Check Processing Control System

General Information

Release 11

GH20-1008-08

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| **Ninth Edition (May 2001)**

| This edition is a revision of, and obsoletes, GH20-1008-7. It applies to Version 1 Release 11 of the IBM Check Processing Control
| System licensed program (Program No. 5734-F11). Each change is indicated by a vertical line (revision bar) in the left margin. This
| publication is current as of PTF numbers **UQ47917** and **UQ47918**.

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Year 2000 Compliance

IBM announces that the Check Processing Control System, Version 1 Release 11, at PTF numbers UN99696 and UN99801, supports Year 2000. This IBM product, when used in accordance with its associated documentation, is designed to be capable of correctly processing, providing, and receiving date data within and between the twentieth and twenty-first centuries. This has been done by allowing the user to set the date format as a default throughout the system.

In the complex global computing environment that we have today, this IBM product's support for Year 2000 is, of course, dependent on the capabilities of all the other products that are working together (for example, hardware, software, and firmware) to properly exchange accurate date data.

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About This Book

This book gives a general introduction to the IBM* Check Processing Control System (CPCS). It describes various characteristics and advantages of CPCS and the hardware and software requirements for operating CPCS. It also discusses CPCS support of the IBM document processors, along with some of the features of these processors. (See “Hardware” on page 1-10 for a description of the 3890/XP Series document processors.)

Who Should Read This Book?

The *CPCS General Information* manual is for executives and managers of financial institutions, administrative personnel, programmers, system engineers, and others who are responsible for evaluating and using CPCS.

How Is This Book Organized?

This book contains the following sections:

- Chapter 1, “Introducing the Check Processing Control System,” describes the characteristics and advantages of CPCS. It also includes information about the hardware configuration and the software requirements for CPCS. In addition, this chapter explains how you can ensure that CPCS fits your specific operational environment.
- Chapter 2, “Describing CPCS in General Terms,” shows how CPCS does a variety of check processing functions.
- Chapter 3, “Summarizing CPCS Controls,” summarizes the functions of the two basic types of controls within CPCS and defines their various control levels.
- Chapter 4, “Using the Online Adjustments Function,” describes an online adjustments balancing function.

This book also contains a glossary, a bibliography, and an index.

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Related Publications

The following publications contain information relating to the IBM Check Processing Control System (CPCS). For an additional list of relevant publications, see the “Bibliography” on page X-7.

- *CPCS Installation Guide*, GA34-2178

  This guide describes the steps necessary for using the IBM System Modification Program Extended (SMP/E) licensed program procedures to install CPCS software. It also provides installation procedures for generating CPCS modules and creating operational data sets. It provides a set of sample problems to test and verify operations after CPCS installation.

- *CPCS General Information*, GH20-1008

  This manual gives a general introduction to CPCS. It describes various characteristics and advantages of CPCS and the hardware and software requirements for operating CPCS. It also discusses CPCS support of the IBM document processors, along with some of the features of these processors.

- *CPCS Customization Guide*, SC31-2853

  This guide provides customization information for CPCS programmers, including system-programming information, generation procedures, and installation procedures.

- *CPCS Messages and Codes*, SC31-4004

  This manual contains terminal and supervisor messages, their responses, and return code information for CPCS application tasks.

- *CPCS Programming and Diagnostic Guide*, SC31-2854

  This guide contains information for CPCS programmers, including descriptive information about application-program processing, problem analysis and documentation procedures, and CPCS module descriptions.

- *CPCS Online Adjustments Guide*, GC31-2723

  This guide provides the program descriptions and terminal operation instructions for online adjustments. It includes information about customization, system and user requirements, the user adjustment-code data set, the adjustment-record formats, and sample reports.

CPCS Web Site

Visit us at our web site:
www.ibm.com/products/cpcs

Summary of Changes for GH20-1008-08

The main changes for this revision are:

- **PTF Number:** This publication is current as of PTF numbers UQ47917 and UQ47918.

Summary of Changes for GH20-1008-07

The main changes for this revision are:

Year 2000 Changes:

- **Date Customization:** CPCS now provides the ability to specify a date format at the system level (as a default). This format is propagated throughout CPCS in reports, screens, and in data sets.
- For more information regarding CPCS code compliance with Year 2000, see "Year 2000 Compliance" on page v. For a summary of Year 2000 changes, refer to the special appendix on this subject in the *CPCS Programming and Diagnostic Guide*.

Enhanced Prime: CPCS supports the capture of multiple entries on a single prime pass without the use of subsets.

Task Groups: This enhancement allows multiple BLDL tasks to be grouped for performance tuning.

System and Application Profile Data Sets: These data sets are used to pass information to programs now and in the future. These profiles contain configuration and run-time option information for the CPCS system and application programs.

MICR JAM Enhancement: You can configure the MICR task to have a refreshed enhanced jam screen displayed at the end of a runout on the 3890/XP.

Sequence Number Assignment: When the **P** record in the sort pattern specifies an **XF** sort, the item sequence number is returned to CPCS from the 3890/XP for each item processed.

PTF Numbers: This publication is current as of PTF Numbers UN99696 and UN99801.

New Web Site: Visit us at our web site: **www.ibm.com/products/cpcs**

Enhanced System Manager Support: CPCS supports the IBM Enhanced System Manager feature, which provides workflow management functions including task starting (based on workflow, time of day, after CPCS End Cycle, after Cold Start, after Warm Start, etc.), task tracking (auto-started and manual, Task Suppression (deadline management), Unit of Work (UOW) functions, and automatic generation of workflows.

Summary of Changes for CPCS Release 11

The new and enhanced functions in this release are in the following areas:

Automatic Restart: When a host or link failure occurs, CPCS restarts interrupted item-capture operations without the physical intervention of operators. The 3890/XP control program maintains a restart buffer where it stores a copy of the records that it sends to the host. When it is recovering from a host or link failure, CPCS retrieves the records contained in the restart buffer and replaces the intermediate buffer records that were lost when the failure occurred.

Blocked BDAM: To use disk storage space more efficiently, you can change the basic direct access method (BDAM) files that are used in CPCS to a blocked format. This capability can improve processing time, especially during startup, when initialization and compression of files occur.

Data-Set Duplexing: CPCS maintains the integrity of all data sets through the data-set duplexing (DUPLEX) function. CPCS duplexes all data sets that are critical to its operation. If a disk failure occurs, you can re-initialize or re-create duplexed data sets through predefined procedures.

Enhanced Logging: CPCS logging has some significantly enhanced features for the automatic recovery of mass-data-set strings. These features include:

- Tracer data-set recovery.
- Automated tracking (history) of mass-data-set strings and logging data sets.
- Elimination of dedicated tape drives.
- Automated full mass-data-set recovery. (Recovery automatically determines which strings should be recovered.)
- Recovery of strings with different mass-data-set definitions. (Recovery performs data conversions to match the existing mass-data-set definition.)
- Recovery of multiple strings with one pass of the logging data set.
- Selective recovery of strings by a generic search capability.

Enhanced Reject Processing: CPCS provides for two types of reject pockets: system reject pockets and user-defined reject pockets. For more information about enhanced reject processing, see page 1-4.

Expanded Document Processor Read Record: The 3890/XP Series document processors give your sort program access to a larger read record. You can now expand the read record to contain as many as 12 header bytes and 244 data bytes. CPCS supports 15 logical fields, 14 of which are available to you. The document processors write data from the code line into the first seven fields. CPCS uses field 8 during codeline data-match processing. Your sort program can set the remaining seven fields. For example, you can use the additional fields for:

- The depositor's account number
- An alternate account-numbering system
- A pass-pocket history of the pocket used on each pass
- Optical character recognition (OCR) data capture.

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Full Document Image Capture: When you add the IBM 3897 Image Capture System to your 3890/XP Document Processor,[1] CPCS can perform full document image capture. This system, when supported by an image system, lets you capture an image (both front and back) of each item in an entry. These images can assist in reject repair. You can also use them for amount capture, eliminating the need to encode amounts before entry. You can store the images for later use in back-end systems, such as exception-item processing, cycle sorting, and statement assembly.

Merged String Distribution: The merged string (***M-string***) distribution module (DKNMDIS) enables CPCS to distribute M-strings.

Online Adjustments: The Online Adjustments function lets you correct mass-data-set errors found during the CPCS reconciliation process. This function processes updated M-string information to provide a balanced and accurate file for analysis and account posting.

The Online Adjustments function includes the following modules:

- Adjustment entry
- Adjustment listing
- Trial balancing.

Power Encoding: CPCS supports the IBM 3892/XP Power Encoder feature on the 3892/XP Document Processor. It encodes the amount data on your checks and the entire MICR code line for MICR rejects. To ensure accuracy, the Power Encoder feature compares the codeline data from the prime pass with the data on the check that it is encoding. The 3892/XP verifies the data and stops processing when it reaches a set number of consecutive discrepancies. You determine this number during installation.

[1] Support for the 3897 Image Capture System is currently available only for the 3890/XP Document Processor. The 3891/XP and the 3892/XP Document Processors are not supported by the ImagePlus &hps. Application Library Services Release 1.

Chapter 1. Introducing the Check Processing Control System

Check processing has changed substantially since magnetic ink character recognition (MICR) was first introduced as the standard for the automated processing of checks. Check processing now involves more critical time schedules, larger and more unpredictable volumes, increased operating expenses, and higher costs associated with delays in the availability of funds. The IBM Check Processing Control System (CPCS) is uniquely equipped to meet the increased demands of modern check processing.

CPCS is designed to:

- Capture large volumes of codeline data effectively[1]
- Capture full document images[2]
- Give a high degree of control through the use of Enhanced System Manager (ESM), product 5799ESM
- Facilitate your custom applications
- Supply data for your in-house funds-availability analysis system
- Supply a full range of image-assisted repair functions[2]
- Process many types of work using common operating procedures
- Supply data that you can use as input to your extract programs for your various posting systems.

Working with the IBM document processors, CPCS offers many advanced features in both hardware and software system design. These features simplify and increase the speed of check processing while they decrease its cost.

This chapter describes various characteristics and advantages of CPCS and the hardware and software requirements for operating CPCS.

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1 The phrase *codeline data* is used throughout this document in reference to a check's codeline, which CPCS copies to the mass data set.

2 The phrase *full document image* is used throughout this document in reference to the full document image (front and back), which the &hps. stores on the Check Image Management System (CIMS) data set.

CPCS Characteristics and Advantages

The following characteristics of CPCS offer you many operational and management advantages.

Automatic Restart: When a host or link failure occurs, CPCS restarts interrupted item-capture operations without the physical intervention of operators. The control program maintains a restart buffer where it stores a copy of the records that it sends to the host. When recovering from a host or link failure, CPCS retrieves the records in the restart buffer and replaces the records that were lost in intermediate buffers when the failure occurred.

Blocked BDAM: To use disk storage space more efficiently, you can change to a blocked format the basic direct access method (BDAM) files used in CPCS. This capability can improve processing time, especially during startup, when initialization and compression of files occur. For more information about blocked BDAM files, see the *CPCS Installation Guide*.

Centralized Control: Centralized control in the check processing department permits quick decision-making, based on check processing needs rather than on the complete system requirements.

To aid in this centralization, CPCS provides the Enhanced System Manager feature to track and control the task sequence for CPCS units of work. CPCS defines the unit of work and sets up the task sequence for each of these units. CPCS then tracks each unit of work through the various tasks and provides statistical data about each unit of work.

Codeline Data Matching: During the first pass of items through the document processor, CPCS captures all data from the MICR codeline and sends it to the mass data set. On later passes, CPCS attempts to match each item with the codeline data that went to the mass data set on the previous pass. Codeline data matching enables the system to detect and compensate for unreadable characters and aids in the isolation of missing items or incorrect sorts from previous passes. Codeline data matching carries the incoming sequence number from pass to pass, giving your adjustment department excellent auditing and tracing information. It also eases pass-to-pass reconciliation.

Concurrent File Sorts: You can concurrently run multiple CPCS application tasks that need internal file sorts. You can also run any combination of CPCS and user-written tasks that include internal file sorts.

Data-Set Duplexing: CPCS maintains the integrity of all data sets through the data-set duplexing (DUPLEX) function. CPCS duplexes all data sets that are critical to its operation. If a disk failure occurs, CPCS can re-initialize the duplexed data sets or re-create them through predefined procedures.

Database: CPCS creates and maintains a comprehensive database to keep track of every document that enters the system during a specific processing cycle. CPCS gives you the option of either using the standard record definition or defining your own record based on the needs of your financial institution.

Dynamic Allocation of Processing Resources: CPCS uses the dynamic allocation and deallocation of tapes and disk data sets and, through terminal commands, the dynamic allocation and deallocation of document processors and printers. Dynamic allocation lets you maintain these devices outside the CPCS environment for use by programs running in other multiple virtual storage (MVS) regions. To regain or relinquish control of these devices, you do not need to stop CPCS, change job control language (JCL) statements, or start CPCS again. This feature increases machine usage and flexibility and maximizes CPCS scheduled availability.

Efficiency: Peak check-handling loads need a large system capacity. CPCS is designed to run under Multiple Virtual Storage/Enterprise System Architecture (MVS/ESA*) systems and can make effective use of available system resources during both peak and normal periods.

High-speed reject reentry and codeline data matching substantially decrease the number of rejects, which in turn decreases costly low-speed manual handling of rejects and speeds the flow of items out of the financial institution. These improvements in reject processing can result in improved availability of funds.

Improved scheduling of work increases productivity at the document-processor stations. You can also expand the number of pockets on the document processors. Consequently, you can decrease the number of document processors or increase your work-load capacity. Also, the improved audit trail supplied by unique item-sequence numbers and codeline data matching can decrease the adjustment department's work load.

Enhanced Logging: CPCS logging has some significantly enhanced features for automatic recovery of mass-data-set strings. These features include:

- Tracer data-set recovery.
- Automated tracking (history) of mass-data-set strings and logging data sets.
- Elimination of dedicated tape drives.
- Automated full mass-data-set recovery. (Recovery automatically determines which strings should be recovered.)
- Recovery of strings with different mass-data-set definitions. (Recovery performs data conversions to match the existing mass-data-set definition.)
- Recovery of multiple strings with one pass of the logging data set.
- Selective recovery of strings by a generic search capability.

For more information about data-set recovery procedures, see the *CPCS Customization Guide*.

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Enhanced Reject Processing: CPCS provides for two types of reject pockets: system reject pockets and user-defined reject pockets. CPCS sends documents to the system reject pockets for one of the following reasons:

- The document goes through the document processor inverted.
- The document is torn or folded.
- One of the required fields, such as the amount or the routing transit field, is missing.

CPCS lets you correct and reenter items in the system reject pockets for the second and third passes of subsequent-pass processing.

User reject pockets contain items that require further processing outside of the CPCS entry. These pockets might include:

- Items with one or more unencoded fields
- Items with unreadable data in one or more fields
- Items that require data adjustment, such as:
  - Correcting account numbers
  - Reassigning routing numbers
  - Special internal processing.

For information on the use of the multiple reject pocket feature of CPCS, see the *CPCS Programming and Diagnostic Guide*.

Error Processing: A display terminal at the document-processor station immediately displays the last few documents processed before a jam so the operator can take corrective action without referring to long jam lists. When necessary, CPCS generates and displays accurate error information at the document processor. CPCS optional procedures let operators select recovery techniques for:

- Jams
- Selector check
- Machine check
- Host system malfunctions.

CPCS also provides extensive system controls through a common database, complete pass-to-pass controls, and audit trails to the item level.

Expandable Stacker Modules: The document processors offer an expandable number of stacker modules. Each module contains six pockets. The document processors can support up to eight modules, offering a total of 48 pockets to aid in decreasing the number of required item passes. CPCS supports the complete range of pocket combinations for selection by your sort programs.

Expanded Document Processor Read Record: The document processors give your sort program access to a larger read record. You can now expand the read record to contain as many as 12 header bytes and 244 data bytes. CPCS supports 15 logical fields, 14 of which are available to you. The document processors move data into the first seven fields from the codeline data. CPCS uses field 8 during codeline data match processing. Your sort program can set the remaining seven fields. For example, you can use the additional fields for:

- The depositor's account number
- An alternate account-numbering system
- A pass-pocket history of the pocket used on each pass
- Optical character recognition (OCR) data capture.

Extended Addressing: CPCS uses COBOL/370, MVS/COBOL, and VS COBOL II for all modules so they can use the extended addressing (above the 16 megabyte line) capability of MVS/ESA.

Extended Stacker Control Instruction (SCI) Addressing: With either 2-byte or 4-byte addressing, you can run existing 3890 programs on the 3890/XP Series document processors. You can also take advantage of the expanded memory in the 3890/XP Series. CPCS initializes sort programs using either 2-byte or 4-byte addressing.

Full-Document Image Capture: If your CPCS system includes the ImagePlus &hps., you can capture the image (both front and back) of all items in an entry. You can use the images for amount capture, eliminating the need to encode amounts before entry. You can store the images for later use in back-end systems, including exception item processing, cycle sorting, and statement assembly.

CPCS provides the interface between CPCS and the Check Image Management System (CIMS), an &hps. host application that retrieves, manages, and stores images on the host. When an image entry starts, CPCS notifies CIMS, which starts capturing document images when the MICR entry starts. Finally, CPCS notifies CIMS when the image entry ends.

High-Level Language Sort Program Modules: CPCS lets you write sort-program modules for the document processors in high-level languages by letting you call these programs from the CPCS-supplied SCI prolog.

Item Capture and Distribution: CPCS reads magnetic ink character recognition (MICR) documents, including control documents, and writes them to a direct-access storage device. Your sort program controls pocket distribution.

Item Numbering: Unique item numbering of every prime-pass document gives more audit-trail capabilities. As CPCS processes rehandle items through subsequent passes, they logically retain the sequence number they received during prime pass. CPCS stores sequence numbers in the new expanded format as well as the older format. You can use the old format, if necessary, for existing programs. CPCS will not, however, guarantee unique sequence numbers in the old format.

Larger Sort Programs: If you operate one of the 3890/XP Series document processors, you can use existing sort programs. These programs must not occupy more than 64K of storage. Programs written for the 3890/XP Series, however, do not have this constraint. You can now:

- Get access to more tables
- Create larger tables for your sort programs
- Have sort programs that are totally table-driven.

Location Convenience: The document-processor station is a self-contained unit that you can place at any distance from the computer. If the document processor is attached through a channel the cable length can restrict its distance from the computer. If you attach the document processor using LU 6.2 protocol, no cable-length restrictions apply. You can place a self-contained document processor near the reconciliation department to improve the flow of work between the reconciliation department and the document processor area. Also, you can place a self-contained document processor in a remote capture site to improve your funds availability.

The use of a display terminal at the document-processor station eliminates the need for your operator to operate the computer system, to be knowledgeable in system operation, or to be in close communication with the system operator.

Merge Feed: The 3890/XP Series document processors store divider slips in a hopper for separating kill pocket items into manageable quantities. When the specified number of documents in the pocket is reached, CPCS records this fact for kill listing and directs the document processors to send a divider slip to that pocket, thereby controlling kill bundle size.

Multibank Processing: CPCS now includes multibank features. You can uniquely identify each financial institution for which you process work. You can define up to 999 financial institutions. This definition includes:

- Name and address data
- Cash letter information
- Control documents
- Processing options
  - Data transmission by field
  - Microfilm options
  - User exit names
  - Concurrent kill options
  - Tracer spray option.

CPCS creates a bank-control-file (BCF) data set to maintain the definitions. It uses the data set to determine processing options when you start a MICR entry. CPCS also lets you make cash letters by bank and extract application data by bank.

MVS Host Support Program Simulator: The 3890/XP MVS Support Program includes a simulator to provide you with a method for testing host-applications and stacker control instruction (SCI) programs together without using a document processor. You provide a file of document codelines, including merge documents, as input. The simulator calls the host-support test-aid program to simulate an SCI run. It simulates codeline data-match processing by retrieving document codeline data records from the simulator input data set. The simulator also builds data-management headers to simulate intervention-required conditions and unit

exceptions. You can configure several simulators to test high-volume capture and processing.

Online Adjustments: The Online Adjustments program lets you correct mass-data-set errors found during the CPCS reconciliation process. This function processes updated M-string information to provide a balanced and accurate file for analysis and account posting.

The Online Adjustments function includes the following functions:

- Adjustment entry
- Adjustment listing
- Trial balancing (including forced).

Online Operation: With IBM display terminals, the system provides:

- Operator communication, jam control, and error control information at the document-processor station
- Low-speed entry of non-processable and rejected work
- Management of work flow
- Supervisory functions and task initiation.

Power Encoder: CPCS supports the IBM 3892/XP Power Encoder feature on the 3892/XP Document Processor. With the Power Encoder feature, the 3892/XP can encode up to 500 documents a minute. It encodes the amount data on your checks and the entire MICR codeline for MICR rejects. To ensure accuracy, the Power Encoder feature compares the code-line data from the prime pass with the data on the check that it is encoding. The 3892/XP verifies the data and stops processing when it reaches a set number of consecutive discrepancies. You determine this number during installation. For more information about the power encoder feature, see the *ImagePlus High Performance Transaction System General Information Manual*.

Programmable Endorsing and Item Numbering: The endorsement that prints on the document is now under the control of the sort program. For each document that flows through any one of the document processors, the sort program can request a different endorsement. The ink-jet printer prints the endorsement requested on each document. CPCS lets you specify custom endorsement data in the initialization record (IREC). The run profile, named in the IREC, can also provide endorsement data.

The IBM 3890/XP Document Processor Toolkit I licensed program (Program No. 5688-043) provides an easy way for you to specify and change endorsement data.

Run Profile: CPCS supports the 3890/XP Series run profile, an ASCII file on the 3890/XP Series disk subsystem. This profile is an extension to the data in the IREC. The run profile contains a set of information that controls the entry. The run profile can contain:

- Names of the modules appended to the sort program
- Names of tables containing information used by the sort program
- Endorsement data
- Other initialization data.

CPCS inserts a run-profile name that you specify in the initialization record.

Scope: CPCS is the base for MICR document applications. It provides the data required for your extract programs. Your programmers write these extract programs to pass the CPCS captured data to your various application-posting systems.

Security: CPCS uses the Resource Access Control Facility (RACF) to provide user identification (user ID) and password security. CPCS also enables you to interact with an equivalent security system that provides a standard approach to security. RACF gives CPCS a security system that has the following characteristics:

- Each password can contain as many as 8 characters.
- Access to applications can be restricted to specific terminal operators.

Selective Microfilming: The document processors permit you to select the documents for microfilming during processing (on-us, transit, or both). Your sort programs supply the control of this process.

Subset Processing: CPCS provides a subset processing feature that lets you process your work concurrently; that is, you do not have to wait until the whole entry is run through the document processor before you start subsequent processing of entered items.

Concurrent processing lets you process two or more jobs at the same time, giving you more effective use of the system. You can start the following tasks for items in a prime-pass entry before completing that entry:

- Reject handling

  You can run high-speed reject reentry or online reject reentry.

- Rehandle sorting

  You can start a subsequent pass or add items to an existing subsequent pass.

- Kill processing.

  You can print kill lists and cash letters. The kill process goes across subset boundaries, to prevent having small kill bundles at the end of each subset.

To aid you in identifying where each subset ends, CPCS provides an option that lets you distribute tracer slips into each pocket at the beginning of each new subset.

Enhanced Prime: CPCS provides an enhanced prime pass processing feature that allows you to process all your work concurrently under a same sort type. As tracer groups are captured, their corresponding I-strings are made available for post-capture processing, without having to end the capture and reinitialize the document processor for each entry.

Enhanced System Manager (ESM): CPCS also supports the Enhanced System Manager, IBM product 5799ESM. The Enhanced System Manager (ESM) supports the CPCS system in the following ways:

1. Controls, manages, and tracks the flow of work through the system
2. Provides sort pattern analysis for automatic workflow generation
3. Performs automatic task initiation
4. Manages various databases including workflow, task profile, unit of work, etc.
5. Controls task processing through passed parameters

Date Customization: CPCS now provides the ability to specify a date format at the system level (as a default). This format is propagated throughout CPCS in reports, screens, and in data sets.

Other Characteristics: CPCS also enables:

- Selective or full encoding of MICR fields.
- Capture of variable-sized MICR fields.
- Optical character recognition (OCR).
- Insertion of divider slips that are under program control from a separate merge-feed unit. This permits pocket sorting without interrupting the flow of items.
- Use of an optional control document that lets you collect subtotals in large batches. These subtotals are not cumulative. The prime-pass listing includes debit and credit totals at the subbatch level, as well as the batch and block level.
- Use of enhanced prime capture that supports the capture of multiple entries on a single prime pass.
- Use of the date reformatting facility that, among other things, allows CPCS to be compatible with the Year 2000. All cycle processing and mass data set processing have been expanded to allow up to 10-character dates.

Hardware and Software Requirements

This section describes the 3890/XP Series document processors and the minimum hardware and software requirements for operating CPCS.

Note: For all the requirements for CPCS installation, both hardware and software, refer to the *CPCS Program Directory*.

Document Processors

The IBM 3890/XP Series document processors are high-speed, high-volume document processors that read magnetically-inscribed documents or optical-character documents.

The IBM 3890/XP Series consists of several models:

3890/XP A document processor that reads data magnetically at a rated speed of 2400 items per minute

3891/XP A document processor that reads items either magnetically or optically at a rated speed of 1700 items per minute[3]

3892/XP A document processor that reads items either magnetically or optically at a rated speed of 1000 items per minute.[3]

Note: The rate at which items go through high-speed processing depends on the characteristics of your work and how you organize your work flow. These characteristics include:

- How you prepare data
- How you use Enhanced System Manager
- How you use subset-string processing
- How you use concurrent-kill processing
- How many item passes you need to complete full endpoint distribution
- How you handle rejects
- How you recover jams
- How you correlate outgoing bundles with their associated lists.

Hardware

CPCS requires, as a minimum, a System/370* 4331 Processor with 8 megabytes of main storage. In addition to the requirements for MVS, the following features and hardware devices are necessary:

- Two disk-storage devices
- One of the following document processors:
  - 3890 with the item-numbering feature and endorsing feature
  - 3890/XP with the programmable item-numbering and endorsing feature
  - 3891/XP with the programmable item-numbering and endorsing feature
  - 3892/XP with the programmable item-numbering and endorsing feature
- One display terminal.

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[3] CPCS lets you activate the OCR feature. CPCS transports data between the 3891/XP or the 3892/XP and the host. However, you must write the programs that instruct these document processors to read the OCR data optically and process the data internally.

* Trademark of IBM

Software

CPCS operates in an MVS/ESA environment. (Image processing **requires** an MVS/ESA environment.) Many application tasks are coded in COBOL. System tasks and interface modules are coded in Assembler.

CPCS uses the following programs:

- MVS/ESA
- Access methods
  - Basic Sequential Access Method (BSAM)
  - Virtual Sequential Access Method (VSAM)
  - Basic Direct Access Method (BDAM)
  - Queued Sequential Access Method (QSAM)
  - Virtual Telecommunication Access Method (VTAM[00]) product[4]
- Assembler H Release 2
- COBOL/370 or MVS/COBOL[5]
- DFSORT or equivalent
- 3890/XP MVS Support Program
- Resource Access Control Facility (RACF[6]) or an equivalent security system.

System Configuration

Correct system configuration depends on the volumes of direct access storage devices (DASD), processing techniques, and performance requirements. The virtual-storage size allocated to CPCS determines the number of subtasks that you can start concurrently; the more storage available, the higher the number of concurrent subtasks. You should provide a minimum region size of 2 megabytes. For assistance with detailed configuration planning, contact your IBM marketing representative.

Identifying User Responsibilities

To customize CPCS to your specific environment, you should perform the following tasks:

- Generate an MVS/ESA system and allocate disk space for data sets
- Supply the parameters required to generate CPCS
- Supply the data to build the bank control file data set, which contains bank-specific processing information
- Supply sort programs for the document processors and online reject reentry
- Prepare tables that provide endpoint identification for kill pockets on each pass
- Supply the data to build an endpoint name-and-address file
- Supply programs, if desired, for proof of deposit, posting extract, and float analysis, using the database provided by the licensed program

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4 Financial institutions that want to run CPCS with the 3891/XP or 3892/XP Document Processor or with the image feature must use VTAM product Version 3 Release 2 or higher.

5 After 31 December 1992, VS COBOL II is no longer a prerequisite. If its use is to continue at your site, a CPCS user modification is required. Call CPCS Level 2 support for more information. For additional details, contact your IBM marketing representative.

6 CPCS uses RACF only if specified for security purposes.

- Establish the local area network (LAN), if necessary, to support the document processors that are attached by using this method.

Chapter 2. Describing CPCS in General Terms

The functions of a check processing application in a financial institution can be characterized briefly as:

- Collecting data from documents for posting to the institution's internal and correspondent accounts.
- Sorting and distributing, by endpoint, the physical documents. Endpoints include other commercial financial institutions, Federal Reserve branches, or regional processing centers.
- Microfilming selected documents for later information retrieval.
- Capturing, when an image system is installed, full document images for use in reject repair, encoding, and other image system applications.

Although the data-collection function requires only one pass of the items through the document processor, the distribution function can require multiple passes for full endpoint breakout. You can sort data from the documents' codeline internally (as opposed to physically) to their endpoints. By synchronizing the internal sorting with the physical sorting of the documents, you can control the pass-to-pass operation from entry through the distribution to endpoints.

This chapter describes the following characteristics of the collection and distribution process:

- Data preparation
- Physical processing
- Internal processing
  - Document records
  - Rejects
  - String merge
  - Subsequent passes
  - Kill-list processing
  - End-of-cycle processing.

Preparing Data for Check Processing

Work coming into the financial institution falls into two basic categories: unencoded documents and pre-encoded documents.

Unencoded documents come from teller stations, large commercial customers, or financial institutions. These documents go to the encoding stations, where they are encoded and grouped. Pre-encoded documents come from correspondent banks, clearing houses, the Federal Reserve bank, and some large depositors.

You prepare the two types of documents in the same way, with a batch slip encoded for each batch received. You can encode a block slip with the cash-letter amount for the sending financial institution.

Note: If you use the image-assisted repair system to repair the reject pocket items, you need not encode the batch slips or block slips.

Grouping the Documents

A ***batch*** is a logical group of work, usually consisting of approximately 300 documents. A batch can be a group of checks (kill bundle) from another financial institution or a *cut* from a teller's machine. For each batch, you encode a batch slip with the dollar total of all debit items within the batch.

After you create a batch, you can divide it into smaller groups called ***subbatches***. Subbatches, the lowest level of control, are optional. You determine the number of documents in each subbatch, preparing them in the same way as you would a batch. You encode a subbatch slip with the total debit dollar value of the documents within the subbatch and then group the subbatches into batches.

A ***block*** is the next higher level of control after the batch (and optional subbatch). A block is a group of batches originating from the same source, such as a cash letter originating from another financial institution or work originating from one branch or teller location. You can group blocks together, each with its own block slip, into trays of approximately 3000 items.

The ***tracer group***, the next higher level of control, consists of a group of blocks. You place tracer-group slips in front of the documents that constitute the tracer group.

An ***entry*** is the highest level of control. By combining several tracer groups, you can form a convenient unit of work for a document processor.

If you want to take advantage of concurrent processing, the ability to start subsequent processing of items before entering all the items of an entry, you can specify subsets within an entry. A subset consists of a single tracer group. CPCS starts the distribution task when you complete the first subset.

For a complete explanation of these control groups, see Chapter 3, "Summarizing CPCS Controls."

Physical Processing

Prime-pass entry is the first task of physical processing. To start a prime-pass entry, the operator logs on to CPCS, starts the MICR task, and enters the identification number of the entry. The identification number consists of the first 4 digits in the account-number field on the first tracer slip of the entry. CPCS refers to this as the entry number. The operator also enters the number of the sort routine and other parameters for the entry (such as the date, the amount, the control number, the account number, and the routing and transit number). When the MICR task indicates that the entry can start, the operator starts feeding items through the document processor.

Processing Control Documents

The first documents that enter the document processor are the tracer slips. Tracer slips maintain pass-to-pass control. The document processor routes them to either the rehandle or the reject pocket. The tracer slips serve to separate and identify the tracer groups within the pockets. CPCS builds a record for each tracer slip selected to a pocket. The tracer records contain the item count and dollar total for each rehandle pocket used during this pass. CPCS uses the totals as a control for items as they reenter the system on subsequent passes.

You can also use tracer groups to divide a large entry into subsets so that you can take advantage of subset processing. If you want to use subset processing, you must specify it in the sort pattern. You must also indicate that every tracer group signals the start of a new subset.

The document processor reads the first group of tracer slips. It then reads the block slip, which identifies all related documents as part of the block, and directs it to the reject pocket.

The batch slip, which identifies all related documents as part of a batch, follows the block slip and is also directed to the reject pocket. Subbatch slips, if you chose to use them, follow the batch slip. You have full control over where to place the subbatch slips. You can place them at several intervals within a batch, because they simply provide an additional totaling function.

CPCS uses the encoded data from the block, batch, and subbatch slips to balance the documents within the block, batch, and subbatch and to identify the source of the documents.

Note: Block, batch, and subbatch slips can either precede or follow the items that they control.

Divider slips separate items within each kill pocket into manageable groups, or ***bundles***. You can use the sort pattern to define the size of each of these bundles. CPCS uses the merge-feed unit of the document processor to hold the divider slips. When a bundle within a kill pocket reaches the limit, the document processor automatically selects a divider slip from the merge-feed unit. Once the divider slip is in the input stream, the document processor routes it to the correct kill pocket.

Processing Individual Items

Individual items follow the tracer, block, batch, and optional subbatch slips. The document processor reads each item. An item-sequence number is printed on the reverse of each item. It can assist in establishing an audit trail that points to the source of the item.

To print an item-sequence number on the back of a document, CPCS requires the programmable item-numbering and endorsing features on the 3890/XP Series document processors or the item-numbering and endorsing features on the 3890. The 3890/XP Series document processors let you specify the use of the programmable-endorser feature when you generate a sort pattern. The programmable-endorser feature lets you specify up to three lines of data to print on the back of each document as an endorsement. For additional information about the programmable-endorser feature, see the *3890/XP Document Processor General Information Manual*.

As the document processor reads data, CPCS receives the data and stores it on the mass data set. Guided by the encoded data and the user sort program, the document processor sorts the documents to the correct pockets. The pockets are either on-us, kill, reject, or rehandle, according to their definition within the sort pattern.

If the document processor has a microfilming feature, you can specify it as a CPCS option when you generate the CPCS system. After you specify this feature, you can selectively microfilm documents as the processor reads them.

When using an image system, you can bypass the encoding step. CPCS lets you process unqualified entries on the 3890/XP Series and capture the codeline image on the mass data set. ("Capture" is the process of reading the documents on the document processor and storing data about the documents in one or more data sets.) At the same time, the IBM 3897 Image Capture System captures the full document image.

With rejected items, you can use the image-assisted repair function to logically capture the mass data set amount field from the courtesy amount field on the Check Image Management System (CIMS) document image record. Documents can be rejected for various reasons; see "Processing Rejects." After the amounts have been captured, you can process the actual items as a subsequent pass on the 3892/XP and, using the corrected string for image matching, encode the amount on the document.

Internal Processing

This section explains the following aspects of internal processing:

- Document records
- Rejects
- String merge
- Subsequent passes
- Kill-list processing
- End-of-cycle processing.

CPCS Document Records

CPCS creates a record on the mass data set for each document that passes through the document processor. CPCS enables you to capture data, such as optical character recognition (OCR) data from remittances or a depositor's account number, from the documents that are processed on any one of the 3890/XP Series document processors. You can store the data in fields 9 through 15 of the data-set record. You must provide the necessary software so that the document processor can read the data and pass it to CPCS. For more information about required software, see "Software" on page 1-11.

Processing Rejects

During any entry, the document processor can reject documents for various reasons. The document processor automatically sorts some of the rejects into the first pocket, identified as the ***system reject pocket*** or ***pocket 1-1***. You can also use the sort program to direct some specific items to pocket 1-1 and tag them as rejects.

In addition to using pocket 1-1, you can identify other pockets as reject pockets and selectively sort items into any of these pockets. You can now define as many as 48 pockets as reject pockets. You can also sort into kill pockets items that would normally be considered rejects. Once the repairs take place, you can print a revised kill list for the kill pockets.

High-Speed Reject Reentry

The high cost of manually handling rejected documents makes it imperative that all items be captured during high-speed operation. The design of CPCS includes a high-speed reject reentry (HSRR) run for the items sent to the prime-pass reject pocket. If the operator manually reconditions the items (for example, turning over inverted checks or unfolding checks) a significant number can be successfully captured on a reentry pass through the document processor. The document processor separates rejected items by their associated block and batch slips in the reject pocket.

After reconditioning the rejects in the system reject pocket, the operator places a new set of tracer slips before the prime-pass reject documents. Then the operator indicates that this is an HSRR entry by entering the HSRR entry number and the associated prime entry number on the associated document-processor display terminal. CPCS assigns a new sequence number for each item in the HSRR run.

Items that the document processor reads correctly go into kill, on-us, or rehandle pockets. CPCS creates a new I-string for this entry. (The group of data records created within the data set for an entry or subset is called an ***I-string***.) If an item in the entry is unreadable, the codeline data record of the item is still established within the I-string with unreadable portions indicated.

If your sort pattern does not specify otherwise, unreadable items enter the system reject pocket with their associated block and batch slips. You can, however, sort items to other pockets that you have defined as reject pockets.

Because a new set of tracer slips is used for the HSRR entry number, the operator must indicate to the system that this tracer group is associated with a previous tracer group. When the tracer groups are linked, CPCS can automatically associate the I-string produced on the HSRR pass with the reject D-string for the same items from the prime pass. CPCS produces a distributed string (***D-string***) by internally sorting the I-string, based on the pocket code in the data record.

If you are using concurrent processing, you can start processing the rejects when the subset string is complete. The only restriction is that you must **not** mix reject pockets from multiple sorters into a single HSRR.

Online Reject Reentry (OLRR)

The online reject-reentry function lets you correct those items that were sorted into a reject pocket during the HSRR entry or, if you did not have an HSRR entry, during the prime-pass entry. OLRR also lets you reenter items from user-defined reject pockets. The rejected items go to the display terminal for online manual entry. Your operator must correct these items in sequence. As the operator corrects the items, CPCS writes the corrected information to the mass data set. These data records make a new string called a reject string (***R-string***). CPCS uses this R-string, merging it with the I-string, to accurately reflect the original document stream on the mass data set.

You can also use the rejected items when balancing the entry and then distribute them manually to the correct endpoints, using separate kill lists and cash letters.

If you use concurrent processing, you can start to process the rejects through OLRR when the subset string is complete.

Image-Assisted Repair

Image-assisted repair includes an amount key entry function. You can perform amount key entry, using a specially dedicated terminal, for the entire entry or for each pocket within the entry. CPCS replaces the codeline image with the convenience amount from the document image. The unencoded documents are then power encoded with the amounts during a subsequent pass.

When you run the image-assisted repair function for a string, CPCS transfers the reject D-string to the LAN that made the request. The repair function uses data from either the digitized image or operator input to correct the rejected fields in the string. The repair function updates the document header information in the CIMS data set record and writes the corrected string record out to an R-string. When the operator completes repairing the string, the repair function sends the R-string to CPCS for more processing.

String Merge

In preparation for additional use of the prime-pass data, CPCS arranges the three string types (the prime-pass I-string, the optional high-speed reject-reentry I-string, and the online reject-reentry R-string) in a sequence identical to the original document stream as it appeared before the prime-pass data capture. This process is referred to as the ***merge*** process.

CPCS permits multiple reject pockets, and not all reject pockets need to be repaired at the same time. As a result, CPCS must perform multiple merges, categorized as follows:

Normal merge This option merges the R-string from OLRR, with the prime-pass I-string and, optionally, with the HSRR I-string.

If you are not using subset processing **and** are not using multiple reject pockets, the normal merge option marks the string as released and initiates the proof-list task.

Consolidated reject merge
CPCS lets you place rejects into good pockets, distribute these rejects from all good pockets, repair the codeline images of these rejects, and create an R-string of the corrected images. This option merges this R-string and the input prime-pass I-string[1] to create a new M-string.

Reject pocket merge
This option handles merges for reject pockets other than pocket 1-1. CPCS creates R-strings for these merges.

Final merge This option merges all subset M-strings for an entry into one M-string. It also marks the string as released and initiates the proof-list task. This option applies only to subset M-strings, and it is optional. The subset M-strings can remain subset M-strings all the way through Balancing (adjustments) and ICRE. The use of final merge is *not* recommended.

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[1] CPCS uses the I-string as input only the first time you run merge for a string or subset string. The next time, CPCS uses the M-string created from the previous run as input. CPCS repeats this process each time it is run for a string.

All references to an I-string apply equally to an M-string.

Regardless of the option, CPCS always merges the R-string into the I-string. The data record for the corrected reject follows its corresponding I-string record in the merged string.

If you run HSRR and then run OLRR for pocket 1-1 of the HSRR run, the merge task uses the R-string and I-string from the HSRR entry. The first part merges these strings. At the end of this step, CPCS merges the resulting intermediate string with the prime-pass I-string of the original tracer group, thus creating an M-string.

After you run the merge, you can use the resulting M-string for proof listing, for reconciliation purposes, and for programs that you supply to perform various applications for your financial institution.

The merge function, which you can run multiple times, lets you repeatedly update the database as strings are repaired. After all strings for the entry have been repaired, you may run a final merge to consolidate all the subset M-strings into one M-string. The final merge is optional, and we do *not* recommend the use of this option.

When you run the final merge (or the normal merge option described above), CPCS automatically produces a ***proof list***. A proof list is a comprehensive list of all items that enter the system. In addition to the encoded document data, the prime-pass proof list displays the unique sequence number that the document processor assigns to each item. It also displays control information at all levels. This provides the reconciliation clerk with enough information to identify error conditions and perform necessary reconciliation procedures.

You can also run the proof list manually for a specific subset or entry.

Subsequent Passes

In any pass, you can designate a number of pockets as rehandle pockets. These pockets receive items that the system identifies as rejects or as items that require multiple endpoint processing. These items require subsequent passes to correct errors or to distribute the items to their correct endpoints.

Running a Subsequent Pass

To run a subsequent pass, the operator takes the documents from the rehandle pockets and places them in trays. The items do not require further data preparation because their accompanying tracer slips identify the original source and automatically cause the creation of pass-to-pass control records. The operator enters the first tracer number of the current group of work displayed on the terminal. Entry of the first tracer number enables CPCS to find the tracer record for this pocket from the previous pass and to automatically determine the control count and amount for the current pass. The tracer-group level provides all necessary controls; no block or batch-control totals are required on passes after the prime pass.

If the document processor fails to read some of the characters of an item on the current pass, you can use codeline data matching to substitute the codeline data that is in storage for that item. Codeline data matching substantially decreases rejects on subsequent passes, which in turn decreases many of the manual tasks associated with rejects. More importantly, codeline data matching carries the item-sequence number from the prime pass with the item through each subsequent

pass. Because CPCS uses the previous-pass data record to reconstruct fields that the document processor reads in error on the current pass, you can trace any item from its kill location back through all passes to its exact prime-pass entry point.

In subsequent passes, as in the prime pass, the processor selects documents into pockets under control of the sort program. The documents that the processor sorts into kill pockets must be put aside until their kill lists and cash letters are printed.

Subsequent-Pass Reconciliation

At the conclusion of any subsequent pass, you can select either or both of the following balancing options:

Option 1: CPCS prints a subsequent-pass balancing report. This report provides the reconciliation clerk with the information required to balance and to identify any errors within the entry. For each tracer group processed, the report shows:

- Control and accumulated totals for the tracer group
- Item count and amount accumulated for each pocket used
- A list of all missing items (listed but not enclosed) and free items (enclosed but not listed) that result from matching data records to prior-pass data records.

For most tracer groups, CPCS can print a subsequent-pass balancing report on a single page.

Option 2: This option provides a detailed listing of all items fed through the document processor on a subsequent pass. CPCS identifies each item by the readable encoded data and by the incoming sequence number assigned on the original prime pass, which is carried forward through codeline data matching. This report prints control totals at the tracer-group level, which facilitates subsequent-pass balancing. This option does not include missing and free information.

Proof of Deposit

You can implement your own proof-of-deposit analysis as part of CPCS. Because the M-string represents the original document stream, you can perform proof-of-deposit analysis and funds-availability or collectability analysis after CPCS creates the final M-string. You need not be concerned with rejected documents; all rejects are corrected before creation of the final M-string. CPCS supports the distribution of normal, non-balanced M-strings or M-strings from image systems.

Note: CPCS does not support the distribution of M-strings created by online adjustments.

Kill-List Processing

As the processor routes documents to kill pockets, CPCS maintains a running item count for each pocket. When a kill pocket reaches the assigned limit for a bundle, the document processor feeds a divider slip from the merge feed and selects it to that pocket.

If you use subset processing, pocket totals are **not** reset at the end of each subset. CPCS resets the totals only at the beginning of a new entry.

When the kill-list program encounters a divider slip, it prints the totals on the kill list, writes a record to the kill-bundle data set, clears out the accumulators in memory,

and records this information for later summarization. This guarantees that the kill lists correspond to the kill bundles.

Kill lists are printed in ***full page format***, meaning that the data appears consecutively in columns. Kill lists are printed on a deferred basis, either at the end of an entry, at the end of the subset, or by request. This deferred printing permits the system to store all kill lists for a common endpoint, so that a complete cash letter can be printed for this endpoint.

When the kill-list program reads a subset D-string, it checks to see whether the first bundle is a partial bundle. If so, CPCS locates the string that contains the beginning of the bundle, as well as any other strings that have data for this bundle, and uses those strings to print the kill lists and create the kill-bundle records.

CPCS also suppresses printing a kill list for the last bundle if it is a partial bundle and the string does not include the end of an entry. The kill-list program only prints a kill list for a partial bundle when the bundle is at the end of an entry, either in the last subset string of an entry or at the end of an entry that had no subsets.

You can identify the kill list by the following information:

- Endpoint name and number

  You can select separate debit and credit totals on the on-us kill lists by specifying this option in the endpoint name-and-address data set for this endpoint.
- Date and time
- Bundle number
- Incoming item number and amount for each item
- Item count and dollar total.

  CPCS maintains separate totals for debits and credits.

CPCS provides a cash-letter summary for each endpoint, indicating the item counts and dollar totals for each kill bundle.

End-of-Cycle Processing

End-of-cycle processing includes all of the tasks used to conclude processing for all completed work in the current cycle. The end-of-cycle process includes the following:

Creating the master data set
: The master data set contains data records of documents that do not require further processing. This data set includes all killed items and corrected rejects. CPCS assigns an outgoing identification number to every data record in the mass data set.

Creating the input data set
: The input data set contains data from documents that entered the system. It includes all M-strings for a cycle.

Freeing space
: Free-space programs let you selectively release strings when you no longer require them.

Ending the cycle

End cycle deletes tracer records for the cycle, summarizes kill-bundle records on a tape, and then deletes the kill-bundle records from the kill-bundle file. The end-of-cycle process also deletes records from both the electronic-mail data set and the divider data set when they are no longer needed.

Producing the microfilm report

CPCS supports the microfilm feature on the 3890 Document Processor or the 3890/XP Series document processors. It can produce a microfilm-cartridge report in batch sequence after completing its daily processing. The report details the item number, cartridge number, input time, and relative location of every block and batch slip filmed during the prime pass. The microfilm report is your guide to finding information pertinent to missing items.

Compressing data sets

This function compresses the kill-bundle and microfilm data sets by removing records that the end-of-cycle and microfilm-report functions flagged for deletion.

Chapter 3. Summarizing CPCS Controls

CPCS provides control over reconciliation and system work flow. In CPCS, internal processing parallels the physical processing as it passes through the system. You implement controls by creating and maintaining a set of interrelated records. As processing continues, the external document stream is continuously sorted. Therefore, each image string has its own control record in which processing is reflected. At any point in the cycle, you can trace the processing history of codeline data all the way back to its source.

There are two basic types of CPCS controls:

- Reconciliation controls, which control the number and dollar amounts of items that are entered, processed, and distributed. Reconciliation controls include the following:

  Deposit For proof-of-deposit work, you can use deposit differences to isolate out-of-balance conditions.

  Subbatch An optional level of control, below a batch.

  Batch A user-defined group of checks, checks and deposits, or credits. This is the lowest required level of control recognized by the system, except when you are using the proof-of-deposit function.

  Block One or more batches of work related to a source.

- System controls, which control the sequence in which items are processed and the synchronization of internal and external data flow. System controls include the following:

  Tracer group One or more blocks of work on which pass-to-pass control is maintained.

  Entry The highest level of system control, made up of one or more tracer groups, assigned to a document processor and processed as an entity throughout the system. A full day's work can be divided into entries corresponding to external constraints, such as time deadlines for working with clearing-house operations. Entries can be divided into subsets for concurrent processing.

  Cycle A flexible control that ties all work processed by the system to a defined time interval (generally one business day). End of the cycle implies that all processing is complete and that you can delete detail items from the system.

This section explains the two types of CPCS controls.

Reconciliation Controls

When you prepare incoming documents for entry into the high-speed system, you organize it into the two major control levels, called ***batch control*** and ***block control***. An optional subbatch control level is also available. If you optimize sizing at these control levels, you can make substantial results in reconciliation benefits. Control-level sizing is described below.

The optional subbatch is the lowest level of control in CPCS, except for deposits. You can vary the number of documents in each subbatch. After you encode each subbatch slip with the dollar total of all debit items in the subbatch, you can then insert them into the document stream before the entry is processed. The document processor selects subbatch slips to the system-reject pocket during prime pass to identify rejected documents and relate them to their subbatch.

The batch is the lowest required level of control (subbatch processing is optional); it contains approximately 300 documents. A batch of work, identified by a control document known as a batch slip, represents either a kill bundle received from another financial institution or a group of work received internally. After you encode the batch slips with the dollar total of all debit items in the batch, you can insert them into the document stream before processing of the entry starts. To identify rejected documents and relate them to their batch, the document processor selects the batch slips to the system reject pocket during prime-pass entry.

The block is the next higher level of input control after the batch. It controls a group of batches, such as a cash letter received from another financial institution. The total of the incoming kill bundles, or the total of the batches, is encoded in the amount field of a block slip. Block slips are sorted to the system reject pocket during prime-pass entry to relate rejected documents to the appropriate block. Blocks can be used in this way to identify work as coming from a specific source and to provide the next level of control in CPCS.

Note: As the document processor reads items, CPCS captures all document data and sends it to direct-access storage. At the same time, it marks each item with an item identification number, using an item-numbering device on the document processor. CPCS assigns this to each codeline data record, establishing the order in which the documents entered the system and an audit trail back to the source of the batch.

System Controls

System controls are in the form of *pass-to-pass operation* controls and *output operation* controls.

Pass-to-Pass Operation

To ensure data integrity in subsequent-pass operations, CPCS includes another form of control, called the ***tracer group***. You establish control groups before entering the original documents by inserting tracer slips between groups of blocks; approximately 10 000 documents constitute a tracer group. When CPCS detects a tracer group on any pass, it creates a pass-to-pass control record.

This record is a summary of all items within the tracer group and it serves as the basis for pass-to-pass controls. A minimum number of tracer slips is necessary for each tracer group to sustain pass-to-pass control. The required number of tracer slips is derived from the number of rehandle passes necessary for full endpoint distribution.

One tracer slip goes to the system reject pocket during each rehandle pass to associate rejected documents with their tracer group. Therefore, the total dollar amount of the checks that follow the tracer slip in the system-reject pocket plus the sum of the checks correctly sorted in a given rehandle pass equals the total number of checks in the tracer group for the pocket that contained these items on the prior pass.

Use of the tracer group enables the system to locate and keep track of all discrepancies, permitting the physical sorting of documents on the next pass before the current pass is balanced. The tracer group retains its identity throughout the system flow. It maintains the control required in the processing of multiple passes using multiple document processors.

Output Operation

The result of CPCS processing is a series of endpoint strings. Endpoint strings can be used internally for posting to accounts or can be sent to other financial institutions. CPCS establishes controls over each group. The placement of the divider slip determines the size of the group.

When CPCS distributes a divider slip to each pocket, it creates a kill-bundle record containing the item count and dollar total of the bundle. This control record establishes an association between printed lists and the kill bundles and provides a summary report of all kill bundles destined for a common endpoint. During master create, CPCS assigns an outgoing sequence number to every item within a kill bundle. This sequence number gives CPCS an additional control that facilitates adjustments and investigations after the processing cycle is complete. Therefore, every transit item that the system processes has an incoming item number and an outgoing kill-bundle or sequence number.

Chapter 4. Using the Online Adjustments Function

CPCS Release 11 uses a balancing function previously provided as the Online Adjustments II program. This balancing function does not allow full use of all the CPCS Release 11 enhancements (the limitations are described below).

This chapter discusses the limitations of the program and describes the following modules of the Online Adjustments balancing function:

- Adjustments entry (DKNADJ)
- Trial balance (DKNTBAL)
- Adjustments list (DKNALST).

For a detailed description of the Online Adjustments function and complete operating instructions, see the *CPCS Online Adjustments Guide*.

Overview

The Online Adjustments balancing function lets you correct mass-data-set errors found in the CPCS reconciliation process. This function processes updated M-string information to provide a balanced, accurate, all-items file for analysis and account posting.

Adjustments Entry

The adjustments entry module (DKNADJ) provides screens for data entry, tracer balancing, and adjustments item display. You can use this module to make corrections to the errors that exist in the data set until the tracer is in balance or until you can force-balance the tracer.

TBAL (Trial Balance) Final Merge

You can use the trial balance module (DKNTBAL) for an entry or a subset of an entry after all the tracers are in balance, or you can force-balance the entry using the adjustments entry feature.

If the entry is in balance, DKNTBAL creates an updated M-string with all the corrections. By producing the updated M-string, you eliminate the need to merge the adjustments M-string with the original M-string.

Adjustments List

The adjustments list module (DKNALST) provides you with an audit-trail list of adjusted items. This list helps your management staff to identify the most common sources of errors and to make the appropriate operational improvements. The most common sources of errors are missing items, extra items, misreads, and encoding errors.

Limitations

In CPCS Release 11, the Online Adjustments balancing function provides limited support for processing new fields. Although the function allows you to make adjustments, similar to earlier releases of CPCS, it does not allow adjustments to optional MICR field 4 or fields 9 through 15.

You can use optional field 4, between the opening account-number field and the routing and transit number field, as the closing account-number field.

The Online Adjustments balancing function recognizes batch controls as the lowest level of control. The function does not allow adjustments for sub-batch balancing.

Glossary

This glossary defines important terms and abbreviations used in this manual. If you do not find the term you are looking for, see the *IBM Dictionary of Computing*, SC20-1699.

A

account number field. An encoded field, on a check or deposit slip, that represents the account number of the item.

adjustment. A change, or a description of a change, that has been made to show a detected error in work that has been processed.

advice. (1) A written form or verbal order from which an electronic entry can be posted to an account (that is, a credit or debit advice). (2) A written acknowledgment or notice of a particular transaction.

amount field. An encoded field on an item that represents the amount of that item.

automatic restart. The process of restarting an interrupted entry without having to find and rebatch any items.

auxiliary on-us field. See *serial number field*.

B

balancing. The act of bringing two sets of related figures into agreement, for example, accumulated detail totals equal input control totals.

batch. The lowest required group of documents that has dollar control established by a control document. A batch normally consists of 500 or fewer documents.

batch number. The number that uniquely identifies a specific batch of documents.

block. (1) A prime-pass control level consisting of one or more batches. CPCS uses this control level to total multiple batches. (2) Work from a specific source.

C

capture. (1) To read the code line that is inscribed on a document. (2) In the &hpts. system, full-item images can be captured by the Image Capture System attached to the document processor or by a low-speed scanner attached to a workstation.

cash letter. An interbank transmittal form, resembling a deposit slip, used to accompany cash items sent from one bank to another.

cash letter summary. A listing that summarizes kill lists by giving dollar and item controls for each kill list.

check. A draft drawn on a financial institution and payable on demand any time on or after the date indicated.

Check Image Management System (CIMS). An IBM licensed program that stores, retrieves, and manages document images.

CIMS. Check Image Management System.

code-line data matching. A method by which a computer system controls items on a detail level by comparing internal data records read from a prior pass with data read from the item on the current pass. Code-line data matching occurs on subsequent operations.

concurrent kill. Producing kill lists for kill pockets in an entry before the entire entry is processed. The concurrent kill feature is available only with subset processing.

concurrent processing. A method of processing in which two or more jobs seem to be processed at the same time. Actually, the instructions of all the jobs are processed one at a time, alternating to make the most efficient use of the system. Also called *multitasking*.

control block. A storage area that a computer program uses to hold control information.

control document. An encoded document that contains control information, such as the monetary amount of the checks that the document controls, the source of the checks, and a code that describes the level of control.

control slip. An encoded document that contains control information (the amount of the items that the document controls and the source of the items) and a code describing the level of the control.

control total. The total dollar value or item count for a group of documents.

correspondent financial institution. A financial institution that carries a deposit balance for, or engages in an exchange of services with, another financial institution.

cutoff. The financial institution's designated point for balancing or releasing work before processing continues. Also, the designated time after which the financial institution cannot accept work for processing.

cycle. (1) A group of work, or an identification of a group of work, processed as a single entity. (2) A convenient grouping of work. A cycle normally contains a variable number of entries.

D

DASD. Direct access storage device.

data preparation. Preparation of documents for processing by a high-speed system.

data record. Items of information organized on the basis of their use in an application, as determined by the user.

data set. A single collection of data that can be stored on cards, a tape, or one or more disks. Examples of data sets are the kill bundle data set and the master data set.

deferred printing. The method by which data is processed, transferred to a storage device, and later printed (as opposed to printing during the processing of data).

deposit slip. A document that details a deposit. The total of the deposit is encoded on the deposit slip.

direct access storage device (DASD). A device in which access time is independent of the location of the data.

distributed string (D-string). The distribution task reads I-strings that the MICR task creates and produces D-strings. Each D-string contains the records that correspond to all documents in a single pocket of the document processor.

divider slip. A control document that is used to separate kill bundles during machine sorting of the checks. It can also be used to support the resynchronization of code-line data matching during subsequent-pass processing.

document processor. A device that can read encoded digits and control characters from documents and sort the documents into multiple pockets.

D-string. Distributed string.

E

encode. The process of inscribing a code in magnetic ink on a document to represent individual characters or groups of characters. The CPCS database contains the information that is encoded.

encoder. A machine that encodes.

endorsement. The signature of the endorser if a person; the stamp if a financial institution or company.

endorser. (1) A person or financial institution other than the maker who presents a check for payment. (2) A device that stamps an endorsement.

endpoint. The destination of a check.

enhanced prime. The capture of multiple entries on a single prime pass without the use of subsets.

entry. A variable number of tracer groups that are processed as a single group of work.

entry number. The number of the first tracer group within the entry.

EPC. Extended process control field.

error description. A detailed error description that is created, detected, and corrected by the processing financial institution.

extended process control field (EPC). An optional encoded field, on an item, that indicates special handling (such as return or truncation).

F

fine sort. Offline manual sorting of bank documents.

float. The portion of the financial institution's total deposits or of a depositor's account that represents items (checks, coupons) in the process of collection.

full page format. A method of page formatting in which items are listed in columns (for example, the first 50 items in column 1, the second 50 in column 2, and so on), printing as many columns as will fit on a page.

funds availability. The portion of the financial institution's total deposits or of a depositor's account that represents items (checks, coupons, and so on) that have been collected and are now available. This includes cash deposited and checks drawn on the depositor's financial institution.

G

generated total. The total dollar value or the total count of items processed by the computer.

H

High Performance Transaction System.
See *ImagePlus High Performance Transaction System*.

high-speed reject reentry (HSRR). The reentering into the document processor of reconditioned items that previously sorted to the system reject pocket (1-1).

holdover. Items that are held for the next processing cycle.

HSRR. High-speed reject reentry.

I

image. The captured facsimile (picture) of an item represented in digital form suitable for computer processing and storage.

ImagePlus High Performance Transaction System. A system that adds image-processing capabilities to document processing.

incoming sequence number. A number that defines the incoming sequence of an item within the input stream. This unique number is associated with the item throughout the entire cycle of computer processing.

input string (I-string). This is a string of documents that the MICR task creates. On each document processor run, an I-string is created. The string includes every document read by the document processor, including control documents and rejected documents. Each record contains related information, such as the pocket selected. The string also includes internally-generated control records.

inscriber. A machine that encodes.

I-string. Input string.

item. A check, deposit slip, or other machine-readable document.

item number. A number that is associated uniquely with a document throughout the processing cycle.

J

jam. A condition that exists when items form a blockage anywhere in the transport mechanism of a document processor.

JCL. Job control language.

JES. Job entry subsystem.

job control language (JCL). A control language used to identify a job to an operating system and to describe the job's requirements.

job entry subsystem (JES). A system facility for spooling, job queuing, and managing input and output.

joggler. A device that straightens and aligns items before high-speed sorting, principally to line up the lower edges and the right sides of a group of documents. This device is an integral component of some document processors.

K

kill. To process items to a point where no further distribution is required.

kill bundle. A group of killed items indicated by divider slips.

kill list. A document that accompanies a kill bundle, listing detail and controls for the items.

kill pass. A pass on which items are distributed to their endpoint pockets.

kill pocket. A document processor pocket assigned to killed items.

L

link-edit. To use a linkage editor to create a loadable computer program.

listed and not enclosed. A condition that exists when an item is listed on an incoming kill list or inscriber tape but is not enclosed in the kill bundle.

logical unit (LU). A port through which a user accesses SNA-network functions to communicate with another user on the network.

low-speed transit. The manual sorting and processing of checks.

LU. Logical unit.

LU 6.2. Logical unit 6.2 protocol.

LU 6.2 protocol. An SNA service that receives requests from users and from the system services control point. This service provides session management and other services for sessions between two logical units.

M

magnetic ink character recognition (MICR). Character recognition of characters that are printed in ink that contains particles of magnetic material.

maker. The person on whose account a check is drawn.

mass data set (MDS). A file that contains images of all active document strings. This file consists of two direct access storage data sets; a directory index and an image data set.

master list. A list of all items that are read during a computer pass.

MDS. Mass data set.

merged string (M-string). DKNMRGE produces the M-string that represents the merging of images from the prime pass I-string with corrected reject data. Reports that result from the M-string let you reconcile and balance input to make sure that all items are captured.

MICR. Magnetic ink character recognition.

misread. A condition that occurs when a document processor interprets a character as a good character other than that which actually appears on the document's code line.

missort. An item that goes to a pocket other than the pocket to which it was supposed to be sorted.

M-string. Merged string.

multitasking. See *concurrent processing*.

O

OCR. Optical character recognition.

OLRR. Online reject reentry.

online fine sort. A computer-controlled sorting (for on-us checks) of account-number sequence, serial-number sequence, or both, used for filing. This process can use image-processing techniques.

online reject reentry (OLRR). Manual entry or correction of data through a display terminal.

on-us checks. Checks drawn on the financial institution that is processing them.

optical character recognition (OCR). A character recognition system or device that uses optical means to identify graphic characters.

optional field 1. An optional field used by some financial institutions for check truncation. It can also be used for other internal purposes.

optional field 2. See *extended process control field*.

outgoing sequence number. A unique sequence number assigned to each item or image, identifying the kill bundle in which the item left the financial institution.

P

pass. A single reading and sorting of a group of items and control documents on a document processor.

pass-to-pass control. A process that maintains dollar and item control of a group of documents on later passes, after control has been established on the prior pass.

piggyback. An item missing from its assigned pocket in a sorter and sorted "free" to an unidentified pocket, as when one document attaches itself to or overlaps another during processing.

pocket 1-1. See *system reject pocket*.

prime pass. The first pass of an entry.

printing after the fact. See *deferred printing*.

process control field. (1) An encoded field on a document, usually representing the type of document. (2) Transaction code.

proof of deposit. The act of totaling items at the deposit level and ensuring that the total of the credits equals the total of the debits.

R

RACF. Resource access control facility.

reconcile. To find and correct the cause of a difference between two sets of totals.

rehandle pocket. A document processor pocket that receives items for multiple endpoints. Items directed to rehandle pockets are processed again on a later pass.

reject. An encoded document that the document processor cannot read in its entirety or that fails certain editing checks. The document processor directs the document to a special pocket called a reject pocket.

reject string (R-string). An R-string represents checks that are reentered through a terminal. The online reject reentry task creates R-strings. R-strings are input to the DKNMRGE task.

rerun. A group of items that are sorted into a pocket on one pass and later brought into a document processor for further sorting.

return item. A check, not honored by the maker's financial institution, returned to the depositor's financial institution.

resource access control facility (RACF). An IBM licensed program that provides access control to a system by identifying and verifying the users for that system, authorizing access to protected resources, logging the detected unauthorized attempts to enter the system, and logging the detected accesses to protected resources.

routing number field. An encoded check field that represents the financial institution on which the check is drawn.

R-string. Reject string.

S

sequence number. An assigned number that uniquely identifies the document's position in a group of incoming or outgoing work.

serial number field. An encoded check field that represents the serial number of that check. Synonymous with auxiliary on-us field.

settlement. The act of bringing sets of related figures from two financial institutions into agreement. Adjustments are made to offset the differences.

sorter. See *sorter station*.

sorter station (also document-processor station). A workstation consisting of a document processor and a terminal for operator communications.

sort pattern. A table used by the sort routine to determine the pocket to which a check should go.

sort routine. A time-dependent routine that does all processing required to direct a document to a specific document processor pocket.

string. (1) The data records that represent a group of items entered through a physical or simulated document processor, or through OLRR. (2) A group of data records associated with a specific document processor pocket. See *distributed string, input string, merged string, reject string*.

subset processing. Processing a portion of an entry beyond the document entry step before the whole entry is run through the document processor.

subsequent pass. A pass on which previously sorted items are re-sorted for further distribution.

subset string. A predefined group of data records that represents a portion of the physical items in an entry. A tracer group defines a subset string. A subset string can contain multiple tracer groups.

system reject pocket. The first physical pocket on the document processor. CPCS uses it to hold machine and user-selected rejects.

T

total system. A system that uses the computer for all phases of an operation.

tracer. A document used to provide pass-to-pass control.

tracer group. An arbitrary grouping of items for control purposes.

transit. The sorting of checks to external destinations.

V

virtual storage access method (VSAM). An access method for indexed or sequential processing of fixed or variable-length records on direct access storage devices.

VSAM. Virtual storage access method.

Z

zero balancing. The procedure that ensures that generated totals for a group of items plus any documented errors minus the control total equals zero.

Numerics

3890/XP Document Processor. A document processor in the 3890/XP Series of document processors that can read and sort documents at a rate of 2400 documents per minute.

3890/XP Series document processors. A series of high-speed document processors that can read and sort 1000, 1700, or 2400 documents per minute. These document processors consist of the IBM 3890/XP Document Processor, the IBM 3891/XP Document Processor, and the IBM 3892/XP Document Processor.

3891/XP Document Processor. A document processor in the 3890/XP Series of document processors that can read and sort documents at a rate of 1700 documents per minute.

3892/XP Document Processor. A document processor in the 3890/XP Series of document processors that can read and sort documents at a rate of 1000 documents per minute.

3892/XP Power Encoder Feature. An optional device that can be attached to the 3892/XP Document Processor to encode the MICR code-line field on a document.

Bibliography

The publications in this bibliography contain information related to CPCS.

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The following publications are related to the ACF/VTAM product:

IBM ACF/VTAM Version 3 Programming, SC23-0115

IBM ACF/VTAM Planning and Installation Reference, SC27-0584

IBM ACF/VTAM, 5735-RC2, 5746-RC3, Program Operator's Guide, SC38-0257.

Document Processor Support Publications

The following publications are related to document processor support:

IBM 3890/XP Series Document Processor General Information, GA34-2012

IBM 3890/XP Series Programming Guide, GC31-2662

IBM 3890/XP Series SPXServ Reference, GC31-2704

IBM 3890/XP MVS Support and IBM 3890/XP VSE Support Program Reference, SC31-2654 (TNL SN31-8160)

IBM 3890/XP Series Stacker Control Instructions Reference, SC31-2703.

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The following publications are related to OS/390:

IBM OS/390 MVS Initialization and Tuning Reference, GC28-1752

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MVS Publications

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The following publications are related to Version 3 Release 2 of the VTAM product:

IBM SNA Transaction Programmer's Reference Manual for Logical Unit Type 6.2, GC30-3084

IBM VTAM Programming for LU 6.2, SC30-3400. Trademark of IBM

Note: Several of these manuals also contain information about VTAM Version 3 Release 1.2 for VM and VSE, Version 3 Release 1.1 for MVS and VM, and Version 3 Release 1 for VSE.

Other IBM Publications

The following publications provide information about topics related to CPCS:

IBM 3270 Information Display System 3274 Control Unit Description and Programmer's Guide, GA23-0061

IBM 3270 Information Display System Customizing Guide Supplement for 3274 Control Unit, GC11-6045

IBM System/370, 30xx, 4300, and 9370 Processors: Bibliography of Industry Systems and Application Programs, GC20-0370

IBM Data Facilities/Data Set Services User's Guide and Reference, SC26-4125.

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