications would have included nearly all the elements of test deck preparation. The test deck approach appeared economically justified, if functional over a period of years. The auditors realize the computer program is, within reasonable time limits, fixed. They also know the equipment is sufficiently reliable so that tests ascertaining that the program performs in a certain manner can be used as evidence that the program has consistently performed in the same way.

After deciding to test the system using the test data² approach, the auditors determined the scope of their testing and the methods of entering the tests into the system; the scope of the test transactions reflected the auditors' assessment of the system as represented to them. Because of the lack of complete documentation in the service center, the auditors prepared and processed transactions designed to test the system in considerable detail.

The alternatives regarding method of input were (1) entry through the teller terminal of the service center and (2) entry through teller terminals in one or more associations.

Using the service center's terminal would have required modification of association programs to allow access by this foreign terminal. Thus the auditors would have been testing the system logic but not the actual programs used by the associations. Furthermore, testing during normal operating hours could not have been accomplished.

² With the advent of generalized computer auditing programs, auditors can now consider one additional alternative to test data.

The auditors decided to process selected transactions through the associations' terminals and examine the results. They felt that there were several positive attributes achieved by testing through association terminals, including the following:

1. Ability to test actual association programs.
2. No additional computer time requirements.
3. Ability to test the central system at sporadic intervals without service center's awareness.
4. No necessity to prepare, modify, or control programs.

To prevent the tests from affecting the client's files and normal operating reports, the auditors processed the test transactions with simulated master records located in an unused portion of the service center's files.³

Report on Service Center

The auditor prepared a report for use by other CPAs describing the control review in the service center and controls in existence over the individual association's programs and data. The auditors making the review made the report and their workpapers available to other CPA firms handling other savings and loan associations using the service center. These documents included the audit procedures, tests performed, and the results thereof. The other auditors could, of course, use the report and workpapers to evaluate their clients' internal control system including the service center processing.

³ For a detailed explanation of test data and the use of simulated master records, see Davis, *Auditing and EDP*, Chapter 11.

APPENDIX D

Selecting a Service Center

This appendix presents sections on considerations in selecting a service center, terms of agreements with service centers, and a sample service center agreement.

Considerations in Selection of Service Centers

The client should request formal proposals from service centers when he is considering having an outside installation process his data. After receiving these proposals, the client selects one on the basis of criteria that should include such matters as the following:

1. Experience with similar problems.
2. Availability of standard, general program packages.
3. Reputation of center.
 - (a) Financial condition.
 - (b) Quality of work.
 - (c) Quality of sales and account representation.
 - (d) Ability to meet time and cost estimates.
 - (e) References.
4. Control philosophy and control features.
5. Willingness to work with accountants and auditors on auditing and control problems.
6. Equipment backup provisions.
7. Amount of work the center subcontracts.
8. Time-of-completion quotation.

9. Cost quotation.
10. Potential to handle future requirements.
11. Quality of proposal.

The auditor may assist his client in selecting a service center by evaluating the reasonableness of the cost estimates and the financial stability of the service centers involved.

Terms of Agreement

After a service center has been selected, a written contractual agreement should be prepared specifying the responsibilities of the service center and the user. The terms of the agreement may include the following:

1. Processing to be performed.
2. Content and format of input and output, and management reports.
3. Procedures for handling errors.
4. Protection of client records.
5. Auditor's right to perform audit procedures.
6. Backup provisions by service center.
7. Client responsibilities, particularly in data preparation, input control, and master file changes.
8. Person at service center responsible for client contact and person in client organization authorized to deal with service center.
9. Charges including these:
 - (a) Normal operating charges.
 - (b) Setup or one-time programming charge.
 - (c) Supplies, if cost is additional.
 - (d) Extra charge for weekend, or overnight premium.
 - (e) Charges for pickup and delivery, storage, and so forth.
 - (f) Charges for special reports.
 - (g) Cost of reruns and changes if requested.
10. Conversion plan.
 - (a) Break-in or parallel running period.
 - (b) Conversion of master files to machine-readable form.

- (c) Time schedule for converting to the service center processing.
11. Liability of service center for lost data or files and for errors in processing. Insurance carried by service center to cover such liabilities.
 12. Program ownership (if a special program is being written to meet client specifications) and ownership of files and documentation.
 13. Form and frequency of billings.
 14. Delivery of documentation concerning progress billings in cases where a special program is written and billed for.

Sample Agreement

A copy of an agreement between a service center and user organizations is set forth below. This service center specializes in the processing of standard program packages for the savings and loan industry. Although it is a specialized service center, the areas covered in the agreement exemplify the types of areas that can be included in a contractual agreement. The rate information is not currently representative because of the age of the agreement. In all cases, the client's legal counsel should be called upon to review a draft of the proposed contract and should be involved in all related negotiations.

DATA PROCESSING

ABC Service Center, Inc., (hereafter referred to as ABC) shall perform the following data processing functions, on-line and off-line, for the service charges quoted below, for each branch, if any, of the Association. Where required, reports will be prepared for each branch with summary totals prepared for the entire Association.

SAVINGS ACCOUNTS AND CHRISTMAS CLUB ACCOUNTS

- A. On-line processing of all transactions and inquiries acceptable to the on-line teller console.
- B. Off-line processing of the following reports by branch office and for entire Association.

1. Daily
 - (a) Transaction listing, prepared in account number sequence by general ledger class and subclass with control totals, including interbranch transactions.
 - (b) Summary trial balance, by control.
 - (c) Transaction listing prepared on request only, by sequence of entry for each teller.
 - (d) Exception listing.
 - (1) New and closed accounts (daily total and accumulated totals for month).
 - (2) Holds added and removed, identified by type.
 - (3) Transferred accounts.
 - (4) Name and address file changes (weekly).
2. Monthly

Trial balance and anticipated dividend prepared in account number sequence. (Also available on request for audit at any time, not to exceed two per year.)
3. Quarterly

Account history, trial balance, and dividend paid.
4. Semiannually
 - (a) Statistical analysis.
 - (1) Employee account listing.
 - (2) FHLB report of accounts over \$15,000.¹
 - (b) Confirmation notices, not more than twice a year and not to exceed ten percent (10%) of the total number of savings accounts each year. Such notices to be prepared at internal auditor's request.
5. Annually
 - (a) Form 1099 reports.
 - (b) Proxy listing, end of year, and exception listing of closed or reduced accounts fifteen (15) days later.

MORTGAGE LOAN, COLLECTION LOAN, AND PASSBOOK LOAN ACCOUNTS

- A. On-line processing of all transactions and inquiries acceptable to the on-line teller console.
- B. Off-line processing of the following reports, by branch office and for entire Association.

¹ This was a requirement at the time this contract was written.

1. Daily
 - (a) Transaction listing—account number sequence by general ledger class and subclass with control totals, including interbranch transactions.
 - (b) Summary trial balance, by control.
 - (c) Transaction listing—on request only, by sequence of entry for each teller.
 - (d) Exception report.
 - (1) Payments other than contractual amounts.
 - (2) Name and address file changes (weekly).
 - (3) Prepaid and paid off accounts.
 - (4) Add-ons, assumptions.
2. During the month
 - (a) Delinquent notices (twice a month).
 - (b) Delinquent reports (twice a month).
 - (c) Notice of collection for collection loan accounts.
 - (d) Participation or serviced loans reports, individually according to servicing agreement (once a month).
 - (e) Borrowers' statements or bills and receipts (once a month).
3. Monthly
 - (a) Trial balance—account number sequence.
(Also available on request at any time for audit, not to exceed two per year.)
 - (b) New loans.
 - (c) List of scheduled items.
 - (d) Statistical analysis.
 - (1) Average portfolio yield.
 - (2) Types of dwellings.
 - (3) Geographic areas.
 - (4) Class of loans.
4. Quarterly
 - (a) Account history and trial balance.
5. Semiannually
 - (a) Confirmation notices, not more than twice a year, and not to exceed ten percent (10%) of the total number of mortgage accounts each year. Such notices to be prepared at internal auditor's request.
 - (b) Employee accounts listing.

6. Annually

- (a) Borrowers' summary statements.
- (b) Escrow analysis.
- (c) Form 1099 report on collection accounts.

ABC agrees to furnish reports, derived from the data maintained on disc files and magnetic tapes, for the purpose of assisting the Association in complying with the Federal Home Loan Bank Board, IRS, and/or state Savings and Loan Commissioner's regulations, and agrees that the records maintained by ABC shall at all times be available for examination and audit by the Federal Home Loan Bank Board.

In addition to the reports listed herein, special processing of this data, contained on disc files and magnetic tapes, may be requested by the Association for audit requirements, imposed by said agencies, or for other purposes, at an additional charge. It is understood that, in the case of State Chartered Association, the state requires for itself and for the Federal Home Loan Bank Board the right to ask for and receive directly from ABC any reports, summaries, or other extracts of information maintained by ABC on disc files or magnetic tapes relative to the Association. Charges which may be made by ABC in fulfilling such requests will be paid by the Association, but in no instance may ABC incur any such expenses without first obtaining the approval of an authorized officer of the Association.

CHARGES

A. Savings and Christmas Club Accounts

<u>No. of Accounts</u>	<u>Cost Per Account</u>	
	<u>Monthly</u>	<u>Annually</u>
100,000	\$0.071	\$0.85
125,000	0.069	0.825
150,000	0.067	0.80
175,000	0.065	0.775
200,000	0.063	0.75
225,000	0.06	0.725
250,000	0.058	0.70
275,000	0.056	0.675
300,000	0.054	0.65

B. Mortgage Loan Accounts

<u>No. of Accounts</u>	<u>Cost Per Account</u>	
	<u>Monthly</u>	<u>Annually</u>
40,000	\$0.15	\$1.57
50,000	0.125	1.50
60,000	0.12	1.44
70,000	0.115	1.38
80,000	0.11	1.32
90,000	0.105	1.26
100,000	0.10	1.20

NOTE (1) With regard to Savings Accounts and Loan Accounts, the phrase "No. of Accounts" used above means the aggregate number of accounts of the Association, other Savings and Loan Associations, banks, and other businesses that agree to receive ABC's on-line services for Savings and Mortgage accounts in existence on the last day of the month immediately preceding the billing period.

NOTE (2) The reduced rates for increased on-line account volumes (above) shall not be applicable to an Association until one (1) year from the start of ABC's performance of on-line services for the Association, as detailed below, unless this agreement is signed prior to January 2, 1967.

C. Collection Loan Accounts

Per month \$0.125

D. Passbook Loan Accounts

Per month \$0.12

E. Dividend and Christmas Club Checks

Per check—single \$0.05

Per check—two up \$0.03

F. Mailing Labels

Per 1,000 labels, four up \$5.00

G. Setting up new accounts or revisions of existing data (not to exceed once per week)

Per 1,000 characters of information \$2.00

H. Daily delivery of reports to each location

To be charged on a cost basis using either a common carrier, a private carrier, or the U.S. mail.

I. Additional on-line computer time prorated among all Associations requiring the additional time

Per hour \$125.00

J. Conversion of existing records

To be included under separate contract.

K. Special reports

To be quoted for each required report.

To obtain in report format special information from data stored on the disc file, the charge, including programs and processing, will be calculated as follows: (1) Cost plus 10 percent not to exceed \$50.00 for any report up to 1,000 print lines; (2) For a report of over 1,000 print lines, there shall be an additional charge of \$4.00 per thousand print lines. (Although report specifications are not known at this time, the prices herein are based upon a selection of data with a maximum of 10 arguments from the master file. An example of a report would be the reporting of all loan types "02" with balances of over \$10,000. This would represent two "arguments.")

Prices quoted herein include stock forms (2-ply) and supplies used by ABC in the preparation of off-line reports. (Stock forms shall be defined as any forms purchased by ABC for use in the on-line system, exclusive of any printed name or other identifying mark of the Association.) Special forms printed exclusively for the Association shall be ordered by the Association and stored at ABC.

All prices quoted herein shall remain in effect for one year from date of this contract, and shall thereafter be subject to yearly increases or decreases based on the changes, if any, in the U.S. government cost-of-living index, as published by the Department of Labor; said increases are not to exceed four percent (4%) per year, and said decreases are not to effect a change greater than the original contract prices. Said changes in prices shall be based upon figures released by the U.S. government for the fiscal quarter ending closest to the anniversary date of this contract compared to the same quarter of the previous year.

All prices quoted herein are based upon specified account record lengths for the disc files. Requirements by the Association for longer account disc records shall necessitate charges for the increased use of the disc files.

PROGRAMMING AND SYSTEMS CHARGE

A. Initial setup

To be covered by separate contract.

B. Subsequent revisions

1. Systems revisions requiring modification of "Director" programs.
Each Director program \$ 75.00
2. Systems revisions requiring rewriting of a Director program.
Each Director program \$100.00
3. Systems revisions requiring new Director programs.
Each Director program \$250.00
4. Systems revisions exceeding the limitations of Director programs will be quoted separately for each revision.

Whenever two or more Associations can make use of the same program revisions, the charges for those revisions will be prorated among these Associations.

CONDITIONS

All conditions of this contract shall become effective on the date of this acceptance.

The conditions under which ABC and the Association shall mutually undertake the work are as follows:

1. ABC agrees to use its best efforts to make the on-line system available, so that the Association is able to utilize the on-line system as soon as practicable, in no event later than _____. ABC agrees to give reasonable notice to the Association of the date that the on-line system will be available for use (hereafter referred to as the commencement date). Upon being advised of the commencement date, the Association agrees to furnish ABC with account balance information, name and address files, statistical information, and other data ABC may require to enable complete processing.

2. ABC guarantees completion of all operations included in this contract, and at all times warrants and agrees that its operation schedule will not interfere with, but be compatible with, the proc-

essing and delivery of the Association's data and reports scheduled in this contract.

3. ABC guarantees that all processing of data will be done on the premises of its _____ office. It is understood that ABC will inaugurate this processing with the on-line computer and that ABC agrees to maintain and operate a computer or computers of equal or greater on-line capacity during the term of this contract. ABC further agrees that the equipment shall at all times be compatible with the terminal units originally purchased or leased by the Association for use with the on-line system, which the Association agrees to have ordered a reasonable period of time before the commencement date.

4. ABC shall maintain on-line services and furnish daily, weekly, monthly, and yearly reports at times to be mutually agreed upon. Service and delivery schedules are predicated upon normal working conditions and are subject to adjustment in the event of strike, fire, war, riot, or any cause or causes beyond the control of ABC.

5. Upon installation of the on-line system, ABC agrees to maintain on-line services, as provided in the contract, from one-half hour before until one hour after normal business hours; said hours to be no earlier than 8:00 a.m., five days a week; no later than 6:00 p.m., four days a week; and no later than 7:00 p.m. on Friday. The charges quoted herein do not include service for any Saturday business hours. In the event that normal business hours are expanded beyond the times included above, additional charges for on-line services will be made on a prorated basis to those Associations requiring said service. The hours when on-line services will be initially required by the Association are as follows:

_____ a.m. to _____ p.m. Monday through Thursday.
_____ a.m. to _____ p.m. each Friday.

6. ABC shall assume the responsibility for delivering all off-line reports to the Association and its branches, and for the collection of all transmittal documents; delivery is to be made by a bonded carrier or other reasonably acceptable service.

7. ABC agrees to treat all records and other information relative to the Association or its depositors with strict confidence.

Peripheral access to this on-line system is available only by using the Association's teller machines, which have a built-in and confidential coding structure automatically impulsed during a transaction. This coding structure cannot be duplicated by manual indexing from the keyboard on the teller console.

8. ABC agrees to use its best efforts in the servicing of the on-line accounting system and for the preparation of off-line reports for the Association; the Association agrees that ABC has no responsibility or liability for loss or expense incurred by the Association by reason of errors in processing, or for nonperformance by ABC as a result of acts of God, insurrection, riot, strikes, or other causes beyond the control of ABC.

9. Historical data more than one year old shall be shown on the previous year's reports. When requested by the Association, records for the previous year shall be forwarded to the Association on magnetic tape or punched cards. ABC shall have no responsibility for historical data more than one year old. If on-line services are started after the beginning of a calendar year, ABC shall be responsible only for data developed after the start of the on-line services.

10. ABC shall keep at all times, on magnetic tape, a copy of all records stored on the disc files; such backup records are to contain all data processed up to the close of the Association's banking hours for the previous business day. ABC shall store this duplicate set of records, updated daily, in a fireproof vault located off the premises of ABC.

11. Transactions received and balances changed during the current business day shall be recorded on magnetic tape in order to make it possible to reconstruct any records damaged by machine or human error during the current business day.

12. In the event of termination or nonrenewal of this contract, it is agreed that ABC shall turn over to the Association all magnetic tape records and shall furnish the Association with a magnetic tape containing all information of the Association's accounts carried on disc files. ABC shall also turn over to the Association copies of all computer programs used in the on-line and off-line processing of the Association's data.

13. On behalf of all the Associations being serviced by the on-line teller system, ABC shall arrange to receive statements of charges from the telephone company for all leased data transmission lines.

14. ABC shall remit the monthly leased-line charges to the telephone company.

15. ABC shall apportion the leased-line charges between the Associations, and each Association agrees to remit to ABC its apportioned share of the charges. (The charges shall be apportioned by any reasonable method agreed upon by the majority of the Associations using a particular leased line.)

16. ABC agrees to furnish data transmission devices to the Association at a mutually agreeable price.

17. ABC shall arrange for data transmission devices and telephone line installation, and shall bill the Association the cost of said installations incurred by ABC.

18. If any new or additional federal, state, county, or municipal taxes are assessed against the data processing equipment leased by ABC for use in the on-line processing system, a proportion of these taxes shall be charged to all Associations. The said proportion will be determined by the time required for the processing of the on-line savings and loan system for a standard 176-hour work month, and will be apportioned to the Association as to the total number of accounts the Association has on the system for the current month.

19. All provisions of this contract are effective and are contingent upon receipt of payment of ABC invoices within twenty (20) days after the invoice date. The Association agrees to accept ABC services and to pay the agreed fee for each savings account and each loan account of the Association in existence as of the last date of the month immediately preceding the billing period. Each billing period shall be a calendar month.

20. It is understood that payments made by the Association to ABC are for services expressly provided herein, and that ABC assumes no responsibility whatsoever for the purchase or maintenance of any equipment outside the premises of ABC, notwith-

standing any such equipment that is part of an integrated system used in providing on-line services to the Association.

21. The term of this contract shall be from the date that it is properly executed by both parties until December 31, 197X. Service charges shall be incurred at the time that on-line processing commences and shall be for amounts covering the number of accounts converted to, and serviced by, the on-line system.

22. ABC shall advise the Association in writing of the terms of a renewal contract not less than twelve (12) months prior to the expiration of this agreement.

23. In the event that this agreement is not accepted within thirty (30) days, it shall be subject to renegotiation.

Entered into this ____ day of _____, 197X.
For ABC Service Center, Inc. _____.
For Institution _____.

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