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Audit approaches for a computerized inventory system; Computer services guidelines

Computerized Inventory Systems Task Force (American Institute of Certified Public Accountants)

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COMPUTER SERVICES GUIDELINES

Audit Approaches for a Computerized Inventory System

American Institute of Certified Public Accountants **AICPA**



Notice to Readers

Computer services guidelines are published to assist members in understanding and utilizing various aspects of data processing. These guidelines represent the recommendations of the computer services executive committee on the various topics covered.

Prepared by

Computerized Inventory Systems Task Force

James H. David, *Chairman*

James Fussell

David M. Harris

Thomas E. Hawkins

AICPA Staff

Carol A. Schaller, *Manager*

Computer Services

Alan Frotman, *Manager*

Computer Services

Approved by

Computer Services Executive Committee (1978-79)

Karl G. King III, *Chairman*

Lois L. Cohn

Jeffrey D. Green

Stanley D. Halper

Thomas J. Koger

Fred L. Lilly

Richard F. Maginn

Phillip A. Parker

Walter D. Pugh

Richard D. Webb

Joseph D. Wesselkamper

Kent Yarnell

AICPA Staff

Donald L. Adams, *Vice President*

Administrative Services

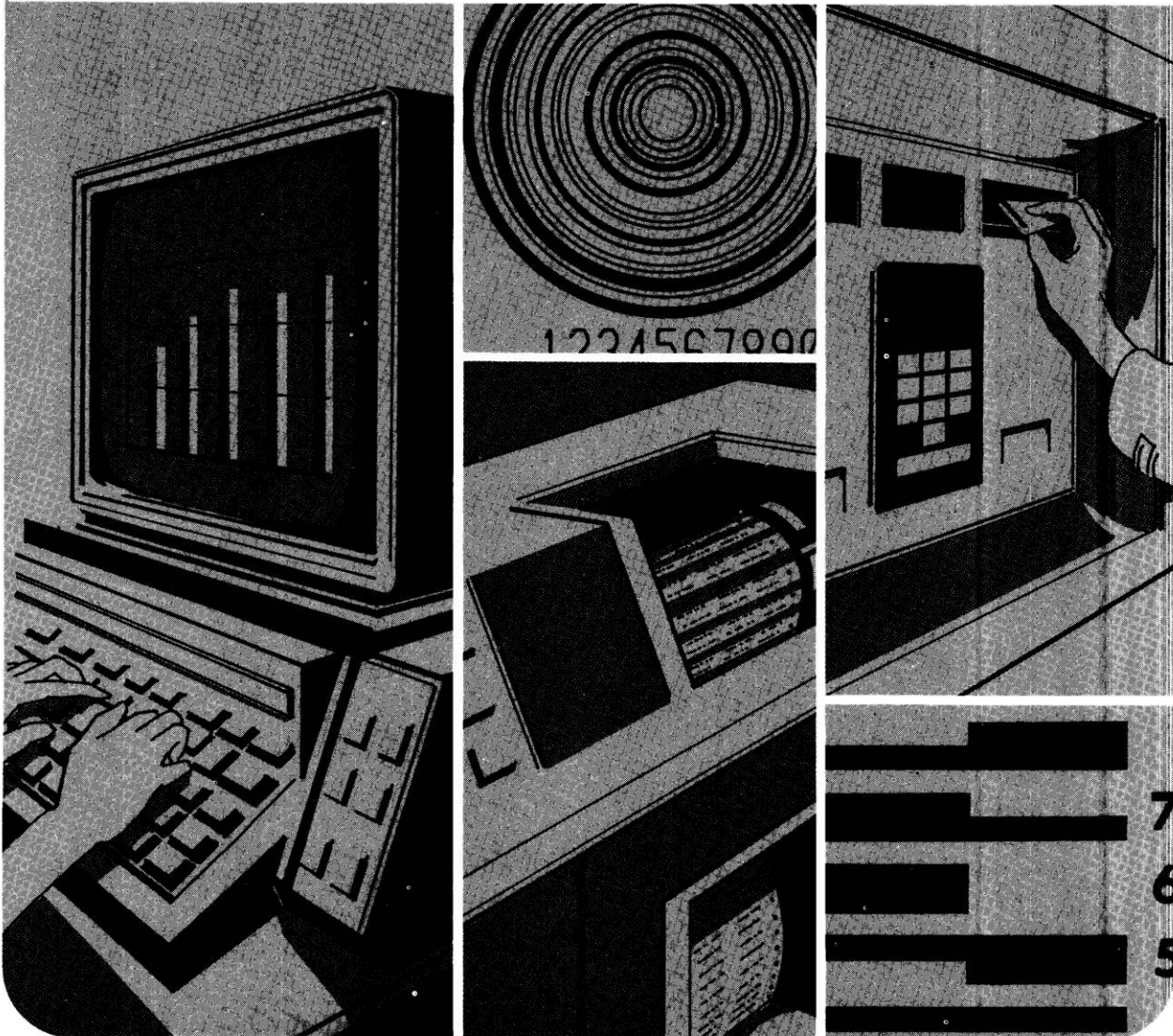
Paul H. Levine, *Manager*

Computer Services

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Audit Approaches for a Computerized Inventory System

American Institute of Certified Public Accountants **AICPA**



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1211 Avenue of the Americas, New York, N.Y. 10036
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Introduction

Objectives

The objectives of this guideline are to help the auditor

- Understand a computerized inventory system.
- Identify control techniques to satisfy control objectives for a computerized inventory system.
- Identify possible compliance and substantive tests for a computerized inventory system.

This guideline is intended for use by an independent auditor who has an understanding of EDP accounting controls and concepts.

SAS no. 3, *The Effects of EDP on the Auditor's Study and Evaluation of Internal Control*, and the audit and accounting guide, *The Auditor's Study and Evaluation of Internal Control in EDP Systems*, define and describe audit procedures that can be performed in the study and evaluation of EDP accounting controls. This guideline relates the guidance provided in the SAS and the guide to the auditor's study and evaluation of a computerized inventory system.

Overview

The guideline describes

- Common functions of computerized inventory systems (chapter 2).
- An example of a computerized inventory system (chapter 3).
- How the objectives of application controls are met in the example system (chapter 4).
- Possible audit procedures for the example of a computerized inventory system (chapter 5).
- The applicability of the control and audit procedures discussed in this guide to other inventory systems (chapter 6).

This guideline addresses the inventory system without elaborating on elements of the accounting system that interface with the inventory applications (for example, purchasing and billing).

Computerized inventory systems are designed to meet the needs of a particular business or entity. These needs are normally dictated by the type of business, the type of product it produces, the volume of transac-

tions to be processed, and the EDP system available. Accordingly, there are many different methods of accounting for inventory. The inventory system described in this guideline represents one of these methods: a fully integrated inventory system. The description of the system does not deal with the use of information for purposes other than accounting (e.g., for production control, purchasing, etc.).

Chapters 3 and 4 are not intended to be a model or guideline for developing an inventory system. They are intended to provide the auditor with an understanding of how computerized inventory systems work in general, and they illustrate control techniques that the auditor might encounter in client systems. Chapter 5 describes some possible audit procedures for testing the system and the data. The procedures are described in order to assist the auditor in planning the review and testing of a computerized inventory system. They do not represent recommended or minimum procedures, nor do they present a comprehensive summary of all procedures that might be applied.

Relevance to Other Computerized Financial Systems

The following chapters, although expressly related to the example system, can also apply to other computerized inventory systems; and certain aspects of the control and audit procedures may apply to any computerized financial system. The rest of this chapter discusses the relevance of the controls and audit procedures described in each chapter to other computerized financial systems.

Description of the System (Chapter 3). The description of the system identifies

- The procedures for developing input to the EDP system.
- The EDP files used during processing.
- The processing of transactions by EDP.
- The information contained in output from the EDP system.

These four aspects of the system are common to all computerized financial applications, and the need to identify them accurately and to understand them is the same for different types of applications.

Input. Chapter 3 describes the input to the computerized system by identifying all the transactions (and the sources of those transactions) that affect the application being studied. Further, the chapter describes (1) what events initiate the transactions, (2) how the user department establishes control over transactions to be processed and how these control procedures are subsequently used to determine the validity of output, and (3) how, and under what controls, the transactions are converted to machine-readable data.

Files. In identifying the files used in the processing of transactions, chapter 3 describes the details of the information on each particular file and the manner in which the information is added or updated. Further, the chapter identifies the data elements used during particular processing operations and describes their use. The chapter also describes how the individuals responsible for the accuracy of the file are able to ascertain the correctness of the data on the file.

Processing. Chapter 3 describes how the computer processes transactions to update files, how it performs calculations, and how it generates output. Each calculation and the significance of its results are described precisely.

Output. Chapter 3 describes the types of output generated by the EDP system and the use that is made of such output. The chapter identifies the point during processing at which each output is created; it describes the control of output distribution; and it explains how both the EDP and user departments gain assurance of the completeness and validity of the output.

Identification of Control Techniques (Chapter 4). In identifying the techniques that help to attain control objectives in a computerized financial application, chapter 4 first states that no weaknesses in general controls have been found that would be significant enough to preclude a reasonable framework for a well-controlled financial application. The chapter then concentrates on application controls. The classifications of controls in the chapter are

- Input controls
- Processing controls
- Output controls

The chapter describes how the control procedures in the example system help to meet the application control objectives identified in the AICPA audit and accounting guide, *The Auditor's Study and Evaluation of Internal Control in EDP Systems*. The control objectives listed in the audit guide are independent of the type of financial application being studied.

For example, the types of input controls in the example system (e.g., batching and logging by user departments) are frequently found in any computerized financial system using batch processing.

Identification of Audit Procedures (Chapter 5). This chapter identifies the types of audit procedures that could be applied in reviewing and testing a computerized financial application. In determining an audit approach to the computerized system, the auditor might categorize the procedures into four major phases of the audit:

- Understanding the application and its controls.
- Planning the audit approach.
- Compliance testing.
- Substantive procedures.

Although the description of these categories uses the example system as a focal point, and although the illustrative audit procedures relate to inventory, the underlying

thought processes and planning relate to any computerized system.

For example, in describing possible substantive procedures relating to the inventory system, chapter 5 identifies tests that are clearly inventory oriented. If these tests are categorized differently, however, the types of tests fall into broader generic categories; such as validation of master files, checking of clerical accuracy, and selection of exception items not meeting certain criteria; which would be equally applicable for any computerized financial system. Like the inventory system that is described, most computerized financial systems have master files containing monetary information. This information is summarized by

computer programs to develop totals for financial reporting purposes. The similarity of this process in all financial applications provides the basis for similarities in audit techniques. For instance, the use of audit software to extend and summarize the inventory master file would be similar to the use of an audit software application to recompute and summarize depreciation and asset value on a fixed assets master file.

Although the guidance offered in this guideline may be applicable to any computerized system, the guidance is only of a general nature. The auditor should adapt the applicable guidance to the specific audit engagements.

Functions of a Computerized Inventory System

A well designed inventory system, when administrative and accounting controls are properly installed and operative, will provide management with reasonable assurance of the following:

- Inventory transactions are recorded and processed in accordance with management's general or specific authorization.
- Inventory transactions are recorded in a manner (a) to permit preparation of financial statements in conformity with generally accepted accounting principles or any other criteria applicable to such statements and (b) to maintain accountability for inventory assets.
- Access to inventory assets is permitted only in conformity with management's authorization.
- The recorded accountability for inventory assets is compared with the existing inventory assets at reasonable intervals, and appropriate action is taken with respect to any differences.
- Data required to make appropriate business decisions is available on a timely basis.

The ability to perform these basic functions depends on the types of transactions the particular system is designed to process (input) and the results of processing (output). Both the input and the output of a computerized inventory system may be in the form of documents or machine-readable files from the inventory system's interfaces with other computerized application systems.

Transactions within an Inventory System

The transactions that are processed in a computerized inventory system can be classified as (a) those that affect inventory quantities, (b) those that affect inventory costs, and (c) those that affect other inventory master file information (for example, changes in warehouse location or unit of measure, or the addition of a new finished good).

Transactions Affecting Inventory Quantities. The transactions affecting inventory quantities vary with the type of inventory (that is, raw materials, finished goods, or work in process). Examples are receipts of merchandise, transfers between stages of production, and shipments to customers. A complete list of the transactions affecting quantities in the example inventory system appears in chapter 3.

Transactions Affecting Inventory Costs. The types of transactions that affect inventory costs depend upon the type of costing system employed by the particular company. Although all companies record the actual cost of mer-

chandise purchased and the labor and overhead required to manufacture its products, such records may or may not be part of the inventory costing system. If a company uses an actual cost method, these transactions would be used to update cost files directly. If the company uses a standard cost method, the inventory cost files might only be changed periodically or when the variance reporting system indicates outdated or incorrect standards.

Certain other transactions, known as *file maintenance transactions*, also directly affect costs. Examples are a reduction of the recorded cost of obsolete inventory to its market value and the addition of a new inventory item with its associated costs.

Transactions Affecting Other Inventory Master File Information. For a computerized inventory system to remain operable and to process information accurately, the master files used in the application must be current. To satisfy this need, the system should permit

certain data to be added, changed, or deleted. Examples of these file maintenance transactions are the addition of a new finished good and its bill of materials, a change to the por-

tion of the record containing the date of last issuance, last sale, etc., and a substitution of one raw material for another in a bill of materials.

Output from an Inventory System

An inventory system's output can range from reports used solely for accounting purposes to those used strictly for nonfinancial purposes. Between these two extremes are many reports used to varying degrees by diverse departments within the organization. The following are examples of organizational units that use the output of a computerized inventory system and the particular output that they might use:

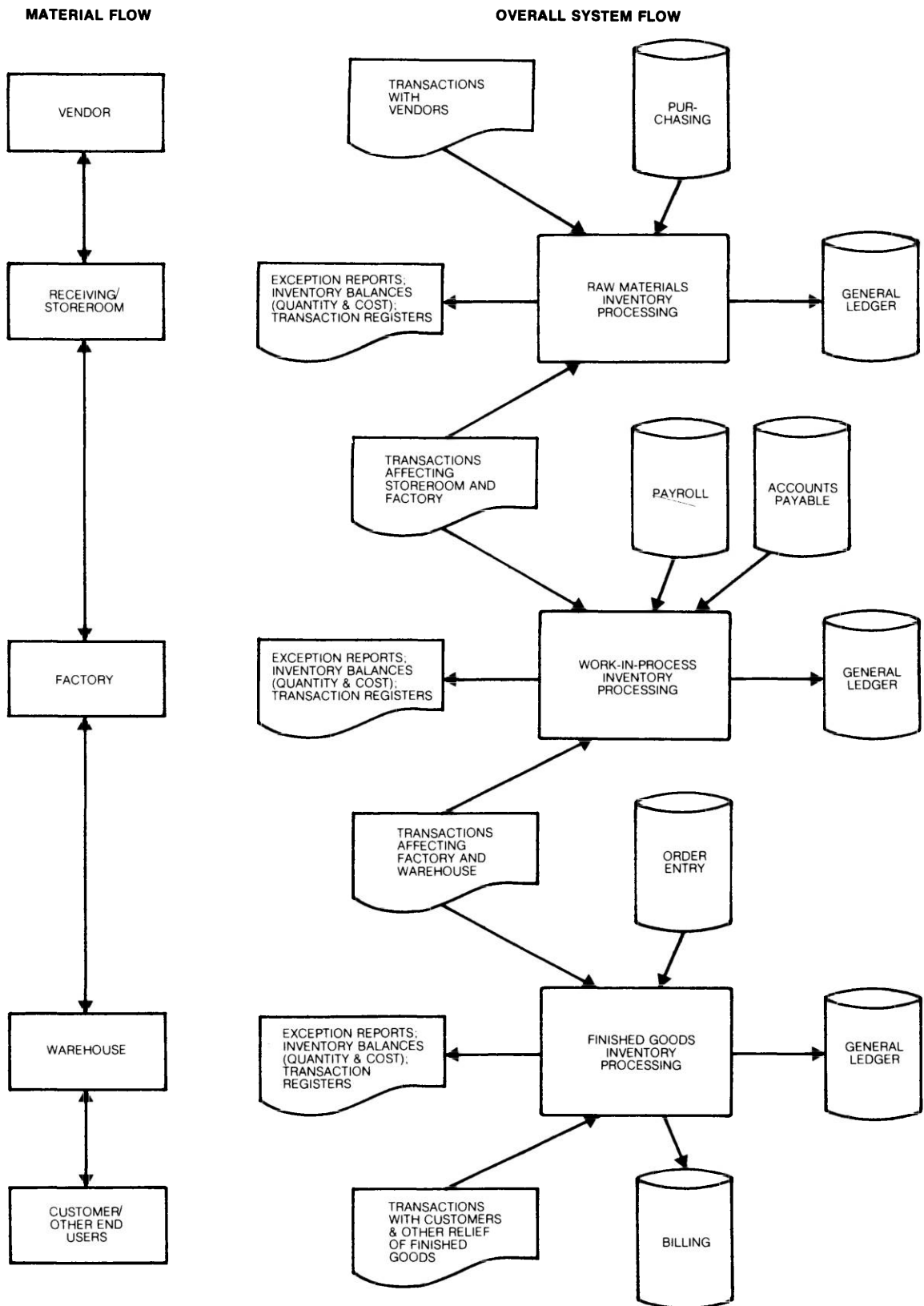
1. *Planning and Scheduling.* Open sales orders, finished goods on hand, open production orders, rework orders.
2. *Purchasing.* Quantities of materials on hand, materials on order, materials allocated to open production orders.
3. *Sales.* Finished goods on hand, slow-moving items, open sales orders, customer returns.
4. *Inventory Control.* Daily, weekly, and/or monthly inventory transactions, exception reports.
5. *Accounting/Budgeting.* Inventory status, cost of sales, variances, book-to-physical-inventory comparisons.
6. *Cost Accounting.* Bills of materials, variances.
7. *Customer Service.* Open order status, returns from customers, finished good inventory quantities.
8. *Management.* Backlog reports, backorder reports, profitability by product, variance reporting.

Interface of Inventory with Other Systems

The data that is input to or output from a computerized inventory system affects more than the quantities, costs, and other inventory master file information for the components of a company's inventory. Most transactions that affect inventory have a direct impact on some other portion of the company's overall financial system. Accordingly, in gaining an understanding of a computerized inventory system, one should carefully consider the interface of the inventory system with other portions of the accounting system (for example, accounts payable, order entry). A computerized inventory system should fit into the overall accounting system. That way, a company can reduce the amount of redundant data that is captured to drive separate application systems, and one system either can automatically provide machine-readable information to another or can process machine-readable output from other systems. Some of the more common automatic interfaces that a computerized inventory system might have include the following:

1. *Purchasing*
 - The purchasing system can use the issuances of material that cause inventory levels to reach reorder points to generate purchase orders.
2. *Accounts Payable*
 - The accounts payable system can match vendors' invoices with the inventory system's receipts of merchandise.
 - The accounts payable system can use the inventory system's returns of merchandise to vendors to prepare debit memos.
 - The inventory system can use the expense distributions recorded in the accounts payable system to allocate overhead.
3. *Payroll*
 - The inventory system can use the direct and indirect labor costs recorded in the payroll system to allocate direct labor and overhead.
4. *Order Entry*
 - The inventory system can use the orders recorded in the order entry system to allocate finished goods and to report back orders.

FIGURE 1



5. *Billing*
 - The billing system can use the shipments of finished goods recorded in the inventory system to prepare invoices.
 - The billing system can use the returns of merchandise from customers recorded in the inventory system to prepare credit memos.
6. *General Ledger*
 - The general ledger system can use the cost of sales and inventory levels recorded in the inventory system to update the proper accounts automatically.

The auditor should know which parts of a client's accounting system interface with others in order to determine the flow of transactions through the overall accounting system.

Inventory systems tend to vary from company to company more significantly than other systems, such as accounts payable, payroll, or general ledger. However, certain functions that have been discussed in this chapter are basic

to all inventory systems. If the inventory system is computerized, an overview of it can be depicted as in figure 1. The receipt of new material by a manufacturing company, its conversion to a finished good, and the ultimate sale of the finished product (shown on the left-hand side of the flowchart) create the transactions that an inventory system records and processes. The right-hand side of the flowchart illustrates the transactions that would generally enter into an inventory system for a manufacturing company, some of the common interfaces with other computerized applications, and the types of reports the inventory system would generate.

To demonstrate how a computerized inventory system can fulfill the functions described in this chapter, and to provide a common reference for the chapters on control and auditing of a computerized inventory system, the next chapter describes the inventory system of a specific manufacturing company. Hereafter, the inventory system described in chapter 3 will be referred to as "the specified system."

Description of the Harvidell Schakins Computerized Inventory System

Background of the Company

Harvidell Schakins & Co., Inc., manufactures men's apparel, principally suits and sport-coats. The apparel is sold to a variety of department and men's clothing stores, none of which purchases more than 8 percent of the company's production. The company has no retail stores. Goods are sold under both the company's label and private labels.

The company considers inventory one of its major assets and has striven to develop a strong system to control it. Certain elements of the inventory system (for example, physical inventory processing) have been computerized

for many years, and these continue to use punched card input; other portions of the system, having been automated only recently, use more current data processing technology.

Perpetual inventory records are maintained on the computer and are adjusted to physical inventory counts. The company takes physical inventory, which is observed by its independent auditors, on October 31 and relies on the perpetual inventory system records to update the general ledger inventory amount from the date of physical count to the company's balance sheet date.

Method of Describing the System

This chapter describes the inventory system in several phases:¹

- Types of transactions processed by the system.
- Daily processing of transactions affecting inventory quantities.
- Processing of file maintenance transactions.
- Monthly processing.
- Quarterly processing.
- Physical inventory procedures.

The introduction to each phase is an overview flowchart of the EDP processing for that portion of the system. The paragraphs directly following the flowchart discuss the processing details. (Appendixes A through D present detailed flowcharts of the entire inventory system, including the interfaces between EDP and the user departments.) The transactions processed through each stage are described in detail, but the guideline avoids repetition of the processing steps for transaction types that are processed in a similar manner.

¹ The level of detail in this description is provided for the purposes of this case study and does not represent that required for the preliminary phase of the auditor's review of the system, as described in SAS no. 3, *The Effects of EDP on the Auditor's Study and Evaluation of Internal Control*.

Types of Transactions Processed by the System

Four departments originate transactions (except for file maintenance transactions) that affect inventory quantities:

- Receiving/storeroom
- Factory
- Warehouse
- Accounting department

All input transactions are recorded by the originating department on prenumbered forms specifically designed for each type of transaction. Any transaction that requires a transfer of inventory between departments is recorded on a multi-part form. The department that transfers the inventory submits one part of the form to data processing, and the department that receives the inventory submits another part. The EDP system will identify any transfers for which the forms do not match or for which one part of the transfer document is missing.

The following are transactions that affect inventory quantity for each originating department:

1. Receiving/Storeroom Transactions

- *Receipt of purchased material.* Receiving reports are prepared for receipts of raw material.
- *Issuance of material for production.* The factory personnel prepare a multi-part form (exhibit 3-1) when they receive a production order from the planning and scheduling department. One part of this form is the storeroom's *issuance of material for production* form. (The other part is the factory's *receipt of material from storeroom* form, which is listed under *Factory Transactions*.) All material needed for completion of a particular production order is issued at one time; and from the time the storeroom issues the materials until manufacturing is completed, the materials are identified by the production order number.
- *Return of material to vendor.* When storeroom personnel return unacceptable material to a vendor, they complete a *return of material to vendor* form. The information is used to change perpetual inventory quantities, and the form serves as support for the debit memo that the accounts payable department issues to the vendor.
- *Return of material from production.* When material previously issued to the factory for a particular production order

is returned to the storeroom, factory personnel complete a multi-part form to accompany the return. One part of this form is the factory's *return of material from production* form, which, when signed by storeroom personnel, is their acknowledgement of receipt of the returned material. (Another part is the *return of material to storeroom* form, which is listed under *Factory Transactions*.)

2. Factory Transactions

- *Receipt of material from storeroom.* The form documenting this transaction is the other part of the same multi-part form listed as the storeroom's *issuance of material for production*.
- *Return of material to storeroom.* The form documenting this transaction is the other part of the same multi-part form listed as the storeroom's *return of material from production*.
- *Transfer of spoiled material to scrap and transfer of production to warehouse.* When the factory completes work on a production order or rework order, the finished merchandise is transferred to the warehouse, and any nonsalvageable merchandise is transferred to scrap. Transfers of finished goods to the warehouse are documented by one copy of a multi-part form, entitled the *transfer of production to warehouse* form. (Another part is the warehouse's *receipt of merchandise from production*.) Transfers to scrap are documented by *transfers of spoiled material to scrap* forms. Both forms are completed by factory personnel.
- *Receipt of merchandise from warehouse for rework.* Occasionally, after finished goods are sent to the warehouse, some of the goods either fail quality control tests or are returned by customers. In either case, warehouse personnel complete a multi-part form and transfer the goods to the factory for additional work. One portion of the form, the factory's acknowledgement of receiving the goods, is called a *receipt of merchandise from warehouse for rework* form. (Another part is the warehouse's *transfer of merchandise to rework*.) While the goods remain in the factory, the rework number is used to identify and track them.

EXHIBIT 3-1
FORM FOR ISSUANCE OF MATERIAL FOR PRODUCTION

Harvidell Schakins & Co., Inc.

ISSUANCE OF MATERIAL FOR PRODUCTION

NO. 091480

PRODUCTION ORDER 61974

DATE 12/02/XX

MATERIAL I.D. NUMBER	DESCRIPTION (OPTIONAL)	UNIT OF MEASURE	QUANTITY
102376		YARDS	12535
103380		YARDS	3500
101860		YARDS	1020
107667		EACH	920
TOTAL QUANTITY			17975

REQUISITIONED BY jd
ORDER FILLED BY D.M.H.

3. Warehouse Transactions

- *Receipt of merchandise from production.* The warehouse acknowledges the transfer of production to warehouse with a *receipt of merchandise from production* form, which is a copy of the factory's *transfer of production to warehouse* form.
- *Transfer of merchandise to rework.* The warehouse completes a *transfer of merchandise to rework* form when goods are sent back to the factory for additional work. (The form is also listed under *Factory Transactions* as the *receipt of merchandise for rework*.)
- *Shipment of merchandise to customer.* When goods are to be shipped to a customer, the sales service department sends a form to the warehouse. Certain information, such as the customer number, name, and address, the finished goods style number, and the quantity ordered, by size, is on the form when it is received. Warehouse personnel locate the goods to be shipped and indicate on the form the quantity shipped and the method of shipment. The completed form, entitled *shipment of merchandise to customer*, is the warehouse's documentation of the quantities shipped. It is used to update the perpetual inventory records and to prepare customer invoices.
- *Removal of merchandise for samples or own use.* When finished goods are removed from the warehouse for samples or other use within the company, the person withdrawing the merchandise submits a requisition to the sales service department. Sales service personnel prepare a *removal of merchandise for samples or own use* form and send it to the warehouse. When warehouse personnel deliver the goods, the party who

requested them signs the form to acknowledge receipt of the merchandise. The form then serves as a basis for reducing the perpetual inventory and for charging the appropriate general ledger account for the cost of the merchandise.

- *Return of merchandise from customer.* When goods are returned by customers, the merchandise is received by warehouse personnel (rather than by the receiving department). The warehouse accepts only returns that have been authorized by the sales service department with a *return of merchandise from customer* form. When the goods are received, warehouse personnel enter the number of units of each item and indicate by a code whether the goods can be returned to stock or will require rework before the merchandise can be re-shipped. If a customer returns items other than the ones listed on the form, warehouse personnel add the finished goods style numbers to the form. If returned merchandise requires rework, warehouse personnel complete a multi-part form to transfer the merchandise to the factory. The *return of merchandise from customer* form is cross-referenced to the rework order.

4. Accounting Department Transactions

- *Physical count adjustment.* During the year, accounting personnel prepare *physical count adjustment* forms on the basis of supplementary physical counts. Supplementary counts are made when the perpetual inventory quantity for a particular raw material or finished good becomes negative or when a raw material quantity reaches the reorder point.

Exhibit 3-4 lists the information on each form.

Daily Processing of Transactions Affecting Inventory Quantities

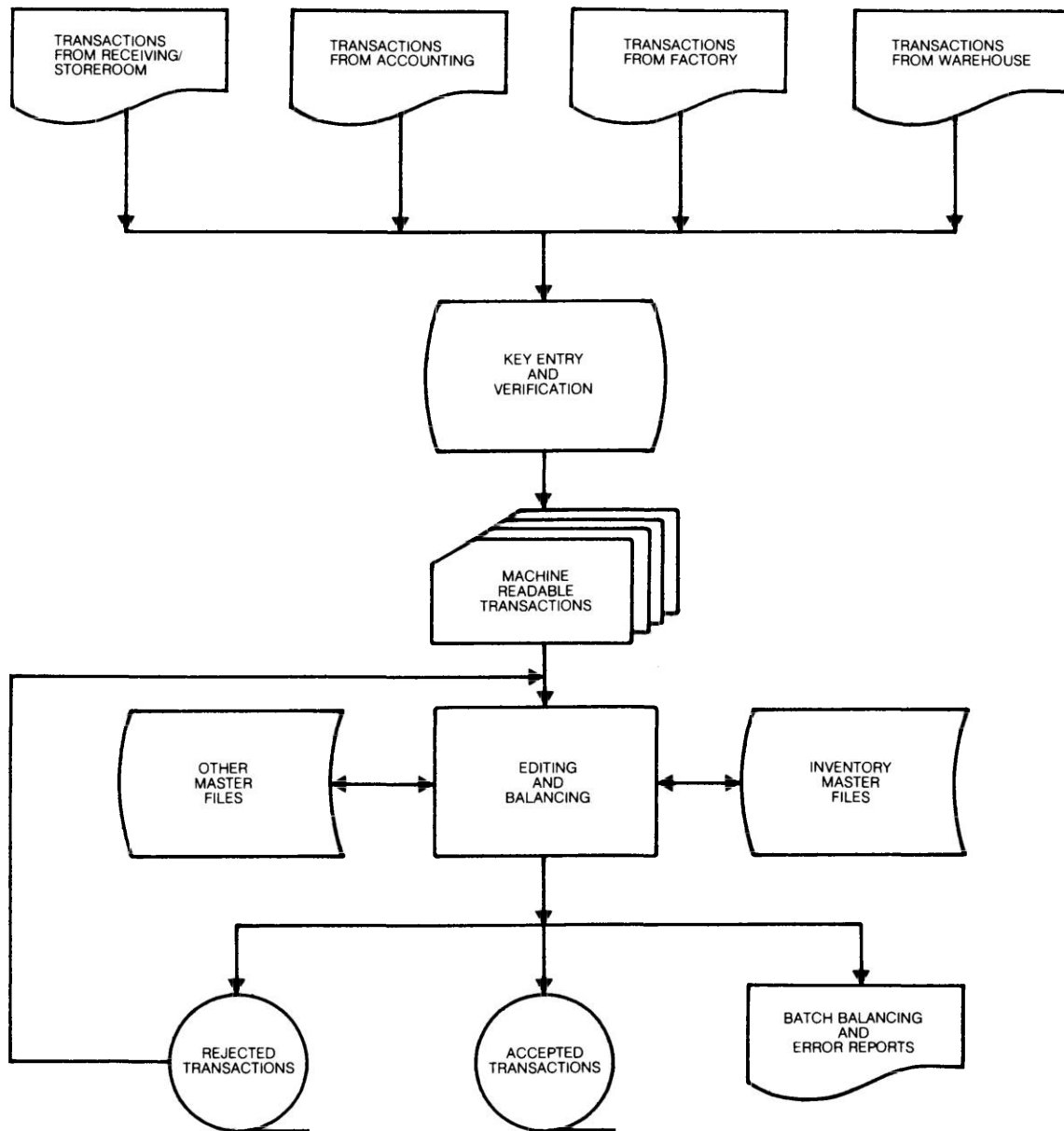
The daily processing of transactions that affect inventory quantities consists of

- Data preparation, entry, balancing, and editing.
- File updating.

Data Preparation, Entry, Balancing, and Editing. The overview flowchart in figure 2 illustrates the processing involved in entering and editing daily transactions.

The processing details are described in the following pages, and a detailed flowchart

FIGURE 2



of the processing is shown in exhibits 1 through 3 of Appendix A.

Each day, after approval by supervisory personnel, clerical personnel in originating departments appropriately group their transactions by type. The groups, or batches, may not contain more than 50 items. The clerk establishes a batch control total for each transaction-type batch. (This is generally the total of the quantity field.)

The clerk in the originating department then assigns a sequential batch number to each batch, using a prefix that identifies the

transaction type. The clerk creates a batch header and records the batch in a log. (See exhibit 3-2 for an illustration of the storeroom's control log.) The information recorded on the batch header and in the log consists of the date, the batch number, and the batch control total. The clerk then sends the source documents and the batch header to the input/output (I/O) control section of the EDP department.

The I/O clerks record the date, batch numbers, and control totals of the batches in logs as the batches are received. (See exhibit 3-3 for an illustration of the I/O control log.) The

**EXHIBIT 3-2
STOREROOM'S I/O CONTROL LOG**

DATE	BATCH NUMBER	QUANTITY	ACCEPTED	REJECTED	RESUBMITTED DATE	RESUBMITTED QUANTITY	ACCEPTED	COMMENTS
12/01/XX	2-1035	798,776	798,776					
12/01/XX	1-1036	1,269,197	1,259,423	9,774	12/02	9,774	9,774	
12/01/XX	3-1037	5,828	5,828					

EXHIBIT 3-3
I/O CONTROL LOG

INPUT/OUTPUT CONTROL LOG

STOREROOM DEPARTMENT

DATE	BATCH NUMBER	QUANTITY	ACCEPTED	REJECTED	REJECTION REASON	RETURNED TO USER	RESUBMITTED DATE	RESUBMITTED QUANTITY	RESUBMITTED ACCEPTED	RESUBMITTED REJECTED	COMMENTS
11/30/xx	4-1034	82,050	82,050								
12/1/xx	2-1035	798,776	798,776								
"	1-1036	1,289,197	1,259,423	9,774	EDIT ERRORS	12/1/xx	12/2/xx	9,774	9,774		LAST BATCH - NOK
"	3-1037	5,828	5,828								
12/2/xx	1-1038	1,243,987	1,243,987								
"	1-1039	2,486,248	2,486,248								LAST BATCH 12/1
"	2-1040	719,285		719,285	IMBALANCE	12/2/xx					
"	1-1041	923,724	923,724								
"	3-1042	17,125	17,125								
"	4-1043	11,475	11,475								
"	2-1044	143,927	130,522	13,405	EDIT ERRORS	12/2/xx					LAST BATCH 12/2

EXHIBIT 3-4 EDIT CRITERIA FOR INVENTORY TRANSACTIONS

TRANSACTION TYPE	TRANSACTION DATA EDITED	DATA EDITED TO DETERMINE IF			
		PRESENT	NUMERIC	VALIDATED TO MASTER FILE	
Receipt of Purchased Material	Receiving Report Number	X	X		
	Date	X	X	X	
	Vendor Number	X	X	X	
	Material I.D. Number	X	X	X	
	Company Order Number	X	X	X	
	Quantity	X	X		
Issuance of Material for Production (copy of factory's Receipt of Material from Storeroom)	Unit of Measure	X		X	
	Document Number	X	X		
	Date	X	X	X	
	Material I.D. Number	X	X	X	
	Production Order Number	X	X	X	
	Quantity	X	X		
Return of Material to Vendor	Unit of Measure	X		X	
	Document Number	X	X		
	Date	X	X	X	
	Vendor Number	X	X	X	
	Material I.D. Number	X	X	X	
	Quantity	X	X		
Return of Material from Production (copy of factory's Return of Material to Storeroom)	Unit of Measure	X		X	
	Document Number	X	X		
	Date	X	X	X	
	Material I.D. Number	X	X	X	
	Production Order Number	X	X	X	
	Quantity	X	X		
Receipt of Material from Storeroom	Unit of Measure	X		X	
	(SEE ISSUANCE OF MATERIAL FOR PRODUCTION ABOVE)				
	Return of Material to Storeroom				
	(SEE RETURN OF MATERIAL FROM PRODUCTION ABOVE)				
	Transfer of Production to Warehouse (copy of warehouse's Receipt of Merchandise from Production)	Document Number	X	X	
		Date	X	X	X
Production or Rework Order Number		X	X	X	
Finished Goods Style Number		X	X	X	
Quantity		X	X		
Unit of Measure (must be each)		X		X	
Transfer of Spoiled Material to Scrap	Document Number	X	X		
	Date	X	X	X	
	Production or Rework Order Number	X	X	X	
	Quantity	X	X		
	Unit of Measure	X		X	
	Receipt of Merchandise from Warehouse for Rework (copy of warehouse's Transfer of Merchandise to Rework)	Document Number	X	X	
Date		X	X	X	
Finished Goods Style Number		X	X	X	
Quantity		X	X		
Unit of Measure (must be each)		X		X	
Receipt of Merchandise from Production		(SEE TRANSFER OF PRODUCTION TO WAREHOUSE ABOVE)			
	Transfer of Merchandise to Rework				
	(SEE RECEIPT OF MERCHANDISE FROM WAREHOUSE FOR REWORK)				
	Shipment of Merchandise to Customer	Document Number	X	X	
		Date	X	X	X
		Finished Goods Style Number	X	X	X
Quantity		X	X		
Customer Number		X	X	X	
Unit of Measure (must be each)		X		X	
Removal of Merchandise for Samples or Own Use	Method of Delivery	X			
	Document Number	X	X		
	Date	X	X	X	
	Finished Goods Style Number	X	X	X	
	Account to be Charged	X	X	X	
	Quantity	X	X		
Return of Merchandise from Customer	Unit of Measure (must be each)	X		X	
	Document Number	X	X		
	Date	X	X	X	
	Finished Goods Style Number	X	X	X	
	Code for Stock or Rework	X	X	X	
	Quantity	X	X		
Physical Inventory Adjustment	Customer Number	X	X	X	
	Unit of Measure (must be each)	X		X	
	Document Number	X	X		
	Date	X	X	X	
	Material I.D. or Finished Goods Style Number	X	X	X	
	Quantity	X	X		
	Unit of Measure	X		X	

EXHIBIT 3-5

HARVIDELL, SCHAKINS & CO. INC.					
STORERCGM TRANSACTIONS					
BATCH BALANCING					
BATCH NUMEER	DOCUMENT NUMBER	DATE	GLAANTITY	CCMPLTED QLANTITY	DIFFERENCE
-----	-----	-----	-----	-----	-----
1-1038			1243987	1243987	
1-1039			2486248	2486248	
2-1040	091435	1202XX	14525		
	091436	1202XX	18600		
	091437	1202XX	17720		
	091438	1202XX	9280		
	091439	1202XX	11435		
	091440	1202XX	10796		
	091441	1202XX	19700		
	091440	1302XX	12920		
	091443	1202XX	9061		
	091444	122XX	21792		
	091445	1202XX	14729		
	091453	1202XX	13068		
	091454	1202XX	8096		
		1202XX	9762		
	091456	1202XX	14277		
	091457		12425		
	091458	1202XX	15390		
	091479	1202XX	9998		
	091480	1202XX	17975		
	091481	1202XX	11234		
	091482	1202XX	15853		
	091483	1202XX	16065		
	091484	1202XX	13740		
	BATCH TOTALS		719285	709175	10110
1-1041			923724	923724	
3-1042			17125	17125	
4-1043			11475	11475	
2-1044			143927	143927	

EXHIBIT 3-6

HARVIDELL, SCHAKINS & CO. INC.
ISSUANCES OF MATERIAL FOR PRODUCTION

ERROR REPORT.

BATCH NUMBER	DOCUMENT NUMBER	DATE	PRODUCTION ORDER NUMBER	MATERIAL ID NUMBER	UNIT OF MEASURE	QUANTITIES ITEM	QUANTITIES DOCU	REASON FOR ERROR
2-1040	091440	1202XX	061939	102064	YARDS	2200	10796	UNIT OF MEASURE WRONG FOR MATERIAL ID
2-1040	091440	1302XX	061952				12920	DOCUMENT NUMBER IS NOT NUMERIC MONTH IS GREATER THAN 12
2-1040	091444	122XX	060954				21792	DOCUMENT NUMBER DOES NOT CONTAIN 6 DIGITS DATE DOES NOT CONTAIN 6 DIGITS PRODUCTION ORDER NUMBER IS NOT NUMERIC
2-1040			01197				9762	DOCUMENT NUMBER IS MISSING PRODUCTION ORDER DOES NOT CONTAIN 6 DIGITS
2-1040	091457						12425	DATE IS MISSING PRODUCTION ORDER IS MISSING
2-1040	091480 091480 091480	1202XX 1202XX 1202XX	061974 061974 061974	102376 10186C	YARDS YARDS	3500 1020		QUANTITY IS MISSING MATERIAL ID NUMBER IS MISSING MATERIAL ID IS NOT NUMERIC
	091480	1202XX	061974	10769	EACH	K20	17975	UNIT OF MEASURE IS MISSING MATERIAL ID NUMBER DOES NOT CONTAIN 6 DIGITS QUANTITY IS NOT NUMERIC
				TOTAL OF REJECTED TRANSACTIONS			85670	
				TOTAL OF ACCEPTED TRANSACTIONS			623505	
				BATCH TOTAL			709175	
2-1044	091496	1202XX	061988	106996	YARDS	2210	13405	INVALID MATERIAL ID NUMBER
				TOTAL OF REJECTED TRANSACTIONS			13405	
				TOTAL OF ACCEPTED TRANSACTIONS			130522	
				BATCH TOTAL			143927	

EXHIBIT 3-7

HARVIDELL, SCHAKINS & CO. INC.

DOCUMENT ACCOUNTABILITY

STOREROOM

12/02/XX

DOCUMENT NUMBER -----	DOCUMENT DESCRIPTION -----	ERROR -----
249327	RECEIVING REPORT	MISSING
249377	RECEIVING REPORT	DUPLICATE
011398	RETURN TO VENDOR	MISSING

EXHIBIT 3-8

HARVIDELL, SCHAKINS & CO. INC.

UNMATCHED TRANSFERS

DOCUMENT NUMBER -----	DATE -----	QUANTITY -----	DOCUMENT DESCRIPTION -----
091502	1202XX	12928	ISSUANCE TO PRODUCTION
037643	1202XX	5209	RETURN FROM PRODUCTION

EXHIBIT 3-9

HARVIDELL, SCHAKINS & CO. INC.
 DAILY INVENTORY BALANCE REPORT

RAW MATERIALS
 12/02/XX

	OPENING BALANCE	RECEIPTS	ISSUANCES TO PRODUCTION	RETURNS TO VENDORS	INVENTORY ADJUSTMENTS	RETURNS FROM PRODUCTION	CLOSING BALANCE
UNITS	49723424	4663733	130522	17125	0	11475	54250985
DOLLARS	34233986	2331927	91365	87923	0	7623	36394248

MONTH TO DATE

UNITS	5923156	929298	22953	0	0	11475
DOLLARS	6344914	658658	90827	0	0	7623

**EXHIBIT 3-10
DOCUMENTATION OF PERPETUAL INVENTORY RECONCILIATION**

PERPETUAL INVENTORY RECONCILIATION STOREROOM			
DATE <u>DEC. 3, 1988</u>	PREPARED BY <u>T. J. 154</u>		
CLOSING BALANCE-PREVIOUS DAY			49,723,424
ADD: TRANSACTION #1 (RECEIPTS)	<u>BATCH NUMBER</u>	<u>CONTROL TOTAL</u>	<u>QUANTITY ACCEPTED</u>
	1-1038	1,243,987	1,243,987
	1-1039	2,486,248	2,486,248
	1-1041	923,724	923,724
TRANSACTION #4 (FACTORY RETURNS)			
	4-1043	11,475	11,475
CORRECTIONS:	1-1036	9,774	9,774
			<u>4,675,208</u>
			<u>54,398,632</u>
DEDUCT: TRANSACTION #2 (ISSUANCES)			
	2-1040	709,175	-
	2-1044	143,927	130,522
TRANSACTION #3 (RETURNS)			
	3-1042	17,125	17,125
CORRECTIONS	-	-	-
			<u>147,647</u>
CLOSING BALANCE-TODAY			<u>54,250,985</u>

I/O clerks determine whether the first batch for a particular transaction type is in sequential order with previously submitted batches, and they account for the sequence of batches received for the day. The batch header for the highest batch number of the day for each originating department (without regard to the prefix indicating transaction type) contains an indication that it is the last batch of the day for that department.

The source documents and batch headers are then sent to the key entry area, where they are entered, and where selected data is key-verified. The keyed data is processed through batch-balancing and editing programs. (See exhibit 3-4 for the editing criteria in the programs for each transaction type.) Batches are processed as follows:

- Batches that balance with the given batch total and that pass editing tests are output to a machine-readable file of accepted transactions.
- Batches that do not balance are rejected by the system.
- Batches that balance but that have transactions that fail the various edit tests are split so that valid transactions are output to a file of accepted transactions and those that failed the edit tests are output to a file of suspense items. The computer (a) calculates a new batch total for the portion of the batch that was accepted, (b) totals the rejected items, and (c) prints the totals on the error report.

This processing generates two summary reports: the batch balancing report (illustrated in exhibit 3-5) and the error report (exhibit 3-6). The batch balancing report lists summary totals for batches that pass batch-balancing and editing tests and shows batches that fail to balance in their entirety. The error report lists batches with erroneous transactions, listing the rejected items, with an explanation of why each transaction was rejected, and showing the total of rejected items for each batch. Subsequently, I/O clerks reconcile the batch totals of the accepted items and of the rejected items with the original batch total.

The error report, if it is generated, and the batch balancing report are given to the I/O clerks along with the original source documents and batch headers. The accepted batches listed on the batch balancing report are noted in the I/O clerks' log. If no errors are listed, the batch balancing report is sent to the appropriate originating department, as indicated in the report distribution manual.

For rejected batches or transactions listed on either report, the I/O clerks compare the rejected items to the source documents to de-

termine whether erroneous key entry caused any of the errors. If so, the report, with corrections noted, is sent to the key entry department for reentry. The transactions are reprocessed through the editing program, and, if appropriate, a new error report is generated.

For all other errors, the I/O clerks record the date and reason for rejection (that is, imbalance or rejected transactions) in the I/O control log and send the error report or batch balancing report to the originating department for correction.

Originating department personnel review the batch balancing report and the error report and make corrections to data and batch totals. Generally, corrections are made the day after the error is discovered. Originating department personnel record the corrections, if any, to batch totals and the date of resubmission in their log; they then send the reports with the corrections back to the I/O control section.

The I/O clerks record receipt of the corrected batch in the I/O control log and submit the corrected data for key entry and processing through the batch-balancing and editing programs.

Every week, the supervisor of the I/O control section reviews the I/O control log and notifies supervisors in originating departments of any batches that were not in balance, were returned to the department, and were not resubmitted. In addition, the computer system generates a weekly report of suspense items for review and investigation by a supervisor in the originating department.

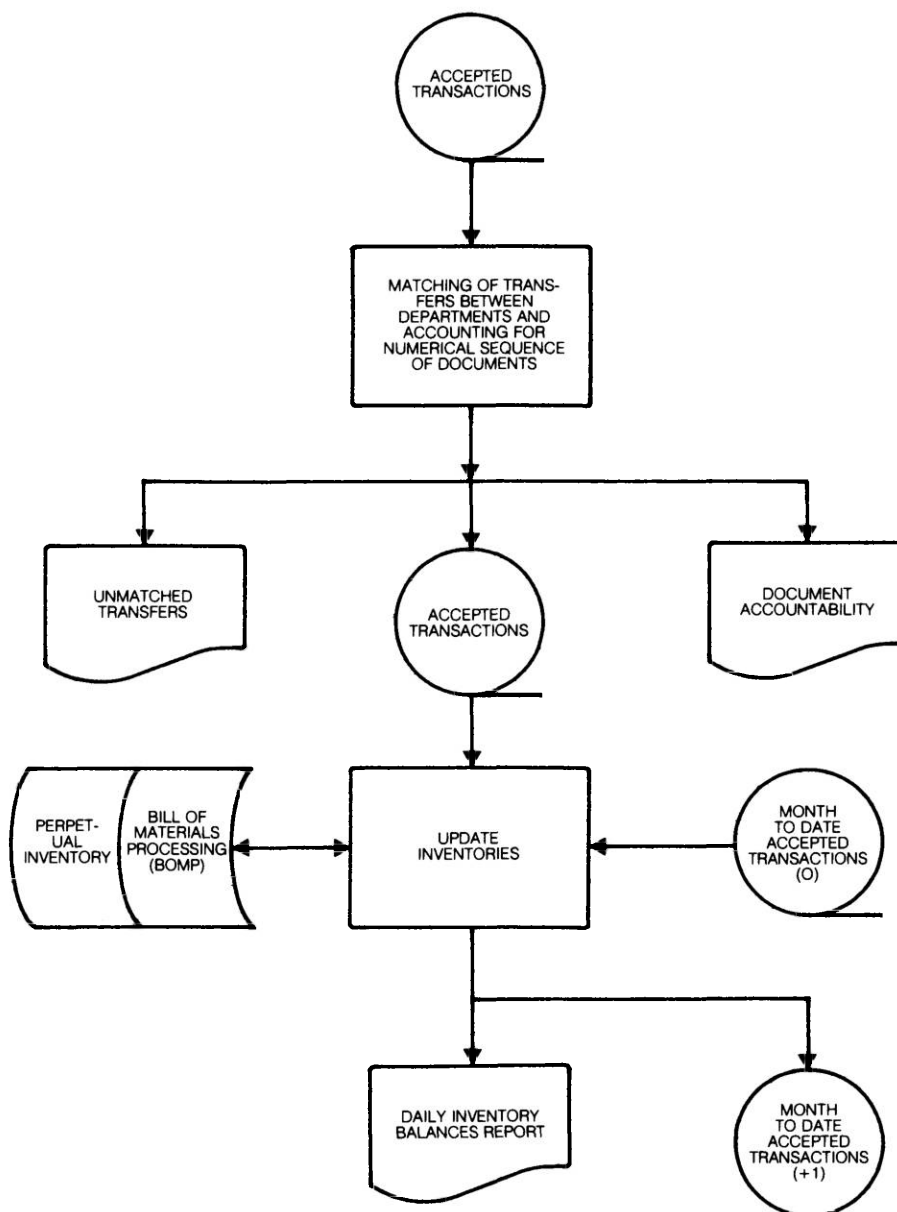
File Updating. Figure 3 depicts the processing of transactions after they have passed batch-balancing and editing tests. The transactions are used to update the perpetual inventory files.

The details of this processing are discussed in the following pages, and a more detailed flowchart is included in Appendixes A (exhibit 4) and B.

Matching Transfers and Checking Sequence. Batches that are in balance and have passed preliminary editing are processed through programs (1) that account for the numerical sequence of transactions and (2) that match transfers between departments to determine that both sides of each transaction have been submitted and that the indicative data (such as unit of measure, quantity, style number) agree. The reports produced are

- The document accountability report, listing transaction documents missing from the numerical sequence (exhibit 3-7).
- The unmatched transfer report, listing in-

FIGURE 3



terdepartment transfers that did not match (exhibit 3-8).

These reports are sent to the I/O control section for distribution to appropriate personnel in originating departments, based upon the report distribution manual.

Supervisory personnel in originating departments review the exceptions on the document accountability report to determine whether or not the missing documents are void and investigate exceptions on the unmatched transfer report to determine the reason that the documents conflict or were not submitted. Any

data to be processed on the basis of this review is submitted as a separate batch referencing the original transaction date. If investigation indicates that any erroneous data was entered, the data is corrected by submission of the appropriate document. (For example, if a *receipt of merchandise from storeroom* was erroneously recorded by the factory and could not be matched to an *issuance of material to factory* form, the factory would correct the error by submitting a "one-sided" *return of material to storeroom* form; the "one-sided" transaction would be listed as an exception on the day on which it was recorded, but no further entry would be made at that time.)

Updating Perpetual Inventory Files. At the end of each day, the transactions that have passed all the batch-balancing and editing procedures are processed in order to update the company's perpetual inventory files. (This processing is performed after the file maintenance activity has been processed—see the following section.) Daily inventory balance reports are produced for each type of inventory (raw materials, work in process, and finished goods). These reports show daily and month-to-date totals for the dollar value and the number of units of each transaction, and they show the ending inventory balances in units and dollars. (See exhibit 3-9 for an illustration of the raw materials balance report.)

The reports are sent to the appropriate clerks in each originating department, as specified in the report distribution manual (that is, the raw materials balances report to the receiving/storeroom, the work in process report to the factory, and the finished goods report to the warehouse, and copies of all the reports to the accounting department). The department clerks do the following:

- Check whether the opening balance agrees with the previous day's closing balance.
- Reconcile the transaction totals and ending balances with the manually maintained control log by accounting items for rejected batches or individual items that have not yet been corrected and resubmitted for processing. For the reconciliation, the clerks in the storeroom and warehouse accept the accuracy of the physical count adjustment forms submitted by accounting personnel. (Accounting personnel have previously checked these adjustments as part of their file maintenance procedures.) As each originating department completes its perpetual inventory reconciliation (exhibit 3-10), the clerk notifies the inventory accountant in the accounting department. The accounting department maintains its copies of the reports for use in the month-end reconciliation.

Processing of File Maintenance Transactions

Figure 4 depicts an overview of the file maintenance processing.

The details of this processing are described in the following paragraphs, and a more detailed flowchart appears in Appendix C.

File maintenance transactions are those used to add, delete, or change existing master file information (other than inventory quantity information). For instance, the addition of a new finished good, the deletion of a raw material that is no longer used, stocked, or purchased, and the changing of a standard price are examples of file maintenance transactions. Because of the nature of the transactions, they typically do not involve any quantities, which could be used in the preparation of a batch total. The system does not edit the file maintenance transactions to the same extent as quantity transactions. Accordingly, the company uses different procedures to control these transactions than those it uses to control other daily transactions.

Originating File Maintenance Transactions. Clerical personnel in the originating department prepare file maintenance transactions and submit them to the supervisor for approval. After the transactions are approved, the supervisor's secretary prepares a batch of each type of approved file maintenance trans-

action (that is, additions, deletions, and changes). The secretary does the following:

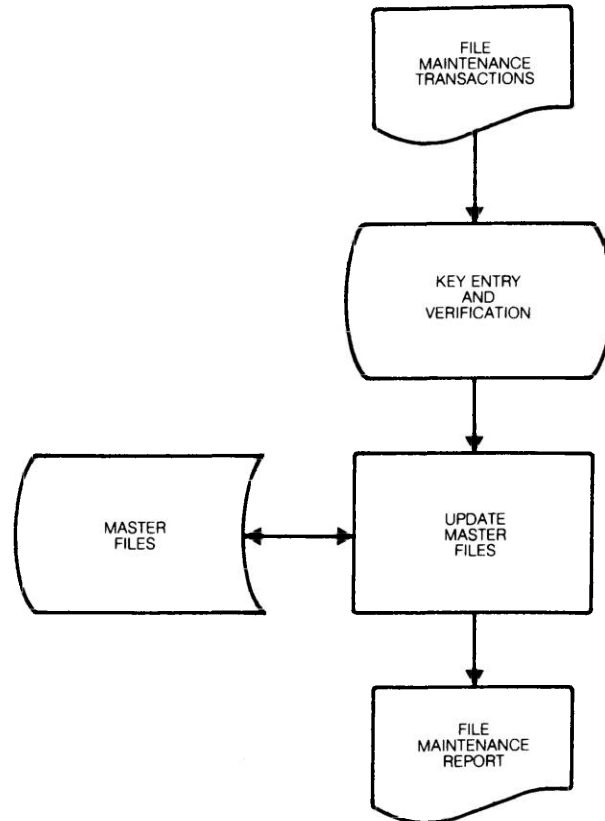
- Counts the number of transactions in each batch.
- Prepares a batch header containing the date and number of transactions.
- Records the batch information in a log, including the date, the type of transaction (addition, deletion, or change), the transaction count, and the adjusted total of master file records after the batch.

Processing File Maintenance Transactions.

The source documents and batch header are then sent to the I/O control section, where receipt of the batch is logged. Because there is only one batch per day for each type of transaction from each originating department, the I/O control section does not account for batch sequence but does check to see whether it receives one batch each day from each department, even if the batch header only indicates "no changes."

The source documents and batch header are then key-entered, and the data is completely key-verified. The batch-balancing programs are processed with the data and then, whether or not in balance on document count, the file is updated and a report is printed. For each transaction, the report shows the affected

FIGURE 4



record both before and after the processing of the transaction. For additions, the “before” record will be blank; the “after” record will be blank for deletions. The report also shows a record count of the affected file after processing. The reports and source documents are sent to the I/O control section, where the output batches are logged. The reports are then sent to the originating department, along with the source documents.

Review of Completed File Maintenance Transactions. The secretary in the originating de-

partment reviews the report to determine that the batches balance and that the ending file record count agrees with the manually controlled total in the file maintenance transaction log. The secretary then proofreads the “after” record on the report, comparing it to the source document to determine whether the transaction was recorded properly.

The entire master file is printed at regular intervals and is reviewed by the supervisor of the originating department to help determine whether unauthorized changes have been made.

Monthly Processing

Figure 5 depicts an overview of the monthly processing performed.

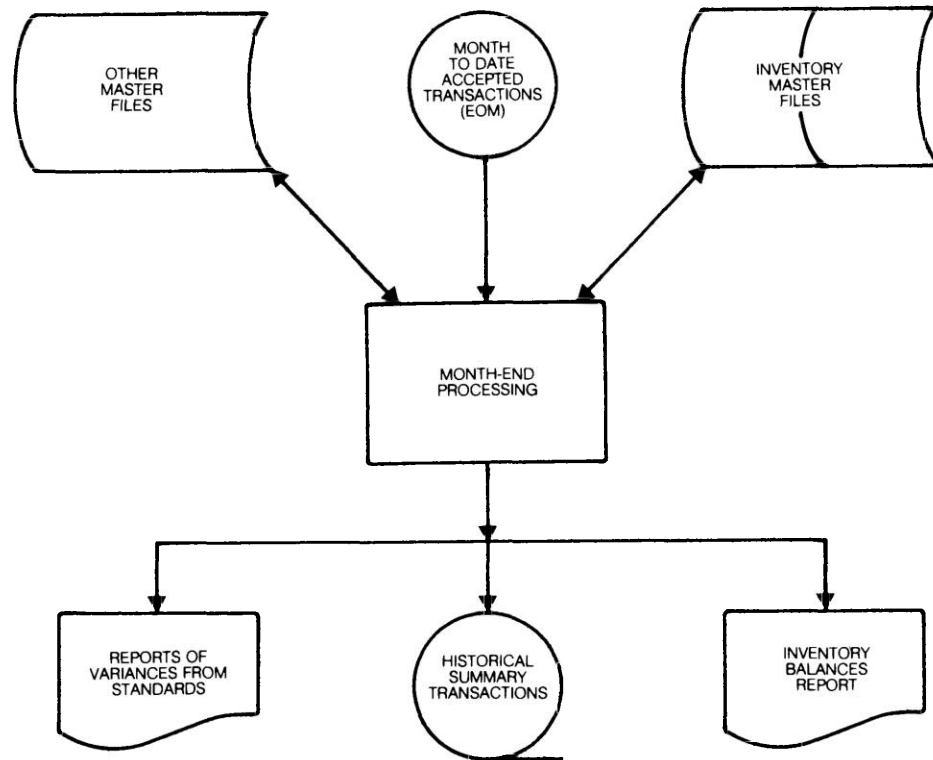
Month-end processing has four categories of output:

- Inventory balances reports for the month
- Reports of variances from standards

- Updated files
- Additional reports

Inventory Balances Reports. At the end of each month, the accounting department receives inventory balances reports for raw ma-

FIGURE 5



materials, work in process, and finished goods. These reports show the opening balance, summarized transaction totals, and closing balance for each inventory item (exhibit 3-11). The overall control totals for each major category of inventory are compared to the daily inventory balances report (exhibit 3-9) for the last day of the month. The reports are reviewed for reasonableness (for example, any unexpectedly large or small amounts or any old open production order numbers) and are compared to the preliminary general ledger. (The preliminary general ledger reflects the summarized output of the inventory and other computerized systems.)

Reports of Variances from Standards. The accounting department also receives copies of reports of variances from standards, which are sent to the cost accounting department. These reports are produced from the inventory files and from the files of other computerized application systems (for example, payroll files, accounts payable files). Cost accounting personnel reconcile the control totals on variance reports with perpetual inventory reports and with output reports of other systems. For example, the purchase price variance report (listing

quantities purchased of each raw material, the extended prices at standard and actual cost, and the variance between the standard actual prices) is reconciled with the quantities and dollars of purchases at standard cost in the perpetual inventory report and with the actual purchases reported by the accounts payable system. The cost accounting department uses the variance reports to identify unusual items to investigate and to adjust standards if the investigation indicates that inaccurate standards exist.

Updated Files. When both the accounting and cost accounting departments are satisfied in regard to the validity of the monthly reports, the EDP department is notified. That department then performs month-end processing of the perpetual inventory file, setting the opening balance for the next month to reflect the current month's closing balance and setting the fields for accumulating month-to-date totals at zero. The summary of the month's transactions for each inventory product is recorded on historical files that maintain monthly totals of purchases and consumption for raw materials and of production and sales for finished goods.

EXHIBIT 3-11

HARVIDELL, SCHAKINS & CO. INC.									
INVENTORY BALANCES									
RAW MATERIALS									
DECEMBER 31, 19XX									
ID NUMBER	UNIT OF MEASURE	OPENING BALANCE	RECEIPTS	ISSUED TO PRODUCTION	RETURN TO VENDORS	RETURN FROM PRODUCTION	ADJUSTMENTS	CLOSING BALANCE	
1J2064	YARDS	17324	8407	12423			412-	12896	
1J2066	YARDS	4297		505				3792	
1J2067	YARDS	192734	27635	74927	3632			51810	
1J2069	YARDS	91446		32941		12436		70941	
1J2070	YARDS	4736		4757			21	0	
19997	EACH	540		604				64-	
TOTAL RAW MATERIALS:		51,122,369	21,790,748	23,928,324	927,923	27839	6134-	48,078,575	

Additional Reports. Reports of open sales orders (which also indicate back orders) and reports of open purchase orders are also produced monthly for review by the sales service

and purchasing departments, respectively. This information is also available upon inquiry at any time through CRT display stations.

Quarterly Processing

At the end of each fiscal quarter, perpetual inventory files are compared to certain historical files, resulting in inventory turnover and sales and profitability-by-product reports. These reports provide, on an exception basis, indications of the raw materials and finished goods that may be slow-moving or overstocked, based on the last six months' activity, and indications of the finished goods that are not being sold at prices that yield a normal gross profit. The accounting department

checks these reports by comparing the reports' control totals to the sum of the last six monthly totals, which they maintain. The accounting department also compares its closing inventory balances for the most recent month to those on the reports. Management uses the reports in formulating marketing strategies and plans for disposal of obsolete inventory; accounting personnel use the same reports for determination of inventory reserves.

Physical Inventory Procedures

The company takes two complete physical inventories a year: one at the end of April and one at the end of October. The October inventory is observed by the company's independent auditors. In addition, on the basis of the perpetual inventory quantities contained in the files, the computerized inventory system identifies certain items to be counted during the year. The requests for counts are generated whenever a perpetual inventory quantity becomes negative or when a raw material quantity reaches its reorder point. Whenever physical counts are made, the perpetual records are adjusted to agree with the counts. (See "Accounting Department Transactions," p. 11.)

Overview of Physical Inventory Counting.

Figure 6 depicts the processing of physical inventory count cards to obtain physical inventory quantities summarized by product.

The details of this processing are described in the following section, and a more detailed flowchart appears in Appendix D (exhibits 1 through 6).

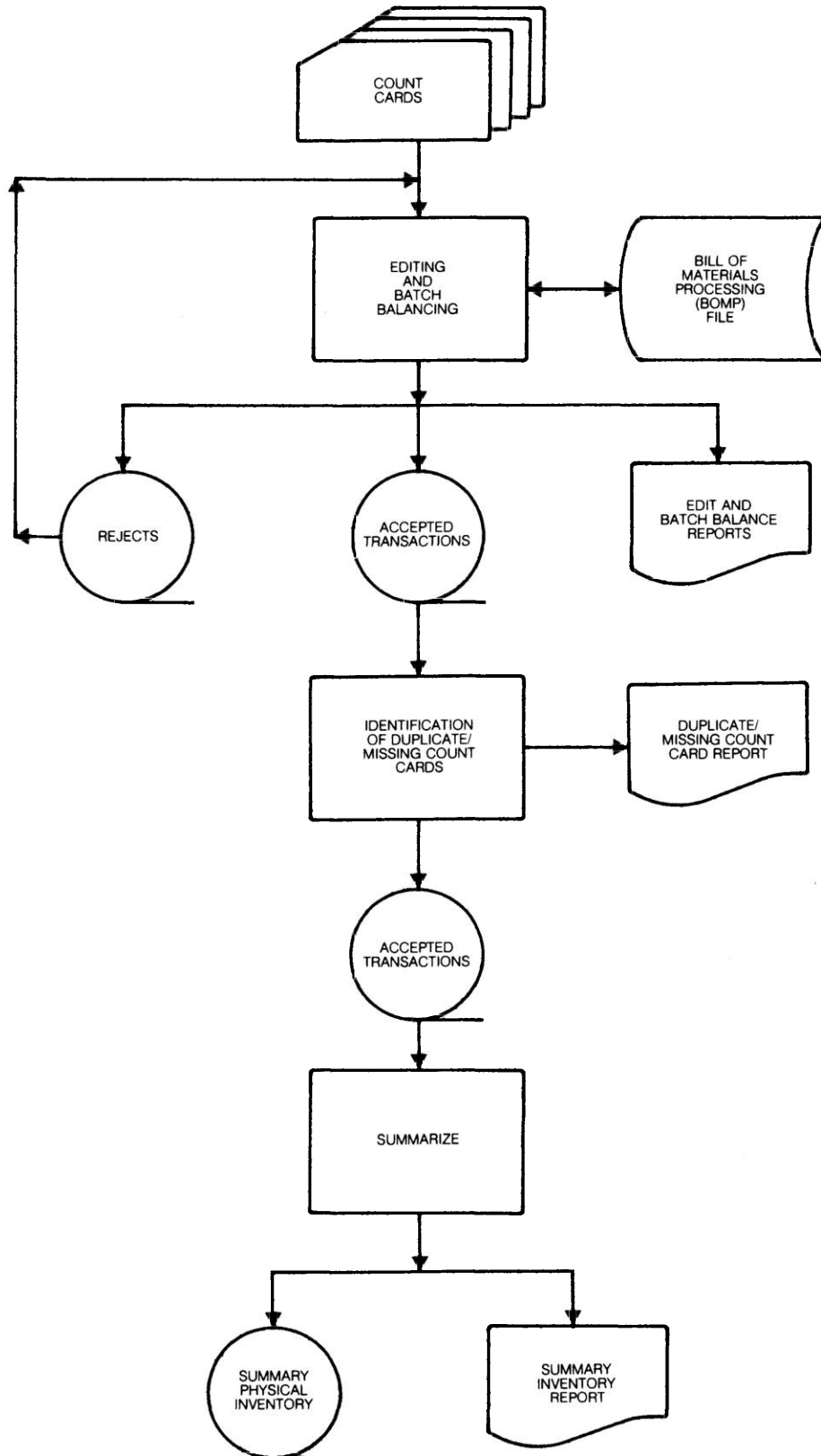
Counting. For the April and October physical inventories, the plant is closed for two days, and each inventoriable item is counted. As a count is made, a member of the count team records the identifying information and the quantity counted, initials the card, and attaches the card and a stub containing identical data to the inventoried item. After a count is recorded by the counting team, a second team recounts the items and initials the cards

as an indication of their recount. When counting and recounting are completed in an area, the count cards are removed from their stub portions, they are collected, and their numerical sequence is checked. (Any cards assigned to the area that were voided are so noted, and they are inserted in their proper sequential place.)

Batching Count Cards. The cards are then sent to the accounting office, along with a transmittal sheet showing the first card number, the last card number, and the number of cards used, unused, and voided. Accounting personnel record the cards on a master count card control log. The cards are then sent to coding clerks, who check the cards to determine whether the count information is present and whether it is in acceptable format (for example, "yards" are uniformly identified as "yd."). If count information is missing, the card is returned to the counting area for completion. The coding clerks also convert any information that was recorded in a nonstandard unit of measurement to the correct unit of measurement and indicate on each card whether it represents a raw material, work in process, or a finished good. Voided and unused cards are coded as "void" and sent to a designated clerk.

The coding clerk puts the used cards into batches of 25 and creates a control total of the quantity fields for the batch. The coding clerk enters the control total on a batch header and forwards the batch and the header to the con-

FIGURE 6



trol clerk. The control clerk assigns a sequential number to the batch and records the batch number and the control total in the count card control log. Unused and voided cards are batched separately from used cards, and the control total is the card count. Batches are then sent to the I/O control section of the EDP department.

The I/O clerk records the batches in a log as they are received. The I/O clerk determines whether the batches are received in sequential order and immediately informs the control clerk in accounting if sequence errors exist. The last batch prepared in accounting will be identified so that the I/O clerk will know when all data has been received.

Keying, Editing, and Batch Balancing. The batches and batch headers are then sent to the key entry area, where they are keyed and completely verified. The keyed data is then processed through batch-balancing and editing programs. The editing consists of determining

- Whether each used card contains a numeric field for card number, identification number (material I.D. for raw materials, the production or rework order number for work in process, and the style number for finished goods), and quantity.
- Whether each card contains a unit of measure and an inventory type code (raw material, work in process, or finished good).
- Whether the identification number is valid for the type of inventory and whether the unit of measure is proper for the identification number.

Cards coded as void are edited to determine that the balance of the card does not contain any identifying data other than card number.

Batches that pass the batch-balancing and editing tests are output to a machine-readable file of accepted transactions. Batches that fail the batch-balancing or the editing tests are rejected, and details of the rejected batches are printed, along with the reason for the rejection (for example, imbalance or items failing edit tests). These batches and items are output to a machine-readable file of rejected transactions.

Correcting Rejected Batches. The reports of accepted and rejected batches are given to the I/O clerk, along with the original source documents and batch headers. The clerks check the reports of rejected batches against the source documents to determine whether any of the rejections were caused by erro-

neous key entry. If key entry errors are found, the corrections are noted on the report, and the report is sent to key entry for correction. If there are no key entry errors or if such errors do not account for all of the rejections, the clerk first records in the batch log the fact that the batch was returned to accounting and the reason for the rejection and then sends the batch report to the accounting department for correction. The accepted batches are recorded in the I/O clerk's log, and the report of accepted batches is forwarded to the accounting department control clerk.

The control clerk in the accounting department records the receipt of accepted and rejected batches in a log. The clerk distributes the rejected batches and the report of rejected batches to the appropriate coding clerks so that the report may be reviewed and the batches corrected. The coding clerk corrects the data and batch totals and sends the batch and report of rejected items to the control clerk. The control clerk records the date of resubmission in the accounting department log and, if appropriate, changes the control total for the batch. The batch and report containing corrections are submitted to the I/O control department.

The I/O clerk records the receipt of the batch containing corrections in the I/O control log and submits the corrected data for key entry and processing of the entire batch through the batch-balancing and editing programs.

Identifying Duplicate or Missing Count Cards.

When all the batches of physical inventory count cards have passed the balancing and editing tests, the data is processed through a program that accounts for the numerical sequence of the count cards and that produces an exception report of missing or duplicate cards. This report is sent to the control clerk in accounting.

The control clerk investigates the duplicate cards by examining the sorted count cards; the cause is generally a miskeyed card number. The clerk makes the correction on the exception report and adjusts the missing count card report, because the card that was miskeyed will be shown as "missing." For the other missing cards, the control clerk identifies the inventory areas to which the card was assigned and contacts the area supervisor to locate the card or, if it cannot be found, to send the details of the inventory to which the stub of the card is attached. If the information comes from the counting area without a card, the control clerk uses an unissued card to record the information and changes the number on that card to the original inventory card

number. The control clerk then creates a batch of the substitute and "found" cards and records the batch in the accounting department's control log.

The corrected duplicate card report and the new batch of cards are then processed in the same manner as the original cards were. This includes the reprocessing of the program that produces the missing and duplicate card report.

Summarizing the Physical Inventory Count. When no missing or duplicate cards are reported, the data from the original cards is processed. The output is a list of the data on every card and an overall quantity total. This report is sent to the control clerk in accounting.

The control clerk compares the total on the report to the footing of the accounting department batch control log. The clerk then compares the listing of cards to the master inventory card control that was created as cards were returned from various counting areas in order to determine that the classification of each card (i.e., used, unused, or void) has not changed. If there are any discrepancies, the clerk obtains copies of the keypunched cards and reviews them with the supervisor to determine whether a change to any card is required. Changes, if any, are noted on the report and sent back for key entry and reprocessing. When the changes have been made and the accounting department has received a correct copy of the detail inventory card listing, the control clerk in accounting notifies the EDP department to continue processing the inventory data.

The inventory data (the magnetic file of accepted cards) is then processed through a series of programs that accomplishes the following:

- Sorts the data by identification number.
- Prints a report (in inventory identification number sequence) listing the details of each card, the subtotal of quantities for each identification number, and the overall quantity total.
- Produces a summary machine-readable record showing total quantity by identification number.

This report is sent to the accounting department, where the total quantity is balanced against the total quantity reflected on the detail inventory card listing. If the reports are in agreement, processing is done to reflect the physical inventory counts in the perpetual inventory records.

Recording of Physical Inventory. Figure 7 depicts the processing of the summarized

physical inventory file to update the perpetual inventory records.

The details of this processing are described in the following pages, and a more detailed flowchart of the processing appears in exhibits 7 through 9 of Appendix D.

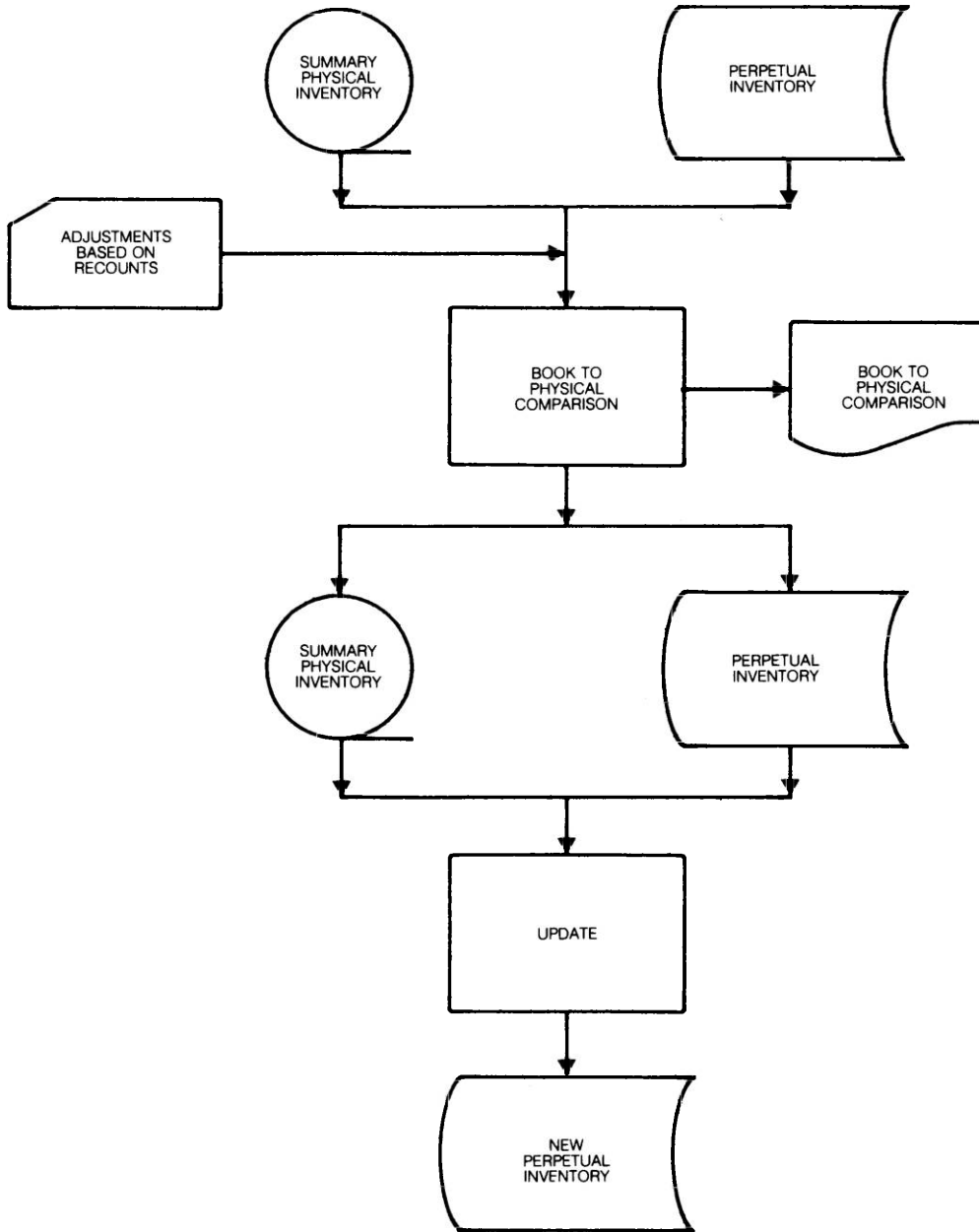
Comparison of Physical to Perpetual Inventory. The file containing summarized physical inventory quantity information is compared to the data recorded on the perpetual inventory files. As a result of this processing, a report is generated, listing, for each identification number, the quantity according to the physical inventory records, the quantity according to the perpetual inventory file, and the difference. This report is sent to the accounting department.

The control clerk in the accounting department compares the totals in this report (a) to those in the report that summarized the physical inventory quantities and (b) to those in the pre-inventory count perpetual inventory reports. The report is then sent to the accounting manager, who reviews it for any large or unusual differences between physical and perpetual quantities. If this review indicates that certain items should be recounted, the accounting manager prepares a request for recount and sends it to the affected area. The supervisor of the area containing the inventory to be recounted is responsible for counting the identified item, without knowledge of the previously recorded quantity. The supervisor then enters the appropriate data and signs the *request for recount* form. The form is returned to the accounting department, where the recount quantity is compared to the original count.

If an adjustment is required, an *adjustment to physical inventory* form is completed. The adjustment forms are batched and are subject to the controls over processing of file maintenance requests. (See "Processing of File Maintenance Transactions," p. 23.) When accounting is satisfied that the recounts have been made and the corrections, if any, recorded, a new physical-to-perpetual-inventory comparison report is produced. This is sent to the cost accounting department for use in investigating differences and adjusting bill of material standards if any differences indicate inaccurate standards.

Updating the Perpetual Inventory Records. The last step in the physical inventory processing is the accounting department's request to the EDP department to replace the month-end perpetual inventory quantities with the ending physical inventory quantities.

FIGURE 7



Application Controls in the Specified System

Statement on Auditing Standards no. 3 identifies two basic types of EDP accounting control procedures: general controls, which relate to all EDP activities, and application controls, which relate to specific accounting applications.

The auditor considers both general and application controls in the study and evaluation of internal accounting control. A weakness in general controls can affect the reliability of every application system. The effects of such weaknesses are described in the AICPA audit and accounting guide, *The Auditor's Study and Evaluation of Internal Control in EDP Systems*, and are not repeated in this guideline. However, the reader should be aware of the importance that general controls have in the

review and testing of an application system such as inventory.

This chapter describes how control procedures in the specified inventory system help to meet the objectives of application controls, as they are discussed in the audit guide. The controls are divided into three categories:

- Input controls
- Processing controls
- Output controls

The example control procedures are only a few of the ways in which application control objectives can be met, and the absence of these individual controls from a computerized inventory system would not necessarily be an internal control weakness.

Input Controls

"Input controls are designed to provide reasonable assurance that data received for processing by EDP have been properly authorized, converted into machine sensible form and identified, and that data . . . have not been lost, suppressed, added, duplicated, or otherwise improperly changed."¹ Input controls include controls over (1) authorization of input, (2) input conversion and code verification, (3) data movement, and (4) error handling.

Authorization of Input. The following techniques are used in the specified system to help assure that input is authorized:

- Approval procedures
- Prenumbered forms
- I/O control function

Approval Procedures. The specified inventory system requires appropriate approval of all

transactions. Every day, supervisory personnel approve each batch of transactions before it is submitted for processing. In physical inventory processing, the count cards are initialed by both the counter and recounter. In file maintenance processing, transactions are approved individually by the supervisor of the originating department and can be submitted only through the supervisor's office.

Prenumbered Forms. To help assure that the approval procedures are followed, all transactions (except file maintenance transactions) must be entered on authorized forms that contain preprinted sequential document numbers; and the sequence of these forms is checked during processing. Sequence checking results in the document accountability report in daily processing and the duplicate or missing count card report in physical inventory processing. These reports are reviewed by appropriate su-

¹ AICPA, Statement on Auditing Standards no. 3, *The Effects of EDP on the Auditor's Study and Evaluation of Internal Control* (New York: 1974), paragraph 8.

pervisory personnel in the originating departments.

I/O Control Function. The I/O control section also helps assure that input is authorized. All transactions must be submitted to them for input to the inventory system, and they accept transactions only from authorized sources.

Input Conversion and Code Verification.

The conversion of input to machine-readable form is controlled in the specified system by a variety of techniques:

- Scanning of input
- Key verification
- Batch control
- Batch balancing and editing

Scanning. To help assure that the information on the documents is complete and in the correct format, the clerk in the originating department reviews the daily processing transactions as they are batched. In physical inventory processing, the coding clerks in the accounting department check whether all required information is present and whether standard coding (for example, yards as "yd.") has been used.

Key Verification. Key entry errors made in converting the input to machine-readable form should be detected by key verification, that is, by rekeying the information a second time and comparing the results. This technique can help identify errors that other controls cannot detect. For example, an error in entering an item identification number could result in an incorrect identification number that is valid for another item. File maintenance transactions and physical inventory count cards are completely key-verified. The high volume of transactions for daily processing reduces the cost effectiveness of the technique; however, selected information that is not checked by other control procedures is key-verified.

Batch Control. The batching of transactions helps assure that transactions are not lost or added during conversion. For all inventory processing, transactions of each type are grouped into batches of a small, specified number. The batch is given a sequential batch number, which is recorded in the originating department's log; and a batch control header document is prepared, containing identifying information and the control total.

Batch Balancing and Editing. To help identify errors in the input, the specified system makes extensive use of batch balancing and editing

programs. *Batch balancing* means checking whether the control total prepared by the originating department matches the computer-generated control total based on the machine-readable data. *Computer editing* is the processing of data through programs that check for a variety of conditions (for example, that all material identification numbers are numeric). The edit criteria for daily processing are shown in exhibit 3-4 on p. 15, and edit criteria for physical inventory processing are listed in chapter 3, p. 29. Both the I/O clerks and the originating departments review the batch balancing and error reports generated by the system. File maintenance transactions are balanced only on record count and are not edited to the same extent that other transactions are edited, but their accuracy is controlled in other ways. (See the "Output Controls" section on p. 36.)

Data Movement. To control data movement between departments and between processing steps, the specified system uses the following techniques:

- Logging and tracking of batches.
- Run-to-run controls and reconciliation to related records.
- Anticipation control.

Logging and Tracking of Batches. The procedures for logging batches in daily processing are described on p. 11 "Data Preparation, Entry, Balancing, and Editing." Several procedures apply to control over data movement:

- Limiting the batches to 50 transactions of one type keeps the batches manageable and convenient to work with if an error is discovered.
- Sequence checking by the I/O clerks and use of batch transmittal forms with sequential batch numbers help to identify missing batches.
- Calculating the control totals on the quantity field highlights discrepancies in quantity data and in record count. Both the I/O control section and the originating department compare the control totals on the output reports to the original batch control total.
- Logging the batches in the originating department and in the I/O control section each time a transfer of data occurs (including returns of rejected batches and submissions of corrections) highlights any misplaced batches.

These same general procedures are followed in physical inventory processing as part of the logging procedures described in the

"Counting" section on p. 27. In addition, personnel record the sequential document number of the first card in the batch, the number of the last card in the batch, and whether the cards are used, unused, or voided. This additional procedure helps identify (1) whether a portion of the batch has been dropped, (2) whether any count cards have been added to the batch, and (3) whether any count cards have changed status (for example, from "void" to "used").

The log of file maintenance transactions includes, for each batch, (1) the number of transactions, (2) transaction type (addition, deletion, or change), and (3) the anticipated total of master file records after the batch has been processed. The inclusion of the anticipated total allows reconciliation of the output report to the log.

Run-to-Run Controls and Reconciliation to Related Records. Run-to-run control totals are checked at various points in inventory system processing; they are discussed under "Processing Controls." Examples of reconciliation for control over data movement are

- Reconciliation of the control totals on the monthly inventory balances report with the daily inventory balances report for the last day of the month ("Monthly Processing," p. 24).
- Reconciliation of the control totals on the quarterly reports of six-month activity with the sum of the last six monthly totals ("Quarterly Processing," p. 27).

Anticipation Control. This technique is based on the anticipated receipt of particular data. It is used in file maintenance transaction processing: the I/O control section expects to receive one batch of file maintenance transactions per day from each originating department. If no transactions are to be processed that day, the "batch" should indicate "No Changes." If no batch is received, the I/O clerks will investigate. Another example of an anticipation control is in daily processing: a program matches transfer forms submitted for the receipt and issuance of materials to help assure (1) that inventory items transferred from one department to another were both sent and received, (2) that the same inventory identification number items were received as were sent, and (3) that the same quantities were received as were sent.

Error Handling. The error-handling procedures in daily processing are described under "Data Preparation, Entry, Balancing, and Editing" on p. 11, and the procedures in the physical inventory processing are described on

p. 27 under "Counting." The following techniques are used to maintain control over the errors detected in daily processing until they have been resolved:

- Error monitoring by the I/O control section.
- Maintenance of error control totals.
- Authorization of corrections.
- Logging of errors.
- Maintenance of original input controls for resubmitted transactions.

Error Monitoring by the I/O Control Section.

The I/O control section is organizationally independent of both the originating departments and EDP operations, systems, and programming. By reviewing batch balancing and error reports and by implementing the four controls discussed in the subsequent paragraphs, the section monitors error handling and serves as a check on both EDP and the originating departments.

Maintenance of Error Control Totals. Errors detected by the batch-balancing and editing programs are recorded on a machine-readable file, and a control total is generated. Personnel reconcile the control totals of the accepted-items file and the rejected-items file with the original batch control total to help assure that all transactions have been included on either of the two files and that none have been dropped.

Authorization of Corrections. The I/O control section reviews all the data items rejected by the inventory system programs and compares the rejected items to the source documents to determine which department caused the error: EDP or the originating department. The I/O control section helps maintain control over authorization of input by allowing the EDP department to correct only the errors it caused (for example, erroneous key entry) and by ensuring that the originating department corrects its own erroneous transactions. The EDP department is not allowed to initiate transactions.

Logging of Errors. The I/O clerks log the rejected items sent back to the originating departments and record the reason for the rejection. The rejected items from the batches that balanced are also stored on a machine-readable file of suspense items. Every week, the supervisors in the originating departments are notified in two ways of any unresolved errors:

- The supervisor of the I/O control section reviews the I/O control log manually for uncleared items and discusses them with the supervisor in the originating department.

- The system generates a weekly report of error suspense items, which is sent to the supervisors.

The originating department also logs errors, both as the error reports are received and as the corrected transactions are resubmitted.

Maintenance of Original Input Controls. The specified system requires that the corrected

transactions that are resubmitted for processing go through the same control procedures as the original transactions. These include authorization by supervisory personnel, batching, logging, key verification, use of control totals, and rerunning of the batch-balancing and editing programs.

Processing Controls

Processing controls are designed to prevent or detect (1) failure to process all input transactions, or erroneous processing of the same input more than once, (2) processing and updating of the wrong file or files, (3) processing of illogical or unreasonable input, and (4) loss or distortion of data during processing.² The processing control techniques used in the specified system include

- Use of control totals and run-to-run controls.
- Programmed limit and reasonableness tests.

Use of Control Totals and Run-to-Run Controls. Control totals are used for the following:

- Daily, monthly, and quarterly processing of transactions affecting inventory quantities. These transactions usually are totalled on the quantity field.
- Processing of file maintenance transactions, which are usually totalled on the number of transactions in the batch and controlled by the number of records expected to exist on the master file after the batch is processed.
- Physical inventory processing. These transactions are totalled on the quantity field.

These totals are checked at various points in the processing to help ensure that data remains complete and accurate throughout processing (run-to-run control). For example, in physical inventory processing, the control totals are calculated and checked at each processing step:

- *Initiation of Transactions.* Control totals of the count cards' quantity fields are calculated as the count cards are batched.

Cards without quantity information (void or unused cards) are batched separately, using the number of cards as the control total. The totals are recorded in the accounting department batch control log as they are submitted to EDP and in the I/O control log as EDP receives them.

- *Key Entry, Editing, and Missing or Duplicate Count Card Processing.* After keying and processing of the batch-balancing and editing programs, the control totals are compared to those in the logs.
- *Resubmission of Corrected Transactions.* Control totals are calculated for batches of corrections and for batches of substitute or "found" cards, and the totals are recorded in the accounting department and I/O control logs.
- *Count Card Listing.* After corrections are processed, the control total on the detail inventory card listing is compared to the footing of the accounting department batch control log.
- *Count Card Summarization.* After processing to summarize the cards, the control totals on the summarized physical inventory file report are compared to the control totals on the detail inventory card listing.
- *Book-to-Physical-Inventory Comparison.* After processing the comparison program, the control totals on the report of the comparison of physical to perpetual inventory quantities are compared to the control totals on the summarized physical inventory report and to the last perpetual inventory report generated before the physical inventory.
- *Processing of Adjustments.* Adjustment to physical inventory forms are batched, and control totals are calculated and logged.

² AICPA, *The Auditor's Study and Evaluation of Internal Control in EDP Systems* (New York: 1977), p. 56.

Control totals are checked after the forms have been processed to update the summarized physical inventory file.

- *Reprocessing of the Comparison.* After reprocessing of the comparison program, the control totals on the new comparison-of-physical-to-perpetual-inventory report are compared to the control totals on the new summarized physical inventory report and to the last perpetual inventory report generated before the physical inventory.
- *Updating of Perpetual Inventory Records.* After the perpetual inventory update program is run, the control totals on the updated perpetual inventory file are

compared to the control totals on the summarized physical inventory file.

Programmed Limit and Reasonableness

Tests. The following are the major uses of limit and reasonableness tests in the specified system:

- The editing programs for daily processing, whose criteria are shown in exhibit 3-4.
- The editing programs for physical inventory processing, whose criteria are outlined in chapter 3 under "Keying, Editing, and Batch Balancing," p. 29.
- The identification of duplicate or missing physical inventory count cards.

Output Controls

"Output controls are designed to assure the accuracy of the processing result . . . and to ensure that only authorized personnel receive the output."³ In the specified system, output is controlled (1) by review of processing results and (2) by output distribution controls.

Review of Processing Results. Throughout the specified system, personnel review the accuracy of processing results by comparing them to other information and source documents. It is an especially useful technique for processing data for which certain input and processing controls are impractical. For example, file maintenance transactions are not edited in the specified system, and the control total is only the transaction count; however, the output includes a report showing the image of the master file record both before and after the file maintenance transaction is processed. The secretary to the supervisor in the originating department proofreads the "after" record on the report, comparing it to the source document in order to determine whether the transaction was recorded properly.

Other examples of this technique include the following:

- The review of the daily inventory balances report, and the perpetual inventory reconciliation. Originating department personnel check the report's opening balance to see

if it agrees with the previous day's closing balance and reconcile the transaction totals and ending balances to the manually maintained control log.

- The accounting department's review of the monthly inventory balances report of the last day of the month, including the review for reasonableness (any unexpectedly large or small amounts, etc.), and the comparison to the preliminary general ledger.
- The accounting department's comparison of the quarterly reports of six-month activity to the last six monthly inventory balances reports.

Distribution of Output. The major techniques used to help ensure that only authorized personnel receive copies of the output of the specified system are (1) establishment of a report distribution manual and (2) distribution of output by the I/O control section. In addition to performing the other control procedures discussed throughout this chapter, the I/O clerks scan the reports for completeness and readability and distribute the reports according to management authorization (and in accordance with the report distribution manual). These formal procedures help ensure that output is delivered on a timely basis to properly authorized personnel.

³ SAS no. 3, paragraph 8c.

Possible Audit Procedures for the Specified System

This chapter describes some of the types of computer-related audit procedures that might be performed in a study of the EDP accounting controls and substantive tests of the computerized inventory system described in chapters 3 and 4. The examples of EDP-related procedures for the specified system are provided to assist the reader in understanding audit procedures applicable to computerized inventory systems. They do not represent a comprehensive list of all procedures, nor do they represent minimum or preferred procedures.

Certain of the EDP-related audit procedures that are described overlap and are aimed at the same audit objective; some accomplish tasks that may be done manually.

The auditor should select an appropriate combination of EDP and manual procedures on the basis of the circumstances and the expected effectiveness and efficiency of each procedure.

For convenience in locating the procedures in the text, "Compliance Tests" and "Substantive Procedures" headings have been used. The procedures are closely interrelated, and in practice they may concurrently provide both evidence of compliance with accounting controls and evidence for substantive purposes. Although listed separately, certain compliance tests would generally be performed concurrently.

Background

This document does not discuss the effects of general EDP controls, although the auditor considers their effects in the evaluation of the inventory application controls. Guidance on the effects of general control weaknesses is provided by the AICPA audit and accounting guide, *The Auditor's Study and Evaluation of Internal Control in EDP Systems*.

For purposes of discussion, the audit procedures have been divided into the following categories:

- Understanding the application.
- Designing audit procedures.
- Compliance tests of controls over processing of perpetual inventory transactions.
- Compliance tests of controls over physical inventory procedures.
- Substantive procedures.

Understanding the Application

The auditor begins the study and evaluation of the computerized inventory system by reviewing the portion of the accounting system and the accounting controls related to inventory. This provides the auditor with an understanding of the inventory system, including both EDP and non-EDP segments. The study and evaluation should provide the auditor with an understanding (1) of the extent to which EDP is used in processing inventory transactions, (2) of the flow of transactions through the in-

ventory system, (3) of the basic structure of accounting control over inventory, (4) of the types of material errors or irregularities that could occur, and (5) of the potential effect of accounting control strengths and weaknesses on auditing procedures. This information is usually obtained through inquiry, observation, review of documentation, tracing of transactions, and use of control questionnaires and checklists.

In reviewing application controls over the inventory system, the auditor should identify the following:

- a. *Transactions.* Computerized systems employ a finite number of transaction types. The source of each transaction and its effect on accounting records will influence the nature, timing, and extent of audit procedures to be employed. Audit documentation usually includes a list of all transaction types (indicating the source of the transaction), obtained by inquiry of client personnel and review of documentation.
- b. *Flow of Transactions.* The auditor needs a description of the flow of documents representing transactions in order to understand the types of errors or irregularities that could occur. The description should include procedures for originating data, receiving data within the EDP function, converting that data into machine-readable form, editing and capturing data within the system, and assuring that rejected transactions are corrected and resubmitted promptly. Audit documentation of the flow of transactions may consist of flowcharts, narratives, memoranda, decision tables, and samples of client documents used to control transactions.
- c. *EDP Processing Steps.* An understanding of the processing performed, of its sequence, and of the information retained by the system enables an auditor to design audit procedures effectively. The auditor typically obtains this understanding by reviewing the systems flowchart (such as the ones presented in the appendixes), obtaining narrative descriptions of system processing, and obtaining copies of file formats and descriptions of the information available in machine-readable form.
- d. *Reports.* By obtaining and reviewing copies of reports produced by the system and by determining their distribution and usage, the auditor can identify the type of output controls in the system. By tracing input information through the system to the report, the auditor can confirm an understanding of the system and begin planning appropriate audit procedures.

Designing Audit Procedures

After obtaining a basic understanding of the inventory system, the auditor would design the audit procedures. The auditor would consider the combination of substantive and compliance tests that will accomplish the audit objectives most efficiently and effectively. (See SAS no. 3, paragraph 26.)

The auditor in this example has agreed to observe the physical inventory count on October 31, although the fiscal year-end is December 31. Although the auditor has decided to rely upon certain perpetual inventory system controls for updating the inventory records and also has performed certain substantive procedures, the applicability of such procedures in other circumstances (e.g., if the client takes a complete inventory at year-end or if the client takes the physical inventory on a cyclical basis throughout the year) rests on the individual auditor's judgment.

These example procedures include use of audit software (whether a generalized audit package, specialized audit programs, or utility programs used for audit purposes). If use of audit software is not feasible because of a lack of compatible software, economics, or auditor skills for that computer system, manual techniques could usually be used to perform the audit procedures.

The example procedures also include many compliance tests of controls. If the auditor decides, or is required by circumstances, to take a substantive approach, many of these procedures would not have to be performed. The auditor would perform the preliminary phase of the review, complete the review, and test only those controls on which he intends to rely. The auditor would set the scope of the substantive tests to accomplish the audit objectives.

Compliance Tests of Controls over Daily Processing of Perpetual Inventory Transactions

Because the physical inventory is taken, and observed by the auditor, two months before

the financial statement date, the auditor must be able to rely on the client's accounting con-

trols over perpetual inventory processing for the period from the physical inventory count to the balance sheet date. Accordingly, the auditor would design auditing procedures to evaluate whether the audited inventory as of October 31 is accurately updated to the financial statement date.

During the evaluation of EDP accounting controls over the inventory application, the auditor would identify controls on which it would be desirable to place reliance, complete the review of those controls, and perform appropriate compliance tests. In the period between October 31 and year-end, the auditor would extend certain compliance tests to evaluate whether the controls continued to function and to provide assurance of the accuracy of the ending inventory. Example compliance tests of the following controls in the specified system are discussed in subsequent paragraphs:

- Prenumbered source documents.
- I/O control function.
- Key verification.
- Batch controls.
- Program edit and batch balancing.
- Transaction error suspense reporting.
- Authorization procedures for corrected transactions.
- Matching of inventory transfers.
- Daily reconciliation of inventory master file balances.

Prenumbered Source Documents. The use of sequentially prenumbered source documents and subsequent accounting for sequence errors in processing help assure that transactions affecting inventory balances are not erroneously omitted, added, or duplicated in processing. The sequence checking of document numbers and the printing of a document accountability report identify missing or duplicate transaction document numbers. To increase understanding and test this control, the auditor could

- Discuss with appropriate personnel the procedures performed in response to the document accountability report.
- Obtain a sample of document accountability reports from throughout the audit period.
- Review evidence of the disposition of a sample of duplicate or missing documents.

Alternatively, the auditor might arrange for originating department personnel under audit supervision to generate sequence errors that document accountability processing should

detect, and the auditor would then evaluate whether these errors were in fact detected and reported. This procedure would be performed only with explicit client permission and under well-controlled circumstances to assure that this manipulation of data does not result in errors in accounting records.

I/O Control Function. The I/O control function helps assure that all authorized transactions are processed completely and accurately, that documents are forwarded to the appropriate personnel, and that rejected transactions are corrected and promptly resubmitted for processing. This control could be evaluated through the following procedures:

- Inquiry of user and I/O control function personnel.
- Review of the I/O control log.
- Tracing of sample transactions and batches from the originating department control logs through the I/O control log to their ultimate disposition.

Key Verification. The description of the inventory data entry procedure indicates that certain data elements of each transaction are key-verified. To evaluate the key verification control, the auditor could

- Discuss the procedures with data entry personnel.
- Review data entry instructions.
- Observe the data entry and verification process.
- Examine the cards sent to processing for evidence of key verification when data entry is performed by the use of cards.
- Review error reports to determine the types and extent of errors that have occurred

Batch Controls. Each originating department groups source documents that represent transactions affecting inventory quantities into batches of the same transaction type. Personnel determine a control total of the quantity of inventory included in each batch. Similarly, transactions or batches of transactions that are rejected from processing are recorded in the batch control logs, and personnel also record the resubmission of rejected data. These logs help assure that all batches of inventory transactions submitted to the data processing department are received, processed, and returned and that rejected batches or individual transactions are identified, corrected, and promptly resubmitted for processing.

To evaluate whether this control is functioning effectively, the auditor could

- Discuss the procedures with personnel in the originating departments who are responsible for maintaining the batch control logs.
- Review the logs for indications of resubmission of rejected transactions.
- Trace selected batches and rejected transactions through the logs to the batch balancing reports and to their ultimate recording.

Program Edit and Batch Balancing. After inventory transactions are converted to machine-readable form, they are processed through a batch-balancing and editing program. The edit controls are described in exhibit 3-4. To evaluate these programmed edit controls, the auditor could

- Review detail program documentation.
- Discuss the system with users, and review edit error reports to identify examples of each type of edit exception described in the documentation.

The auditor might also wish to develop test data to test whether each of the edit routines is functioning. The auditor would design the test data to incorporate each type of error, both separately and in combinations, that the prescribed edits are designed to detect. The test data could then be processed by the batch-balancing and edit program, and the resulting report could be compared to the predetermined processing results. This approach may be time consuming, but it may result in economies in subsequent tests of this control. The AICPA audit and accounting guide, *Computer-Assisted Audit Techniques*, provides guidance on the circumstances in which use of test data would be appropriate and on procedures to help assure the effectiveness of the technique.

Transaction Error Suspense Reporting.

The batch-balancing and transaction-edit routines generate a cumulative transaction error suspense file. This file maintains the details of transactions that failed the edit tests until corrections are submitted and processed. The transactions on the suspense file are printed each week and forwarded to the appropriate user department. This control procedure helps assure that rejected transactions will be corrected and resubmitted. Possible audit procedures to evaluate this control could include

- Review of detailed documentation describing the control procedure.
- Discussion of the use of the report by the departments responsible for initiating transactions.

- Comparison of the details of the reports produced from the error suspense file to the details of rejected transactions in the related departmental batch control log.

Authorization Procedures for Corrected Transactions. In the specified inventory system, rejected transactions, other than those caused by data entry errors, are to be corrected only by the originating user department. This helps assure that transactions are authorized and that corrections are made accurately. To evaluate this control procedure, the auditor could

- Make inquiries of data entry, I/O control, and originating department personnel.
- Review the batch control logs in the originating departments and the I/O control function in order to identify resubmitted batches or transactions, which the auditor could then review to evaluate whether corrections were made by appropriate personnel.
- Review the details of exceptions on the batch balancing, error, unmatched transfers, and document accountability reports, and consider whether the listed items were corrected by appropriate personnel.

Matching of Inventory Transfers. The inventory system uses multi-part forms to provide control over inventory transfers between departments. Copies are submitted separately to data processing by the issuing and the receiving department. When either the "transfer out" or "transfer in" portion of an inventory transfer form is not received and processed through the inventory system, an exception report entitled "unmatched transfers" is printed. Originating department personnel use this report to identify and correct missing transactions. This procedure helps prevent loss or duplication of transactions affecting inventory quantities. The auditor could evaluate the functioning of this control by doing the following:

- Discussing it with originating department personnel.
- Obtaining a sample of unmatched transfer reports and reviewing evidence of the disposition of selected unmatched transfers listed in the report.

The auditor could also test this control by creating intentional unmatched transfers as test data. The auditor should consider the cautions regarding test data, discussed in "Program Edit and Batch Balancing."

Daily Reconciliation of Inventory Master File Balances. To maintain control over the quantity of each type of perpetual inventory, a document entitled “perpetual inventory reconciliation” is prepared (exhibit 3-10). The reconciliation consists of balancing the previous day’s total inventory quantity against the current day’s ending balance by adding and subtracting the totals of accepted quantities of each batch submitted in the day’s processing (as reported on the batch balancing and error reports). This control helps to detect a failure to process all authorized transactions, the processing of unauthorized transactions, dupli-

cate processing of transactions, or the use of the wrong perpetual inventory master file for the transactions. Procedures to evaluate this control include

- Discussion with personnel responsible for performing the reconciliation.
- Selection of a sample of reconciliations during the period under review and tests of the reconciliation to evaluate its accuracy.
- Tracing of selected batches and file balances to the related system-produced reports.

Compliance Tests of Controls over Physical Inventory Procedures

After obtaining a basic understanding of the processing procedures and controls over the physical inventory (described in the “Physical Inventory Procedures” section of chapter 3), the auditor would consider whether reliance on controls over the physical inventory procedures would allow restriction of the extent of substantive tests of the inventory.

During the processing of physical inventory data, the auditor usually would identify controls on which reliance is planned and perform compliance tests of those control procedures—in addition to observing the count and gathering information needed to perform substantive tests.

Procedures to evaluate the following controls in the specified system are discussed in this section:

- Independent multiple counts.
- Prenumbered count cards with detachable stubs.
- Clerical review of completed count cards.
- Key verification.
- Count card batch control procedures.
- Batch-balancing and transaction-editing programs.
- Run-to-run controls.
- User department correction of rejected data.

Independent Multiple Counts. Subsequent independent verification of each count before the data is submitted for processing provides greater assurance that the submitted counts are accurate. The auditor could evaluate this control procedure in the following ways:

- Reviewing instructions given to the inventory count teams.
- Observing the recount procedure.
- Noting evidence of initials of the recount team on the inventory count cards.

Prenumbered Count Cards with Detachable Stubs.

The use of prenumbered inventory count cards with detachable stubs, and the associated control log and programmed sequence-checking of count cards, helps assure that cards are not lost, suppressed, or duplicated and that unauthorized cards are not added. If planning to rely on these controls, the auditor would evaluate their functioning by procedures such as the following:

- Determining the range of authorized count card numbers.
- Observing physical inventory count procedures.
- Reviewing the count card control log.
- Reviewing written instructions for maintaining control over count card sequence numbers.
- Inquiring of personnel responsible for maintaining the controls.
- Reviewing the missing/duplicate count card reports and the disposition of exceptions.

Clerical Review of Completed Count Cards.

After the physical inventory count is completed, the count cards are forwarded to the accounting department, and clerical personnel review them to determine their completeness and accuracy before sending them

to the EDP department. This review provides additional control over the accuracy of count card information submitted for processing, and it reduces the number of items rejected during computer processing. However, this procedure permits clerical personnel to initiate changes to data; the auditor should consider whether the circumstances under which this procedure is performed are appropriate. The auditor may wish to do the following:

- Review written instructions to the persons performing this manual edit.
- Interview and observe the clerical personnel performing the function.
- Review selected modifications that were initiated in the procedure.

Key Verification. The description of the inventory count card data entry procedure indicates that all data are key-verified. Key verification of the inventory identification number is particularly important because a keying error could result in an incorrect number that is a valid number for another item. The auditor could evaluate the functioning of this procedure by doing the following:

- Discussing the procedure with data entry personnel.
- Reviewing data entry instructions.
- Observing the data entry and verification process.
- Examining the cards sent to processing for evidence of key verification when data entry is performed by the use of cards.
- Reviewing error reports to determine the types and extent of errors that have occurred.

Count Card Batch Control Procedures.

Before the accounting department sends the count cards to the data processing department, the cards are grouped into manageable batches, a control total based on the quantity of inventory included in the batch is developed, a batch control header document is prepared, and the batch is recorded with a sequential batch number in a batch control log. A similar batch control log is maintained in the I/O control section of the data processing department. These logs help assure that all batches of cards submitted to the data processing department are received, processed, and returned and that rejected batches or rejected count cards are identified, corrected, and promptly resubmitted for processing. To evaluate whether this control is functioning effectively, the auditor could

- Discuss the procedures for maintaining

batch control with accounting department personnel and I/O control personnel.

- Review batch control logs, noting indications of resubmission of rejected transactions.
- Trace the rejected items to the Batch Balance Error List.

The batch control log is also used to develop an overall quantity total, which is compared to the detail inventory card listing report; and the auditor might wish to evaluate the functioning of this balancing procedure.

Batch Balancing and Transaction Editing Programs.

The keyed inventory count data is processed through batch-balancing and editing programs. The editing controls built into this processing are

- Numeric count card number.
- Identification number.
- Quantity.
- Valid unit of measure.
- Valid inventory type code.
- Absence of information other than count card number on void count cards.

Several types of computer-related audit procedures could be used to ascertain the existence and functioning of these programmed edit controls. The auditor could determine that these control procedures are prescribed by reviewing detail program documentation. The auditor could review the types of errors shown on the batch balance report and on the edit/batch balance error list in order to find examples of each type of error for which editing is performed (as evidence that the edit routines are functioning).

In certain circumstances the auditor might also decide to develop test data to test each of the edit routines. When planning to rely on certain edit routines, the auditor would design test data that include the types of errors, both separately and in combination, that these edits are expected to detect. The test data would then be processed by the batch-balancing and edit programs, and the resulting reports would be compared to the predetermined results.

Run-to-Run Controls. There are five distinct program processing steps in the physical inventory system. These are the following:

- Data entry and edit.
- Missing and duplicate card count processing.
- Count card summarization.
- Book-to-physical comparison.
- Perpetual update.

The system provides the information that is needed to maintain run-to-run controls, which assure that the same data are processed in each of the first four steps in the processing sequence. The physical inventory system does not provide the information that is needed to assure that the same data were processed in the perpetual update processing, but the results of this processing can be determined from the beginning balance of the daily inventory balance report for the first day after the inventory is taken. To test the run-to-run controls, the auditor could review

- Balancing of the accounting department batch control log against the missing/duplicate ticket report.
- Reconciliation of the missing/duplicate ticket report with the detail listing of cards report.
- Reconciliation of the control totals in the detail listing of cards report with the summary inventory report.
- Reconciliation of the summary inventory report with the total of physical counts shown in the book-to-physical comparison report.

The physical inventory balance in the book-to-physical comparison report can be compared to the opening inventory in the daily inventory balance report.

User Department Correction of Rejected Data.

The description of the inventory system states that corrections to count transactions, other than key entry errors, are to be initiated by accounting department personnel only. This procedure helps to assure that transactions are authorized and that corrections are made accurately. To evaluate the functioning of this control procedure, the auditor could

- Discuss the procedures with data entry, I/O control, and accounting department personnel.
- Review the batch control logs in both the accounting department and the I/O control department in order to identify resubmitted batches or transactions, which the auditor could then review in detail to evaluate whether corrections were made by appropriate personnel.
- Review the edit and batch balance reports to evaluate whether errors were corrected by appropriate personnel.

Substantive Procedures

In addition to the computer-related compliance tests described in the preceding sections, the auditor would perform substantive tests. The nature, timing, and extent of these tests would depend on the particular circumstances and on the results of the compliance tests. This section discusses the use of the computer in substantive tests of the specified system.

The audit procedures that are performed for manual inventory systems remain useful in auditing computerized systems. For example, during the inventory observation process, the auditor usually makes and records selected test counts of inventory and records receiving and shipping cutoff information for subsequent testing of client-prepared inventory data. Although this may be done in either a computerized or manual system, when EDP is used to process an inventory, the auditor can choose to use computer-assisted audit techniques. In a manual system, this alternative method of performing the audit procedures would not exist.

In a computerized inventory system, audit software could be used to perform some audit procedures associated with the review of inventory. It may be possible, of course, to continue to use manual techniques to accomplish

those audit procedures associated with the review of inventory. Such manual techniques, which would include sampling techniques, could be used to perform such procedures as tracing an auditor's test counts to computerized inventory reports and testing clerical accuracy of the reports (including footing computer-printed listings). These types of procedures are discussed from an audit software perspective in the following paragraphs.

The types of audit procedures that audit software can perform are usually limited only by the information in machine-readable form and by feasibility factors. Feasibility factors are described in the audit and accounting guide, *Computer-Assisted Audit Techniques*, and are not repeated in this guideline. The formats for the inventory system files (Appendix E) identify the information available in machine-readable media. The information contained in these files can be summarized as follows:

1. *Inventory Master File.* This file contains three separate record types:
 - Raw materials, identified by the material identification number.

- Work in process, identified by both the material identification number and the assigned work order number.
- Finished goods, identified by the style number.

Actual quantities are maintained on the inventory master file.

2. *Bill of Materials Master File.* This master file contains
 - A record type for each raw material used in each finished goods style.
 - A record type identifying each operation to produce a finished good and its associated standard labor and overhead.

The bill of materials master file contains the information needed to price inventory at standard cost.

3. *Accepted Count Card Master File.* This file contains one record for each physical inventory count card. The record contains the count card number, material identification number, unit of measure, quantity, and inventory type.

Based on the master file information available in the specified inventory system, audit software can be used to accomplish such procedures as the following:

- Comparison of the auditor's inventory test counts to the client's physical inventory count and printing exceptions.
- Printing of any missing or duplicate inventory count cards.
- Independent pricing and extension of the physical inventory and printing of control totals by inventory type.
- Pricing and extension of the perpetual inventory before the physical adjustment, comparison of the priced perpetual inventory to the priced physical inventory, and printing of an exception report of the monetary effect of differences between perpetual and physical inventory records.
- Printing of a report of raw materials inventory received and finished goods inventory shipped within a specified number of days preceding physical inventory.
- Printing of a list of old and possibly obsolete materials.
- Comparison of inventory standard cost of the prior year to the current year's standards and printing of a sample of new items and of items with prices that have changed more than a specified amount.

These example audit procedures are discussed below.

Tracing of Test Counts and Review for Missing or Duplicate Count Cards. The use of audit software to trace the auditor's test counts to the client's counts may be helpful when audit procedures include a large number of test counts or when the details of inventory count transactions that are used in developing the summarized physical inventory quantities are not otherwise available.

The use of audit software to account for the numerical sequence of count cards and to identify missing or duplicate cards may be helpful if the auditor is concerned about the controls over missing or duplicate count cards or if the effort to test for this error in other ways exceeds the effort required to use audit software.

To perform these procedures, the auditor would obtain a copy of the accepted count card master file after the client's corrections have been completed. The auditor's physical inventory test counts would then be keyed into machine-readable form as a separate file. A utility program or a sort facility in the generalized audit software would then sequence both files by count card number. The count card numbers on the accepted count card file would then be matched against the count card numbers on the auditor's test count file through the use of audit software, and a comparison would be made of the material identification numbers, units of measure, and quantities contained on the two files. Differences between the auditor's test counts and physical inventory counts would be printed and reviewed by the auditor.

During this audit software processing, duplicate and missing count card numbers, as well as those numbers falling outside the auditor's recorded range of valid count card numbers, could also be identified and printed for audit review.

Recalculation of Prices and Extensions.

After reviewing inventory quantities, the auditor may decide to recalculate the inventory prices and extensions. The auditor could use audit software to resequence and summarize the accepted count card master file into inventory type and material I.D. number sequence. The audit software could then process this file with the standard cost information on the bill of materials master file to accomplish the following:

- Extend the physical inventory.
- Create an extended physical inventory file.
- Print control totals.

The auditor could compare this report to the physical inventory valuation developed by the client's system in order to evaluate the clerical accuracy of the extended inventory.

Comparison of Current Standard Costs to Prior Year's Standard Costs.

The inventory is extended, based on the standard costs contained in the bill of materials master file. In reviewing the price of inventory, the auditor may wish to identify significant variances in standard costs between the prior examination and the current one. If the auditor manually made a detailed comparison of standard cost reports from the two different periods, this procedure would be very time consuming; however, if this information is available in machine-readable form, the auditor could ask the client to retain a copy of the bill of materials master file from the preceding year, or, preferably, the auditor could have retained a copy from the prior audit. Using audit software, the auditor could compare the file to the current bill of materials master file and could identify significant standard cost changes. The resulting report could identify

- Inventory items with significant standard cost changes.
- A sample of new inventory items.
- A sample of other items.

The auditor could use the report in investigating engineering and accounting computations used to develop the standard costs.

Physical-to-Perpetual-Inventory Comparison.

The description of the inventory system indicates that a physical-to-perpetual-inventory variance report is printed, showing differences between quantities on the perpetual inventory master file and quantities determined through physical inventory counts. The report could be useful to the auditor in identifying possible errors. However, because the report identifies all variances, the volume of data may make use of the report too time consuming. Also, because the report does not show the monetary effect of the variance, the auditor may have difficulty in efficiently identifying large dollar value variances.

The auditor can use the information on the physical-to-perpetual-inventory variance report more effectively if a report is designed to print the details of variances having a significant monetary effect. Audit software could be used to create such a report. The auditor would obtain a copy of the perpetual file before adjustment to physical quantities and a copy of the bill of materials master file. The bill of materials master file would be used to accomplish the following:

- Obtain the cost information for the perpetual inventory master file.
- Calculate extensions.

- Create a file containing the perpetual inventory master file items along with the extended costs as they were before the physical inventory adjustment.

This extended perpetual master file could then be processed with the extended physical inventory file. This would enable the auditor

- To calculate the monetary differences between the physical and perpetual inventories.
- To print a report of the items with differences in excess of an auditor-specified amount.

Analysis of Cut-Off and Possible Obsolescence.

The perpetual inventory master file contains the dates of the following:

- Last issuance of raw materials
- Last receipt of raw materials
- Last sale for finished goods

The auditor could use audit software to access this information and to perform analyses related to possible obsolescence and inventory cut-off. The audit software program

- Accesses the perpetual inventory master file.
- Tests records for a date of last sale (for finished goods) or date of last issuance (for raw materials) further in the past than a date which the auditor specifies.
- Prints a report of potentially obsolete inventory items.

The audit software program could also test records for a date last received or date last sold near the inventory date and can print a report of inventory items meeting the cutoff selection criteria.

The possible obsolete items report could help the auditor evaluate whether the inventory is stated at lower of cost or market value. The obsolescence test could be performed at the date of the physical count or at year-end. The auditor could use the cutoff report of inventory items received or shipped near the physical inventory date to evaluate whether a proper cut-off was accomplished between inventory and sales and between inventory and purchases.

Substantive Procedures During the Intervening Period.

In addition to performing whatever compliance tests of controls over perpetual inventory processing that he believes are necessary under the circumstances, the auditor may also perform substantive tests of the changes to inventory from the date of physical count to year-end. The auditor is concerned with the monetary balances of the perpetual inventory and the validity of transac-

tions affecting that balance. The substantive tests may be performed manually or by using computer-assisted audit techniques.

The auditor could help assure himself that inventory is correctly updated from the date of physical inventory to the financial statement date by reviewing the monthly reconciliation of perpetual inventory with the general ledger. The auditor could obtain copies of the monthly reconciliations and could trace balances and changes in inventory to the system-produced report of the month's inventory activity. (This report, entitled "Inventory Balances," appears as exhibit 3-11.) Selected changes in inventory could then be traced to supporting documentation, such as invoices, shipping documents, and receiving reports.

Generalized audit software or specialized audit programs could also be used to gather support for the change in inventory between the date of physical inventory and the financial statement date. One approach, sometimes referred to as "parallel simulation," would be to reprocess the inventory transactions of the intervening period to compare the results of the independent processing to those of the inventory system. The auditor could obtain copies of the accepted inventory transaction files for the intervening period and could develop an audit software program to summarize the transactions, print totals of the effect on quantity of each separate inventory transaction type, and print a sample of individual transactions. The totals for each transaction type could then be used to reconcile the quantity of physical inventory with the ending perpetual balance. The sample of detailed transactions selected in this processing could be traced to their related supporting documentation. This technique is time consuming but may be useful when the auditor plans little reliance on internal control.

A computer-assisted audit technique that may be useful when the client's system of internal accounting control is strong is the use of an embedded audit module. An *embedded audit module* is a section of program code to perform audit functions, which is inserted into the company's application program. An audit module could be written and inserted in the inventory transaction edit and batch-balance program in order to select a sample of the processed transactions and to record the sample transactions on a separate audit file. The audit file could then be printed, perhaps using generalized audit software; and the listing of a sample of transactions processed during the

intervening period could be traced to supporting documentation. The auditor should consider that use of this technique is time consuming and involves reliance on the client's controls over using and changing programs.¹

In addition to inventory transactions that affect inventory quantities, certain file maintenance transactions have an impact on the value of the ending inventory. For example, file maintenance changes to standard cost (contained on the bill of materials master file) will have a direct impact on the value of year-end inventory. Substantive tests of these transactions could include manual review of file maintenance transaction reports and source documents of selected transactions or the use of computer-assisted audit techniques, such as generalized audit software, specialized audit programs, and embedded audit modules to select and print a sample of file maintenance transactions (by a method similar to that described in the preceding paragraph).

Substantive Procedures at Year-End. In performing audit procedures relating to year-end inventory balances, the auditor is concerned with the substantive accuracy of recorded inventory. The auditor restricts the scope of substantive procedures on the basis of the extent to which internal accounting controls will be relied upon. Procedures listed in preceding sections could be performed at year-end, depending on the circumstances and the auditor's judgment of the timing of certain tests. For example, obsolescence testing, as described on p. 45, could be performed at year-end.

In addition to the year-end tests of detailed transactions and balances described in this section, the auditor may decide to perform analytical review procedures such as computation and review of cost of sales and inventory turnover statistics. The analytical review procedures can involve manual or EDP techniques. The approach is generally not affected by the method of processing, and this document does not describe the analytical review procedures.

Review of Cutoff. The review and testing of inventory cutoff usually involves (1) examination of the documentation of those transactions that affect inventory receipts and shipments occurring during the periods immediately preceding and following year-end and (2) review of sales and payables transactions after year-end. As described on p. 45, the review of

¹ AICPA, *Controls Over Using and Changing Computer Programs* (New York: 1979).

inventory cutoff could involve computer-assisted audit techniques. The auditor could use the same generalized audit software programs developed to identify inventory receipts and shipments occurring near the date of the physical inventory if minor modifications were made to the programs to identify these transactions near year-end.

To identify cutoff transactions before year-end, the auditor would process the perpetual inventory master file as of the date of the financial statements. To identify transactions occurring after year-end, the auditor would process a copy of the perpetual inventory master file after year-end. The auditor could then use the reports in examining supporting documentation to evaluate whether the transactions were included in the proper accounting period.

Clerical Accuracy. To test the clerical accuracy of year-end inventory, the auditor could manually test the extension and footing of the detail inventory listing. However, the inventory system described in this guideline does not provide such a listing. In this case, audit software could be used to price, extend, and foot the perpetual inventory master file as of year-end. If audit software had been used, as described under "Recalculation of Prices and Extensions" on p. 44, the audit software program would require little, if any, modification for use at year-end. In this case, the approach would be an efficient means to test the clerical accuracy of the year-end inventory.

Inventory Costing. The auditor's concern with inventory costing at year-end is to consider whether cost changes made since the physical inventory observation are appropriate and whether appropriate cost changes have been made to reflect changes in market or manufacturing conditions. To test the changes in inventory costing between the date of the physical inventory count and year-end, the auditor could identify cost changes for testing and evaluation by obtaining bill of materials master file listings (or detail inventory listings showing unit cost) as of the physical inventory date and as of year-end and by manually comparing these two reports. This would probably be laborious and time consuming.

An alternate approach would be to use audit software to compare inventory standard costs on the bill of materials master file as of the physical inventory date with the year-end version of the same file. A sample of items for

which inventory costs have changed between these two dates would be printed so that the auditor could test year-end costing. If audit software had been used in previous audit procedures to test the costing of physical inventory (as described under "Recalculation of Prices and Extensions" and "Comparison of Current Standard Costs to Prior Year's Standard Costs," pp. 44 and 45), its use in year-end costing would probably not require any significant program modifications and would thus be an efficient approach.

The following are possible audit procedures to evaluate whether appropriate cost changes have been made to reflect changes in market or manufacturing conditions:

- Review of the inventory variance reports for large or unusual differences between standard and actual costs.
- Comparison of raw material open purchase commitments to prevailing market prices.
- Calculation of lower-of-cost-or-market amounts based on current sales and cost data.

Although the information used in performing these procedures is in machine-readable form rather than written records, the use of EDP has little effect on the audit approach.

The auditor would also be concerned with unrecorded transactions as of year-end. Because of the design of the specified inventory system, inventory transactions might not be recorded in the appropriate period if they were rejected or otherwise unprocessed. To evaluate whether inventory transactions were recorded in the proper accounting period, the auditor could review the various exception reports generated by the system. The batch balancing and error reports as of year-end and a listing of the error suspense file would help to identify the transactions that should be included in the current year but were rejected by the system. The auditor could investigate the disposition of these rejected transactions to evaluate whether appropriate adjustments have been made or whether perpetual inventory processing of the year-end perpetual inventory master file had been held open until all rejected transactions were corrected, re-submitted, and processed.

The unmatched transfers and document accountability reports also provide the auditor with information about missing transactions. The auditor may review these reports to evaluate whether appropriate adjustments have been made for items appearing in the reports.

Inventory System Differences

The inventory system that is used as an example in this guideline is essentially a transaction-driven, batch-oriented system with specified controls in the user department as well as in EDP. There is a wide variety of inventory systems that can accomplish the same goals as the one described but that appear to be very different. Some of the differences that might be encountered involve

- Data processing methods
- Industries
- Inventory valuation methods

The differences in industries and in valuation methods have little effect on the guidance in this document because the variations are so basic that they will affect the audit methodology whether the client's system is completely manual, employs very advanced EDP

technology, or falls anywhere in between. Differences in data processing methods, on the other hand, may significantly affect the applicability of this guide to a review of a particular inventory application. The major impact of different data processing methods concerns the identification of controls used to meet control objectives.

Once the control strengths and weaknesses of the application have been identified, the auditor may find that the audit procedures available are limited in some way (e.g., hard copy may not be available throughout the audit trail or transaction history files may not be maintained), but the auditor generally will still be able to select a combination of compliance tests and substantive procedures to achieve the audit objectives.

Appendixes

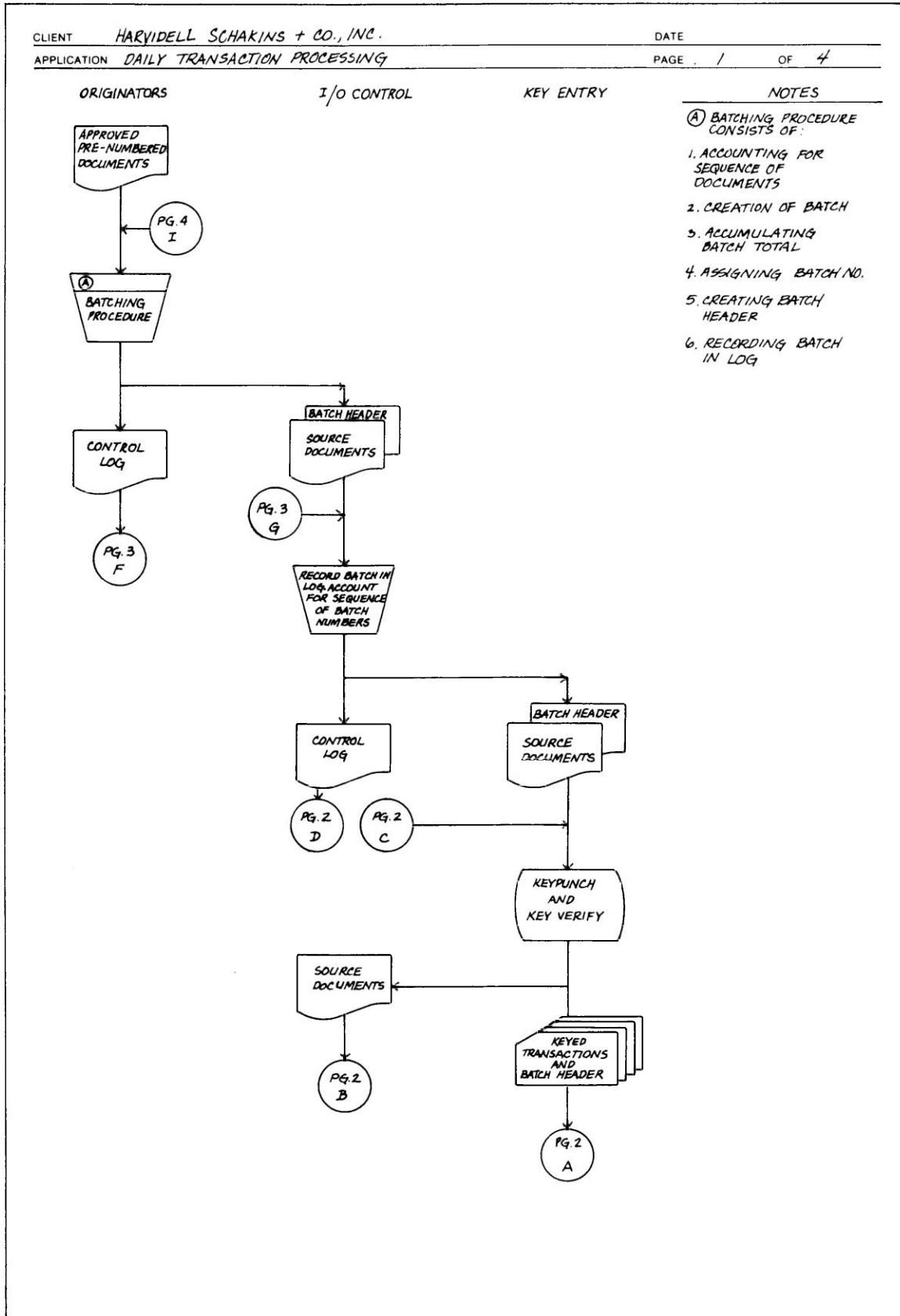
Certain programs that perform functions necessary for processing but that are not significant to the understanding of the case study (e.g., sort and merge programs) have not been shown in the accompanying flowcharts.

So that the reader is presented with more than one method of flowcharting, the flowchart in Appendix C is not as detailed as those in

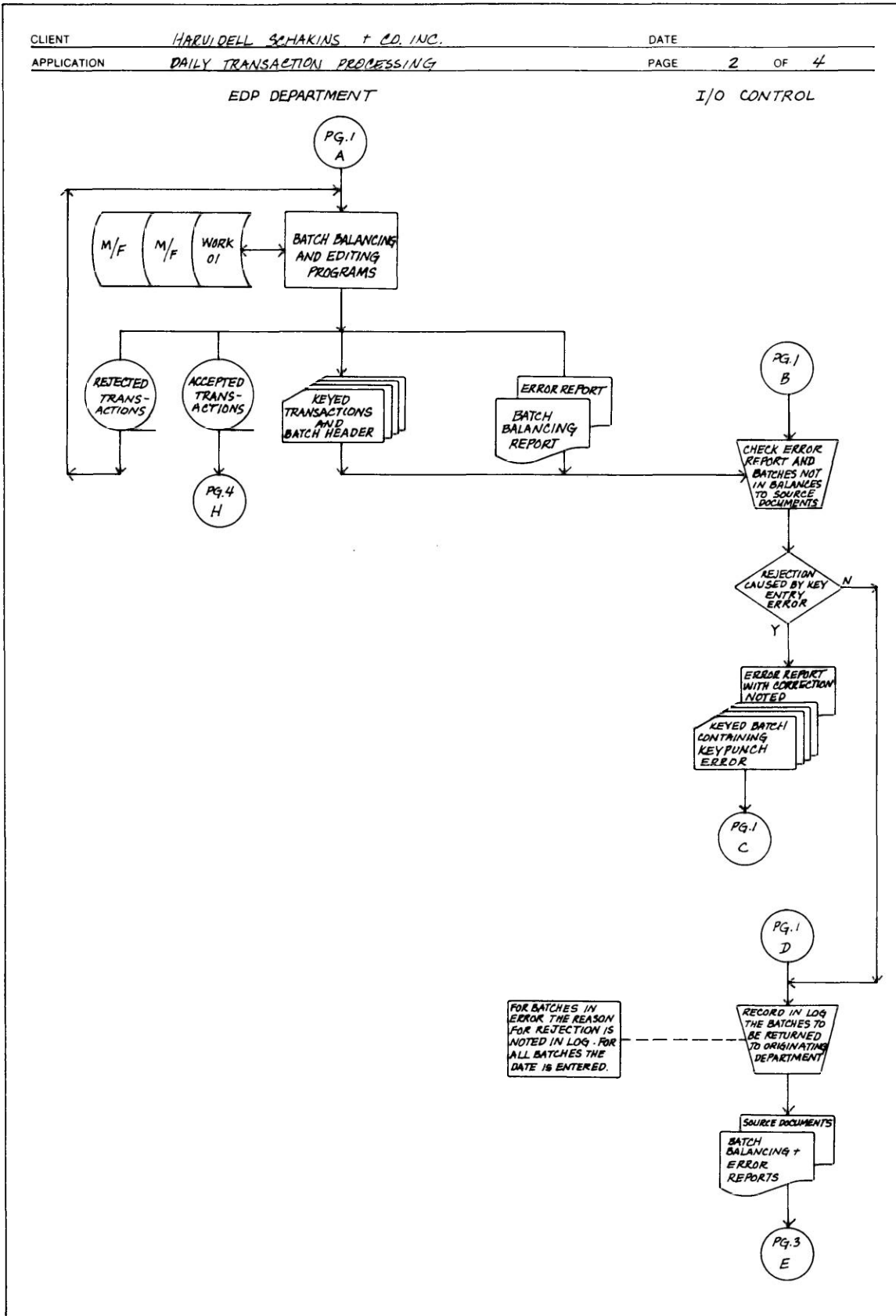
the other appendixes; instead of showing the files that are updated, it concentrates on an overview of the processing.

These flowcharts are included for the purpose of describing the specific system and should not be considered models of the way in which systems should be documented or models of complete documentation.

APPENDIX A—EXHIBIT 1



APPENDIX A—EXHIBIT 2

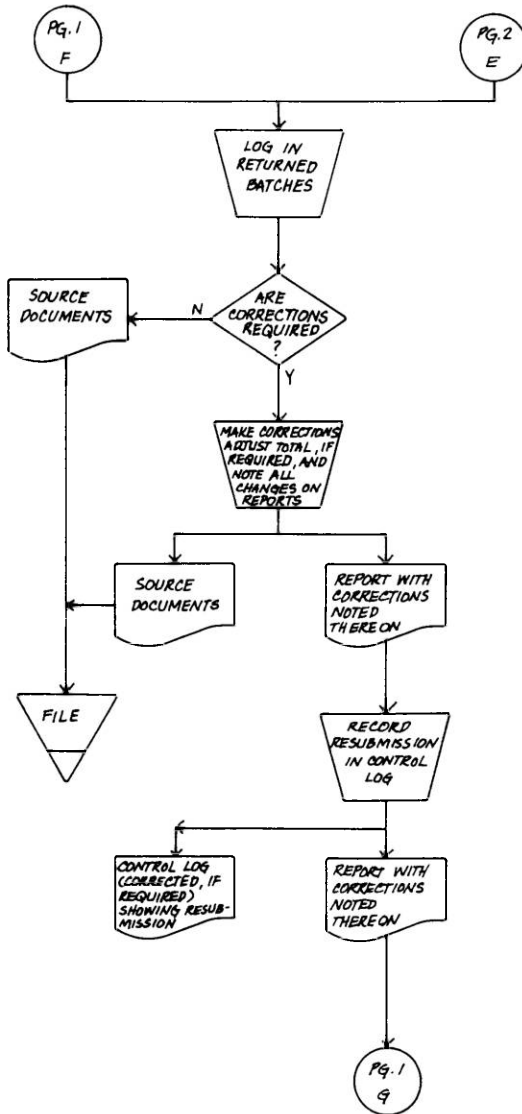


APPENDIX A—EXHIBIT 3

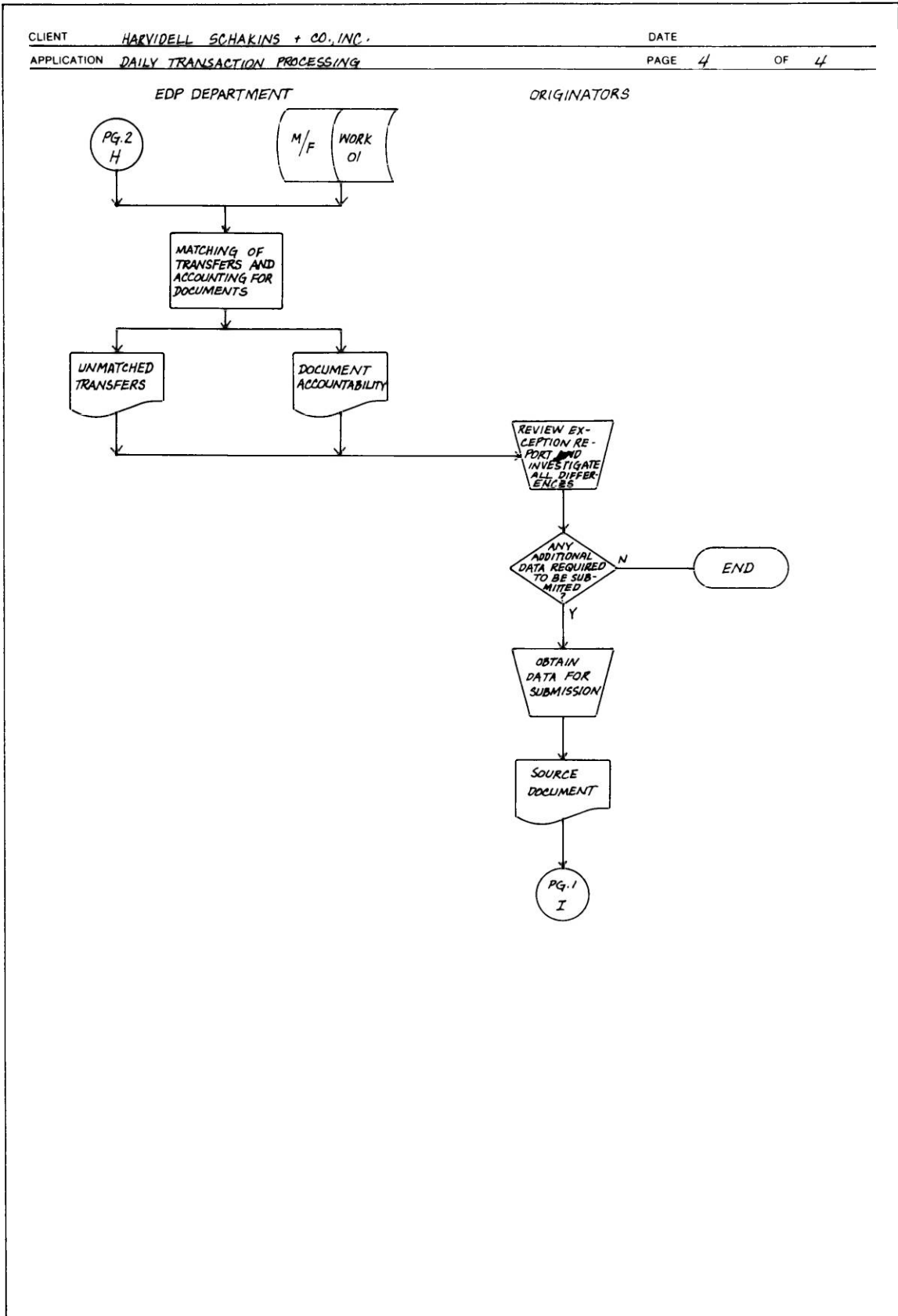
CLIENT HARVIDELL SCHAKINS + CO., INC.
APPLICATION DAILY TRANSACTION PROCESSING

DATE
PAGE 3 OF 4

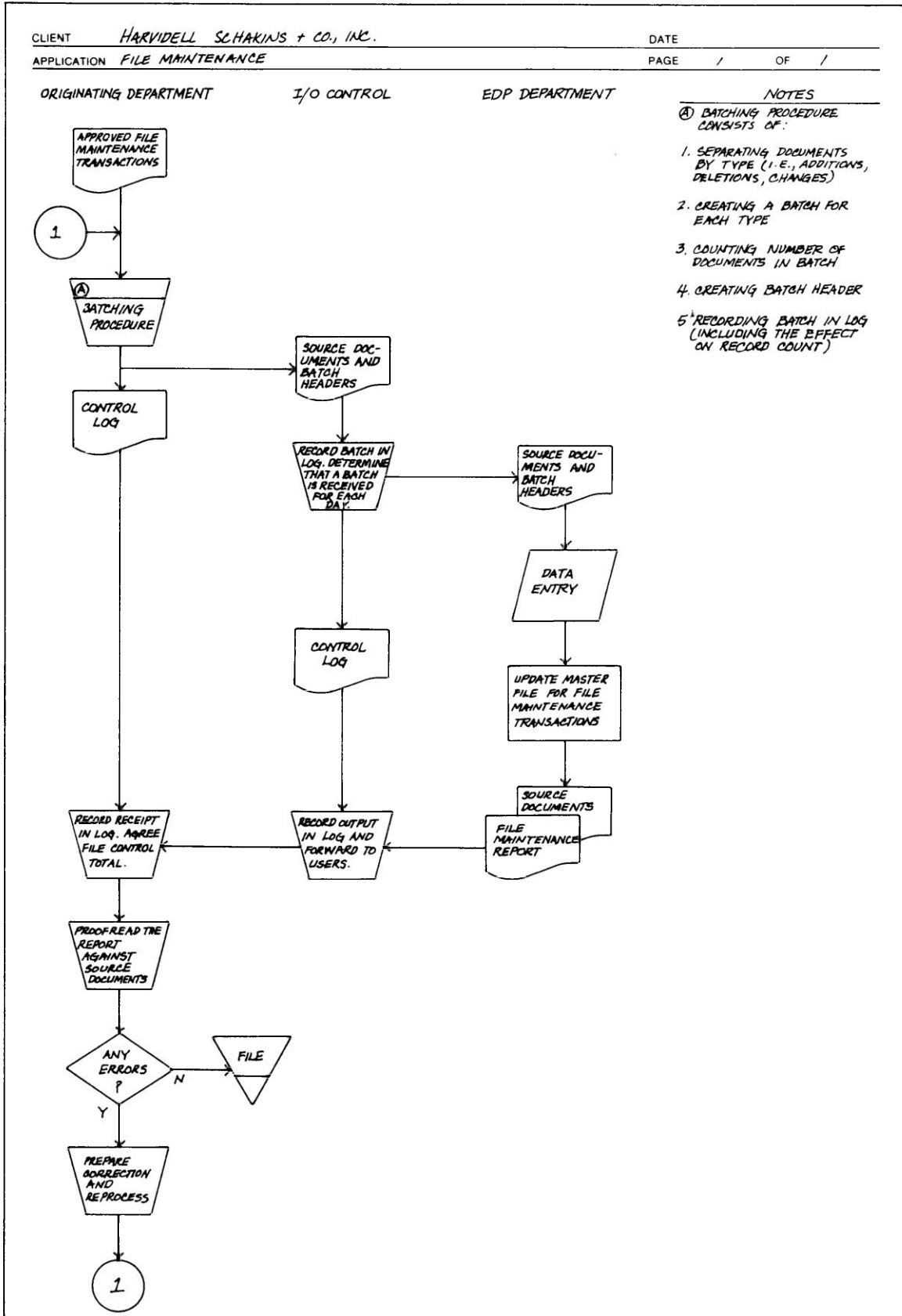
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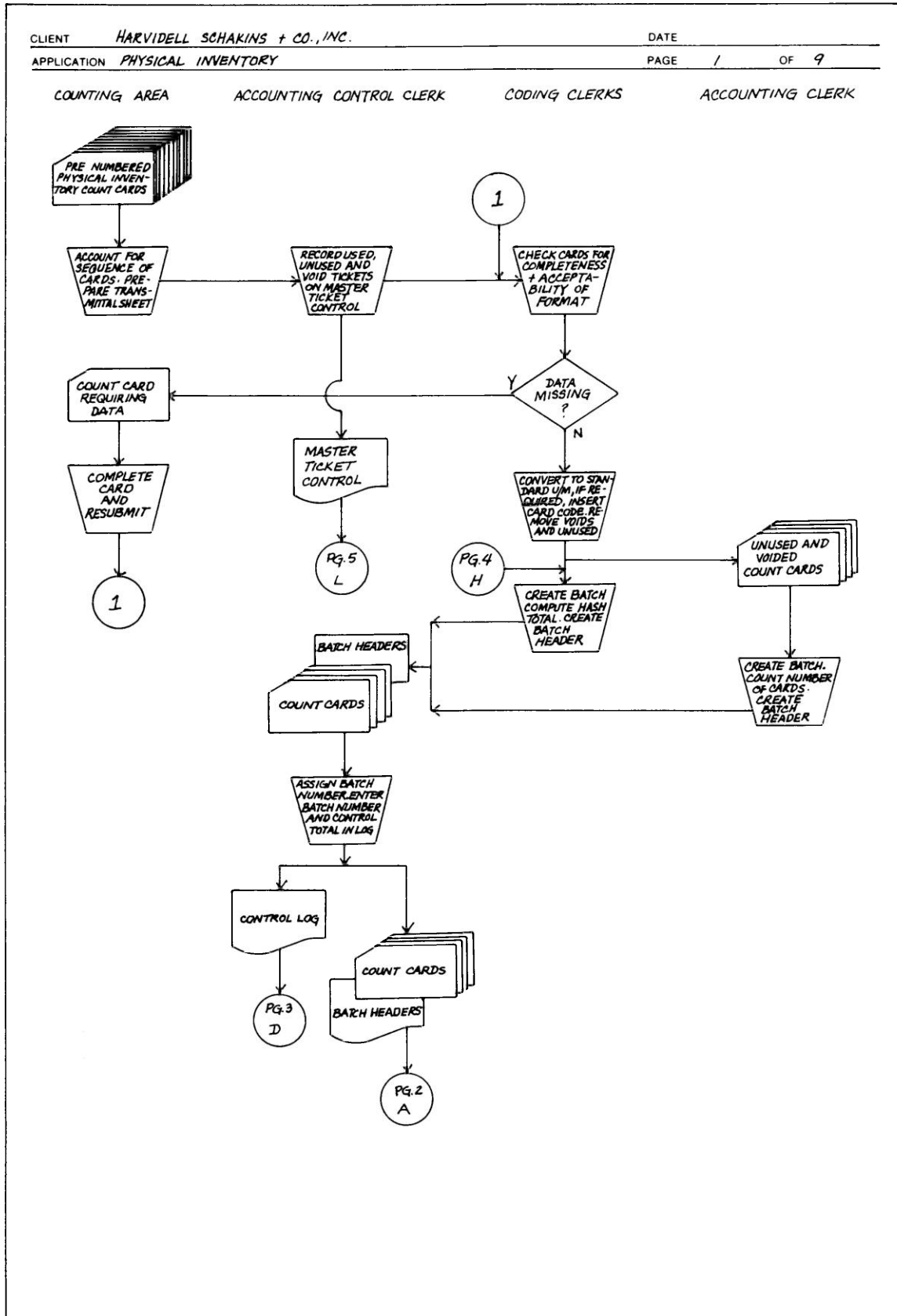
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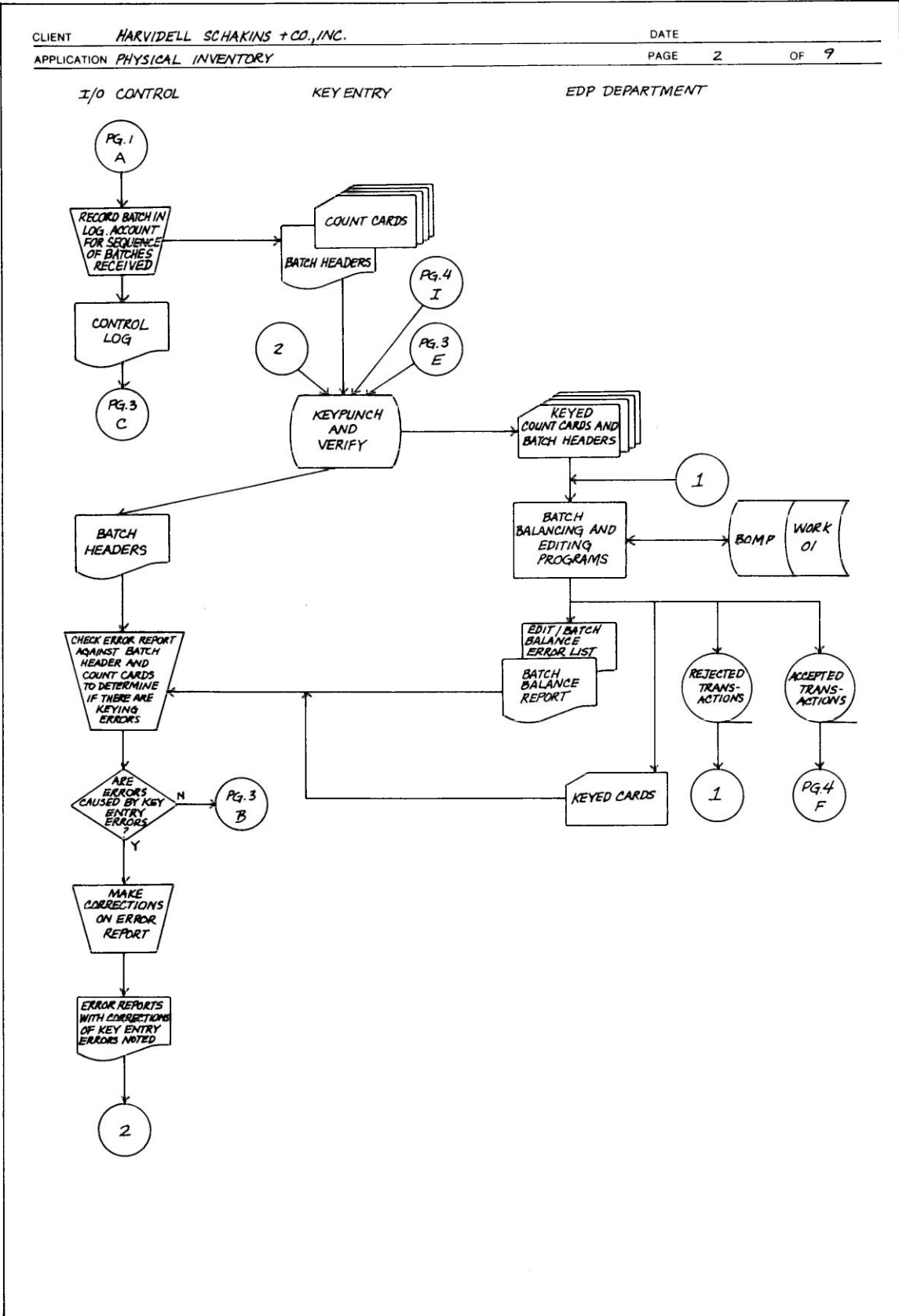
APPENDIX C



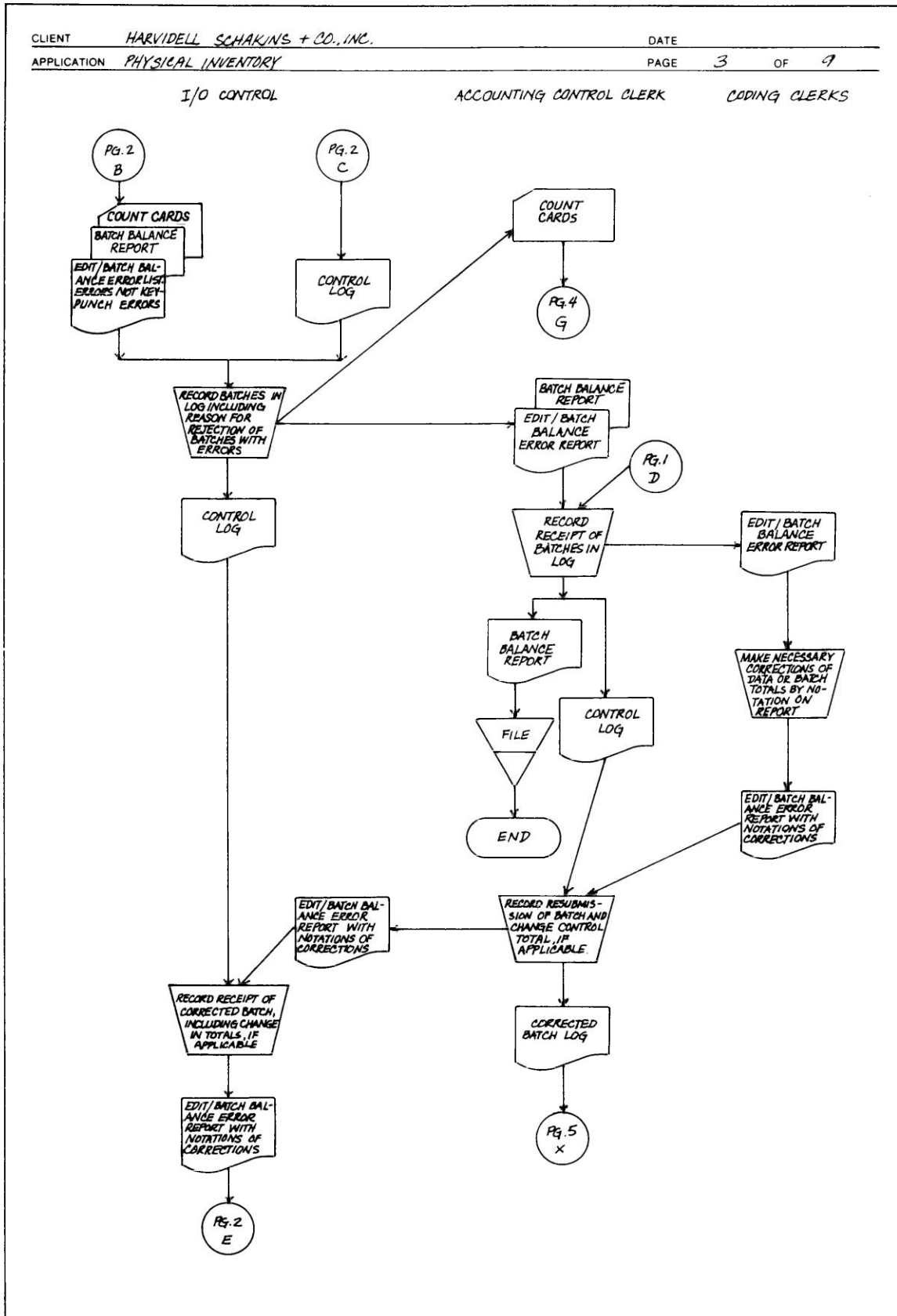
APPENDIX D—EXHIBIT 1



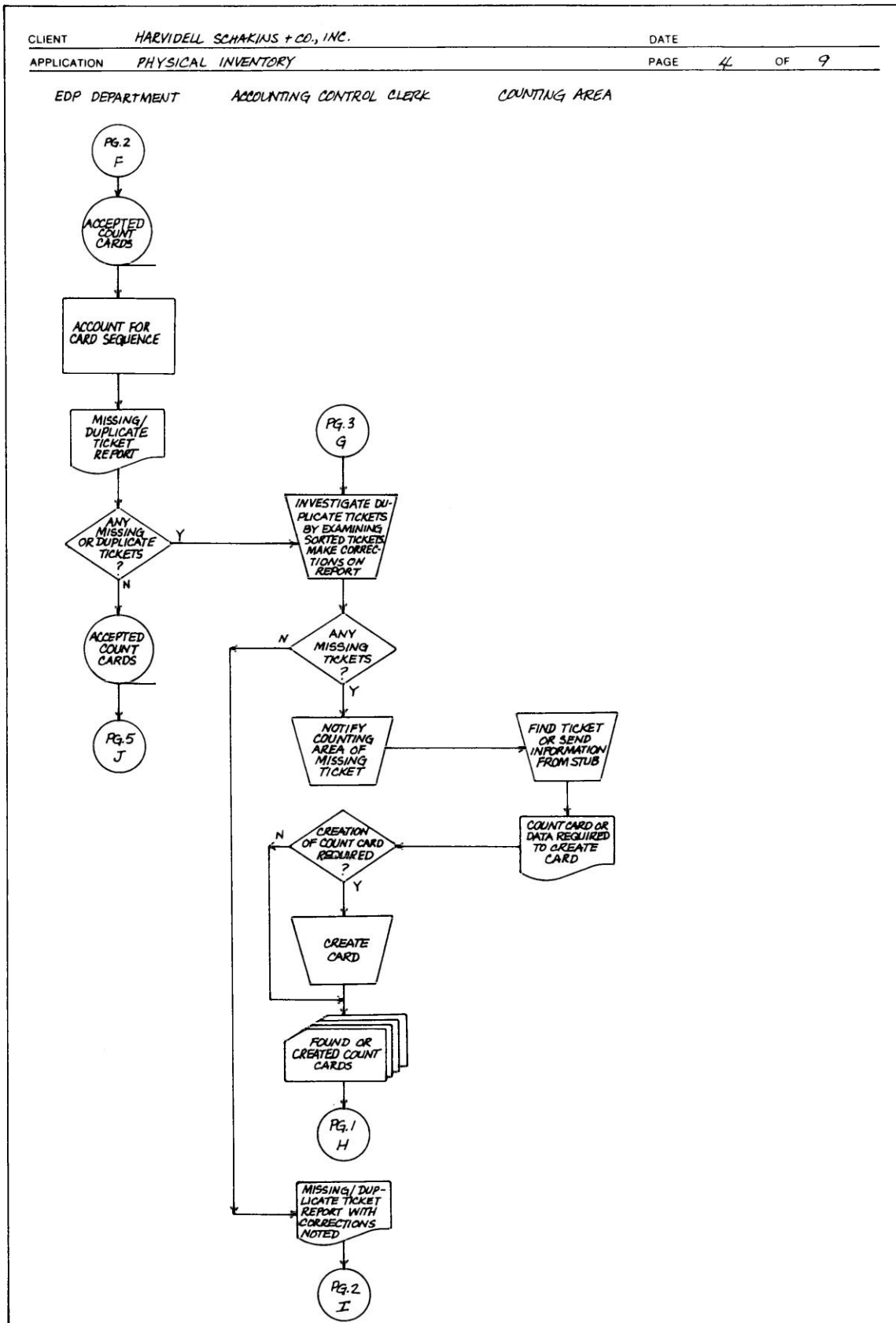
APPENDIX D—EXHIBIT 2



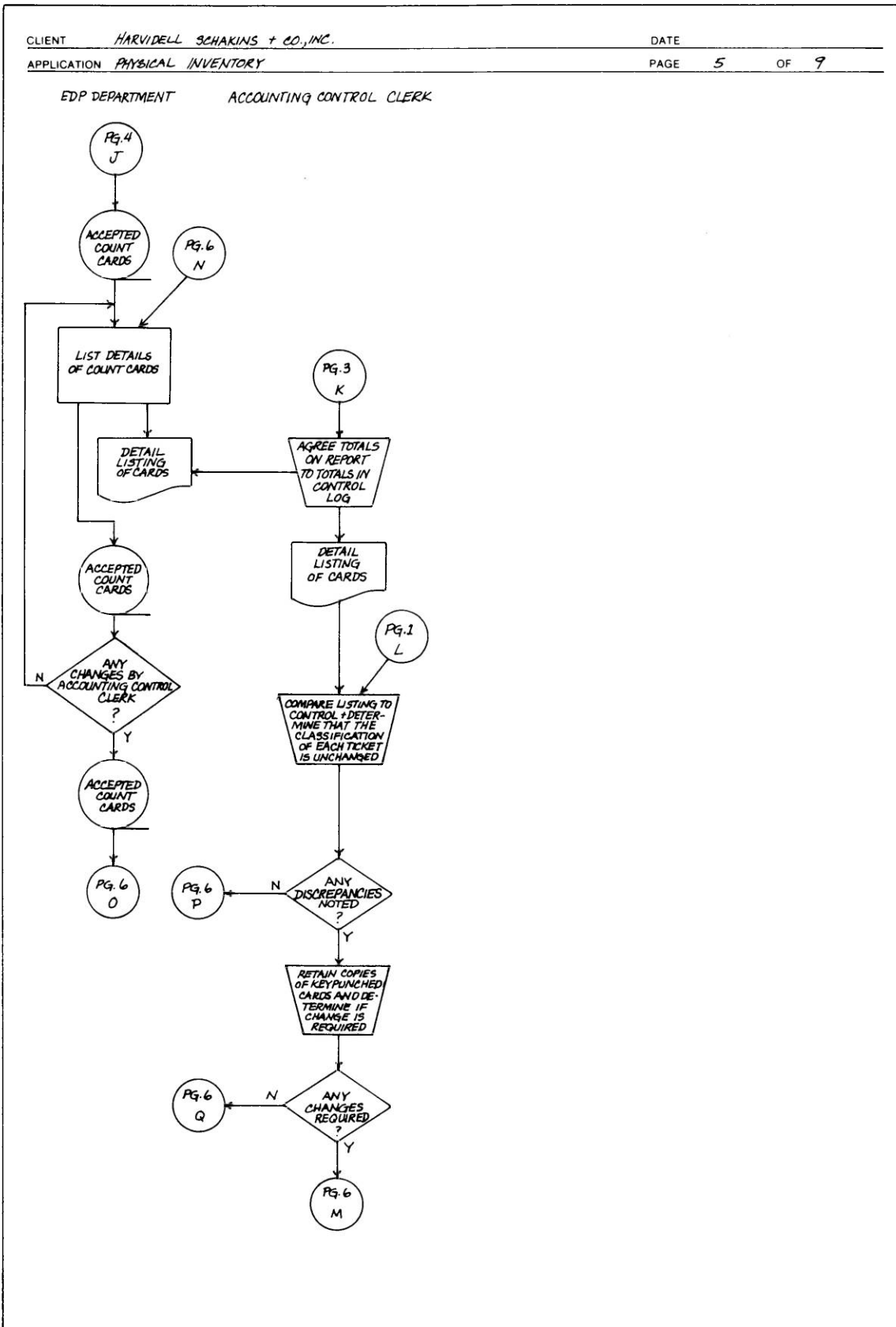
APPENDIX D—EXHIBIT 3



APPENDIX D—EXHIBIT 4



APPENDIX D—EXHIBIT 5

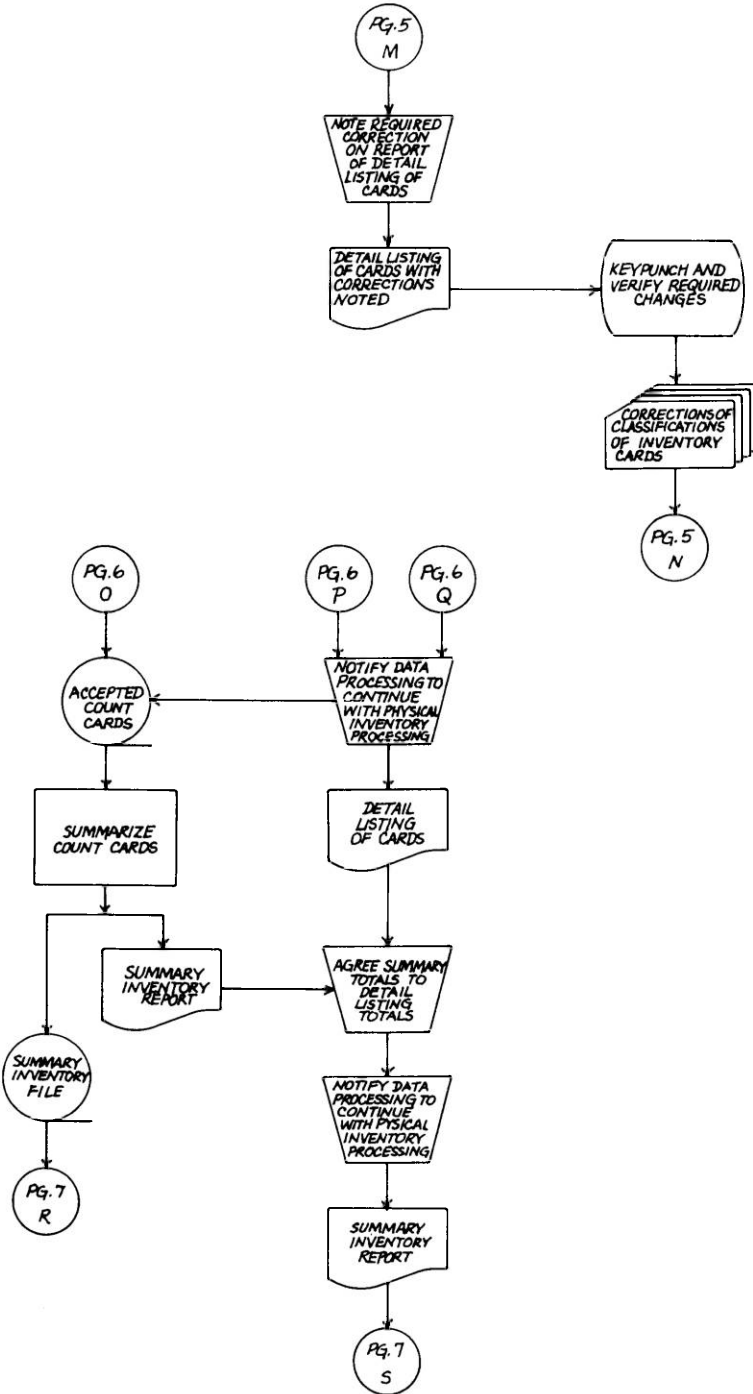


APPENDIX D—EXHIBIT 6

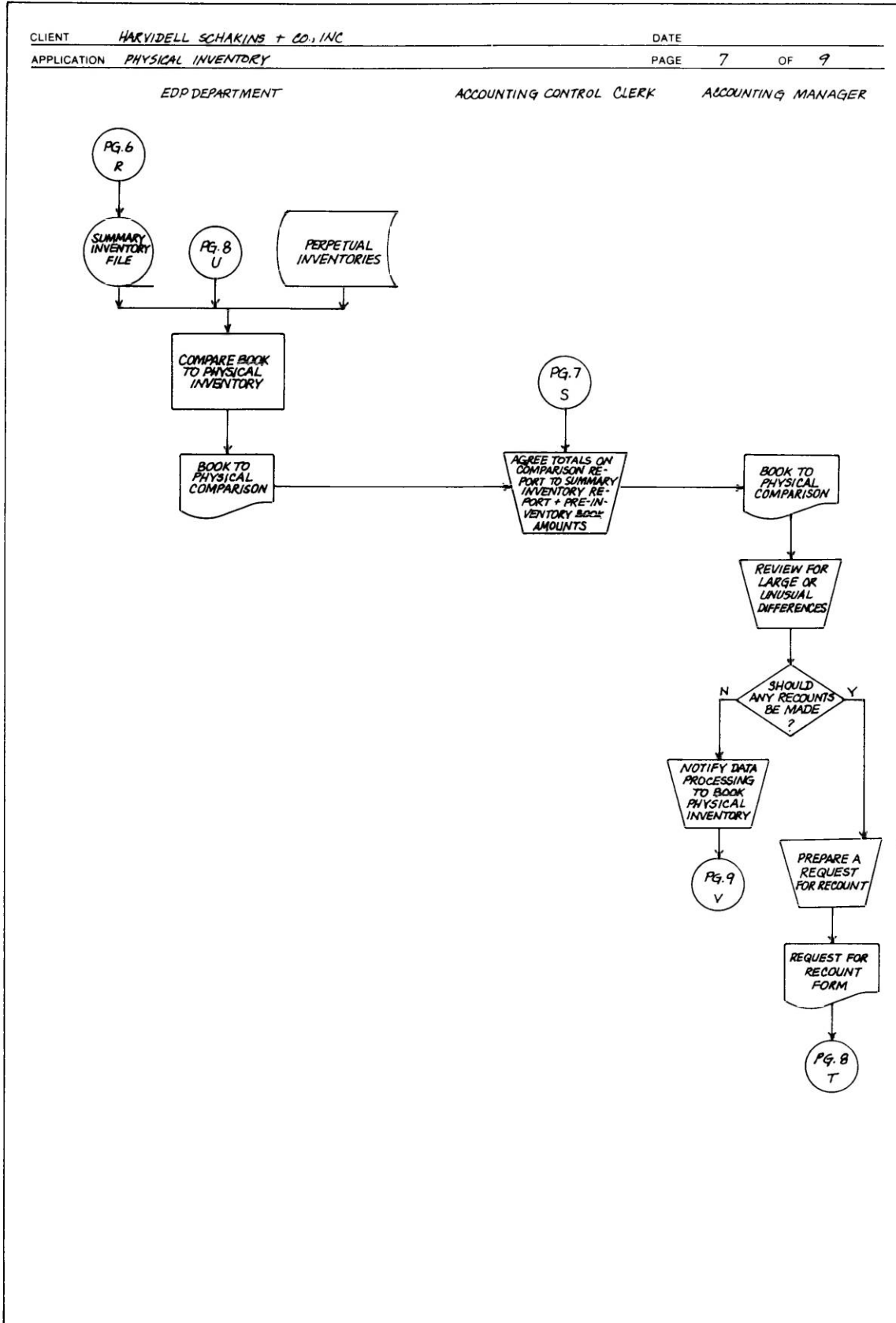
CLIENT HARVIDELL SCHAKINS + CO., INC.
 APPLICATION PHYSICAL INVENTORY

DATE _____
 PAGE 6 OF 9

EDP DEPARTMENT ACCOUNTING CONTROL CLERK DATA ENTRY



APPENDIX D—EXHIBIT 7



APPENDIX D—EXHIBIT 8

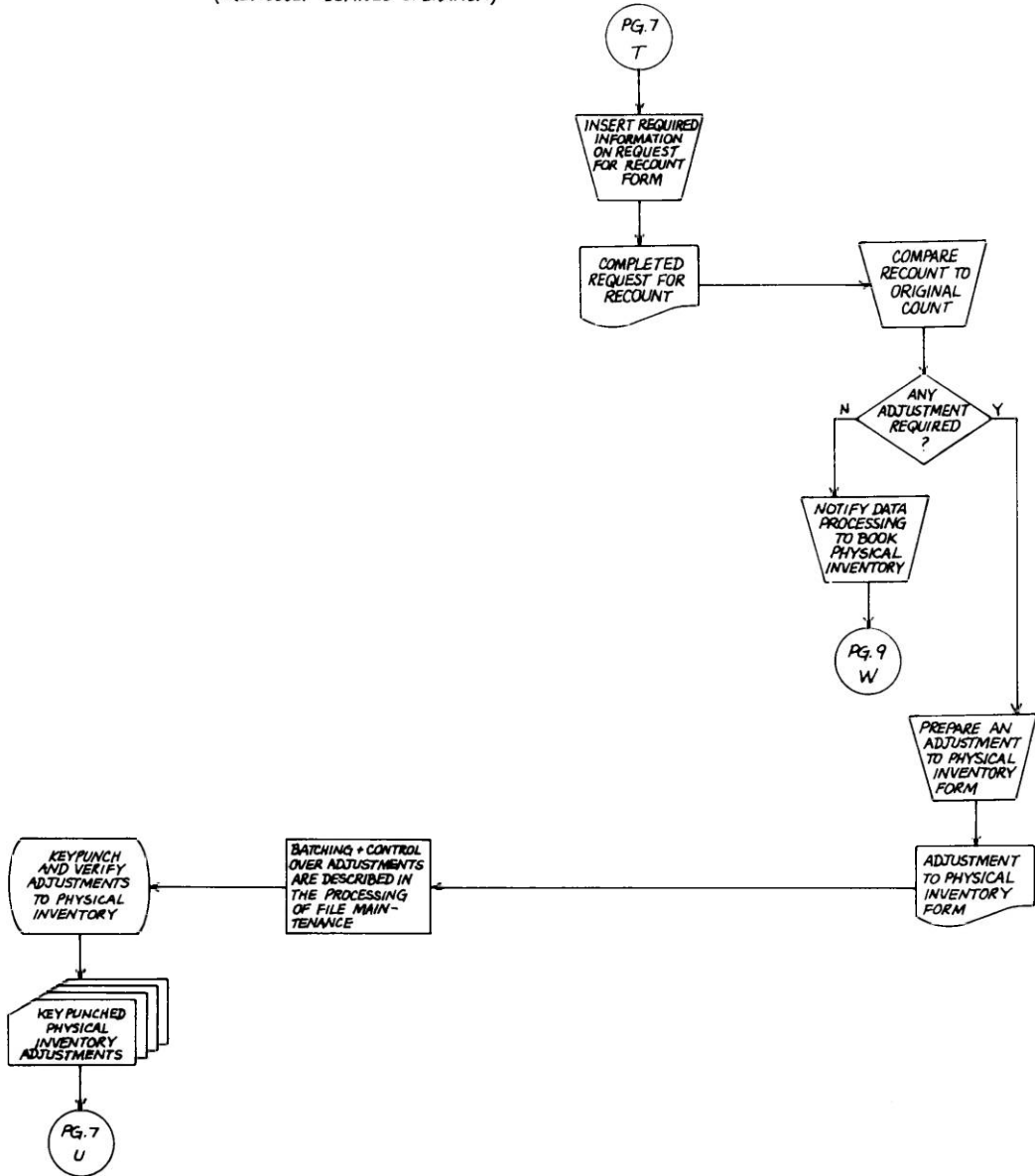
CLIENT HARVIDELL SCHAKINS + Co., INC. DATE _____
 APPLICATION PHYSICAL INVENTORY PAGE 8 OF 9

KEY ENTRY

BATCHING + CONTROL
(PREVIOUSLY DEFINED OPERATION)

COUNTING AREA

ACCOUNTING MANAGER



APPENDIX D—EXHIBIT 9

