

Audit Guide For
Assessing Reliability
Of Computer Output



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FOREWORD

Over half of all General Accounting Office audits now involve computers or computer output. The auditor is responsible for making an appropriate examination to insure that computer output is reliable, consistent with its use in a GAO report.

To help the auditor make an appropriate examination, we developed this reliability assessment guide--to be consulted as soon as the auditor determines that the reliability of computer output is important in accomplishing assignment objectives. It begins with relatively simple audit procedures and continues with more complex procedures that require more time and technical competence. If the auditor can rely on computer outputs after following the simple audit procedures, no further examination is needed. Otherwise, the more complex audit procedures must be completed until the auditor is satisfied. This step-by-step organization should minimize the time and effort needed to assess the reliability of computer output.

Although auditors must continue to use judgment in their work, the detailed audit procedures and the step-by-step approach presented in this guide should lead to more uniform evaluations of internal controls and greater assurance that computer output is reliable.

Since data processing is a continuously developing area, we anticipate that this guide will be revised. Suggestions are welcome, and should be addressed to the Director, Financial and General Management Studies Division, U.S. General Accounting Office, Washington, D.C. 20548.

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INTRODUCTION

General Accounting Office audits often involve evaluating program results, efficiency and economy, and compliance with laws and regulations. Computer output is frequently used in GAO reports on these audits. The auditor must assess the computer's output to make sure it is accurate and reliable (consistent with its intended use). In this guide, computer output, computer products or reports, and computer-processed data or information are synonymous. See appendix II for a glossary of additional terms.

GAO AUDIT POLICY

In discussing automatic data processing (ADP), the Comprehensive Audit Manual (CAM) (part I, ch. 11) places the responsibility for determining the extent of reliability assessment squarely on the auditor:

--"When ADP is an important integral part of agency operations which we are auditing, our work should include an appropriate examination of the functioning of the ADP system. Further, if computer products or output are to be used in a report or in support of a finding, we should make an appropriate examination to provide reasonable assurance that the information is reliable, consistent with its intended use."

* * *

--"In determining the extent of examination, the auditor should consider the importance of the computer processed information in relation to the point being developed, and the degree of risk in using information that may contain inaccuracies."

* * *

--"On each assignment, the auditor must determine whether there would be a serious adverse effect on the accomplishment of our audit and reporting objectives if the information being used were incomplete or inaccurate in any material respect."

* * *

--"The auditor is responsible for performing sufficient evaluation work to provide reasonable assurance that information, whether processed by computer or otherwise, is relevant, accurate, and complete."

ADP audits require the auditor to apply the same policies and objectives used in examining any other agency program or activity. Auditing objectives remain the same whether ADP is employed or not. However, auditing procedures required to accomplish these objectives may be changed by the method of data processing used and may require the auditor to employ specialized ADP expertise.

PURPOSE OF THIS GUIDE

This guide presents an approach for testing the accuracy and reliability of computer-processed data used in audits of program results, efficiency and economy, and compliance. The guidelines should help the auditor

- determine what data should be evaluated,
- select appropriate tests for reliability, and
- reach a conclusion about the data's reliability.

This guide pertains to all GAO audits, reviews, staff studies, etc., except audits made primarily to express an opinion on financial statements. A separate "Audit Guide for Reliability Assessment of Controls in Computerized Systems (Financial Statement Audits)" deals with these audits.

RISK OF USING COMPUTER PRODUCTS

Obviously, products of any information system, whether computerized or not, can be inaccurate or incomplete. However, computer-based products are special in that (1) they are deceptively neat (suggesting accuracy), (2) they do not show alterations made to data in the computer files, (3) their reliability is affected by data processing controls which are seldom consistently used in agency systems, and (4) they are part of a field where continuous changes in equipment and techniques hinder long-term credibility of a system.

Assessing controls over computer processing will help quantify the risks in using products from computerized information systems. The fewer the controls, of course, the greater the risk of using inaccurate information. The reliability assessment, however, helps determine only the potential for error; the dollar value or number of errors must still be determined through regular audit tests.

AUDIT APPROACH

The objective of a reliability assessment is to evaluate the accuracy and reliability of computer-processed information. Auditors must decide whether to test computer data for reliability whenever they find it will be used in a GAO product. This approach does not mean that a reliability assessment should be performed on every audit involving computer products. Instead, a reliability assessment need be performed only when the accuracy or reliability of computer output is important in accomplishing assignment objectives.

Reliability tests

The auditor is encouraged to use data verification procedures like those used in audits that do not involve computers, and inquire into the functioning of computer controls only in sufficient depth to judge the reliability of the information processed. This guide presents various tests for data reliability that should satisfy the auditor's data validation requirements without extensive, time-consuming work.

Each succeeding section describes more comprehensive and detailed work--to be done only if necessary depending on how the computer data will be used in the report. It usually will be necessary to

- identify the computer data to be used,
- determine the importance of the data to the audit,

- determine the source of the data and understand its flow through the system,
- identify controls used to assure accurate processing, and
- test for data reliability.

Decision to do additional work

After completing each section in this guide, the auditor must decide whether additional work is necessary.

This decision will be based on

- the importance of the computer-processed data to the audit,
- the potential for obtaining more reliable data from other sources,
- the practicality of performing the additional work, in light of overall job objectives, and
- the need for information about systems controls to support a recommendation for a separate systems evaluation by technical staff.

Summary memorandum

When reliability assessment work is completed, whether at the end of section I, section II, or section III of this guide, the auditor should prepare a memorandum summarizing the work and the reasoning behind any conclusions about reliability. Section IV contains an outline of the summary memorandum.

Exhibit 1 is an overview of the reliability approach described in this guide.

Working Papers

GAO policy for documenting reliability assessments is stated in the Comprehensive Audit Manual (part I, ch. 11):

"Work performed and the auditor's conclusions about the functioning of the ADP system and the reliability of computer processed data included in a GAO report or used in support of findings, conclusions, and recommendations should be recorded in the working papers in accordance with the standards prescribed in CAM I, chapter 19. When work is performed by use of computerized techniques including data processing and statistical programs, the step-by-step process should be sufficiently documented to permit the process to be repeated."

The working papers should be

- self-contained,
- prepared, indexed, and reviewed the same way as regular audit working papers,
- made part of the permanent file on the agency, and
- updated during each cyclical audit.

The audit working papers should include

- the specific computer-processed data selected for use in the report.
- the document flow used in processing the information,
- the information that was tested,
- the kinds of tests,
- the amount of testing,

- the results of the tests, and
- the dates of the tests.

STAFF REQUIRED FOR THE REVIEW

The audit staff conducting the review should gather information for sections I and II of this guide, assess the reliability of the computer-processed data and the risk associated with its intended use, and prepare the summary memorandum, outlined in section IV on reliability assessment results.

Technical staff are available in an advisory capacity to help the audit staff complete sections I and II. If test results indicate reliability problems and the audit staff is not willing to accept the risk of relying on the computer data, the technical staff should be called upon to survey the agency's internal controls (section III). The audit staff should familiarize themselves with internal controls and help with the control survey. If major system deficiencies are found at any time during the assessment, the auditor should consider having the technical staff conduct a complete systems evaluation.

OVERVIEW OF RELIABILITY ASSESSMENT APPROACH

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PREPARE SUMMARY MEMORANDUM

SECTION I

IMPORTANCE OF COMPUTER-PROCESSED DATA

The first steps in a reliability assessment are (1) identifying the computer data to be used during the audit and (2) determining the data's importance in relation to its intended use. The data, for example, may be "extremely significant," or less error tolerant, because it will be used to support a finding in a report, or it may be "less significant," or more error tolerant, because it will be used merely as background information.

IDENTIFYING THE COMPUTER DATA TO BE USED

1. Specifically identify and describe the computer-processed data to be used during the audit.

Computer-processed data, as defined in this guide, falls into the following broad categories:

- Output from automated accounting, benefit payment, inventory, payroll, and management information systems and the like. This category includes routine or special agency reports, computerized data files, letters, forms, and checks.
- Reports manually prepared from computer-generated information.

--Special reports or information obtained by the agency or GAO using agency computerized data files and software packages, i.e., data retrieval.

2. Identify the computer systems (accounting, payroll, management information, etc.) which process the data.

DETERMINING THE IMPORTANCE OF COMPUTER DATA

1. Determine how the data will be used in the final audit product.

How deep an assessment of reliability is needed depends on the intended use of the data and its importance to the final audit product. Generally, computer-processed data is used by GAO auditors in the following ways: as background information, as a tool for audit planning, or as support for a finding.

2. Determine what impact the data's accuracy and reliability will have on its planned use.

The auditor must decide how the audit report will be affected if data is incomplete or inaccurate. For example, data used as background information is less sensitive (or more error tolerant) than data used to support a finding.

- A. Background--Data used only for background or informational purposes may not be critical to the report.

For example, a report may cite the number of recipients in a benefit payment program. In such a case, an exact figure is not needed, since inaccurate data would not lead to an erroneous finding or conclusion.

However, the audit staff should be alert for background data that indirectly supports a finding. For example, a report introduction may specify the total dollar expenditures for a State's medical program, while the report body shows total incorrect reimbursements. To place the misspent amount in proper perspective, it must be compared with the total spent. Thus inaccurate background data could significantly alter the impact of the finding.

- B. Tool for audit planning--Computer data is often used in planning the direction of an audit or in setting its scope. Because the auditor may base critical decisions on such data, errors could lead to wasted audit resources.

For example, an analysis of computer data may show potential problems in an agency's management of medical payments. The data reliability must then be assessed before resources are committed to the review. Inaccurate or incomplete data could prove very costly.

As another example, an agency may provide a computer listing of medical payments for a specified period. To evaluate management of the payment system, the auditor will have to select cases from the listing for detailed review. If the listing omits critical cases, the review may be biased.

(Note: This category does not include random samples taken to project results for a universe. Computer data used for statistical sampling is considered support for a finding, as discussed below.)

- C. Support for findings--Analyses of computer data or figures taken directly from agency computerized reports or files often support audit findings. Such data is extremely sensitive; its unreliability could significantly weaken the final audit product. For example, a GAO report may cite data from an agency's computer system to show the status of a worker protection program. Inaccurate or incomplete data could portray a distorted picture of program results.

In other instances, statistical estimates based on a sample of agency computer records may be used to support a report finding. Usually such estimates support criticisms of agency management. For example, an analysis of welfare payments to ineligible recipients might demonstrate procedural problems at a State agency. Unreliable data could support invalid conclusions.

Another example would be an analysis of cost-benefit data used to justify a new program. Often, such data will employ a computer model to project program effects. Therefore, the reliability of such data becomes important to the auditor's evaluation. In this case, technical staff might assist in reviewing the model's computer program, the model's logic and authenticity.

For some audits, technical staff may retrieve and analyze data from an agency's computers. The auditor is responsible for assessing the reliability of the agency's data base.

DECIDING WHETHER TO TEST FOR RELIABILITY

1. Contact the technical staff to determine whether reliability assessments have been performed previously on the system. If so, review the memorandum summarizing that assessment to determine whether a new assessment is needed.

The auditor should be aware that GAO approval of accounting systems or CPA certification of financial statements does not guarantee reliability.

--GAO bases accounting system approvals on evaluations of planned system design and documentation, not of actual operations. Unless the system was recently audited (in which case a review of that work is in order), a reliability assessment may be necessary.

--Financial statement certifications by CPAs may or may not have included tests of automated systems. Therefore, the depth to which the CPA reviewed a system should be determined.

Alternatives available

Having defined the significance of computer data, the auditor has the following alternatives:

1. Should it be impossible or impractical to assess reliability (whether due to staffing or time constraints, overall job objectives or audit conditions, etc.), the auditor should at least determine how the agency or contractor assures that data from its computerized systems is reliable. The auditor must then decide whether or not to accept such assurances.

In any event, if the data validation requirements are not satisfied during the audit, the auditor must:

--State, in any report, that no validation was performed, and clearly explain why.

--Prepare the summary memorandum in section IV stating the reason(s) for the decision not to test for data reliability.

2. Should a reliability assessment be necessary, the auditor should follow the procedures and tests for determining data accuracy and reliability described in the following sections of this guide. The selection of appropriate audit procedures for testing data reliability and the time necessary to complete these tests depend directly on the importance of the computer data to the final product.
3. Should the auditor have specific knowledge of major systems problems, technical staff should be contacted for a possible systems evaluation. If a review is warranted, sections II and III of this guide, along with a separate GAO "Audit Guide for Evaluating Automated Systems," should be completed. The auditor should still prepare the summary memorandum in section IV explaining the events leading to the systems evaluation.

SECTION II
INITIAL TESTS FOR DATA RELIABILITY

GENERAL

First, the auditor should obtain an understanding of how the computer system generates the data--from the preparation of source documents through final distribution and use of the output.

While learning how the system works, the auditor should identify potential areas for testing, using audit techniques familiar to the GAO auditor:

- Interviewing agency personnel (i.e., users, systems analysts, programmers, etc.).
- Reviewing agency documentation (i.e., system documentation files, input preparation instructions, users' manuals, etc.).
- Inspecting, comparing, and analyzing agency records (i.e., comparing input documents with output reports, etc.).

The procedures described in this section provide the auditor with a systematic approach for assessing reliability. Although the suggested work steps are presented in logical sequence, there is no requirement that each procedure be completed. The auditor should do only what is necessary to determine reliability.

AVAILABILITY OF DATA FOR TESTING

To test data reliability, the auditor must have access to the computer-processed data, any related output, and input

source documents which produce the data. Many ADP systems, however, are not centrally located. For instance:

- The input source documents may be located in another region or headquarters.
- The source documents may be input at centers throughout the Nation, a region, or a State.
- Data may be input into a regional online system via computer terminals connected to a headquarters computer which produces the report.

In dealing with these logistics problems, the auditor has several alternatives: (1) perform the tests at other regions or headquarters, (2) request regional or headquarters assistance, (3) test a sample of the input centers, (4) if feasible, request that the data be transmitted to the audit staff for testing, (5) develop some other method(s) to test for reliability, (6) use the computer information with a qualifier that logistics problems prevented testing for data reliability, or (7) substitute the computer data with other known reliable data. The ease and timeliness with which the auditor can perform adequate tests for reliability, consistent with the data's intended use, should determine which approach is used.

The auditor may also encounter situations where the agency or contractor obtains its data processing from some private service center or other outside source. After GAO's authority to review such data is determined (we generally have access if the program being audited is

federally funded), the auditor should (1) determine what the service center or outside source does to assure itself of reliable data, (2) verify those assurances by following, to the extent possible, the work steps in this guide, and (3) decide whether the assurances are adequate to support the data's reliability for GAO use. If the auditor is limited in or prevented from establishing reliability, the final audit product should include a statement to that effect, along with a brief explanation.

TESTING RELIABILITY

1. Obtain background information

- A. Obtain background information on the specific computer application(s) that generates the product. Discussions with agency officials should provide the following general information:
- The name (title) of the computer product.
 - The purpose of the product.
 - The system's name and identification number.
 - The date the system was implemented.
 - The type of computer used (i.e., manufacturer's model) and location.
 - The frequency of processing and type of processing (i.e., batch or online).
 - The person(s) responsible for the specific computer application and data base which generates the computer product.

The background information may also be recorded in the system documentation files. Since these files may not be current or complete, the auditor should verify any information with the responsible programmer or analyst.

- B. Contact the agency's internal audit group to determine whether and to what extent the computer system was evaluated. If so, determine the extent to which the system was evaluated. The information may be helpful in determining data reliability.

2. Define data

The auditor must clearly understand what is being recorded by the agency information system; therefore, the individual elements of data must be defined. Titles can be deceptive. For example, is the cost current period or cumulative cost? Is the cost accrued or incurred? What are the components of the cost amount? Has the composition of cost changed during the fiscal periods covered by our reviews?

- A. Define the data elements in data files used to generate the computer product.

The agency's data elements dictionary is the best source of these definitions; however, if one is not available, the record layout may contain

the needed definitions. Exhibit 2 is an example of a record layout.

- B. Determine if the computer product is generated by computing data (addition, multiplication, etc.), summarizing data (totals, averages, etc.), or by using some other form of data manipulation.

In many instances there is no one-to-one relationship between data elements and the information in a computer-processed report or file. Examples of some common differences are shown in exhibit 3.

3. Understand the document flow

To determine the scope and depth of test for data reliability, the auditor must identify the documents which generate the computer product, understand how they flow to and from the computer system, and verify the flow. This can be done through:

- discussions with agency users or other knowledgeable people, such as internal auditors, input/output specialists, or possibly even the agency director, and by
- reviewing the agency procedures manual, which describes the source documents and the types of operations performed as they move through the system.

On occasion, an agency user or other personnel in the computer center may already have a document flow

diagram showing the origination of data and its journey to and from the computer. (This should not be confused with a system flow chart which illustrates the detailed computer processing of data or a program flow chart which describes a computer program, either of which might be useful in developing flow.) More often than not, the auditor will have to capture the document flow in a format familiar to him, whether it is a narrative description, a block diagram using simple symbols, a flow chart using standard symbols, or some combination.

The document flow should not describe the actual computer processing inside the "black box"; this processing may be reviewed later by the technical staff. If the computer output is the product of more than one input, this condition should be clearly noted in the document flow description.

A. Prepare the document flow showing

- each source document by title and ID number (copies should be attached),
- the point of origin for all source documents,
- each operating unit or office through which data passes,
- destination of each copy of the source document and what action is taken (i.e., is the document filed, audited, keypunched?),

--actions taken by each unit or office through which the data passes (i.e., are items recorded in a ledger, are unit prices added and extensions computed, are control numbers recorded and checked?),

--controls over the transfer of source documents between units or offices to assure none are lost, added, or changed (i.e., record counts, control totals, arithmetic totals of important data, etc.), and

--recipients of computer outputs.

- B. Verify the document flow's accuracy and completeness by "walking" typical transactions through the system and observing what actions are actually performed on the documents. If any discrepancies are identified, they should be resolved with agency personnel.

Document flow in a typical payroll system is shown in the exhibits at the end of this section. Exhibit 4 is a block diagram with rectangular symbols. Exhibit 5 shows the same document flow in narrative form.

4. Identify users

Users of computer-processed data can help the auditor by identifying errors. Therefore, the auditor should identify principal users and possibly interview them to determine specifically how they use the computer data and what their opinions are concerning its accuracy and completeness.

A. Complete exhibit 6, OVERVIEW - PRINCIPAL USERS, for each computer output. All users should be shown on a current computer product distribution list which can usually be obtained from the data processing department.

Sometimes it is impossible or impractical to list all principal users. In such cases, the auditor should select a manageable number of users from different geographical locations who are best able to judge the data's reliability.

5. Test for data reliability

Some suggested tests for data reliability are listed below. The auditor may use any or all of these tests or develop some other means to test the computer data. The key is to perform enough tests to support an opinion on the data's reliability.

- A. Confirmation--confirm data with independent sources (i.e., regular users of the data, internal auditors, third parties, suppliers of input data, and ADP department personnel). Use exhibit 7, USER SATISFACTION QUESTIONNAIRE--COMPUTER-PROCESSED PRODUCTS.
- B. Common sense--review the data for reasonableness (i.e., are amounts too small or too large and is the math correct?).
- C. Comparison--compare the data with independent sources where possible (i.e., source documents, physical counts and inspections, computed amounts, and other records, files or reports).

Confirmation tests

On program results, efficiency and economy, and compliance audits, the internal controls evaluation will not ordinarily precede the confirmation test (controls are checked in a later phase). Therefore, the auditor must select the elements of data to be confirmed without knowing the internal control strengths and weaknesses. Emphasis should be placed on the data which, if found to be incomplete or inaccurate, would distort the audit conclusion. Several confirmation sources follow.

--Regular users of the computer data: The previously prepared list (exhibit 6) should include the names and locations of principal users. The auditor should ordinarily begin confirmation tests with these principal users because they use the information daily and because they are directly affected by inaccuracies in the information.

Typically, users of computer products have varying knowledge about the product's quality. To obtain confidence in the confirmation responses, the auditor should personally interview enough users, using exhibit 7, USER SATISFACTION QUESTIONNAIRE--COMPUTER-PROCESSED PRODUCTS, to develop a general idea about the computer output's usefulness.

When there are a large number of principal users or several users at different locations, it may be impractical to personally interview each one. In these cases, the auditor may (1) select a sample of users based on number, location, or some other suitable criteria, (2) interview users by telephone, or (3) distribute the questionnaire. In this last situation, the auditor must maintain control over the questionnaires and conduct some followup or debriefing to assure accurate responses.

When conducting the interviews, it is especially important to obtain evidence of incomplete or inaccurate data mentioned by the users. The auditor should determine

- The nature of the problem--amounts overstated or understated, incorrect totals, incomplete data fields, negative balances which should be positive, etc.
- How frequently errors are being observed--isolated instances, problems of a recurring nature, etc.
- Whether the user can help explain why errors are occurring. Since data errors affect users, they may have conducted

studies to show the magnitude and cause of errors.

--Whether users keep manual records for use instead of the computerized reports or other output. Manually maintained records in a computerized systems environment can mean poor quality of computer output and unnecessary expenditures for duplicate recordkeeping. The auditor may also find that manual records better satisfy the need for reliable audit evidence.

--Internal audit: An increasing number of internal auditors are now participating with systems designers in defining necessary audit trails and controls to assure the reliability of processing in automated systems. This participation ordinarily includes testing of computer products and requires detailed knowledge of system design and operation. Thus, internal auditors may have the best overall knowledge of the system and its products.

If internal auditors recently audited the data, results can contribute to the auditor's knowledge and minimize other planned reliability tests.

Even if internal auditors did not recently audit the data, they can help evaluate computer products by:

--Aiding with the "common sense tests" discussed in detail in a later section. What may appear incorrect to an external reviewer (i.e., a credit balance in inventory on hand) can sometimes be explained by an internal auditor without extra work.

--Identifying personnel who have the best ability to confirm the contents of a report--not necessarily the current user of a report.

--Identifying information sources against which the data can be compared--other files, reports, studies, manual records, etc.

--Third parties: Confirming data with third parties is often beneficial because the third party is independent of the information system which generated the data. Some examples of third party sources are:

--Banks - cash balances on hand, numbers or amounts of loans.

- Warehouses - assets stored, volume of transfers.
- Training institutions - number of students serviced, dollar volume of contracts.
- Common carriers - rates for freight shipments, volume of passengers between selected locations.
- Medical facilities - daily rates for patient care, types of outpatient services available.
- Private business concerns - billings for utility services, wholesale prices of generic drugs.
- Other Government agencies - checks cancelled by a U.S. Treasury Department disbursing center for another agency, statistics on another agency's use of GSA automobiles.
- Suppliers of input data: Persons, sections, or organizations supplying input to the computerized system were identified earlier. If they are not the same as the regular users of the system output, they may be contacted to confirm

the accuracy and completeness of the data they prepared for system processing.

--ADP department personnel: The auditor should contact ADP department personnel to determine the history and number of errors associated with a specific application or product of a system.

Computers are almost always programed to edit data that is entered for processing. These edits help determine whether the data is acceptable. If the data contains errors or fails to meet established edit criteria, it is rejected. A computer record of rejected transactions should be available from the control group responsible for reviewing output. Errors shown on this record can be related directly to the application being processed.

The auditor should exercise care in reaching conclusions about edit tests because a system with many rejected transactions may produce reliable information. For example, a system with insufficient computer edits may routinely accept erroneous data and print out few rejected transactions, while a system with extensive edits may reject many transactions but actually produce a far more accurate final product.

A more extensive evaluation of error handling and the adequacy of computerized edits may be done later.

Common sense tests

Through discussions with internal auditors and data users, the auditor should have obtained the criteria to judge the data's reasonableness. For instance, the auditor should ask:

- Are the amounts too small? (i.e., cost per mile to operate a 1-ton truck = \$.004; 3 universities in the State of New York.)
- Are the amounts too large? (i.e., accrued annual leave balance for 1 employee = 3,000 hours; a single student loan for \$15,000.)
- Are the data fields complete? (i.e., social security payments listed for only 46 States; all 9 Federal census regions listed but no program enrollment data shown for 2 of them; checks listed in numerical order but one group of checks within the series not accounted for.)
- Are calculations correct? (i.e., columns of data include 4-digit items but the column

total includes only 3 digits; a unit cost extension for 1,200 items which should be for only 120 items.)

These common sense tests can be done quickly and can alert the auditor to data reliability problems.

Comparison tests

Operational audits are usually "first-time" investigations, which preclude comparing current period data with previous data collected by the auditor. Certain comparisons can, however, be useful. This is especially true if the data being compared comes from independent sources. Some of the more typical sources of information against which the the auditor may compare data are:

--Source documents: Any time information in a computer-processed report, listing, or file can be compared with data on the original source documents, the auditor should consider doing so.

However, because of computation, summarization, and other data manipulation which may occur as the data passes through the system, the end product may not be readily compared with the raw data which entered the system. One example is the salary check. Source data for a salary check will usually consist of (1) a time and attendance record for hours worked, (2) a W-4 form for claiming tax exemptions, (3)

other forms authorizing various payroll deductions, and (4) personnel forms showing employment grade, promotion actions, etc. Obviously, the net amount of a salary check cannot be directly compared to any one of these source documents.

--Physical counts and inspections: A physical count can be made to verify information concerning the quantities, types, or condition of any tangible asset. When this technique is used, the comparison should be made both ways--from the record to the physical count and from the physical count to the record.

--Computed amounts: This test requires an independent calculation of an amount which can then be compared with the amount for the same item shown in the computer report or file.

Examples include computations of

- benefit payments for selected categorical grant recipients,
- investment repayment balances on government construction projects,
- loan balances and delinquent amounts, and
- resale prices of foreclosed and repossessed properties.

--Records, files, and reports obtained from other sources: The validity of recorded data may also be

checked by comparing it with the same type of information obtained from another independent source.

Reports on government programs and activities issued by outside contractors, universities, internal audit groups, privately funded foundations, and others may contain useful information.

If these third party reviewers, however, obtained their information from the activities they are evaluating, it may be the same information which the auditor has chosen to review for reliability. This precludes its use for data comparison purposes unless the third party organization has itself evaluated the reliability of the information. Experience has shown that this type of reliability testing is seldom done, and the auditor should never assume it has been done.

6. Alternatives Available

Upon completing the reliability tests, the auditor has reached a decision point. The auditor can either finish and prepare the summary memorandum outlined in section IV or request the technical staff to continue the reliability assessment by evaluating the internal controls. The auditor's decision depends upon

- the results of the confirmation, common sense, and comparison tests,

- the scope of those tests, and

--the significance of the computer-processed information in relation to its intended use.

When the tests indicate that computer data is incomplete or inaccurate, the auditor must determine the significance of the problem in relation to the scope of these tests. If the auditor determines the problems to be insignificant, considering how the data is to be used in the report, an evaluation of controls may not be necessary. The auditor's evaluation of the risk in using the data and his willingness to accept the risk determine the course of action.

A. Data used as background information

Since computer-processed data used as background information is generally less sensitive or more error tolerant, an evaluation of the system's internal controls (section III) is not necessary if tests show no major problems with the data's completeness and accuracy. In this case, the auditor can use the computer-processed data, but he/she must make sure the scope and type of reliability tests were sufficient to reveal any deficiencies.

When the tests show the data to be incomplete or inaccurate, the auditor can take one of the following actions:

- Use the data with a qualifying statement indicating the nature of the problem (e.g., the tests indicate a value is understated; the auditor can use this value in the report by stating it is a conservative estimate).
- Use other information found during the tests if the auditor judges it to be more accurate and complete than the computer-processed information (e.g., a manual system maintained by users may have more accurate information than the computerized data).
- Expand the audit scope to include a finding on the inaccurate or incomplete data. In this case, the technical staff should be contacted to perform the work in section III, Survey of Internal Controls.

The auditor should complete the summary memorandum outlined in section IV unless a decision to expand the scope of the audit is made.

B. Data used as tool for planning audits

When computer data is used for planning purposes, the auditor must determine whether there would be an adverse impact on the planned product if the information is incomplete or inaccurate.

When tests reveal no significant problems, the auditor should complete the summary memorandum outlined in section IV and use the information as planned.

If tests cast doubt on the data's reliability, the auditor has the following alternatives:

- Find another source of information to meet the audit objectives (i.e., the tests should disclose alternative information the auditor can rely on).

--Use the data with qualifications by stating the problems noted and the effect on the audit.

--Expand the audit scope and develop the reliability problems into a separate finding. Technical staff should provide support by surveying the internal controls outlined in section III.

The auditor should complete the summary memorandum outlined in section IV unless a decision to expand the scope of the audit is made.

C. Data supporting a finding

When computer information is used to support a finding or is itself a finding, an evaluation of the system's internal controls is generally required to complete development of the finding. However, the auditor does have several options.

When reliability tests show the computer data to be accurate and complete, the auditor can either:

--Request the technical staff to evaluate the system of internal controls as outlined in section III or

--Use the computer data with a qualifying statement indicating the type and scope of tests performed, and complete the summary memorandum in section IV.

When tests reveal major problems with the data, the auditor has the following options:

--Substitute other reliable data uncovered during the reliability tests and complete the summary memorandum in section IV.

--Use the computer data with a qualification indicating the nature and extent of problems noted and complete the summary memorandum in section IV.

--Develop the problem data into a separate finding by requesting the technical staff to review the system's internal controls as explained in section III. Also, discuss the possibility of a complete systems evaluation to identify systems problems and determine the related causes and effects necessary to develop a separate report. If undertaken, the "Audit Guide for Evaluating Automated Systems" should be used in lieu of section III in this guide.

The above alternatives are presented in the following decision tables which are based on use of the data in the final audit product, reliability test results, and the auditor's willingness to accept the risk.

TABLE 1				
AUDIT SIGNIFICANCE				
COMPUTER-PROCESSED DATA USED IN AN AUDIT AS	BACKGROUND INFORMATION	AUDIT TOOL FOR PLANNING	SUPPORT FOR A FINDING	
IDENTIFY COMPUTER DATA USED	X	X	X	X
DETERMINE AUDIT SIGNIFICANCE	X	X	X	X
GET INFORMATION ON COMPUTER APPLICATION	X	X	X	X
DEFINE DATA TO BE EVALUATED	X	X	X	X
PREPARE DOCUMENT FLOW	X	X	X	X
IDENTIFY USERS OF COMPUTER DATA	X	X	X	X
PERFORM RELIABILITY TESTS	X	X	X	X
GO TO TABLE 2	X	X		
GO TO TABLE 3				X

TABLE 2					
BACKGROUND INFORMATION/PLANNING					
TEST RESULTS ARE OK	Y	Y	N	N	N
AUDITOR ACCEPTS RISK	Y	N	Y	N	N
AUDITOR DECIDES TO EXPAND AUDIT	-	-	-	Y	N
DO NOT USE COMPUTER DATA					X
USE DATA WITH QUALIFYING STATEMENT EXPLAINING PROBLEMS NOTED			X		
USE OTHER RELIABLE DATA					X
PREPARE SUMMARY MEMORANDUM	X		X		X
CONTACT THE TECHNICAL ASSISTANCE STAFF; GO TO TABLE 4		X		X	

TABLE 3					
SUPPORT FOR A FINDING					
TEST RESULTS ARE OK	Y	Y	N	N	N
AUDITOR ACCEPTS RISK	Y	N	Y	N	N
AUDITOR DECIDES TO EXPAND AUDIT	-	-	-	Y	N
DO NOT USE COMPUTER DATA					X
USE DATA WITH QUALIFYING STATEMENT INDICATING SCOPE OF TESTS PERFORMED	X				
USE DATA WITH QUALIFYING STATEMENT EXPLAINING PROBLEMS NOTED			X		
USE OTHER RELIABLE DATA					X
PREPARE SUMMARY MEMORANDUM	X		X		X
CONTACT THE TECHNICAL ASSISTANCE STAFF; GO TO TABLE 4		X		X	

TABLE 4	
TECHNICAL ASSISTANCE STAFF RESPONSIBILITIES	
ENTER	Y
SURVEY OF INTERNAL CONTROLS (SECTION III)	X
SUMMARY OF ADEQUACY OF INTERNAL CONTROLS	X
AID AUDITOR IN ASSESSING OVERALL RELIABILITY	X
DETERMINE WHETHER FURTHER SYSTEM EVALUATION IS NECESSARY	X

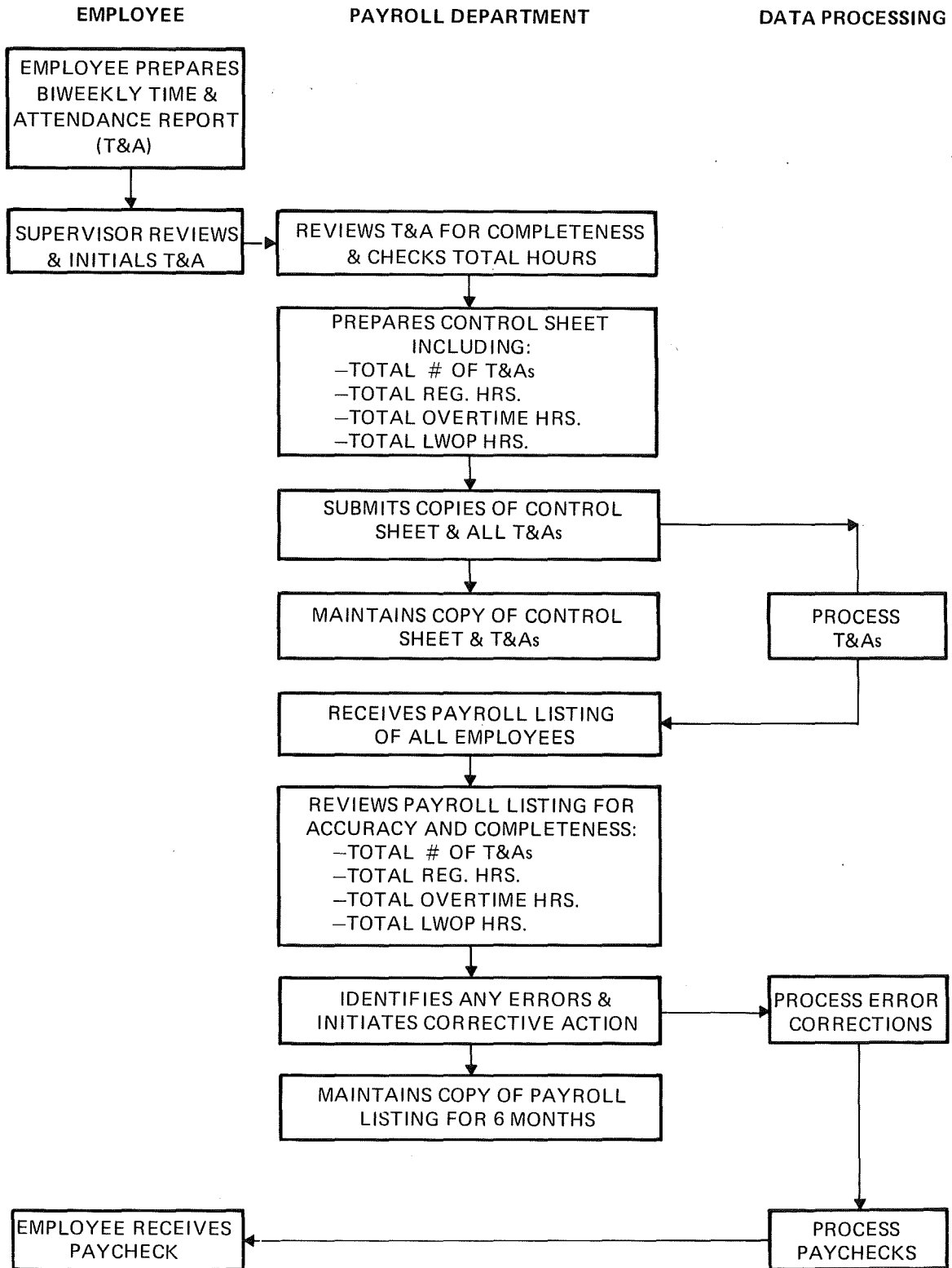
DESCRIPTION OF PAYROLL DATA FILE

<u>Data Element</u>	<u>Position in Data File</u>	<u>Data Element Description</u>															
SSN	1-9	Social Security Number															
Name	10-29	Name - Last, First, Middle Initial															
Grade	30-31	Payee's Grade															
Salary	32-37	Yearly Salary															
Taxes	38-43	Weekly Tax Deduction															
Insurance	44-49	Weekly Insurance Deduction															
Bond Code	50	Bond Deduction Code															
		<table border="1"> <thead> <tr> <th><u>Bond Code</u></th> <th><u>Bond Amount</u></th> <th><u>Weekly Deduction</u></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>\$ 100</td> <td>\$ 2</td> </tr> <tr> <td>2</td> <td>200</td> <td>4</td> </tr> <tr> <td>3</td> <td>500</td> <td>10</td> </tr> <tr> <td>4</td> <td>1,000</td> <td>20</td> </tr> </tbody> </table>	<u>Bond Code</u>	<u>Bond Amount</u>	<u>Weekly Deduction</u>	1	\$ 100	\$ 2	2	200	4	3	500	10	4	1,000	20
<u>Bond Code</u>	<u>Bond Amount</u>	<u>Weekly Deduction</u>															
1	\$ 100	\$ 2															
2	200	4															
3	500	10															
4	1,000	20															
Hours	51-52	Hours worked during current pay period															

EXAMPLES OF DIFFERENCES BETWEEN COMPUTER
OUTPUT AND DATA ELEMENTS

<u>Differences</u>	<u>Explanation of the difference</u>
Total deductions on a payroll report might represent an addition of several data elements (taxes + health insurance + bonds + ...).	The computer program used to produce the report adds the individual deductions and prints the total.
Bond deductions might be represented by a 1-character code on the data file.	The computer program converts the 1-character code to a dollar amount (e.g., 1 = \$100 bond, 2 = \$200 bond, etc.).
Weekly salary appears on the report and only annual salary is found in the data file.	The computer program converts the yearly salary into a weekly amount through division by weeks.
Average annual salary appears as an individual statistic while annual salaries are recorded in the data file.	The computer program totals all annual salaries in the file and divides the total by the number of records.
A report might show details and summary statistics for GS-12s while the data base contains payroll information for all grade levels.	The computer program selects only GS-12 records for printing and summarization.

DOCUMENT FLOW DIAGRAM OF PAYROLL PROCESS



Narrative Document Flow of Payroll Process

The following procedures are used to process a biweekly employee payroll:

- At the end of the pay period, each employee completes a time and attendance (T&A) report.
- The employee's supervisor reviews and initials the T&A and submits it to Payroll Department.
- Payroll clerk reviews T&A for completeness and checks total hours reported.
- When all the T&A reports are received, the payroll clerk prepares a control sheet which shows totals for: number of T&A reports, number of regular hours, overtime hours, and LWOP hours.
- Payroll clerk keeps the originals and sends a copy of the control sheet and all T&A reports to Data Processing.
- Data Processing enters the payroll data on the terminal.
- At the completion of payroll processing, a listing of all employees paid is sent to the payroll clerk.
- The payroll clerk reviews the listing for completeness and accuracy, which includes a comparison of the number of T&A reports, regular hours, overtime hours, and LWOP hours with the control sheet totals.
- Any discrepancies are researched and resolved. Errors affecting pay are corrected and resubmitted to Data Processing for immediate action. Errors in leave are corrected in the subsequent pay period.
- The payroll clerk keeps the payroll listing for 6 months.
- The payroll process also prints the paycheck and mails it directly to the employee.

OVERVIEW - PRINCIPAL USERSWorkpaper
Index

1. Obtain a copy of the ADP department's product distribution list. This list should identify the specific users of computer-processed information.
2. Use the following working paper headings and prepare a summary schedule from the responses recorded on each USER SATISFACTION QUESTIONNAIRE--COMPUTER-PROCESSED PRODUCTS.

Workpaper Index to USER SATISFACTION QUESTIONNAIRE	Computer Product Number	Name of User	User's Principal Function
Purpose of Product	Briefly Describe Problems Relating to Each Product and Its Impact		

The information on this schedule should help the auditor prepare a concise but informative Summary Memorandum on Results of Reliability Assessment.

USER SATISFACTION QUESTIONNAIRE--
COMPUTER-PROCESSED PRODUCTS

This questionnaire is designed to obtain the user's evaluation of computer-processed products. It includes questions on product format, sufficiency and accuracy of reported information, necessity for the product, and possibilities for product improvement. Since computer-processed data is ultimately generated for its users, responses to this questionnaire can be considered strong indicators of whether computer-processed products are reliable.

Product Identification:

1. Title _____
2. Data processing identification _____
3. Portion of product to be evaluated _____

4. Frequency of product _____

User Identification:

1. Name _____ Date _____
2. Title _____
3. Organization _____

4. Phone No./Address _____

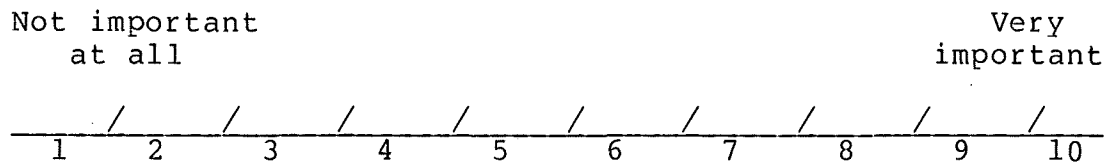
5. Extent of your knowledge about product _____

User Evaluation of Product

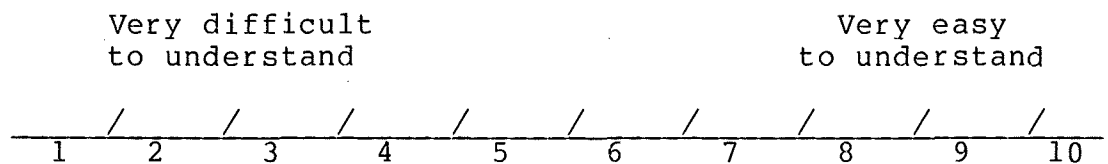
1. For what purpose do you use the product?

- Initiate transactions
 - Authorize changes to the system
 - Operate computer terminal
 - Maintain data controls
 - Design/Program applications
- Other--Explain _____

2. In relation to the work of your office or division, the product is:



3. The product's contents are:



Explain answers for questions 2 and 3 _____

4. Can the product be used as is without correction, further identification, or analysis?

Yes No

5. In your judgment, is the data:

- Accurate and reliable? Yes No
- Available when needed? Yes No
- Current (v. outdated)? Yes No
- Useful? Yes No
- Understandable? Yes No

For each "No" answer, please explain below and provide examples.

6. In your opinion, should the product

- provide more data? Yes No
- provide less data? Yes No
- be combined with other products? Yes No
- (a) Is any part of the product
obsolete? Yes No
- (b) Can it be improved to make your
job easier? Yes No

For each "Yes" answer, please explain below.

7. If you maintain manual records to supplement computer-processed information, briefly explain.

8. Does the product duplicate any other information you receive?

___ Yes ___ No

Explain _____

9. Can you readily obtain, from other sources, the information contained in the product?

___ Yes Source(s) _____
___ No _____

10. Do you supply the raw data (input) for this product?

___ Yes ___ No

11. Do you check this product for quality when you receive it from data processing?

___ Yes ___ No

If "No," please identify the person who performs this function.

12. Is the product ever rerun by data processing?

___ Yes ___ No

If "Yes," (a) How frequently? _____

(b) Why were reruns necessary? _____

(c) How do you make sure that rerun material is correct? _____

13. If you have/had problems with this product, with whom would/did you discuss them? _____

Is this person authorized to make changes to the product?

___ Yes ___ No ___ Unknown

14. Do you maintain correspondence with data processing or other departments concerning the product?

___ Yes ___ No (If yes, obtain copies)

15. Could you effectively perform your duties

(a) without this product? ___ Yes ___ No

(b) if this product were produced less often? ___ Yes ___ No

16. Did you or your department participate in designing the product?

___ Yes ___ No ___ Unknown

17. Does this product save you any clerical effort?

___ Yes Explain. _____

___ No _____

18. Can this product be improved to make your job easier?

Yes Explain _____

No _____

19. How often do you refer to this product?

Daily

Weekly

Monthly

Annually

Never

Other (Explain _____)

20. How long is the product kept after receipt?

1 day

1 week

1 year

Other (Explain _____)

Filed at (location) _____

SECTION III

SURVEY OF INTERNAL CONTROLS

GENERAL

The preceding sections provide detailed procedures to help the auditor

- identify computer data to be used,
- determine the importance of the data in relation to its intended use,
- understand data flow through the system, and
- conduct tests to determine if the data is reliable.

If the auditor is not yet satisfied with the data reliability, a survey of internal controls as described in this section should be performed.

RESPONSIBILITIES OF TECHNICAL STAFF

Because of the technical complexities involved in evaluating internal controls in a data processing system, it is often desirable for technical staff to conduct the survey. The general auditor (defined here as the general staff auditor responsible for the assignment) should provide the technical staff with the results of work done in sections I and II of this guide. The technical staff should then conduct the survey of internal controls and prepare a memorandum summarizing survey results that highlight control weaknesses and the impact on data reliability.

The general auditor should work closely with the technical staff in evaluating internal controls. It is important for the general auditor to understand the nature of internal controls and the rationale behind the negative answers recorded in the questionnaire, which usually help disclose control problems in data processing.

In cases where the data processing facility is located outside the GAO region, the general auditor should first contact the local technical staff to determine whether the internal controls were previously surveyed. If no information is available locally, the general auditor and technical staff should contact the technical staff of the appropriate division or region and request assistance in completing this section.

QUESTIONNAIRES FOR SURVEYING INTERNAL CONTROLS

Exhibits 8 through 20 include questionnaires needed to survey internal controls. A brief narrative description of the internal control is followed by a series of questions. Any "no" answer should be considered a potential control deficiency.

In addition to the questionnaires, profiles (exhibits 13 and 21) are included to help the auditor quantify the degree of risk. Although the auditor uses judgment to decide which risk category applies, the profiles provide a standard set of criteria which should lead to more

uniform internal control evaluations. Appendix I includes instructions for using profiles and assessing risk.

A. Complete the questionnaires and profiles in exhibits 8 through 21.

B. Complete the summary memorandum in section IV.

ALTERNATIVES AVAILABLE

Analysis of the data obtained in exhibits 8 through 21 should provide enough information to assess the reliability of computer-processed data. The general auditor, together with the technical staff, should make this assessment. The general auditor should then decide whether to use the computer data or disregard it because of reliability problems.

Depending on the extent of reliability problems, the auditor might consider using the data with a qualifying statement indicating problems noted. If control problems are severe, technical staff could be requested to perform a complete systems evaluation which will provide the basis for a separate report. (See GAO's "Audit Guide for Evaluating Automated Systems" for guidance in performing systems evaluations.)

ORGANIZATIONAL CONTROLS QUESTIONNAIRE

Adequate separation of duties provides an effective check to insure the accuracy and propriety of system and program changes and the consistency of information flowing through the computerized system. The following questions should establish the degree of job segregation within an automatic data processing facility.

	<u>Yes</u>	<u>No</u>
1. Is the ADP function independent from other agency operations?	-----	-----
2. Is each of the following functions performed by a different individual?	-----	-----
a. Maintaining the operating system/data management system, etc.	-----	-----
b. Systems design	-----	-----
c. Programing	-----	-----
d. Acceptance testing	-----	-----
e. Authorizing program changes	-----	-----
f. Handling source documents (keypunching, etc.)	-----	-----
g. Hardware operations	-----	-----
h. File maintenance (librarian for data and files)	-----	-----
i. Input data	-----	-----

NOTES

- a. Explain any "No" answers on a separate workpaper. Note alternate control procedures.
- b. After gathering all information required by this questionnaire, complete the Organizational Controls portion of the ADP Department Controls Profile, exhibit 13.

COMPUTER OPERATION CONTROLS QUESTIONNAIRE

The following questions should help the auditor determine whether the computer facility operates in accordance with prescribed processing procedures. An analysis of the responses should help the auditor determine whether operating personnel could alter computer data without user knowledge.

	<u>Yes</u>	<u>No</u>
1. Have documented procedures been established covering the operations of the data center? (If so, obtain a copy.)	----	----
2. Are daily equipment operating logs maintained?	----	----
3. Is computer downtime shown and explained?	----	----
4. Is there an abnormal termination of job log or report for each such run?	----	----
5. Does an operator maintain a daily input/output log for each job processed?	----	----
6. Are these logs reviewed daily by the ADP operations manager?	----	----
7. Does the ADP operations manager initial each log to indicate that the review has been performed?	----	----
8. Are all operator decisions recorded in a daily log?	----	----

	<u>Yes</u>	<u>No</u>
9. Is the console typewriter used to list:		
a. Date?	-----	-----
b. Job name and/or number?	-----	-----
c. Program name and/or number?	-----	-----
d. Start/stop times?	-----	-----
e. Files used?	-----	-----
f. Record counts?	-----	-----
g. Halts (programed and unscheduled)?	-----	-----
10. If the system does not have a console typewriter, does some other method afford adequate control and record the activities performed by both the computer and operator?	-----	-----
11. Is all computer time accounted for from the time it is turned on each day until it is shut down?	-----	-----
12. Are disposition notes entered on the console log showing corrective actions taken when unscheduled program halts occur?	-----	-----
13. Are job reruns recorded on the console log?	-----	-----
14. Is the reason for each rerun recorded?	-----	-----
15. Are console log pages sequentially numbered?	-----	-----
16. Is the console log reviewed and signed at the end of each shift by the supervisor and filed as a permanent record?	-----	-----
17. Are console printouts independently examined to detect operator problems and unauthorized intervention?	-----	-----

EXHIBIT 9

EXHIBIT 9

	<u>Yes</u>	<u>No</u>
18. Are provisions adequate to prevent unauthorized entry of program changes and/or data through the console and other devices?	_____	_____
19. Does some form of printout indicate every operating run performed?	_____	_____
20. Is there a procedure to prevent superseded programs from being used by mistake?	_____	_____
21. Does the data center use a formal mechanism for scheduling jobs?	_____	_____
22. Has a formal method been established for prioritizing the work schedules for operations?	_____	_____

NOTES

- a. Explain any "No" answers on a separate workpaper. Note alternate control procedures.
- b. After gathering all information required by this questionnaire, complete the Computer Operation Controls portion of the ADP Department Controls Profile, exhibit 13.

ACCESS CONTROLS QUESTIONNAIRE

This questionnaire deals with access to the computer area, remote computer terminals, systems documentation, computer programs, and computer output. The auditor should pay particular attention to the adequacy of documented security measures surrounding the entire system.

	<u>Yes</u>	<u>No</u>
<u>Computer Area</u>		
1. Is access to the computer area limited to necessary personnel?	_____	_____
2. Are all employees required to sign an agreement regarding their role and responsibility in the department and the ownership and use of processing equipment and information within the data center?	_____	_____
3. Do combination locks, security badges, or other means restrict access to the computer room?	_____	_____
4. Are combinations on locks or similar devices periodically changed?	_____	_____
5. Are account codes, authorization codes, passwords, etc., controlled to prevent unauthorized usage?	_____	_____
<u>Remote Computer Terminals</u>		
6. Are terminals adequately secured to prevent unauthorized usage?	_____	_____
7. Are access passwords to remote terminals controlled to prevent unauthorized usage?	_____	_____

EXHIBIT 10

EXHIBIT 10

Systems Documentation

Yes No

- | | | |
|---|-------|-------|
| 8. Are operators denied access to program and system documentation? | ----- | ----- |
| 9. Are program listings inaccessible to computer operators? | ----- | ----- |
| 10. Do documented procedures exist for controlling systems documentation? | ----- | ----- |

Computer Programs

- | | | |
|--|-------|-------|
| 11. Are programs protected from unauthorized access? | ----- | ----- |
| 12. Are privileged instructions in operating and other software systems strictly controlled? | ----- | ----- |
| 13. Does the agency use automated methods (e.g., a program management system) to restrict access to applications programs? | ----- | ----- |

Computer Output

- | | | |
|---|-------|-------|
| 14. Is access to blank stock of critical forms (i.e., negotiable instruments, identification cards, etc.) restricted to authorized individuals? | ----- | ----- |
| 15. Have controls been established over the issuance of critical forms for jobs being scheduled for processing? | ----- | ----- |
| 16. Are copies of critical output that needs to be destroyed maintained in a secure location until the destruction process can be accomplished? | ----- | ----- |

NOTES

- a. Explain any "No" answers on a separate workpaper. Note alternate control procedures.
- b. After gathering all information required by this questionnaire, complete the Access Controls portion of the ADP Department Controls Profile, exhibit 13.

FILE CONTROLS QUESTIONNAIRE

This questionnaire deals with maintenance, storage, and access to computer-processed tapes, disk packs, and other data storage media. The auditor should pay particular attention to the adequacy of documented security measures for releasing, returning, and maintaining data files.

	<u>Yes</u>	<u>No</u>
1. Is the responsibility for issuing and storing magnetic tapes and/or disk packs assigned to a tape librarian?	_____	_____
2. Is this duty the librarian's chief responsibility?	_____	_____
3. Are library procedures documented? (If so, obtain a copy.)	_____	_____
4. Is access to the library limited to the responsible librarian(s)?	_____	_____
5. Does the agency use automated methods (e.g., a file management system) to restrict access to computerized files?	_____	_____
6. Are all data files logged out and in to prevent release to unauthorized personnel?	_____	_____
7. Are tape and disk inventory records maintained?	_____	_____
8. Are tape and disk status records maintained?	_____	_____

EXHIBIT 11

EXHIBIT 11

	<u>Yes</u>	<u>No</u>
9. Have external labeling procedures been documented? (If so, obtain a copy.)	_____	_____
10. Are external labels affixed to active tapes and/or disks?	_____	_____
11. Do labels tie in with inventory records?	_____	_____
12. Are work or scratch tapes or disk packs kept in a separate area of the library?	_____	_____

NOTES

- a. Explain any "No" answer on a separate workpaper. Note alternate control procedures.
- b. After gathering all information required by this questionnaire, complete the File Controls portion of the ADP Department Controls Profile, exhibit 13.

DISASTER RECOVERY CONTROLS QUESTIONNAIRE

Disaster recovery controls are preventive procedures that help protect critical files, programs, and systems documentation from fire or other hazards. To the extent possible, the auditor should examine the agency's preventive procedures to determine whether data processing could be continued in the event of a computer facility disaster.

	<u>Yes</u>	<u>No</u>
1. Has the computer system operated, without major malfunction, within the last year?	_____	_____
2. Is the data center backed up by an uninterruptible power source system?	_____	_____
3. Have procedures been established to describe what action should be taken in case of fire and other hazards involving the data center, data files, and computer programs?	_____	_____
4. Are these procedures implemented as defined?	_____	_____
5. Are there provisions for retaining and/or copying master files and a practical means of reconstructing a damaged or destroyed file?	_____	_____
6. Are sufficient generations of files maintained to facilitate reconstruction of records (grandfather-father-son routine)?	_____	_____

EXHIBIT 12

EXHIBIT 12

	<u>Yes</u>	<u>No</u>
7. Is at least one file generation maintained at a location other than the tape storage area?	-----	-----
8. Are copies of critical files stored at a remote location and restricted from unauthorized access?	-----	-----
9. Are copies of operating programs stored outside the computer room?	-----	-----
10. Are duplicate programs maintained at a remote location and restricted from unauthorized access?	-----	-----
11. Have documented backup procedures been established with another compatible data center for running the agency's programs in the event of a natural disaster or other emergency situation?	-----	-----
12. Are backup procedures periodically tested at the backup data center?	-----	-----

NOTES

- a. Explain any "No" answers on a separate workpaper. Note alternate control procedures.
- b. After gathering all information required by this questionnaire, complete the Disaster Recovery Controls portion of the ADP Department Controls Profile, exhibit 13.

ADP DEPARTMENT CONTROLS PROFILE

Agency: _____ Preparer: _____ Date: _____

Job Code: _____ Reviewer: _____ Date: _____

You must use judgment in completing this profile. Based on the questionnaire responses relating to the following control characteristics, how much risk (low, medium, high) do you believe is involved in relying on the agency's computer-processed data? Refer to appendix I for more information on assessing risk.

<u>CONTROL CHARACTERISTIC</u>	<u>Is the control in place?</u>	<u>Is the control effective?</u>	<u>Is some alternate control in place?</u>	<u>Is the alternate control effective?</u>	<u>Level of potential risk</u>
ORGANIZATIONAL CONTROLS					
COMPUTER OPERATION CONTROLS					
ACCESS CONTROLS					
FILE CONTROLS					
DISASTER RECOVERY CONTROLS					

Briefly describe your justification for assigning the various risk levels for each control characteristic noted on the previous page. This information should be used in preparing the Summary Memorandum on Results of Reliability Assessment.

<u>Control characteristic</u>	<u>Brief description of risk justification</u>	<u>Recommendation for further systems audit work</u>
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APPLICATION SYSTEM INVENTORY QUESTIONNAIRE

This questionnaire should be completed for each computerized application; although the data gathered is not directly related to data reliability, it will provide the auditor with useful systems information. This document should be kept in the permanent file and updated during subsequent audits.

Major Application(s) System

1. System name and agency's ID number _____
2. Date of initial implementation _____
3. Is the system a vendor designed system or an agency designed system? _____
4. What is system type (administrative, engineering, process control, scientific, other (specify))? _____
5. Type of processing: Batch or online? _____
6. Number of programs? _____
7. Size of largest program (bytes of storage)? _____
8. Programing language used? _____
9. Was system tested with test data, live data, or not at all? _____
10. Are system test results available? _____
11. Number of system modifications in last 2 years? _____
12. Date last modification tested? _____
13. Date of last audit or evaluation (obtain report)? _____
14. Processing frequency? _____
15. Total monthly processing hours? _____

APPLICATION SYSTEM DOCUMENTATION AND
PROGRAM MODIFICATION CONTROLS QUESTIONNAIRE

Comprehensive and current documentation is necessary to describe how a computer application operates. In assessing the adequacy of a system's documentation, the auditor should determine not only that the documentation reflects the application's current status, but also that the documentation is complete and in accordance with established standards. Although comprehensive documentation is normally prepared when an application is initially implemented, subsequent changes may be inadequately documented and should be given special attention by the auditor.

	<u>Yes</u>	<u>No</u>
<u>System Documentation</u>		
1. Does a procedures manual cover the preparation of source documents? (If so, obtain a copy.)	_____	_____
2. Does this manual:		
a. Include control procedures?	_____	_____
b. Define data preparation responsibility?	_____	_____
3. Is there a user's data entry/conversion manual? (If so, obtain a copy.)	_____	_____
4. Does this manual:		
a. Include instructions for entering data?	_____	_____
b. Identify all records/fields which are subject to verification?	_____	_____

	<u>Yes</u>	<u>No</u>
5. Is there an overall narrative description of the application system?	_____	_____
6. Is there an overall flow chart of the application system?	_____	_____
7. Is each application program documented separately?	_____	_____
8. Does program documentation include:		
a. Request for program development/changes?	_____	_____
b. General narrative description of the program?	_____	_____
c. Systems specifications - both original and modifications?	_____	_____
d. Detailed narrative description of the program?	_____	_____
e. Detailed logic diagram or decision table?	_____	_____
f. Input record formats?	_____	_____
g. Input record descriptions?	_____	_____
h. Output record formats?	_____	_____
i. Output record descriptions?	_____	_____
j. Master file formats?	_____	_____
k. Master file descriptions?	_____	_____
l. Lists of constants, codes, and tables used?	_____	_____
m. Source program listing?	_____	_____
n. Object program listing?	_____	_____
o. Operating instructions?	_____	_____
p. Description of test plan and data used to test program?	_____	_____
q. Detailed history of program failures?	_____	_____
9. Do computer operations run manuals exist?	_____	_____
10. Are these run manuals provided to computer operators?	_____	_____

- | | <u>Yes</u> | <u>No</u> |
|--|------------|-----------|
| 11. Do operators' run manuals: | | |
| a. Define input data, data source, and data format? | _____ | _____ |
| b. Describe setup procedures? | _____ | _____ |
| c. Characterize all halt conditions and actions to be taken? | _____ | _____ |
| d. Delineate expected output data and format? | _____ | _____ |
| e. Delineate output and file disposition at completion of run? | _____ | _____ |
| f. Include copies of normal console sheets? | _____ | _____ |
| 12. Do operators' run manuals exclude: | | |
| a. Program logic charts or block diagrams? | _____ | _____ |
| b. Copies of program listings? | _____ | _____ |
| 13. Is all documentation reviewed to insure its completeness and adherence to established standards? | _____ | _____ |
| 14. Are copies of all documentation stored off the premises? | _____ | _____ |
| 15. If "yes", is the stored documentation periodically compared and updated with that being used? | _____ | _____ |
| 16. Is there written evidence of who performed the systems and programming work? | _____ | _____ |

Program Modification

- | | | |
|--|-------|-------|
| 17. Are all program changes and their effective dates recorded in a manner which preserves an accurate chronological record of the system? | _____ | _____ |
| 18. Are programs revised only after written requests are approved by user department management? | _____ | _____ |

EXHIBIT 15

EXHIBIT 15

	<u>Yes</u>	<u>No</u>
19. Do these written requests describe the proposed changes and reasons for them?	_____	_____
20. Are changes in the master file or in program instructions authorized in writing by initiating departments?	_____	_____
21. Are departments that initiate changes in master files or program instructions furnished with notices or listings showing changes actually made?	_____	_____
22. Are changes reviewed to see that they were made properly?	_____	_____
23. Do major users approve initial system design specifications?	_____	_____
24. Is approval for each new application program supported by a cost-benefit analysis?	_____	_____
25. Have program testing procedures been established?	_____	_____
26. Does the test plan include cases to test:		
a. Mainline and end-of-job logic?	_____	_____
b. Each routine?	_____	_____
c. Each exception?	_____	_____
d. Abnormal end of job conditions?	_____	_____
e. Combinations of parameter cards and switch settings?	_____	_____
f. Unusual mixtures and sequences of data (i.e., multiple transactions following deleted masters)?	_____	_____

NOTES

- a. Explain any "No" answers on a separate workpaper. Note alternate control procedures.
- b. After gathering all information required by this questionnaire, complete the Application System Documentation and Program Modification Controls portion of the Computer Application Controls Profile, exhibit 21.

DATA INPUT CONTROLS QUESTIONNAIRE

Input controls are established to verify that data is accurately transferred from an external document into a machine-readable format. The auditor should try to make sure that source data reaches the processing programs without loss, unauthorized additions, or error.

	<u>Yes</u>	<u>No</u>
1. Have procedures been documented to show how all source data is entered and processed?	_____	_____
2. Is there an input/output control group?	_____	_____
3. Do the initiating departments independently control data submitted for processing using:		
a. Turnaround transmittal documents?	_____	_____
b. Record counts?	_____	_____
c. Predetermined control totals?	_____	_____
d. Other? (describe) _____	_____	_____

4. Are duties separated in initiating department to make sure that one individual does not perform more than one phase of input data preparation (e.g., establishing new master records plus changing or updating master records)?	_____	_____
5. Are source documents retained in a manner which enables tracing of all documents to related output records?	_____	_____
6. Is information transcribed from the source document to some other document before being sent to the ADP department?	_____	_____

	<u>Yes</u>	<u>No</u>
7. Does the transcribing department, if separate from other offices, independently control data submitted for processing using:		
a. Turnaround transmittal documents?	_____	_____
b. Record counts?	_____	_____
c. Predetermined control totals?	_____	_____
d. Other? (describe) _____	_____	_____

8. Are control totals developed in the transcribing department balanced with those of initiating departments and are all discrepancies reconciled?	_____	_____
9. Are coding, keypunching, and verifying the same document performed by different individuals?	_____	_____
10. Does the transcribing department have a schedule, by application, that shows when data requiring transcription will be received and completed?	_____	_____
11. Is responsibility separate to make sure that one individual does not perform more than one of the following phases of a transaction:		
a. Initiating data?	_____	_____
b. Transcribing data?	_____	_____
c. Inputting data?	_____	_____
d. Processing data?	_____	_____
e. Correcting errors and resubmitting data?	_____	_____
f. Distributing output?	_____	_____

NOTES

- a. Explain any "No" answers on a separate workpaper. Note alternate control procedures.
- b. After gathering all information required by this questionnaire, complete the Data Input Controls portion of the Computer Application Controls Profile, exhibit 21.

DATA ERROR CONTROLS QUESTIONNAIRE

Data error controls involve the detection, correction, and resubmission of erroneous data. Adequate controls over rejected data are necessary for establishing a reliable data base and reliable computer-processed products. The auditor should carefully review the handling of data errors and rejected data to insure that corrected data is promptly reentered into the system without loss or unnecessary manipulation.

	<u>Yes</u>	<u>No</u>
1. Are controls in place covering the process of identifying, correcting, and reprocessing data rejected by the computer programs?	---	---
2. Are record counts and predetermined control totals used to control these rejected transactions?	---	---
3. Are all corrections and resubmissions performed in a timely manner?	---	---
4. Are error corrections reviewed and approved by persons outside the data processing department?	---	---
5. Do initiating departments review error listings affecting their data?	---	---
6. Are erroneous and unprocessable transactions (i.e., no master record corresponding to transaction record or vice versa) rejected and written to an automated suspense file?	---	---

EXHIBIT 17

EXHIBIT 17

	<u>Yes</u>	<u>No</u>
7. Does the automated suspense file include:		
a. A code indicating error type?	----	----
b. Date, time, and some sort of initiator ID?	----	----
8. Are error correction transactions matched against suspense file entries?	----	----
9. Are periodic printouts of suspense file entries produced?	----	----

NOTES

- a. Explain any "No" answers on a separate workpaper. Note alternate control procedures.
- b. After gathering all information required by this questionnaire, complete the Data Error Controls portion of the Computer Application Controls Profile, exhibit 21.

BATCH PROCESSING CONTROLS QUESTIONNAIRE

Computer programs should develop control totals after processing data. These control totals should be compared with totals previously developed in the data initiating or transcribing departments. Control totals should also be compared to help make sure that data is properly processed through the entire system, i.e., run-to-run totals and trailer label checking.

	<u>Yes</u>	<u>No</u>
1. Does the data processing department independently control data submitted and processed using:	_____	_____
a. Turnaround transmittal documents?	_____	_____
b. Record counts?	_____	_____
c. Predetermined control totals?	_____	_____
d. Other? (describe) _____		

2. Are control totals balanced with those of the initiating department and are all discrepancies reconciled?	_____	_____
3. Are run-to-run control totals used to check for completeness of processing?	_____	_____
4. Do the computer operating instructions for each program identify which data files are to be used as input?	_____	_____
5. Do the operating instructions for each program clearly identify output files and storage requirements?	_____	_____
6. Do all programs include routines for checking file labels before processing?	_____	_____

EXHIBIT 18

EXHIBIT 18

	<u>Yes</u>	<u>No</u>
7. Are there controls in place to prevent operators from circumventing file label routines?	-----	-----
8. Are internal trailer labels containing control totals (e.g., record counts, dollar totals, hash totals, etc.) generated for all magnetic tapes and tested by the computer program to determine that all records have been processed?	-----	-----
9. Do computer programs include the following types of tests for validity:		
a. Code?	-----	-----
b. Character?	-----	-----
c. Field?	-----	-----
d. Transaction?	-----	-----
e. Combinations of fields?	-----	-----
f. Missing data?	-----	-----
g. Check digit?	-----	-----
h. Sequence?	-----	-----
i. Limit or reasonableness test?	-----	-----
j. Sign?	-----	-----
k. Crossfooting of quantitative data?	-----	-----

NOTES

- a. Explain any "No" answers on a separate workpaper. Note alternate control procedures.
- b. After gathering all information required by this questionnaire, complete the Batch Processing Controls portion of the Computer Application Controls Profile, exhibit 21.

TELECOMMUNICATIONS PROCESSING CONTROLS QUESTIONNAIRE

This questionnaire is concerned with two remote data entry categories--remote batch systems and online systems. Remote batch systems permit access to the computer system at prearranged times. Online inquiry and updating systems permit almost immediate access to the computer system.

The auditor should determine whether

- access to the system, application programs, and files is limited to authorized personnel,
- job scheduling procedures are used so that data is processed according to some priority, and
- logs are maintained showing that transactions were entered into the system.

If the agency does not have a remote data entry network, place N/A in the Telecommunications Processing Controls Section of the Computer Application Controls Profile, exhibit 21, and ignore this questionnaire.

If the agency has a data entry network, obtain a listing of the remote locations and a copy of network documentation. This information should be placed in the permanent file and updated in subsequent reviews. The auditor should then complete this questionnaire for the central processing facility and for a sample of remote entry facilities.

EXHIBIT 19

EXHIBIT 19

	<u>Yes</u>	<u>No</u>
1. Are there documented procedures for using the telecommunications network? (If so, obtain a copy.)	_____	_____
2. Are authorization codes required to:		
a. Access the computer system?	_____	_____
b. Access the applications programs?	_____	_____
c. Perform transactions?	_____	_____
3. Are different authorization codes required to perform different transactions?	_____	_____
4. Are authorization codes controlled to restrict unauthorized usage?	_____	_____
5. Are authorization codes periodically changed?	_____	_____
6. Is a nonprinting/nondisplaying or obliteration facility used when keying in and acknowledging authorization codes?	_____	_____
7. Is a terminal identification check performed by the computer so that various transaction types can be limited to authorized data entry stations?	_____	_____
8. If any answers to questions 2-7 are "yes," do these security measures work as designed?	_____	_____
9. Is there a computer program used to:		
a. Send acknowledgements to the terminal?	_____	_____
b. Periodically test line and terminal operating status with standardized test messages and responses?	_____	_____

	<u>Yes</u>	<u>No</u>
10. Is the message header used to identify:		
a. Source, including proper terminal and operator identification code?	-----	-----
b. Message sequence number, including total number of message segments?	-----	-----
c. Transaction type code?	-----	-----
d. Transaction authorization code?	-----	-----
11. Is the message header validated for:		
a. Proper sequence number from the identified terminal?	-----	-----
b. Proper transaction code or authorization code for terminal or operator?	-----	-----
c. Number of message segments received equal to count indicated in header?	-----	-----
d. Proper acknowledgement from terminal at end of transmission?	-----	-----
e. Balancing of debit/credit totals derived from adding all message segments and comparing with corresponding totals in message header?	-----	-----
12. Are there either accumulators in the terminal for keeping input totals or terminal-site logging procedures that record details of transactions?	-----	-----
13. Are error messages returned to originating terminal, indicating type of error detected and requesting correction?	-----	-----
14. Is a block of characters automatically retransmitted when an error is detected?	-----	-----
15. Does an end-of-transmission trailer include:		
a. Message and segment counts?	-----	-----
b. Value totals, including debit and credit?	-----	-----
c. An ending symbol?	-----	-----

EXHIBIT 19

EXHIBIT 19

	<u>Yes</u>	<u>No</u>
16. Is a transaction log of sequence-numbered and/or time-of-day-noted transactions maintained in addition to a periodic dump/copy of the master file?	-----	-----
17. Is the transaction data log used to provide:		
a. Part of the audit trail, including originating terminal and message ID, transaction type code, time of day that the transaction is logged, and copy of transaction record?	-----	-----
b. A transaction record for retrieval from terminal?	-----	-----
18. At the end of the processing day, is the master file balanced, via programed routine, by subtracting current totals from start-of-day totals and comparing the remainder to transaction log values?	-----	-----
19. Are all master file records periodically processed to balance machine-derived totals against control trailer record totals?		
20. Is the master file data log used to provide:		
a. File restructuring capability?	-----	-----
b. Restart points and indicators of valid data flow?	-----	-----
c. Storage for partial dump of vital tables, including message queue allocation, polling table contents, transaction routine tables, etc.?	-----	-----

NOTES

- a. Explain any "No" answers on a separate workpaper. Note alternate control procedures.
- b. After gathering all information required by this questionnaire, complete the Telecommunications Processing Controls portion of the Computer Application Controls Profile, exhibit 21.

DATA OUTPUT CONTROLS QUESTIONNAIRE

Output controls help make sure that data processing results are reliable and that no unauthorized alterations have been made to transactions and records while they are in the custody of the data processing facility. The auditor should make sure that output control totals are compared against those originally established and reports distributed to appropriate users.

	<u>Yes</u>	<u>No</u>
1. Does the initiating department balance control totals generated during computer processing with those originally established and reconcile discrepancies?	_____	_____
2. Can transactions be traced forward to a final output control?	_____	_____
3. Can transactions be traced back to the original source document?	_____	_____
4. Is there some means of verifying master file contents: e.g., are samples periodically drawn from those records being printed and reviewed for accuracy?	_____	_____
5. Is there an input/output control group?	_____	_____
6. Is the input/output control group assigned to review output for general acceptability and completeness?	_____	_____
7. Is a schedule maintained of the reports and documents to be produced by the ADP system?	_____	_____
8. Are there documented control procedures for distributing reports?	_____	_____

	<u>Yes</u>	<u>No</u>
9. Is responsibility separated to make sure that one individual does not perform more than one of the following phases of a transaction:		
a. Initiating data?	_____	_____
b. Transcribing data?	_____	_____
c. Inputing data?	_____	_____
d. Processing data?	_____	_____
e. Correcting errors and resubmitting data?	_____	_____
f. Distributing output?	_____	_____

NOTES

- a. Explain any "No" answers on a separate workpaper. Note alternate control procedures.
- b. After gathering all information required by this questionnaire, complete the Data Output Controls portion of the Computer Application Controls Profile, exhibit 21.

COMPUTER APPLICATION CONTROLS PROFILE

Agency: _____ Preparer: _____ Date: _____

Job Code: _____ Reviewer: _____ Date: _____

You must use judgment in completing this profile. Based on the questionnaire responses relating to the following control characteristics, how much risk (low, medium, high) do you believe is involved in relying on the agency's computer-processed data? Refer to appendix I for more information on assessing risk.

<u>CONTROL CHARACTERISTIC</u>	<u>Is the control in place?</u>	<u>Is the control effective?</u>	<u>Is some alternate control in place?</u>	<u>Is the alternate control effective?</u>	<u>Level of potential risk</u>
-------------------------------	---------------------------------	----------------------------------	--	--	--------------------------------

APPLICATION
SYSTEM DOCU-
MENTATION
AND PROGRAM
MODIFICATION
CONTROLS

DATA INPUT
CONTROLS

DATA ERROR
CONTROLS

BATCH
PROCESSING
CONTROLS

TELECOMMUNICA-
TIONS
PROCESSING
CONTROLS

DATA OUTPUT
CONTROLS

Briefly describe your justification for assigning the various risk levels for each control characteristic noted on the previous page. This information should be used in preparing the Summary Memorandum on Results of Reliability Assessment.

<u>Control characteristic</u>	<u>Brief description of risk justification</u>	<u>Recommendation for further systems audit work</u>
-------------------------------	--	--

SECTION IV
SUMMARY MEMORANDUM ON
RESULTS OF RELIABILITY ASSESSMENT

INTRODUCTION

The purpose of a reliability assessment is to determine the accuracy and completeness of computer-processed data. Stated another way, reliability assessment helps the auditor determine the "net risk" in relying on computer data. After completing audit steps in previous sections of this guide, the audit staff should be able to make an informed judgment on the data's reliability, and should prepare a memorandum summarizing results of the reliability assessment, including the work done, a statement about the data's reliability, and conclusions reached.

WORK STEP

A. Prepare a summary memorandum that includes the following information:

- Introduction: Identify the specific computer-processed data being used and comment on its sensitivity, i.e., what impact incomplete or inaccurate data would have upon the final audit product. If the auditor concludes that a reliability assessment is not required, the reasons should be clearly stated.
- Background: Include a brief statement about the agency/contractor program being audited, the

computer system used to maintain the data, and the purpose for which the data is being used by agency/contractor personnel.

- Work performed: Briefly describe work performed to establish reliability of the data.
- Results: Summarize results of the reliability tests performed in section II and the internal controls evaluation performed in section III.
- Conclusion: Include a statement about the reliability of the data being used in the final audit product. If the auditor decides to use the data with a qualifying statement, any limitations on the use of computer-processed data should be included in the statement. If the auditor decides not to use the computer data, the reasons for this decision should be fully disclosed.

The summary memorandum should be completed, signed, and dated by the site supervisor and audit/project manager or team leader. The technical staff should also review and sign the summary memorandum and keep a copy on file for future reference.

REPORTING TO THE AGENCY

If tests for data reliability and/or the technical staff's survey of internal controls disclose deficiencies

in agency operations, the audit staff should inform the agency promptly through the standard exit conference and reporting process. Also, any useful suggestions and comments obtained from the USER SATISFACTION QUESTIONNAIRE--COMPUTER-PROCESSED PRODUCTS in exhibit 7 should be aggregated and presented at this time.

If major control problems or weaknesses warrant further analysis, and the audit staff chooses to expand the current scope of review, deficiencies and recommendations should be reported as a separate topic in the final audit product. The technical staff should assist the general auditor by evaluating the system's internal controls. If the technical staff is requested to perform a systems evaluation using the "Audit Guide For Evaluating Automated Systems," a separate report to the agency will result.

APPENDIX I

ASSESSING RISK

Two primary criteria should be used to determine the degree of potential risk associated with computer-processed data: Is a control in place, and is it effective? The following chart shows possible risk levels that could be assigned to computer system controls.

DETERMINING RISK LEVELS

<u>CONTROL CHARACTERISTIC</u>	<u>Is the control in place?</u>	<u>Is the control effective?</u>	<u>Is some alternate control in place?</u>	<u>Is the alternate control effective?</u>	<u>Level of potential risk</u>
e.g., ORGANIZATIONAL CONTROLS	Yes	Yes	No	-	Low
	No	-	Yes	Yes	Medium
	Yes	No	Yes	Yes	Medium
	Yes	No	No	-	High
	No	-	Yes	No	High
	No	-	No	-	High
	Yes	No	Yes	No	High

POSSIBLE EFFECT ON AUDIT WORK

<u>Level of potential risk</u>	<u>Possible Effect</u>
Low	Unlikely that more audit tests are required.
Medium	Likely that more audit tests are needed <u>unless</u> another information source can be used <u>or</u> when the auditor is satisfied that the risk <u>is</u> acceptable. Recommendations for corrective action(s) may be possible.
High	Need for additional audit tests is a virtual certainty <u>unless</u> another information source can be used <u>or</u> the auditor is satisfied that the risk <u>is</u> acceptable. Recommendations for corrective action(s) may be possible. The auditor may want to consult with technical staff for advice or assistance.

APPENDIX II

GLOSSARY

- Application - The system, functional area, or problem to which a computer is applied. A computer application is a set of computer instructions where either arithmetic computations or data-handling operations predominate for a specific purpose such as payroll, accounting, inventory control, or management analysis.
- ASP - An extension of the operating system that provides increased automation of computer operations.
- Backup - (1) The provision of duplicate records for use in case of loss. (2) Provision of duplicate computing capability in case of equipment malfunction or overloading.
- Batch Control Ticket - A document accompanying a batch of transaction documents that records such information as batch number, control totals, and routing.
- Batch Processing - A technique in which items to be processed are collected into groups (batched) to permit convenient and efficient processing. Note: The records of all transactions affecting a particular master file are accumulated over a period of time, then arranged in sequence, and processed against the master file; most business applications are of a batch-processing type. Sequential processing is the same as batch processing.
- Batch Total - A sum of a set of items which is used to check the accuracy of operations on a particular batch of records.
- CICS - A general purpose data communications monitor designed to control multiple online user terminals and applications.
- Data Base - A collection of one or more files which may be integrated to retrieve specific information.
- Data Dictionary - A list of data elements of a data base: e.g., in a payroll system the employee number, pay rate, hours worked; each of these comprises a data list.
- Data Element - Identifies the specific field in the data. For example, an individual's name, social security number, or pay grade would each be considered a data element or field.

Data File - A collection of related records treated as a unit, e.g., all of an agency's employees' payroll records.

Document Flow - A general type flow chart which portrays the overall document flow and interrelationship throughout the organization. The emphasis will be to show the documents flowing into an organization and resultant output reports. No details of how the reports are generated are included.

File Maintenance - The activities involved in keeping a file up to date by adding, changing, or deleting data.

HASP - An extension of the operating system that provides supplementary job management, data management, and task management functions.

Header Label - A machine-readable record at the beginning of a data file containing information identifying the file and data used in file control.

Master File - A file containing relatively permanent information used as a source of reference and generally updated periodically.

Online Processing - Data processing involving direct entry of data into the computer or direct transmission of output from the computer.

Operating System - A set of programs and routines which guide a computer in the performance of its tasks.

Program Flowchart - A graphic representation for the solution of a problem in which symbols are used to represent the logical flow of the solution.

Record Layout - A diagram showing the size, position, and composition of data items which make up a record.

System Flowchart - Diagram reflecting the flow of work, documents, and operation in a data processing application.

Teleprocessing - The use of communication facilities to transmit information to and from a computer simultaneously with a varied number of users. This usually involves processing of data from remote locations.

APPENDIX II

TOTAL - A software package used for implementing and accessing a data base.

Trailer Label - A machine-readable record that appears in the last record in a file and contains information on the file which may include control totals of specific amounts, record counts, etc.

SELECTED BIBLIOGRAPHY

- American Federation of Information Processing Societies, Inc. ' Security System Review Manual, AFIPS Press, 1974.
- American Institute of Certified Public Accountants. Audits of Service-Center-Produced Records--Audit Guide, 1974.
- _____, Management, Control, and Audit of Advanced EDP Systems, 1977.
- _____, The Auditor's Study and Evaluation of Internal Control in EDP Systems--Audit and Accounting Guide, 1977.
- _____, The Effects of EDP on the Auditor's Study and Evaluation of Internal Control--Statement on Auditing Standards 3, 1974.
- American National Standards Institute, Inc. American National Standards Vocabulary for Information Processing, 1977.
- Davis, Gordon B. Auditing and EDP, AICPA, 1968.
- Institute of Internal Auditors, Inc. System Auditability and Control Study, 1977.
- Martin, James. Security, Accuracy, and Privacy in Computer Systems, Prentice-Hall, 1973.
- National Bureau of Standards. Federal Information Processing Standard Publication, Flowchart Symbols and Their Usage in Information Processing, FIPS PUB 24, 1973.
- _____, Guidelines for Automatic Data Processing Physical Security and Risk Management, FIPS PUB 31, 1974.
- _____, Guidelines for Documentation of Computer Program and Automated Data Systems, FIPS 38, 1976.
- _____, Computer Security Guidelines for Implementing The Privacy Act of 1974, FIPS PUB 41, 1975.
- Study Group on Computer Control and Audit Guidelines. Computer Control Guidelines, The Canadian Institute of Chartered Accountants, 3d printing, 1973.
- _____, Computer Audit Guidelines, The Canadian Institute of Chartered Accountants, 1975.

U.S. GENERAL ACCOUNTING OFFICE
AUDIT GUIDE FOR ASSESSING RELIABILITY OF
COMPUTER OUTPUT

CHECK LIST OF TRANSMITTAL SHEETS

Upon receipt of each transmittal sheet, the recipient should make necessary changes in the guide and place initials on the corresponding line below.

TS No.	Initials	TS No.	Initials	TS No.	Initials
1	_____	18	_____	35	_____
2	_____	19	_____	36	_____
3	_____	20	_____	37	_____
4	_____	21	_____	38	_____
5	_____	22	_____	39	_____
6	_____	23	_____	40	_____
7	_____	24	_____	41	_____
8	_____	25	_____	42	_____
9	_____	26	_____	43	_____
10	_____	27	_____	44	_____
11	_____	28	_____	45	_____
12	_____	29	_____	46	_____
13	_____	30	_____	47	_____
14	_____	31	_____	48	_____
15	_____	32	_____	49	_____
16	_____	33	_____	50	_____
17	_____	34	_____	51	_____