

**IBM System/3  
Disk System  
Utility Program for the  
IBM 1255 Magnetic Character Reader  
Reference Manual**

**Program Number 5702—UT2**

**Program Product**

SC21-7521-4

#### **Fifth Edition (September 1972)**

This is a major revision of, and obsoletes SC21-7521-3 and Technical Newsletter SN21-7596. Changes have been made in this manual to support the IBM 3410/3411 Magnetic Tape Drive. Changes are indicated by a vertical line at the left of the change; added or extensively revised illustrations are denoted by the symbol ● at the left of the caption.

This edition applies to version 07, modification 00, of the IBM System/3 Model 10 Disk System 1255 Utility Program, Program Product 5702-UT2, and to all subsequent versions and modifications until otherwise indicated in new editions or Technical Newsletters.

Changes are continually made to the specifications herein; before using this publication in connection with the operation of IBM Systems, consult the latest IBM System/3 Newsletter, Order Number GN20-2228 for the editions that are applicable and current.

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This publication describes the IBM System/3 1255 Magnetic Character Reader Utility Program and how to use that program.

The Utility Program is designed for use in demand-deposit banking applications. It enables the user to control the processing of documents on an IBM 1255 Magnetic Character Reader that is attached to an IBM System/3 Model 10 Disk System.

The Utility Program enables the user to:

- Read selected information from documents.
- Sort documents into selected stackers.
- Accumulate amounts.
- Keep track of the number of documents processed.
- Print information from documents.
- Print accumulated amount totals.
- Store information from documents on disk or tape to be available as input to other programs.

This manual describes utility program specifications, operating procedures, program halts and error messages, a specifications example, and a sample program. This publication is written for a person with limited data processing knowledge and experience, but a person who is acquainted with the IBM System/3 Model 10 Disk System and the IBM 1255 Magnetic Character Reader. It is assumed that the user has read the following manuals:

- *IBM 1255 Magnetic Character Reader Component Description, GA24-3542.*
- *IBM System/3 Disk System Introduction, GC21-7510.*

# Contents

How This Manual Is Organized . . . . .	iii	Reserved (Columns 31-36) . . . . .	27
<b>CHAPTER 1. IBM SYSTEM/3 UTILITY PROGRAM</b>		Modulus Check (Columns 37-47) . . . . .	27
FOR 1255 . . . . .	1	EOF/Control Field (Column 48) . . . . .	28
Input Documents . . . . .	1	Control Document Contents (Columns 49-58) . . . . .	28
Output Produced By Utility Program . . . . .	3	End-of-File Document Contents (Columns 59-68) . . . . .	28
Sorted and Stacked Documents . . . . .	3	Print Line Length (Columns 69-71) . . . . .	28
Printed Listing of Specifications . . . . .	3	Stacker Code (Column 72) . . . . .	28
Printed Listing of Documents . . . . .	3	Reserved (Columns 73-95) . . . . .	28
Disk and Tape Records . . . . .	3	System Specification (Column 96) . . . . .	28
IBM 1255 Magnetic Character Reader . . . . .	4	Stacker Specifications . . . . .	29
System Requirements . . . . .	4	Sequence Number (Columns 1-2) . . . . .	29
<b>CHAPTER 2. USING THE UTILITY PROGRAM</b> . . . . .	7	Stacker Number (Columns 3-4) . . . . .	29
Determining That Specifications Are in Proper Sequence . . . . .	9	Validity or Presence Check (Columns 5-9) . . . . .	29
Specifying Fields That Are to be Read . . . . .	9	Reserved (Columns 10-11) . . . . .	30
Specifying Fields to be Printed . . . . .	10	Field Comparison Tests (Columns 12-28, 29-45, 46-62, 63-79, 80-96) . . . . .	30
Verifying Account Numbers . . . . .	11	Number of Stacker Specifications . . . . .	31
Using 1255 Self-Checking Feature . . . . .	11	Summary of System and Stacker Specifications Entries . . . . .	32
Using Utility Program Modulus Checking . . . . .	11	<b>CHAPTER 4. TIMING CONSIDERATIONS</b> . . . . .	35
Specifying Document Count Condition . . . . .	12	Document Processing Rate Formulas . . . . .	35
Stopping the 1255 (S-Stop) . . . . .	13	Example of Estimating Document Processing Time . . . . .	36
Routing a Control Document (I-Indicate) . . . . .	13	Operator Intervention Conditions . . . . .	38
Routing Documents to Alternate Stacker (A-Alternate) . . . . .	14	<b>CHAPTER 5. EXAMPLE OF SPECIFICATION USE</b> . . . . .	39
Defining Control and End-of-File Documents . . . . .	14	<b>CHAPTER 6. OPERATING PROCEDURES</b> . . . . .	45
Control Documents . . . . .	15	Preparing the OCL Job Stream . . . . .	46
End-of-File Document . . . . .	15	Reading Job Stream from MFCU . . . . .	50
Defining The Documents . . . . .	16	Starting the 1255 . . . . .	50
Specifying Stacker Numbering on the 1255 . . . . .	18	<b>CHAPTER 7. CHECKING AND ERROR DETECTION</b> . . . . .	53
Selecting Stackers . . . . .	18	Errors in Utility Program Specifications . . . . .	53
Stacker Number . . . . .	18	Document Errors Detected by the 1255 . . . . .	59
Field Validity or Presence Check . . . . .	18	Halt Codes . . . . .	60
Field Comparison Tests . . . . .	19	Error Conditions That Occur During Processing . . . . .	61
Field Length Validity Check . . . . .	20	<b>CHAPTER 8. SAMPLE PROGRAM</b> . . . . .	63
Creating and Using Disk and Tape Files . . . . .	22	Using the Sample Program . . . . .	63
Track Allocation . . . . .	24	Input Documents . . . . .	63
<b>CHAPTER 3. SYSTEM AND STACKER SPECIFICATIONS</b> . . . . .	25	System and Stacker Specifications . . . . .	63
System Specifications . . . . .	25	Operation Control Language . . . . .	63
Sequence Number (Columns 1-2) . . . . .	25	Output . . . . .	63
Document Count Condition (Columns 3-6) . . . . .	25	<b>APPENDIX. DEBUGGING TEMPLATE</b> . . . . .	67
Reserved (Columns 7-8) . . . . .	27	<b>INDEX</b> . . . . .	69
Fields to be Printed (Columns 9-13) . . . . .	27		
Reserved (Columns 14-15) . . . . .	27		
Field Definition (Columns 16-18, 19-21, 22-24, 25-27, 28-30) . . . . .	27		



## HOW THIS MANUAL IS ORGANIZED

This publication is divided into eight sections.

*Chapter 1* introduces the Utility Program and its uses, and describes the input to and the output from the program.

*Chapter 2* describes how to prepare specifications for using the Utility Program. It discusses the relationship among specification entries, and provides the background for the remainder of the publication. The user should be familiar with the contents of this chapter before proceeding to Chapter 3.

*Chapter 3* contains detailed entry-by-entry descriptions of the specifications necessary for the Utility Program. The entries are described as they appear on the specifications. This section assumes knowledge of Chapter 2 and is primarily a reference section to be used when preparing specifications for a job. A quick reference chart is included.

*Chapter 4* provides formulas for projecting the time required for an application.

*Chapter 5* contains an example of system and stacker specifications for a job.

*Chapter 6* contains procedures for operating a 1255 attached to an IBM System/3 Disk System.

*Chapter 7* contains a description of error detection and the halts and messages produced by the utility program.

*Chapter 8* explains how to prepare a sample program that can be used for demonstrating the 1255 utility program on the IBM System/3 Disk System.



The IBM System/3 1255 Utility Program is a disk-resident program that enables the user to control the processing of documents on an IBM 1255 Magnetic Character Reader that is attached to an IBM System/3 Model 10 Disk System.

The IBM 1255 is designed for use in demand-deposit banking applications. It reads documents imprinted with magnetic ink characters. Such documents are called MICR-encoded documents. MICR refers to magnetic ink character recognition.

By providing specifications to the utility program, you can request that the program:

- Read selected information from MICR-encoded documents.
- Check account numbers for validity (using modulus checking).
- Sort documents into stackers.
- Accumulate amount totals and a count of the documents for each stacker (except the reject stacker) and for the entire job.
- Print accumulated totals.
- Print information from documents.
- Store information from documents on disk or tape records, which then can be used as input to other programs.

Specifications are of two types:

1. Those that describe the input and output files and the processing to be performed (system specification).
2. Those that define what type of documents are to be routed to specific stackers (stacker specifications).

**INPUT DOCUMENTS**

Documents read by the 1255 must contain predefined fields of information printed on them in magnetic ink using the MICR E-13B font. This information is printed near the bottom edge of the document and is read starting from the right edge of the document. The E-13B font must be printed as recommended by the American Bankers Association (A.B.A.) Technical Committee on the Mechanization of Check Handling. Symbols available on the E-13B font are shown in Figure 1.

Each document processed by the utility program may contain five or fewer fields. The number of characters in each field varies, depending on the type of field. Dashes and spaces may be included, but are not counted as character positions. Each document can contain a maximum of 53 characters (45 digits plus 8 special symbols).

E-13B	Graphic
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
. <sup>1</sup> (Amount)	\$
<sup>2</sup> (On-U)	.
<sup>3</sup> (Transit)	<
(Dash)	-

Figure 1. E-13B Font Symbols

An example of a typical document containing the E-13B font symbols is shown in Figure 2. The five possible fields and their maximum lengths are:

- *Amount*, which is a fixed length field of ten or eleven digits. A 10-digit amount field is standard for the U.S.A, but 11 digits are allowed in foreign countries. The amount field must be enclosed by amount ( ⑆ ) symbols.
  - *Process Control*, which is a variable length field of six or fewer digits. The process control field is located to the left of the amount field. It must be followed on the left by the on-us ( ⑆ ) symbol.
- Dashes and spaces are to be ignored when determining the digit portion of a number for sorting. For example, the 3 in the number 113 02-2 is in sort position 4 (reading from right to left).
- *Account Number*, which may be either a fixed length field of five through ten digits, or a variable length field

of ten or fewer digits. The account number field must be preceded by the first on-us symbol and followed on the left by the on-us or the transit ( ⑆ ) symbol.

- *Transit-Routing*, which is a fixed-length field of eight or nine digits. The field must be enclosed by transit ( ⑆ ) symbols. An 8-digit transit-routing field may contain either two 4-digit numbers separated by a dash, or a 3-digit and a 5-digit number separated by a dash. A 9-digit transit-routing field is permitted only if the 1255 is equipped with the dash transmission feature.
- *Serial Number*, which is a variable length field of ten or fewer digits. The field must be enclosed by on-us symbols ( ⑆ ).

Input documents may be paper and cards of varying sizes. Document sizes and characteristics are outlined in Figure 3.

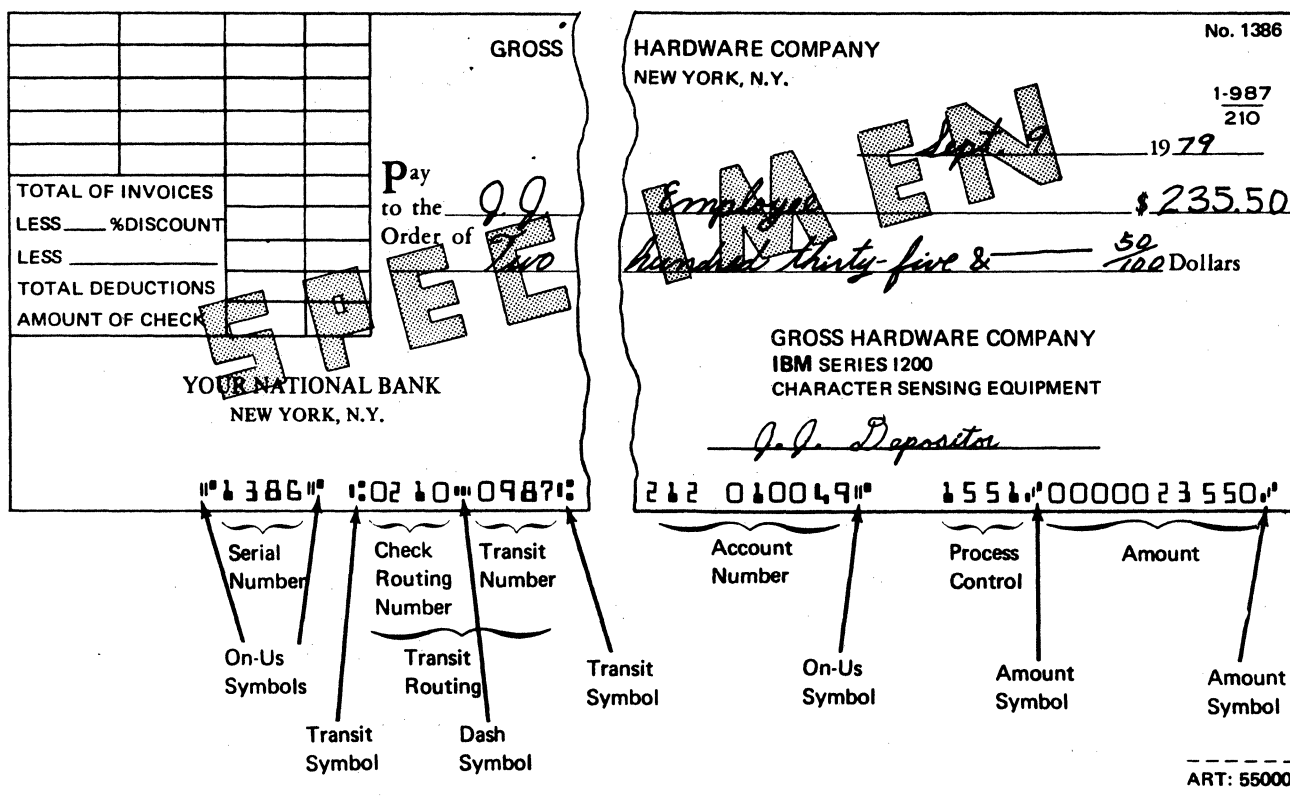


Figure 2. Typical Document: Valid Fields and E-13B Font Symbols



Width	2.5 inches (63.33 mm) through 4.25 inches (107.65mm).
Length	5.750 inches (146.05mm) through 8.875 inches (225.42 mm)
Thickness	0.003 inches (0.076 mm) through 0.007 inches (0.178 mm), and carriers containing a document up to 0.013 inches (0.330 mm).
Weight	Short and long grain 20 through 44 pounds (75 through 165 grams per square meter). (Including card stock and American Express Travelers Checks.)
Maximum Characters	53 characters (45 digits and 8 special symbols).
Maximum Fields	5 fields

Figure 3. Document Size Limits and Characteristics

## OUTPUT PRODUCED BY UTILITY PROGRAM

The utility program produces four types of output:

1. Stacks of sorted MICR-encoded input documents.
2. A printed listing of the system and stacker specifications and any diagnostic messages associated with those specifications.
3. A printed listing containing information from the MICR-encoded documents, accumulated amount totals, and accumulated document count totals.
4. A disk or tape record for each document read.

The form and type of the output is controlled by system and stacker specifications. Each of the types of output is described in the paragraphs that follow.

### Sorted and Stacked Documents

Stacked documents are MICR-encoded input documents after they have been read and routed to specific stackers of the 1255. System and stacker specification entries determine to which stacker a document is to be routed. The stacked documents are not changed.

### Printed Listing of Specifications

Before any documents are read, the system and stacker specifications are checked for incorrect or missing entries. Each specification is printed after it has been read.

If errors in specifications are encountered, the error is noted. Messages explaining the error notes are printed after all specifications have been analyzed.

### Printed Listing of Documents

The utility program always prints certain information about documents on the IBM 5203 Printer. This information includes the number of the stacker into which each document was routed, a total sum of the amount fields of all valid documents read, and a total count of the number of documents read during the job. In addition, the user can specify that certain fields and subtotals are to be printed.

The contents of selected fields from a document and the number of the stacker into which that document was routed make up one *printed record*. Records are consecutively placed on a printed line. The number of records on a printed line depends on the length of the line specified by the user.

Descriptions of how to specify the fields of each document that are to be printed and how to calculate the number of records that can be printed on a line may be found in Chapter 2 under the heading *Specifying Fields to be Printed*.

### Disk and Tape Records

After each document has been read, the utility program creates a disk or tape record for that document. This record contains the contents of all fields present in the document, the stacker into which the document was to be routed, and indicators that tell whether fields in the document are valid or invalid.

All output records for a job are accumulated in a disk or tape file. This file can then be processed by any other IBM System/3 program that is capable of processing disk or tape files.

Disk and tape files are described in Chapter 2 under the heading *Creating and Using Disk and Tape Files*.

## IBM 1255 MAGNETIC CHARACTER READER

The 1255 is available in three models:

Model	1	2	3
Number of stackers	6	6	12
Maximum throughput in documents per minute	500	750	750

When used with the System/3 Model 10 Disk System, the 1255 reads data from MICR-encoded documents, transmits that data to the System/3 processing unit, and then routes the documents to appropriate stackers as determined by the utility program.

The 1255 Model 1 is shown in Figure 4. Its six stackers are arranged in a vertical group to the right of the hopper. The front of the hopper and the stackers are exposed to allow easy access to these areas. The front of the 1255 is angled back to keep documents from spilling.

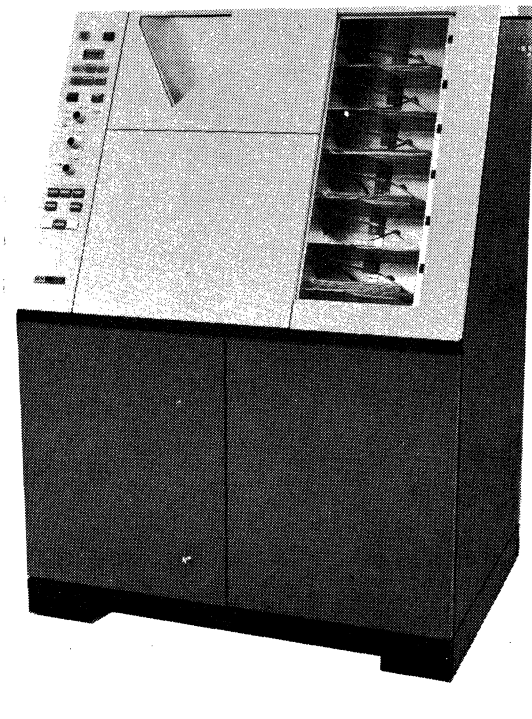


Figure 4. 1255 Model 1 Magnetic Character Reader

Each stacker can accommodate 2-1/2 inches of documents. This is about 800 documents that are 0.003 inches thick.

The following optional features for the 1255 can be used when the 1255 is attached to the IBM System/3 Model 10 Disk System:

- *51-Column Document*, which allows documents shorter than the standard input documents to be read and sorted along with the standard-size documents. The shorter documents may be 4.85 inches or longer. A money order is an example of a short document.
- *Account Number Self-Checking*, which performs a modulus 10 or modulus 11 check on a digit of the account number and informs the utility program when a document has an invalid account number.
- *Dash Transmission*, which by transmitting a dash in the transit-routing field provides the System/3 processing unit with a means of distinguishing between USA and foreign documents that have like numeric digits in the transit-routing field.

## SYSTEM REQUIREMENTS

The minimum configuration required by the utility program is as follows:

1. An IBM System/3 Model 10 Disk System equipped with:
  - An IBM 5410 Processing Unit equipped with at least 12,288 bytes of main storage.
  - An IBM 5424 Multi-Function Card Unit.
  - An IBM 5203 Printer.
  - An IBM 5444 Disk Storage Drive, Model 1.
2. An IBM Serial Input/Output Channel, Feature Code 7081.
3. An IBM 1255 Magnetic Character Reader, Model 1, 2, or 3.

### *Additional Devices Supported*

- An IBM 1403 Printer, Model 2 or N1. This printer can replace the IBM 5203 Printer.
- An IBM 5471 Printer Keyboard. This device can be used instead of the MFCU for entering Operation Control Language (OCL) statements and utility program specifications.
- An IBM 5445 Disk Storage Drive. (Use of this device with the utility program requires a Processing Unit equipped with at least 16,384 bytes of main storage.)
- An IBM 3410/3411 Magnetic Tape Drive. The 3410/3411 can be used instead of the 5444 or 5445 for output records. (Use of the 3410/3411 utility program requires a processing unit equipped with at least 16,384 bytes of main storage.)

The 1255 Utility program operates under the control of the IBM System/3 Model 10 Disk System. The utility program will also operate on systems with the dual programming feature; but, in this case, the utility program must be the only program operating at the time. The remaining program level must not be used.



System and stacker specifications are used to describe each job to be done by the utility program. Only one system specification is permitted for a job. This specification must precede all stacker specifications for that job.

As many stacker specifications as desired can be entered for a job. One or more stacker specifications must be entered for each stacker used, except when stackers are used in an alternating manner. The alternating stacker concept need not be understood at this point. It is described later in this chapter under the heading *Specifying Document Count Condition*.

System and stacker specifications either are to be punched into appropriate columns of 96-column cards, or are to be entered through the IBM 5471 Printer Keyboard. For the procedures necessary to make the specifications available to the utility program, see Chapter 6: *Operating Procedures*.

Preparing system and stacker specifications for a job involves some or all of the following steps:

- Determining that specifications are in proper sequence.
- Specifying fields to be read.
- Specifying fields to be printed.
- Verifying account numbers.
- Specifying document count condition.
- Defining control and end-of-file documents.
- Specifying stacker numbering of the 1255.
- Selecting stackers into which documents are to be routed.

The remainder of this chapter describes how you can complete the system and stacker specifications for each of these steps and how the specification entries relate to one another. Detailed descriptions of each specification entry are contained in Chapter 3: *System and Stacker Specifications*.

Each specification is printed after it has been read. You can cause comment lines to be printed among the specifications by preceding a comment with an asterisk (\*) in position 1 of the card or statement entered as input.

To aid you in preparing system and stacker specifications, IBM has a form (GX21-9101) containing pre-printed headings that identify the information that can be placed in each column of a specification record. This form is depicted in Figure 5.

Figure 5. System and Stacker Specifications Form

International Business Machines Corporation  
**SYSTEM/3 SPECIFICATIONS**  
**FOR 1255 UTILITY**

Form X21-9101  
 Printed in U.S.A.

Date \_\_\_\_\_

Program \_\_\_\_\_

Programmer \_\_\_\_\_

Punching Instructions	Graphic						
	Punch						

Sheet	of
-------	----

**System Specification**

Sequence Number	Document Count	Condition	Action-S/I/A	Fields To Be Printed					Field Definition					Reserved	Modulus Check		Control Document Contents	End-of-File Document Contents	Print Line Length	Stacker Code - 4/8/A	Reserved	System Specification																																																																													
				Field 1	Field 2	Field 3	Field 4	Field 5	Field 1	Field 2	Field 3	Field 4	Field 5		Modulus No.	Weighting Factor (Account Number)							EOF/Control Field No.																																																																												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00

**Stacker Specifications**

Sequence Number	Stacker Number	Validity or Presence Check (N or P)					Field Comparison Tests																																																																																												
		Field 1	Field 2	Field 3	Field 4	Field 5	Test 1				Test 2				Test 3				Test 4				Test 5																																																																												
Reserved	Field Number	Relative Pos.	Field Length	Not - N	Compare - E/L/G	Test Characters	Field Number	Relative Pos.	Field Length	Not - N	Compare - E/L/G	Test Characters	Field Number	Relative Pos.	Field Length	Not - N	Compare - E/L/G	Test Characters	Field Number	Relative Pos.	Field Length	Not - N	Compare - E/L/G	Test Characters	Field Number	Relative Pos.	Field Length	Not - N	Compare - E/L/G	Test Characters																																																																					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00

## DETERMINING THAT SPECIFICATIONS ARE IN PROPER SEQUENCE

For convenience, you can assign a 2-digit number to each specification card in a job and use that number to keep the specification cards in numeric sequence. These numbers are particularly valuable in putting cards back into sequence after they have been accidentally dropped or upset. Documents may be sorted incorrectly if specification cards are not placed in the proper order.

Sequence numbers may be entered in columns 1 and 2 of the specification cards. If sequence checking is not desired, place 99 in columns 1 and 2 of the system specification.

As specification cards are being processed, the utility program checks to determine if the sequence number of each successive card being processed is greater than the sequence number of the preceding card. If the sequence number of a card is not greater than the sequence number of the card preceding it, a note indicating this condition is printed on the output listing.

Since only one system specification is required for a job and since this system specification must precede all stacker specifications for that job, you should assign the lowest sequence number used in the job to the system specification card.

If a system specification is not the first specification in the job, the utility program treats all specifications as comments until a /\* Operation Control Language statement is found. Specifications treated as comments are not processed but merely printed on the output listing.

## SPECIFYING FIELDS TO BE READ

Before documents can be processed, you must define the characteristics of the fields that are to be read from those documents.

As mentioned previously, a document that is to be processed can contain as many as five fields: amount, process control, account number, transit-routing, and serial number. The utility program refers to these fields by number rather than by name, as follows:

Number	Field Name	Allowable Length
Field 1	Amount	Ten or eleven digits.
Field 2	Process Control	Six digits or less.
Field 3	Account Number	Ten digits or less.
Field 4	Transit-Routing	Eight digits.
Field 5	Serial Number	Ten digits or less.

If the dash transmission feature is attached to the magnetic-character reader, an additional digit is included in the transit-routing field to accommodate the dash.

Columns 16-30 of the system specification are used to identify fields that are to be read from a document. These

columns are collectively referred to as the *Field Definition* entry.

The Field Definition entry is divided into five subentries, each of which is three columns long. Each subentry is associated with a particular field. The subentries appear as follows on the system specification:

Field Definition														
Field 1			Field 2			Field 3			Field 4			Field 5		
For V	Length		For V	Length		For V	Length		For V	Length		For V	Length	
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Subentry			Subentry			Subentry			Subentry			Subentry		

The first column of a subentry defines whether the field is fixed (F) in length for all documents to be read or whether it varies (V) in length from one document to another. The second and third columns define the length of the field. If the length of the field varies among the documents being read, these columns must contain the maximum length of the field, otherwise, the field may be found invalid. Special symbols, such as dashes, should not be included as part of the defined length. (A dash is to be included as part of the field length for the transit-routing fields only when the dash transmission feature is used.)

If a field is not to be read, the subentry corresponding to that field must be left blank. If invalid information is placed in the columns for a subentry, the subentry is ignored.

A properly completed subentry indicates that the corresponding field is to be read. For example, if only the account number is to be read, you must complete the subentry for Field 3 (columns 22-24) and leave the subentries for Fields 1, 2, 4, and 5 blank. Assuming that all account numbers are of fixed length and consist of ten digits, you would enter the following information as the subentry for Field 3:

Field 1			Field 2			Field 3			Field 4			Field 5		
For V	Length		For V	Length		For V	Length		For V	Length		For V	Length	
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
						F	10							

Now, suppose you had another job in which you wanted to read five fields consisting of the following:

- Amount: 10 digits, fixed length
- Process Control: 0-6 digits, variable length
- Account Number: 10 digits, fixed length
- Transit-Routing: 8 digits, fixed length (assume that the dash transmission feature is not present)
- Serial Number: 6 digits, fixed length

In this case, you would complete the Field Definition entry as follows:

Field Definition														
Field 1			Field 2			Field 3			Field 4			Field 5		
F or V	Length		F or V	Length		F or V	Length		F or V	Length		F or V	Length	
F	10		V	06		F	10		F	08		F	08	
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

### SPECIFYING FIELDS TO BE PRINTED

Certain information about documents is always printed on the System Printer. This includes the number of the stacker into which each document was routed and, at the end of the job, the document count and amount field totals.

In addition, you may request that certain fields are to be printed from each document that has been read. Columns 9 through 13 of the system specification are used for this purpose. Enter a P in the column that corresponds to the field you want printed. You need not print all fields from a document.

Each printed record will contain both the fields you have specified and the number of the stacker into which the document was routed. Fields are printed from left to right in the order they appear on the input document; that is, field 5 is printed first, followed by fields 4, 3, 2, and 1.

If an invalid digit has been read from a field, an asterisk (\*) is printed in the position of the invalid character and the entire field is considered to be invalid (see *Field Validity or Presence Check* later in this chapter).

An R (reject) is printed if the document was routed to the reject stacker by the utility program. An AR (automatic reject) is printed if the document was routed to the reject stacker by the 1255. A PR (parity check reject) is printed if the document was routed to the reject stacker because information from it was not properly transmitted to the utility program by the 1255. An LR (length reject) is printed if the 1255 transmitted more characters than

requested. This condition is usually caused by depressing the wrong VALIDITY CHECK AND READOUT keys on the 1255 console. Documents routed to the reject stacker are not included in any accumulated totals.

For example, if you only want the amount and account number fields printed, enter a P in column 9 (for Field 1 which is the amount field) and a P in column 11 (for Field 3 which is the account number field).

Assuming that the account number for a document is 22084-2670, the amount is \$56.70, and the stacker used for that document is 2, the printed record will appear as follows:

SK	FLD3		FLD1	
02	220842670		0000005670	

ART: 55016

The number of characters that can be printed on a line varies anywhere from four characters through the maximum number of characters that can be printed on a line by the printer being used. This maximum number may be 96, 120, or 132. In columns 69-71 of the system specification, you may indicate the number of characters to be printed per line by the printer being used. These columns make up the "Print Line Length" entry.

Each printed line contains as many records as can be placed on that line. You can determine the number of records that will be printed on each line by doing the following arithmetic:

1. Add one to the length of each field to be printed. (If three fields are to be printed whose lengths are 6, 3, and 10 respectively, the expanded lengths would be 7, 4, and 11.)
2. Add the expanded lengths. (Using the lengths calculated in step 1, this total would be 22.)
3. Add 3 to allow for the stacker number to be printed and for a space between records. (Using the total calculated in step 2, this new sum would be 25.)
4. Divide the sum calculated in step 3 into the value specified in the Print Line Length entry (columns 69-71), and ignore the remainder. The result is the number of records that would be printed per line. (Using the sum calculated in step 3, and assuming that 96 was specified in columns 69-71, the answer would be 96 divided by 25 which equals 3. Three records would be printed per line. The remaining space on a line would be blank and the next record would be printed on the following line.)



## VERIFYING ACCOUNT NUMBERS

An account number can be verified by one of two methods:

1. Use the account number self-checking feature on the 1255, or
2. Complete the Modulus Check entry on the system specification.

Both of these methods perform in a similar manner, except that the first is done automatically by the 1255 and the second is done by the utility program.

### Using 1255 Self-Checking Feature

Use of the optional account number self-checking feature on the 1255 is described in detail in the publication *IBM 1255 Magnetic Character Reader Component Description*, GA24-3542.

### Using Utility Program Modulus Checking

When using the utility program to verify account numbers, you must complete the Modulus Check entry in columns

37-47 of the system specification. This entry should not be used when the account number self-checking feature is attached to the 1255. If both the Modulus Check entry and the self-checking feature are used, modulus checking is done twice on each account number.

The 11-digit Modulus Check entry identifies the location of the self-check digit, indicates whether modulus 10 or modulus 11 checking is to be used, and defines the weighting factor to be used in computing the self-check digit. Figure 6 depicts the use of modulus 10 and modulus 11 to calculate self-check digits.

The Modulus Check entry has two subentries: Modulus Number (column 37) and Weighting Factor (columns 38-47). They must both be specified if modulus checking is to be performed. These subentries appear on the system specification as follows:

Modulus Check											
Modulus No.	Weighting Factor (Account Number)										
	37	38	39	40	41	42	43	44	45	46	47

Using Modulus 10 To Calculate Self-Check Digit	Using Modulus 11 To Calculate Self-Check Digit																																										
<p>1. Multiplies each digit of the account number by its corresponding digit of the weighting factor.</p> <table style="margin-left: 40px;"> <tr> <td>account number</td> <td>5</td> <td>2</td> <td>0</td> <td>5</td> <td>6</td> <td>3</td> </tr> <tr> <td>weighting factor</td> <td>2</td> <td>1</td> <td>2</td> <td>X</td> <td>1</td> <td>2</td> </tr> <tr> <td></td> <td>10</td> <td>2</td> <td>0</td> <td></td> <td>6</td> <td>6</td> </tr> </table> <p>2. Adds each digit of the products:</p> $1 + 0 + 2 + 0 + 6 + 6 = 15$ <p>3. Determines the next number divisible by 10 that is higher than the sum computed in step 2.</p> <p style="margin-left: 40px;">From the sum 15, 20 is the next higher multiple of 10.</p> <p>4. Subtracts the sum computed in step 2 from the number determined by step 3. The difference is the self-check digit.</p> $20 - 15 = 5. \text{ The number 5 is the self-check digit.}$	account number	5	2	0	5	6	3	weighting factor	2	1	2	X	1	2		10	2	0		6	6	<p>1. Multiplies each digit of the account number by its corresponding digit of the weighting factor.</p> <table style="margin-left: 40px;"> <tr> <td>account number</td> <td>5</td> <td>2</td> <td>0</td> <td>6</td> <td>3</td> <td>2</td> </tr> <tr> <td>weighting factor</td> <td>6</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>X</td> </tr> <tr> <td></td> <td>30</td> <td>10</td> <td>0</td> <td>18</td> <td>6</td> <td></td> </tr> </table> <p>2. Adds the products:</p> $30 + 10 + 0 + 18 + 6 = 64$ <p>3. Determines the next number divisible by 11 that is higher than the sum computed in step 2.</p> <p style="margin-left: 40px;">From the number 64, 66 is the next higher multiple of 11.</p> <p>4. Subtracts the sum computed in step 2 from the number determined by step 3. The difference is the self-check digit.</p> $66 - 64 = 2. \text{ The number 2 is the self-check digit.}$	account number	5	2	0	6	3	2	weighting factor	6	5	4	3	2	X		30	10	0	18	6	
account number	5	2	0	5	6	3																																					
weighting factor	2	1	2	X	1	2																																					
	10	2	0		6	6																																					
account number	5	2	0	6	3	2																																					
weighting factor	6	5	4	3	2	X																																					
	30	10	0	18	6																																						

Figure 6. Calculating the Self-Check Digit

**Modulus Number Subentry:** You specify a 0 if you want modulus 10 checking to be performed; or a 1 if you want modulus 11 checking to be performed.

**Weighting Factor Subentry:** You identify both the weighting factor to be used in computing the self-check digit and the location of the self-check digit in the account number. The weighting factor is a constant supplied for each position in the account number except for the position of the self-check digit. The weighting factor for each position of the account number may be any digit from 0 through 9.

The weighting factor digits should be right-justified if the account number is less than ten digits.

The self-check digit may be in any position of the account number. Its position corresponds to the position occupied by an X in the weighting factor.

Once both the Modulus Number and Weighting Factor subentries are completed, the utility program calculates the self-check digit. This calculated self-check digit is then compared with a self-check digit in the account number. Figure 6 depicts how the self-check digit is calculated.

If they match, that account number is considered to be valid. Otherwise, the account number is considered to be invalid and the account number validity indicator in the disk or tape record is made blank (see *Creating and Using Disk and Tape Files*).

A completed Modulus Check entry follows. In the example, modulus 10 checking is to be performed on a 6-digit account number. The weighting factor is 21212. The third position from the right is the self-check digit.

Modulus Check										
Modulus No.	Weighting Factor (Account Number)									
	37	38	39	40	41	42	43	44	45	46
0					2	1	2	X	1	2

## SPECIFYING DOCUMENT COUNT CONDITION

The Document Count Condition entry (columns 3-6 of the system specification) is used to cause a certain action to be performed after a specific number of documents have been routed to a stacker. The entry is made up of two subentries: Count in columns 3-5 and Action in column 6.

In columns 3 through 5 (the Count subentry), you enter the maximum number of documents that you want routed to any of the stackers. In column 6 (the Action subentry), you indicate what you want done when that number of documents have been routed to a stacker.

The document count condition is met and the prescribed action is performed as soon as one of the stackers contains the number of documents designated in columns 3 through 5.

The Action subentry (column 6) can request that the utility program do one of the following:

- Stop the 1255 and wait for operator intervention. In this case, the Action subentry would be the letter S (for Stop).
- Indicate that the document count condition has been met for a stacker by routing the next control document read to that stacker. In this case, the Action subentry would be the letter I (for Indicate). (Control documents are used to cause the printing of those totals accumulated since the last control document was encountered. They are described later under the heading, *Defining Control and End-of-File Documents*.)
- Route the documents not meeting the criteria for any other stacker to an alternate stacker. In this case, the Action subentry would be the letter A (for Alternate).

Each time a document count condition is met, the following intermediate totals are printed:

1. The number of the stacker for which that condition was met.
2. The number of documents routed to the stacker noted in item 1 since the last document count condition for that stacker.
3. A total of the valid amount fields of documents routed to the stacker noted in item 1 since the last document count condition for that stacker.

Hereafter, these intermediate totals are referred to as *document count condition totals*. They are printed on one line of the output listing and appear as in Figure 7.

### Stopping the 1255 (S—Stop)

When the document count condition is met for a stacker, the 1255 is stopped, the operator is informed (the program issues the C' halt), the document count condition totals are printed, and the document count is set back to zero. The operator must manually start the 1255 again. This is easily accomplished by pressing the START key on the processing unit (or pressing the HALT RESET key if the system is equipped with the dual programming feature).

The following example shows the specifications request- ing that the 1255 be stopped after 125 documents have been routed to a stacker.

Sequence Number		Document Count Condition				Action-S/I/A	Reject	Fields To Be Printed				
1	2	3	4	5	6			7	8	9	10	11
		1	2	5	S							

### Routing a Control Document (I—Indicate)

When the document count condition is met for a stacker, the next control document encountered by the utility program is routed to the stacker that met the condition, and a control totals line is printed (control totals are combined document count and amount field totals accumulated since the last control document was encountered, control totals are described under *Defining Control and End-of-File Documents*). The document count condition totals for the stacker that met the document count condition are then printed and the document count totals for that stacker are reset to zero. Document reading and processing then continues as before the document count condition was met.

If a control document is not available immediately after the document count condition has been met, the utility program continues to read documents and route them to appropriate stackers. Thus, a control document in a stacker indicates that at least the number of documents specified in columns 3-5 have been routed to that stacker. Control documents are described under the heading, *Defining Control and End-of-File Documents*.

When encountered, control documents are routed to stackers in the same sequence in which those stackers met the document count condition. Control documents are not routed to stackers that have not met the document count condition. For example, if stacker 4 was the first stacker to meet the document count condition and if stacker 0 was the second and last stacker to meet the document count condition; the first control document is routed to stacker 4, the second control document is routed to stacker 0. Any remaining control documents are routed to the reject stacker.

The utility program can route control documents into every stacker at the same point in the job and thus separate documents into batches. To cause this batch separation to be done, enter a Count of 1 (right-justified) in columns 3-5 and an I in column 6; then ensure that a group of at least six or twelve (six for Models 1 and 2, twelve for Model 3) control documents are included among the input documents at the points in the job where the batch separation is to be done.

STACKER NUMBER-XX DOCUMENT COUNT-XXXX AMOUNT FIELD TOTAL-XXXXXXXXXXXX

Figure 7. Document Count Condition Totals

Figure 8 specifies that the first control document read after a stacker contains 95 documents is to be routed to the stacker that contains the 95 documents. However, by the time the control document is routed, that stacker may contain more than 95 documents. This is because documents may have been read and routed before the control document was encountered.

The following example specifies that stackers 0, 2, and 4 are to be used to alternately receive documents. After 300 documents have been routed to one of the stackers, documents are to be routed to the next alternate stacker. After 300 documents have been routed to that stacker, documents are to be routed to the next alternate stacker. This is to continue until the job is ended.

### Routing Documents to Alternate Stacker (A—Alternate)

When an A is placed in column 6, stackers 0, 2, and 4 work in combination as alternate stackers. No stacker specifications are required for stackers 0, 2, and 4. However, stacker specifications may be used to route other document types.

The alternating cycle begins with stacker 0. As documents that do not meet the criteria on any stacker specification are encountered, they are routed to stacker 0. When stacker 0 meets the document count condition, documents are routed to alternate stacker 2. When stacker 2 meets the document count condition, documents are routed to alternate stacker 4. When stacker 4 meets the document count condition, documents are routed to stacker 0 and the cycle begins over again. Documents routed to stackers 0, 2, or 4 by stacker specifications are not included in the alternating count.

Each time a stacker meets the document count condition, the stacker number, and the actual number of documents in that stacker and the sum of the amount fields for those documents since the last document count condition are printed.

Sequence Number	Document Count Condition		Action-S/I/A	Reserved	Fields To Be Printed							
	Count	Condition			Field 1	Field 2	Field 3	Field 4	Field 5			
1	2	3	4	5	6	7	8	9	10	11	12	13
		3	0	0	A							

### DEFINING CONTROL AND END-OF-FILE DOCUMENTS

Both control and end-of-file documents may be defined by means of the system specification. As many control documents can be included in a job as desired. However, only one end-of-file document can be included.

Disk or tape records are created for control and end-of-file documents just as they are created for all other documents that are read. For additional information on disk or tape records, refer to *Creating and Using Disk and Tape Files*.

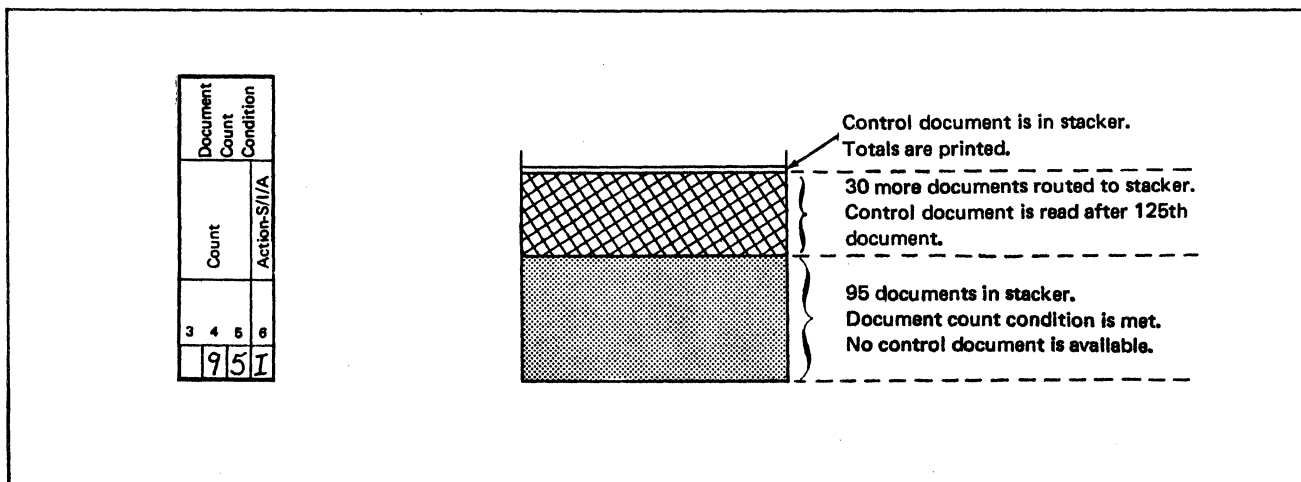


Figure 8. Control Document Routing

## Control Documents

Control documents are used to control the printing of document count and amount field totals, and to separate documents that have been routed to stackers.

Whenever a control document is read, document count and amount field totals are printed. This is true regardless of where the control document is routed.

The totals printed as a result of a control document are called *control totals*. They are:

- The number of documents that have been read since the last control document was encountered.
- A cumulative total of the valid amount fields in the documents that have been read since the last control document was encountered.

Control documents and documents routed to the reject stacker are not included in either total.

Control totals are printed on one line of the output listing and appear as in Figure 9.

Control totals are only printed once when consecutive control documents are read. This is because no regular documents have been read between these control documents and, subsequently, no further totals have been accumulated.

In addition to controlling printing of totals, control documents serve to separate documents that have been routed to stackers. In this case, the Document Count Condition entry must be specified with the letter I in the Action subentry. The document count condition is described under the heading, *Specifying Document Count Condition*.

As control documents are read, they are routed to the reject stacker until the document count condition has been met for a stacker. Thereafter, the next control document read is routed to the stacker that met the document count condition.

If the letter I has not been specified as the Action subentry, all control documents are routed to the reject stacker.

## End-of-File Document

The end-of-file document is used to indicate that all documents for the job have been read and that the job is to be ended. An end-of-file document must be specified in the system specification for each job.

When an end-of-file document is read, the following totals are printed:

- The document count condition totals are printed for each stacker, *if the document count condition was specified in columns 3-5 of the system specification*. These totals are the stacker number, document count, and amount field sums since the last document count condition was encountered for that stacker.
- Control document totals. These totals are the document count and amount field sums since the last control document was encountered.
- A stacker-by-stacker count of the number of documents routed to stackers.

```
CONTROL TOTALS  DOCUMENT COUNT-XXXX AMOUNT FIELD-XXXXXXXXXXXXXXXX
```

Document Count can be a maximum of 5 digits.

Amount Field can be a maximum of 14 digits.

Figure 9. Control Totals

- Stacker-by-stacker sums of the amount fields of the documents processed during the job.
- The total number of documents routed to stackers during the job.
- Total sum of the amount fields of all documents processed during the job.

End-of-file totals appear on the printed listing as in Figure 10. Control documents, the end-of-file document, and all other documents routed to the reject stacker are not included in any totals. Documents containing invalid amount fields that are routed to a stacker other than the reject stacker are included in document count totals, but not in amount field totals.

### Defining the Documents

Defining control and end-of-file documents means telling the utility program how to differentiate among regular documents, control documents, and an end-of-file document.

After a document is read, the utility program determines what type of document has been read by checking the contents of a particular field in the document. Therefore, when defining control and end-of-file documents, you must indicate which field is to be checked and what that field should contain in order for the document to be considered a control or an end-of-file document.

Document Count Totals	STACKER NUMBER-XX	DOCUMENT COUNT-XXXX	AMOUNT FIELD-XXXXXXXXXXXX
	STACKER NUMBER-XX	DOCUMENT COUNT-XXXX	AMOUNT FIELD-XXXXXXXXXXXX
	STACKER NUMBER-XX	DOCUMENT COUNT-XXXX	AMOUNT FIELD-XXXXXXXXXXXX
	STACKER NUMBER-XX	DOCUMENT COUNT-XXXX	AMOUNT FIELD-XXXXXXXXXXXX
	STACKER NUMBER-XX	DOCUMENT COUNT-XXXX	AMOUNT FIELD-XXXXXXXXXXXX
Control Totals	CONTROL TOTALS	DOCUMENT COUNT-XXXX	AMOUNT FIELD-XXXXXXXXXXXX
Stacker-by-Stacker Totals	FINAL STACKER TOTALS		
	SK	COUNT	AMOUNT FLD TOTALS
	XX	XXXX	XXXX
Final Totals	FINAL TOTALS	DOCUMENT COUNT-XXXXX	AMOUNT FIELD-XXXXXXXXXXXX
	XX	XXXX	XXXX
	XX	XXXX	XXXX

Maximum number of digits:  
 Document Count - 5 digits  
 Amount Field  
 (Control and Final Totals) - 14 digits  
 (Stacker-by-Stacker Totals) - 12 digits  
 (Document Count Totals) - 11 digits  
 Stacker Count - 4 digits

Figure 10. End-of-File Totals

You can define control and end-of-file documents by completing the following entries on the system specifications:

- In column 48 (EOF/Control field), enter a number from 1 through 5 that identifies the field to be checked for end-of-file and control document contents.
- In columns 49-58 (Control Document Contents), enter the ten or fewer digits that must be contained in the field identified by column 48 in order for the document to be considered a control document. If the field is fixed length, you must enter the same number of digits here as you have specified in the Field Definition (columns 16-30). If the field is variable length, you may enter as many or fewer digits here than you have specified in the Field Definition (columns 16-30). If these columns are blank, the utility program assumes that control documents are not being used.
- In columns 59-68 (End-of-File Document Contents), enter the ten or fewer digits that must be contained in the field identified by column 48 in order for the document to be considered an end-of-file document. If the field is fixed length, you must enter the same number of digits here as you have specified in the Field Definition (columns 16-30). If the field is variable length, you may enter as many or fewer digits here than you have specified in the Field Definition (columns 16-30).

When the dash transmission feature is being used, the dash is a valid digit in the field. Therefore, if column 14 identifies the transit-routing field and the dash transmission feature is being used, the dash must be included in the field length size and must be considered when testing for control document and end-of-file document contents.

As an example of defining documents, assume that your job requires that the account number field be used for distinguishing whether a document is a regular document, a control document, or an end-of-file document as follows:

- If the account number consists of ten 9's (9999999999), the document is to be considered an end-of-file document.
- If the account number consists of ten 8's (8888888888), the document is to be considered a control document.
- If the account number consists of any other digits, the document is to be considered a regular document.

To provide this information to the utility program you would make the following entries on the system specification for that job:

Field 3			EOF/Control Field No.	Control Document Contents										End-of-File Document Contents										
For V	Length			48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68
F	1	0	3	8	8	8	8	8	8	8	8	8	8	9	9	9	9	9	9	9	9	9	9	9

Now, as the documents for that job are read, the contents of Field 3 are compared with ten 8's and then with ten 9's.

If Field 3 contains ten 8's, the utility program considers the document to be a control document. It then determines whether the document count condition has been satisfied for a stacker and whether the Indicate action has been specified. If the Indicate document count condition has been satisfied for a stacker, the control document is routed to that stacker. Otherwise, the control document is routed to the reject stacker. In either case, the utility program continues to read and process documents.

If Field 3 contains ten 9's, the utility program assumes that all documents have been read and ends the job. This end-of-file document is then routed to the reject stacker.

If Field 3 contains digits other than ten 8's or ten 9's, the utility program considers the document a regular document and processes it accordingly.

## SPECIFYING STACKER NUMBERING ON THE 1255

You must indicate how the stackers are numbered on the 1255 being used. To do this, make one of the following entries in column 72:

<i>Entry</i>	<i>Explanation</i>
4	The 1255 has 6 stackers numbered 0, 1, 2, 3, 4, and R.
8	The 1255 has 6 stackers numbered 0, 2, 4, 6, 8, and R.
A	The 1255 has 12 stackers numbered 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, and R.

If no entry is made in column 72 or if an invalid entry is made, an entry of A is assumed, the remaining stacker specifications in the job are analyzed, and the job is ended before a document is read.

## SELECTING STACKERS

You can route documents to stackers by means of stacker specifications. On a stacker specification, you define the stacker to which documents are to be routed and the tests to be passed by a document before it can be routed to that stacker.

All tests designated for a document on a stacker specification must be successfully passed before that document is routed to the stacker. Otherwise, the document is tested against the next stacker specification for the job. If no further stacker specification exists, the document is routed to the reject stacker.

If no tests are designated on a stacker specification, all documents that have not been routed to a stacker by a previous specification are routed to the stacker indicated for that specification. All following specifications (if any) for the job are ignored by the program.

The tests are specified in columns 5 through 96. Two groups of tests can be performed:

- Field Validity or Presence Check (columns 5-9).
- Field Comparison Tests (columns 12-96).

These tests are performed immediately after a document has been read.

Based on the results of the tests performed on a document, the utility program selects the stacker to which a document is routed.

## Stacker Number

This entry identifies the stacker to which a document is routed if it passes all the tests of that stacker specification.

The stackers of the 1255 Model 1 and Model 2 are numbered either 0, 1, 2, 3, 4 and R (reject) or 0, 2, 4, 6, 8 and R. The numbering of the stackers for Models 1 and 2 is not dependent on the model of the 1255 being used. The stackers of Model 3 are numbered 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A and R.

The stacker number is specified right-justified in columns 3 and 4. These columns make up the Stacker Number entry.

## Field Validity or Presence Check

These tests determine whether certain specified fields are present and valid in a document. They are made before any field comparison tests are performed.

If the document meets the criteria defined by these tests, it undergoes field comparison tests specified on this stacker specification. If no field comparison tests are specified, the document is routed to the stacker identified in columns 3 and 4.

If the document fails to meet the criteria defined by these tests, it is tested against subsequent stacker specifications. If no more stacker specifications exist, the document is routed to the reject stacker.

You can request that validity and presence checks be performed by making appropriate entries in columns 5 through 9 of the stacker specifications. One entry can be made for each field as follows:

- P, if the field must be present and valid before further testing is done.
- N, if the field must be not present or invalid before further testing is done.



If a column is blank, the field associated with that column is not checked; that field may be either valid, invalid, or absent. If column 5 (indicating amount field) is blank, the utility program assumes that the amount field must be present and valid before further testing is done; that is, the utility program assumes that a P has been specified in column 5. For example, assume the following conditions:

- Documents are to be routed to stacker 0 when fields 1 (amount) and 3 (account number) in these documents are valid, and field 4 (transit-routing) is invalid or missing. The contents of the remaining fields in the documents are of no concern.
- Field comparison tests are not to be done on documents meeting the criteria established in item 1.

In this case, you would complete the stacker specification as follows:

Sequence Number		Stacker Number					Validity or Presence Check (N or P)	
1	2	3	4	5	6	7	8	9
	0	2	0	0	P			
	0	2	0	0	P			
	0	3	0	0		P		
	0	4	0	0			N	

Notice that in the preceding example, all of the conditions specified must be met before the document is routed to stacker 0. If documents are to be routed to stacker 0 when any one of the conditions is met (either field 1 is valid or field 3 is valid or field 4 is invalid or missing), the following stacker specifications are required:

Sequence Number		Stacker Number					Validity or Presence Check (N or P)	
1	2	3	4	5	6	7	8	9
	0	2	0	0	P			
	0	3	0	0		P		
	0	4	0	0			N	

All columns not shown in the preceding examples must be blank.

## Field Comparison Tests

These tests enable you to have the utility program compare document fields against test characters. From the results of this comparison, the utility program determines whether or not documents are to be routed to the stacker indicated in columns 3-4 of the stacker specifications.

You can request that the utility program test to determine if a document field is equal to, greater than, or less than the test characters; or if a document field is not equal to, not greater than, or not less than the test characters.

You can also request that the utility program test to determine if a variable length field is long enough in a document for additional comparison tests to be performed on that field. This facility is described later in this chapter under *Field Length Validity Check*.

As many as five fields in a document can be tested. Ten or fewer digits of a field can be compared. Entries for the tests are marked 1 through 5 on the stacker specifications.

The tests are performed one at a time beginning with test 1. If the comparison test is satisfied, test 2 is performed. If test 2 is satisfied, test 3 is performed, and so forth. This continues either until a test is unsatisfactory or until the last test on a stacker specification has been successfully performed.

A document is routed to the stacker indicated in columns 3-4 only after it successfully completes all the tests on the stacker specification. Testing is considered complete either (1) when five consecutive tests have been performed successfully, or (2) when the next Field Number subentry on the stacker specification is blank and all preceding tests have been successful, or (3) when a test has failed.

If the document fails a test, no further tests on the stacker specification are performed. Instead, the document is tested against the next stacker specification. If no further stacker specification exists, the document is routed to the reject stacker.

When the dash transmission feature is being used, the dash is a valid digit in the field. Therefore, if a Field Comparison Test is to be performed on the transit-routing field and the dash transmission feature is being used, the dash must be included in the field length size and must be considered as a valid character in the field being tested.

**Standard Field Comparison Tests**

To specify that a field comparison test is to be performed, you must identify:

1. The number of the field to be tested (Field Number subentry).
2. The relative location from the end of the field of the first digit that is to be tested; the rightmost digit in the field is considered to be at position 0 (Relative Pos. subentry).
3. The number of characters to be compared (Field Length subentry).
4. The results of the comparison in order for the test to be considered successful: equal (E), less than (L), greater than (G), not equal (NE), not less than (NL), not greater than (NG).
5. The characters against which the field is to be compared (Test Characters subentry).

These five items or subentries make up one Field Comparison Test Entry. Field comparison test entries occupy columns 12-96 of the stacker specification. As mentioned previously, these columns are grouped into five entries numbered Test 1, Test 2, and so forth through Test 5.

Each of these entries is of the same format. The Test 1 entry appears on the stacker specification as follows:

Test 1																												
Field Number	Relative Pos.	Field Length	Not - N	Compare - E/L/G	Test Characters																							
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28												

**Using Field Comparison Tests to Route Documents:**

Figure 11 shows how field comparison tests may be used to determine which documents are to be routed to certain stackers. Stacker specifications are shown for stackers 1, 2, and 3. It is assumed that the system specification for the job has been satisfactorily completed.

Stacker 1 is to be selected for those documents that have amount fields of \$1,000.00 or greater. The contents of other fields are of no concern.

Stacker 2 is to be selected for those documents with an account number less than 555-555-55. The contents of other fields are of no concern.

Stacker 3 is to be selected for those documents with an account number of 555-555-55 or greater. The contents of other fields are of no concern.

Validity or presence checks are performed first on each document to quickly eliminate those documents that lack either an account number or a valid amount field.

**Field Length Validity Check**

As mentioned previously, you can also use field comparison tests to determine if a variable length field is long enough in a document for additional comparison tests to be performed on that field.

To do this, you enter the following in a field comparison test entry on a stacker specification.

1. The number of the field to be tested (Field Number subentry).
2. The desired length of the field (Relative Pos. subentry).
3. The number 1 in the Field Length subentry.
4. The letter E in the Compare subentry.
5. Blanks in the Not and the Test Characters subentries.

From this information the utility program determines whether the specified field is long enough. If the field is as long, or longer, than the length specified in the Relative Position subentry, the test is satisfied and further tests on that stacker specification are performed. If the field is not long enough, the test is not satisfied and the document is tested against the next stacker specification.

If desired, the letter N may be placed in the Not subentry. In this case the field must be shorter than the specified length (Relative Pos. subentry) to satisfy the test. If the field is as long, or longer, than the specified length, the test is not satisfied and the document is tested against the next stacker specification. See Figure 12 for an example of a field length validity check.

Sequence Number	Stacker Number	Validity or Presence Check (N or P)					Reserved	Test 1										Field Number										
		Field 1	Field 2	Field 3	Field 4	Field 5		Field Number	Relative Pos.	Field Length	Not - N	Compare - E/L/G	Test Characters															
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
02	01	P	P								1	0	1	0		G	0	0	0	0	0	9	9	9	9	9		
03	02	P	P								3	0	0	8		L		5	5	5	5	5	5	5	5	5		
04	03	P	P								3	0	0	8	N	L		5	5	5	5	5	5	5	5	5		

- 02- This specification determines whether a document has an amount field of \$1000.00 or greater. If so, the document is routed to stacker 1 (columns 3-4). If not, the document is tested against the stacker specification identified by sequence number 03.

Before the amount field is tested, the document is checked to determine if it contains both a valid amount field and a valid account number (designated by a P in columns 5 and 7).

The test against the contents of the amount field is designated by columns 12-28. Column 12 indicates that field 1 (the amount field) is to be tested. The first character to be tested is at relative position 0 (column 14) which is the right-most position of the field. Ten characters are to be tested (columns 15-16). The test is to determine if the amount is greater than (column 18) \$999.99 (columns 19-28).

- 03- This specification determines whether a document has an account number less than 555-555-55. If so, the document is routed to stacker 2 (columns 3-4). If not, the document is tested against the stacker specification identified by sequence number 04. As a result of stacker specification 02, documents with an amount field of \$1000.00 or greater would have already been routed to stacker 1.

Before the account number is tested, the document is checked to determine if it contains both a valid amount field and a valid account number (designated by a P in columns 5 and 7).

The test against the contents of the account number field is designated by columns 12-28. Column 12 indicated that field 3 (the account number field) is to be tested. The first character to be tested is at relative position 0 (column 14) which is the right-most position of the field. Eight characters are to be tested (columns 15-16). The test is to determine if the account number is less than (column 18) 55555555 (columns 19-28).

- 04- This specification determines whether a document has an account number equal to or greater than 555-555-55. If so, the document is routed to stacker 3 (columns 3-4).

Before the account number is tested, the document is checked to determine if it contains both a valid amount field and a valid account number (designated by a P in columns 5 and 7).

The test against the contents of the account number field is designated by columns 12-28. Column 12 indicates that field 3 (the account number field) is to be tested. The first character to be tested is at relative position 0 (column 14) which is the right-most position of the field. Eight characters are to be tested (columns 15-16). The test is to determine if the account number is not less than (columns 17-18) 55555555 (columns 19-28).

Figure 11. Specifying Field Comparison Tests



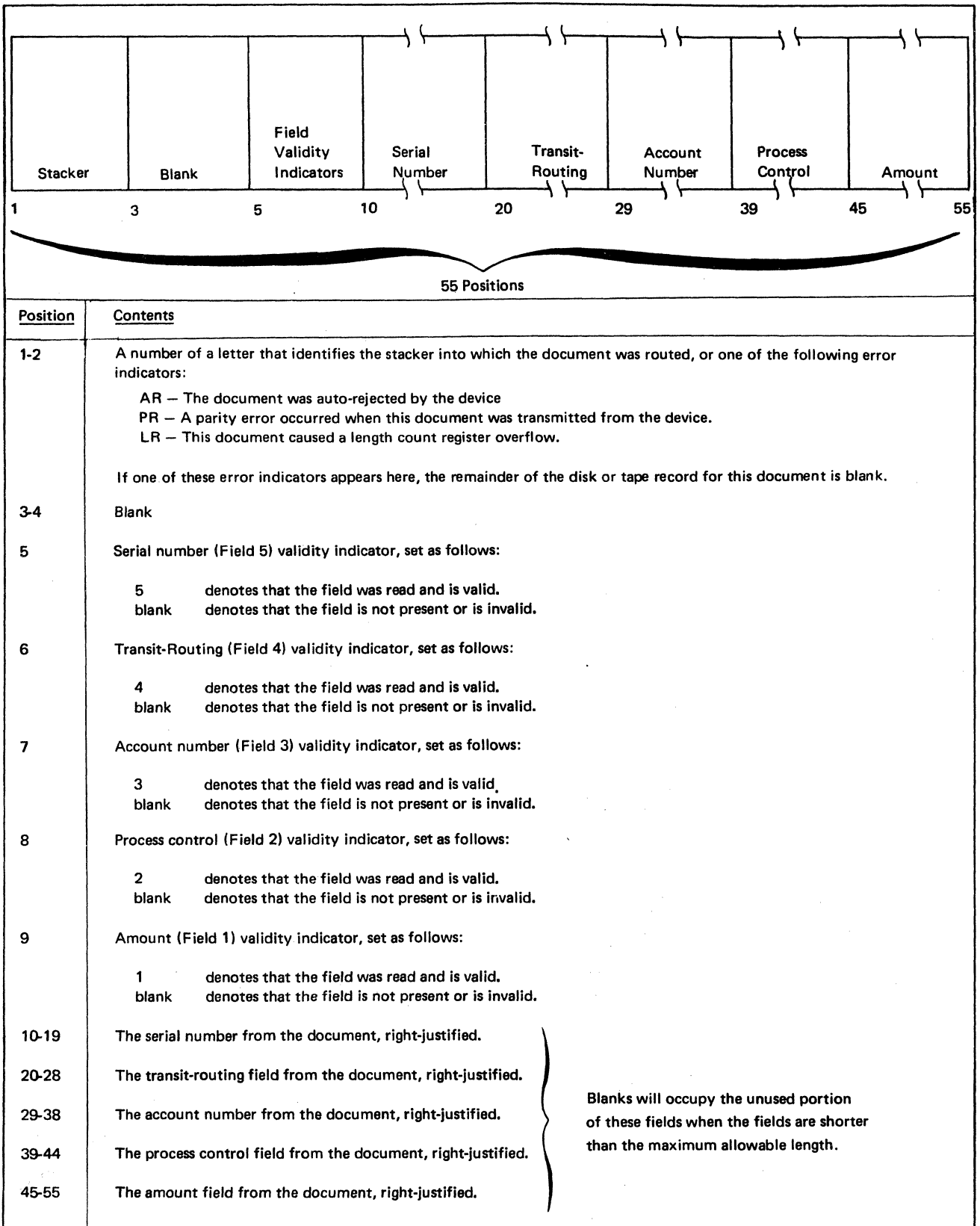


Figure 13. Format and Contents of the Disk or Tape Output Record

To create more than one disk file with different dates but with the same name and label, either the **TRACKS**, **RECORDS**, or **LOCATION** parameter on the **FILE** statement must be different from that for the files already created. If these parameters are the same as for a previously created file, the old file will be replaced by the newly created file.

Date and label are the only means of distinguishing among the files. The date can be used to distinguish among files created on different dates. However, several disk files may be created on the same date. In this case, the label must be used to distinguish among the files created on the same date.

The **FILE** statement is described in the *IBM System/3 Model 10 Disk System Control Programming Reference Manual*, GC21-7512.

For example, assume that two jobs are processed by the utility program on April 2, 1971; and that one job is processed by the utility program on April 3, 1971.

Two of these files would be dated 040271; and one would be dated 040371. The label is the only item that distinguishes the two files created on April 2, 1971. The date is sufficient to identify the file created on April 3, 1971. Assuming that you labeled these three files **FILE1**, **FILE2**, and **FILE1**, the identifiers for the files would be as follows:

<b>First File Created</b>	<b>Second File Created</b>	<b>Third File Created</b>
DATE—040271	DATE—040271	DATE—040371
LABEL—FILE1	LABEL—FILE2	LABEL—FILE1

To properly use data from a disk or tape record in another program, make certain that the appropriate field validity indicators (positions 5-9 of the record) denote that the fields are valid before using the contents of those fields (positions 10-55 of the record). Otherwise, invalid information may be processed.

#### **Track Allocation**

When creating disk files, each document read by the utility program is stored on a 55-byte disk record. The following table may be helpful in determining the number of tracks needed for a disk file with a given number of records.

<b>Number of Documents or Records</b>	<b>Number of Tracks Needed</b>
111	1
223	2
558	5
1117	10
2234	20
5585	50

## Chapter 3. System and Stacker Specifications

This chapter describes system and stacker specification entries one at a time in the sequence in which they are to appear on the specifications. It is to be used as a reference aid by persons familiar with Chapter 2: *Using the Utility Program*. Chapter 2 discusses how the entries relate to one another.

As mentioned previously, IBM has available a form (GX21-9101) containing pre-printed headings that identify the types of information that can be placed in each column of a specification. This form is shown in Figure 5 in Chapter 2.

All multi-column entries are to be right-justified; that is, the last digit of the entry must appear in the rightmost column that can be occupied by the entry. For example, columns 3-5 of the system specification have been allotted for the Count subentry which may be a number from one through three digits long. If the number to be entered is two digits long, such as 23, the 3 must be placed in column 5 and the 2 must be placed in column 4. Column 3 could either contain a zero or be left blank.

### SYSTEM SPECIFICATIONS

Only one system specification is permitted for a job. This specification must precede all stacker specifications in the input stream for that job.

System specification entries describe the documents to be read and the printed output to be produced. They also define the control documents, the valid stackers on the 1255 model used, the end-of-file document, and the weighting factor for modulus checking.

If a system specification is not the first specification in the job, the utility program treats all further specifications as comments. Specifications treated as comments are not processed but merely printed on the output listing.

### Sequence Number (Columns 1-2)

This entry is a 2-digit number used to aid in keeping specification cards in proper sequence. The number has no effect on the processing of a job: it causes a note to be printed on the output listing if the sequence number is invalid. Since the system specification must precede all other stacker specifications in the job, it should be given the lowest sequence number of any specifications in the job. If sequence checking is not desired, place 99 in columns 1 and 2 of the system specification.

### Document Count Condition (Columns 3-6)

This entry designates that document count conditions are being used to control the job. The document count condition entry consists of two subentries:

- Count (columns 3-5)
- Action—S, I, A (column 6)

If one or both of these subentries is blank, the entire entry is ignored.

*Count (Columns 3-5):* Is a number from one through three digits that denotes the number of documents to be routed to a stacker before the document count condition is met. For example, 090 causes the document count condition to be met after 90 documents have been routed to a stacker.

When a document count condition is reached, the Action specified in column 6 is performed.

**Action (Column 6):** Defines the action to be performed after the document count condition is met for a stacker. One of the following can be specified:

**Entry Action**

**S** Stops the 1255, informs the operator that the 1255 has stopped, prints document count condition totals, and sets the document count (for all stackers meeting the condition) back to zero.

To restart the 1255, press the START key on the processing unit (or press the HALT RESET key if the system is equipped with the dual programming feature).

When the utility program becomes aware of a document count condition, one or two documents may have already been fed into the 1255 but may not yet have been analyzed by the utility program. If this is so, the utility program analyzes those documents and routes them to the proper stacker before the 1255 stops. If that stacker happens to be the stacker for which the document count condition has been met, that stacker would then contain one or two more documents than specified by columns 3-5. These extra documents are counted and their amount fields are totaled in the document count condition totals for the stacker.

**I** Indicates that the document count condition has been met for a stacker by routing the next control document read to that stacker. After a control document is routed to a stacker, both document count condition and control totals are printed, and the document count for that stacker is reset to zero. The control document is not included in the document count.

Document count condition totals are the stacker number and the document count and amount field totals for that stacker *since the last document count condition was encountered*. They are described in Chapter 2 under the heading *Specifying Document Count Condition*.

Control totals are the document count and amount totals since the preceding control document was encountered. They are described in Chapter 2 under the heading *Defining Control and End-of-File Documents*.

**Entry Action**

**I** (continued)

If a control document is unavailable after a document count condition has been met, the utility program continues to analyze and route documents until a control document is available. Then, the control document is routed to the stacker that has met the document count condition. Thus, the control document indicates that at least the number of documents specified in columns 3-5 have been routed to that stacker.

If several stackers meet the document count condition before a control document is read, the first control document read thereafter is routed to the first stacker that met the condition; the second control document is routed to the second stacker that met the condition; and so forth. Extra control documents are routed to the reject stacker.

**A** Alternates placing of documents into stackers 0, 2, and 4.

The alternating cycle begins with stacker 0. Documents are routed into that stacker until the document count condition is met for the stacker. Documents are then routed into stacker 2 until the document count condition is met for that stacker. Next, documents are routed into stacker 4 until the document count condition is met for that stacker. This completes one cycle.

The next document is routed to stacker 0 and the cycle is repeated. This continues until all documents have been read.

Each time a stacker meets the document count condition, the following are printed:

- The stacker number, and
- The number of documents in the stacker and the sum of the amount fields for those documents since the last document count condition.

When A is specified, no stacker specifications are required for stackers 0, 2, and 4. However, stacker specifications may be used to route other document types to stackers not involved in the alternating cycle. If stacker specifications are used to route documents to stackers in the alternating cycle, the stackers will contain more than the specified document count (columns 3-5) when the document count condition occurs.



### Reserved (Columns 7-8)

These columns are reserved for future use and should be blank. They are ignored by the utility program.

### Fields to be Printed (Columns 9-13)

This entry designates which fields are to be printed as follows:

Entry	Meaning
-------	---------

P	This field is to be printed.
---	------------------------------

blank	This field is not to be printed.
-------	----------------------------------

Each field to be printed must also have a valid Field Definition (columns 16-30) entry. For example, if the contents of fields 2 and 4 are to be printed, a P must be entered in columns 10 and 12; columns 9, 11, and 13 must be blank.

### Reserved (Columns 14-15)

These columns are reserved for future use and should be blank. They are ignored by the utility program.

### Field Definition (Columns 16-18, 19-21, 22-24, 25-27, 28-30)

This entry consists of five subentries (each three columns long) that describe the fields to be read from a document.

Each 3-column subentry corresponds to one of the five fields that can be contained in a document. Columns 16-18 describe field 1, columns 19-21 describe field 2, columns 22-24 describe field 3, columns 25-27 describe field 4, and columns 28-30 describe field 5. If a subentry is blank, the corresponding field is not read.

The first column of each subentry must contain one of the following:

- F, if the field is of fixed length in all documents in the job.
- V, if the field varies in length from one document to another.
- Blank, if the field is not read.

The second and third columns of each subentry contain a value that designates the number of digits contained in a fixed-length field, or a value that designates the maximum number of digits that can be contained in a variable-length

field. Normally, special symbols, such as a dash, should not be included as part of the length defined in these columns. However, if the 1255 used has the dash transmission feature, the dash should be included as part of the length defined for the transit-routing field.

### Reserved (Columns 31-36)

These columns are reserved for future use and should be blank. They are ignored by the utility program.

### Modulus Check (Columns 37-47)

This entry designates that modulus checking is to be performed to verify the account number on a document. The entry consists of two subentries:

- Modulus No. (Column 37)
- Weighting Factor (Columns 38-47)

From these two subentries, the utility program calculates a self-check digit and compares that digit to the self-check digit printed on the document. Any digit in the account number may be used as a self check digit. When the self-check digits are not equal, the account number is considered invalid. Modulus checking is not performed on end-of-file or control documents. For additional information, refer to the heading, *Verifying Account Numbers* in Chapter 2.

If one or both subentries are blank or invalid, modulus checking is not performed.

**Modulus No:** This entry designates whether modulus 10 or modulus 11 is to be used in verifying the account number as follows:

Entry	Meaning
-------	---------

0	Modulus 10 checking is to be performed.
1	Modulus 11 checking is to be performed.

Modulus 10 and modulus 11 checking is described in this section under the heading *Verifying Account Numbers*.

**Weighting Factor:** This entry designates the weighting factor to be used in generating the self-check digit for modulus checking. The weighting factor must contain the same number of digits as the account number, the entry should be right-justified.

Each digit in the account number may have any weight from 0 through 9. An X must be specified in the position corresponding to the self-check digit. For example, if the account number is ten digits long and modulus 10 checking is specified, a possible weighting factor is "121212121X". In this case, the self-check digit is the rightmost digit in the account number.

#### **EOF/Control Field (Column 48)**

This entry is the number (from 1 through 5) of the field used to define the end-of-file and control documents. This field must be one of the fields specified to be read from the document. As is done for other documents, a disk or tape record is created for each control and end-of-file document.

When the dash transmission feature is being used and the transit-routing field is specified as the test field, the dash must be considered a valid character in the field.

#### **Control Document Contents (Columns 49-58)**

This entry shows the contents of the field specified in column 48 which is used to recognize a control document. The contents must be in the same format as defined for that field by the Field Definition entry. The control documents are always routed to the reject stacker unless I has been specified as the Action Subentry (column 6) of the system specification.

#### **End-of-File Document Contents (Columns 59-68)**

This entry shows the contents of the field specified in column 48 which is used to recognize an end-of-file document. The contents must be in the same format as defined for that field by the Field Definition entry. This entry must be completed for every job. The end-of-file document is always routed to the reject stacker.

#### **Print Line Length (Columns 69-71)**

This entry is a number that indicates the number of characters to be printed per line. The number must be at least the size of one print record and can be as high as the maximum number of characters that can be printed on a line by the printer being used. If these columns are blank, the utility program determines the maximum number of characters that can be printed per line by the printer being used.

#### **Stacker Code (Column 72)**

This entry indicates the manner in which the stackers are numbered on the 1255 being used. One of the following can be specified:

<i>Entry</i>	<i>Explanation</i>
4	The 1255 has 6 stackers numbered 0, 1, 2, 3, 4, and R.
8	The 1255 has 6 stackers numbered 0, 2, 4, 6, 8, and R.
A	The 1255 has 12 stackers numbered 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, and R.

If the stacker code entry is omitted or if an invalid entry is made, an entry of A is assumed, the remaining stacker specifications in the job are analyzed, and the job is ended before a document is read.

#### **Reserved (Columns 73-95)**

These columns are reserved for future use and should be blank. They are ignored by the utility program.

#### **System Specification (Column 96)**

This entry must be an S to identify this specification as a system specification.

## STACKER SPECIFICATIONS

Entries on a stacker specification define a stacker and the tests that must be successfully performed on a document before that document is routed to that stacker.

With one exception, one or more stacker specifications must be entered for each stacker used. The exception is when alternating stackers (0, 2, and 4) are used, as indicated by the Document Count Condition entry on the system specification for the job. In that case, stacker specifications should not be entered for the alternating stackers (0, 2, and 4).

Stacker specifications are processed in the order in which they are entered. This order affects the way documents are routed to stackers. Therefore, sequence number should be used to ensure that the specifications are in proper order.

A formula to compute the maximum number of stacker specifications which may be used in a job is given in this chapter under *Number of Stacker Specifications*.

A description of each stacker specification entry follows.

### Sequence Number (Columns 1-2)

This entry is a 2-digit number used to aid in keeping specification cards in proper sequence. Except when 99 has been entered in columns 1-2 of the system specification, the Sequence Number entry of each stacker specification must be greater than the sequence number on the previous specification card for this job. A note is printed on the output listing if the sequence number is not greater than the sequence number of the previous specification in a job. The sequence number has no other effect on the processing of a job. Leave this entry blank if sequence checking is not desired.

### Stacker Number (Columns 3-4)

This entry identifies the stacker to which a document is routed if it satisfies the conditions on the stacker specification.

The stackers of the 1255 Model 1 and Model 2 are numbered either 0, 1, 2, 3, 4, and R (reject) or 0, 2, 4, 6, 8, and R. The numbering of the stackers for Models 1 and 2 is not dependent on the model of the 1255 being used.

The stackers of the 1255 Model 3 are numbered 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, and R.

The stacker number is specified right-justified in columns 3 and 4. A leading zero may be used in column 3 if desired.

The number specified for the stacker number entry must coincide with the way the stackers are numbered on the 1255 being used. Otherwise, any document that satisfies the conditions of the stacker specification is routed to the reject stacker and the 1255 stops. This is the same as if a stacker command stop occurred (see Chapter 6 under the heading *Stacker Command Stop*).

### Validity or Presence Check (Columns 5-9)

This entry defines the conditions that must exist before further processing associated with the stacker specified in columns 3-4 is done on the document.

The following may be specified in columns 5-9 (each column checks one field):

Entry	Meaning
P	Field must be present and valid.
N	Field must not be present or must be invalid.
blank	If in column 5 (amount field), an entry of P is assumed indicating that amount field must be present and valid.
blank	If in columns 6-9, field is not checked.

For example, if Fields 3 and 5 must be valid *and* Field 4 must be either invalid or not present, columns 7 and 9 must contain a P, column 8 must contain an N, and columns 5 and 6 must be blank. Since all three conditions must be met, one stacker specification line is required for this example.

If Fields 3 and 5 must be valid *or* Field 4 must be either invalid or not present, two stacker specification lines are required. The first must have a P in columns 7 and 9. The second must have an N in column 8. Columns 5, 6, and 8 must be blank in the first line. Columns 5, 6, 7, and 9 must be blank in the second line.

If the validity or presence check conditions are satisfied, further processing is done on the document. This may consist of either (1) performing the field comparison or field length tests defined in columns 12-96, or if no tests are specified, (2) immediately routing the document to the stacker specified in columns 3-4.

If the validity or presence check conditions are not satisfied, the document is checked against the next stacker specification. If no further stacker specifications exit the document is routed to the reject stacker.

#### Reserved (Columns 10-11)

These columns are reserved for future use and should be blank. They are ignored by the utility program.

#### Field Comparison Tests (Columns 12-28, 29-45, 46-62, 63-79, 80-96)

These tests cause the utility program to compare document fields against test characters, and to determine from this comparison whether or not to route documents to the stacker indicated in columns 3 through 4 of the stacker specification.

A document field is compared against test characters for that field to determine if it is equal to, greater than, less than, not equal to, not greater than, or not less than the test characters. A variable-length document field can be tested to determine if it is long enough for additional comparison tests to be performed on it.

Five or fewer fields in a document can be tested. Ten or fewer digits of a field can be compared. The tests are marked 1 through 5 on the stacker specification. They are performed one at a time beginning with Test 1. If the Test 1 comparison is satisfied, the comparison requested by Test 2 is performed, and so forth.

Comparison test entries must be specified in the sequence they appear on the stacker specification. The entry for Test 2 cannot be specified if the Test 1 entry is blank.

All specified tests must be satisfied in order for the document to be routed to the stacker indicated in columns 3-4. Otherwise, the document is checked against the next stacker specification or is routed to the reject stacker if no further stacker specification exists.

Each 17-column comparison test entry consists of six subentries:

- Field Number (1-column)
- Relative Pos. (2-columns)
- Field Length (2-columns)
- Not—N (1-column)
- Compare—E/L/G (1-column)
- Test Characters (10-columns)

*Field Number (Columns 12, 29, 46, 63, 80):* Is the number of the field to be tested, as follows:

Entry	Field
1	Amount field.
2	Process control field.
3	Account number field.
4	Transit-routing field.
5	Serial number field.

**Relative Pos. (Columns 13-14, 30-31, 47-48, 64-65, 81-82):** Is a number that defines the relative location of the rightmost digit to be tested. This number refers to the number of positions that the desired digit is located from the rightmost digit in the field; that is, it refers to the relative position of that digit from the rightmost position in the field. The rightmost digit is considered to be at position 0. If the relative position entry is blank, the utility program assumes a Relative Position subentry of 0. (For field length tests this entry is the length to which the field is compared.)

**Field Length (Columns 15-16, 32-33, 49-50, 66-67, 83-84):** Is a number that designates the number of positions being tested. At least one position must be tested. (The entry must be 1 for a field length test.)

**Not – N (Columns 17, 34, 51, 68, 86):** Is the letter N that is used in conjunction with the E/L/G entry to indicate that the following tests are to be performed:

Not and Compare Entries	Test
NE	For a not equal condition.
NL	For a not less than condition.
NG	For a not greater than condition.

If the Not subentry is blank or if it contains a character other than N, the Not subentry is ignored for the corresponding test.

**Compare—E/L/G (Columns 18, 35, 52, 69, 87):** Designates the type of condition being tested, as follows:

Entry	Meaning
E	Test to determine if the contents of the specified field are equal to the test characters (also specified for field length tests).
L	Test to determine if the contents of the specified field are less than the value of the test characters.

**Entry Meaning (continued)**

**G** Test to determine if the contents of the specified field are greater than the value of the test characters.

If the Compare subentry is blank or if it contains a letter other than E, L, or G, the utility program assumes that E has been specified.

**Test Characters (Columns 19-28, 36-45, 53-62, 70-79, 87-96):** Are ten or fewer characters that are to be compared with the contents of the designated field. Comparison starts with the character designated by the Relative Position subentry and proceeds to the left until the desired number of characters have been tested.

This entry must be blank if the length of a field is being tested.

When the dash transmission feature is being used and the transit-routing field is specified as the test field, the dash must be considered a valid character in the field. For example, to indicate transit-routing field 0912-0069 in Test 1, a dash must be placed in column 24 of the stacker specification.

**Number of Stacker Specifications**

The number of stacker specifications that may be used in a job is limited to the number of storage positions available to store information from those specifications. In the following formula, the computed value of X (the number of storage positions required for specification information) must not exceed 2000:

$$X = 3(N_S + N_L) + 4N_C + N_D$$

The variables in the formula designate the following:

- X is the number of storage positions required for specification information.
- N<sub>S</sub> is twice the number of stacker specifications in a job.
- N<sub>C</sub> is the number of field comparison tests.
- N<sub>L</sub> is the number of field length tests.
- N<sub>D</sub> is the total number of digits in all field comparison tests.

This formula can also be used to calculate the number of tape storage positions required for specification information. The maximum value (2000) is variable, however, depending on factors such as the size of the BLKL parameter.

**SUMMARY OF SYSTEM AND STACKER SPECIFICATIONS ENTRIES**

Figures 14 and 15 summarize the detailed descriptions of specification entries presented earlier in this section. These figures are designed as quick reference aid to be used when preparing specifications for jobs. Figure 14 summarizes the system specification entries. Figure 15 summarizes the stacker specification entries.

SYSTEM SPECIFICATION		
Column	Descriptive Name	Entries/Explanation
1-2	Sequence Number	A 2-digit number that aids in keeping specification cards in proper sequence. Must be lowest sequence number of any specification in job. Place 99 in these columns if sequence checking is not desired.
3-5	Document Count	A number from one through three digits that denotes the number of documents to be routed to a stacker before the document count condition is met.
6	Action	Defines the action to be performed after the document count condition is met for a stacker:  S—Stop the 1255 I—Indicate document count condition by means of control documents. A—Alternate stackers
7-8	Reserved	Should be blank.
9-13	Fields to be Printed	Designates which fields are to be printed:  P—Field is to be printed. blank—Field is not to be printed.
14-15	Reserved	Should be blank.

Figure 14 (Part 1 of 2). System Specification Entries

SYSTEM SPECIFICATION		
Column	Descriptive Name	Entries/Explanation
16-30	Field Definition	<p>Consists of five 3-column subentries that describe the fields to be read from a document.</p> <p>First column of each subentry must contain either:</p> <p>F—Field is fixed length. V—Field is variable length.</p> <p>Second and third columns of each subentry must contain a number designating the length of a fixed-length field, or the maximum length of a variable-length field.</p>
31-36	Reserved	Should be blank.
37	Modulus Number	<p>Designates whether modulus 10 or modulus 11 is to be used in verifying account number:</p> <p>0—Modulus 10 is to be used. 1—Modulus 11 is to be used.</p>
38-47	Weighting Factor	A weighting factor of 10 or fewer characters to be used in generating the self-check digit for modulus checking. A character may be any digit 0-9, or the letter, X.
48	EOF/Control Field	A number from 1 through 5 that identifies the field used to define end-of-file and control documents.
49-58	Control Document Contents	The contents of the field used to identify a control document.
59-68	End-of-File Document Contents	The contents of the field used to identify an end-of-file document.
69-71	Print Line Length	<p>A number that denotes the number of characters to be printed per line. This number may be any value from 4 through the maximum number of characters that may be printed per line by the printer being used. The maximum entries are:</p> <p>96—96 character print line 120—120 character print line 132—132 character print line</p>
72	Stacker Code	<p>A number that designates how stackers are numbered on the 1255 being used:</p> <p>4— For 6 stackers numbered 0, 1, 2, 3, 4, and R.</p> <p>8— For 6 stackers numbered 0, 2, 4, 6, 8, and R.</p> <p>A—For 12 stackers numbered 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, and R.</p>
73-95	Reserved	Should be blank.
96	System Specification	The letter S to identify this as a system specification.

Figure 14 (Part 2 of 2). System Specification Entries

STACKER SPECIFICATION		
Column	Descriptive Name	Entries/Explanation
1-2	Sequence Number	A 2-digit number that aids in keeping specification cards in proper sequence. Must be greater than the sequence number on the system specification.
3-4	Stacker Number	A number or a letter (A or R) that identifies the stacker associated with this stacker specification.
5-9	Validity or Presence Check	Defines the status of the fields that must exist before further processing associated with the stacker specified in columns 3-4 is done on this document:  P—Field must be present and valid. N—Field must be not present or invalid. blank (col. 5)—Field must be present and valid. blank (col. 6-9)—Field is not checked.
10-11	Reserved	Should be blank.
12-28	Field Test 1	Tests the contents of any field in a document, or tests a digit of any variable-length field to determine if the field is long enough to allow more tests to be performed.
12	Field Number	The number (1-5) of the field to be tested.
13-14	Relative Position	A number that corresponds to the relative location of the rightmost digit to be tested. The number of digits needed in a field to satisfy a length test.
15-16	Field Length	A number that designates the number of positions being tested.
17	Not--N	The letter N used in conjunction with column 18 to indicate that tests are to be performed for a not equal, not less than, or a not greater than condition.
18	Compare — E,L,G,	Designates the type of condition being tested:  E— Field contents equal test characters or a length test is to be performed. L— Field contents less than test characters. G— Field contents greater than test characters.
19-28	Test Characters	Ten or less numeric characters that are to be compared with the contents of the designated field. Must be blank if the length of a field is being tested.
29-96	Field Tests 2,3,4,and 5	Contain the same types of information as the entries for Field Test 1.

Figure 15. Stacker Specification Entries



This chapter describes how to estimate the time it will take the 1255 utility program to process a specified number of documents. This *document processing time* begins when the 1255 begins feeding documents and ends when the utility program has finished processing those documents (the last document has been routed to a stacker).

Document processing time is influenced by the model of the 1255 being used, the speed of the attached printer, the length of the printed record, the length of the documents being processed, the length of the print line on the attached printer, the need for operator intervention, and the number of documents being processed.

**DOCUMENT PROCESSING RATE FORMULAS**

Simple formulas can be used to estimate document processing rates when operator intervention is not required. In cases where operator intervention is required (see the last section of this chapter), document processing time cannot be predicted.

Document processing rates can be estimated as described in Figure 16. Figures 17 and 18 list the document-per-minute (DPM) rates for the models of the 1255.

Without 51-Column Document Feature	With 51-Column Document Feature
<ol style="list-style-type: none"> <li>1. Look up DPM rate from Figure 17 or 18.</li> <li>2. Calculate DPM rate using the appropriate formula.                                <math display="block">1255 \text{ Model 1 DPM} = \frac{3000}{\text{Length}}</math> <math display="block">1255 \text{ Model 2 or 3 DPM} = \frac{4500}{\text{Length}}</math> </li> <li>3. Compare DPM results from steps 1 and 2. The lowest result is the number of documents that can be processed per minute under the conditions specified for the particular job.</li> </ol>	<ol style="list-style-type: none"> <li>1. Look up DPM rate from Figure 17 or 18.</li> <li>2. Calculate DPM rate using the appropriate formula                                <math display="block">1255 \text{ Model 1 DPM} = \frac{2400}{\text{Length}}</math> <math display="block">1255 \text{ Model 2 or 3 DPM} = \frac{3600}{\text{Length}}</math> </li> <li>3. Compare DPM results from steps 1 and 2. The lowest result is the number of documents that can be processed per minute under the conditions specified for the particular job.</li> </ol>
<p><i>DPM</i> is the number of documents that can be processed per minute.</p> <p><i>Length</i> is the average length (in inches) of the document to be processed.</p> <p>Document processing time begins when the 1255 begins feeding documents and ends when the utility program has finished processing those documents. Document processing time does not include the time required to prepare the 1255 for processing documents or for any operator intervention time that may be needed during the course of the job.</p> <p>Document processing time will be increased if operator intervention is required, if the document count condition entry (columns 3-6 of the system specification) has been specified, or if control documents are used.</p>	

Figure 16. Estimating Document Processing Rate

**EXAMPLE OF ESTIMATING DOCUMENT PROCESSING TIME**

Assume that you want to process a job with the following criteria:

- The 1255 Model 1 is being used.
- The 200 lines per minute printer with 96 print positions is used to print both the specifications and the documents.
- Each printed record is 12 characters long.
- There are 5000 six-inch documents to be read and processed.
- The 51-column document feature is not used.

These conditions indicate that document processing time can be determined as follows:

1. In Figure 17 look up the DPM rate for a printed record length of 12 characters on the 200-lines-per-minute 5203 Printer with a print line length of 96 characters.
2. Calculate the DPM rate using the formula for the 1255 Model 1 without the 51-column document feature:  
$$DPM = \frac{3000}{6} \text{ or } DPM = 500$$
3. Compare the results of steps 1 and 2. Both equal 500. Thus, 500 documents per minute will be processed by the utility program for the specified job providing operator intervention is not required, the document count condition entry (columns 3-6) has not been specified, and control documents are not used.
4. Calculate the document processing time. To process 5000 documents at 500 documents per minute; 10 minutes will be required.

Printer Speed	Print Line Length (Characters)	Printed Record Length (Characters)	DPM
100 lines per minute	96 characters	4-19	500
		20-24	400
		25-32	300
		33-48	200
		49-54	100
	120 characters	4-24	500
		25-30	400
		31-40	300
	132 characters	41-54	200
4-26		500	
27-33		400	
200 lines per minute	96 characters	34-44	300
		45-54	200
		4-32	500
	120 characters	33-48	400
		49-54	200
		4-41	500
	132 characters	42-54	400
		4-44	500
		45-54	400

Figure 17. Estimated Documents Per Minute (DPM) Rates on 1255 Model 1

Printer Speed	Print Line Length (Characters)	Printed Record Length (Characters)	DPM
100 lines per minute	96 characters	4-12	750
		13	700
		14-16	600
		17-19	500
		20-24	400
		25-32	300
		33-48	200
	49-54	100	
	120 characters	4-15	750
16-17		700	
18-24		600	
25-30		400	
31-40		300	
132 characters	4-16	750	
	17-18	700	
	19-22	600	
	23-26	500	
	27-33	400	
	34-44	300	
	45-54	200	
200 lines per minute	96 characters	4-24	750
		25-32	500
		33-48	400
		49-54	200
	120 characters	4-30	750
		31-40	600
		41-54	400
	132 characters	4-33	750
		34-44	600
45-54		400	

Figure 18. Estimated Documents Per Minute (DPM) Rates on 1255 Model 2 or 3

## OPERATOR INTERVENTION CONDITIONS

Document processing time is unpredictable whenever operator intervention is required in processing documents. Operator intervention is required under the following conditions:

*Condition 1:* A stacker command stop is issued by the 1255. This occurs when the utility program takes too much time to select a document into a stacker or when a specification indicates that a document is to be routed to a stacker and the number of that stacker does not exist on the 1255 being used.

The maximum time that the Utility Program can take to select a stacker is as follows:

	<i>Stacker 0</i>	<i>All Other Stackers</i>
Model 1	24 ms	50 ms
Models 2 and 3	24 ms	24 ms

On the Model 1, this allows for at least 120 decisions for stacker 0 and 330 decisions for any other stacker without incurring a stacker command stop. A decision is a validity or presence check, a field length validity test, or a field comparison test.

On the Models 2 and 3, the stacker selection time limit permits at least 120 decisions for any stacker.

*Condition 2:* The 1255 is stopped due to:

1. Jam stop
2. Stacker command stop
3. Empty hopper stop

## Chapter 5. Example of Specification Use

Figure 19 contains sample specifications for using the utility program to sort bank documents. The types and formats of input documents expected, and the stackers to which these documents are to be routed are as follows:

Type of Input Document	Account Number Formats	Stacker To Be Selected
Regular Checking Account Checks	xx7-xxx-x xx8-xxx-x	0
Special Checking Account Checks	xx2-xxx-x xx3-xxx-x	1
Business Checks	xx1-xxx-x	2
Special Handling Documents	xxx-07xxxx xxx-08xxxx	3
Special Handling Documents	01x-xxx-x 02x-xxx-x 03x-xxx-x 04x-xxx-x 05x-xxx-x 06x-xxx-x 07x-xxx-x 08x-xxx-x	4
Checks from Other Banks		R
Checks over \$25,000		R
Documents Rejected by 1255		R
Documents with Account Numbers other than Above		R

Figure 20 describes the entries on the system specification shown in Figure 19. The system specification is to precede all stacker specifications in the job.

Figure 21 describes the entries on the stacker specifications shown in Figure 19. These specifications define the criteria for routing a document to stackers. The stacker specifications are processed against a document in the order of their sequence numbers. If a document does not satisfy all of the conditions on a particular stacker specification, that document is tested against the next stacker specification in the sequence. If the document does not satisfy all of the conditions on the last stacker specification (sequence number 11), that document is routed to the reject stacker.

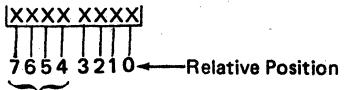
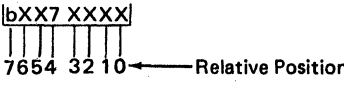
Figure 22 shows headings that will appear on output produced by the job that uses the specifications in Figure 19.



Columns	Meaning												
9,11	The amount field (column 9) and the account number field (column 11) are the only fields to be printed.												
16-18, 22-24, 25-27	The size of the amount, account number, and transit-routing fields are as follows:  <table border="1"> <thead> <tr> <th><u>Columns</u></th> <th><u>Field</u></th> <th><u>Size</u></th> </tr> </thead> <tbody> <tr> <td>16-18</td> <td>Amount (Field 1)</td> <td>Fixed length, 10 positions</td> </tr> <tr> <td>22-24</td> <td>Account Number (Field 3)</td> <td>Variable length, 1-9 positions</td> </tr> <tr> <td>25-27</td> <td>Transit-Routing* (Field 4)</td> <td>Fixed length, 8 positions</td> </tr> </tbody> </table>	<u>Columns</u>	<u>Field</u>	<u>Size</u>	16-18	Amount (Field 1)	Fixed length, 10 positions	22-24	Account Number (Field 3)	Variable length, 1-9 positions	25-27	Transit-Routing* (Field 4)	Fixed length, 8 positions
<u>Columns</u>	<u>Field</u>	<u>Size</u>											
16-18	Amount (Field 1)	Fixed length, 10 positions											
22-24	Account Number (Field 3)	Variable length, 1-9 positions											
25-27	Transit-Routing* (Field 4)	Fixed length, 8 positions											
48-68	In addition to identifying the account number, field 3 is used to identify control and end-of-file documents. If field 3 contains nine 8's, the document is considered to be a control document. If field 3 contains nine 9's, the document is considered to be an end-of-file document.												
69-71	A 96-character print line is being used.												
72	Stackers are numbered 0, 1, 2, 3, 4, and R.												
96	This is a system specification.												

\* The dash transmission feature is not present.

Figure 20. Description of Entries on System Specification Example

Sequence Number	Purpose	Conditions To Be Satisfied
02	To route all documents from other banks to the reject stacker (R in column 4).	<ol style="list-style-type: none"> <li>Amount field (column 5) and transit-routing field (column 8) are present and valid.</li> <li>First four positions or transit-routing field are not 0010 (columns 12-28). (It is assumed for this example that the dash-transmission feature is not present.)</li> </ol> <div style="text-align: center;">  <p>Positions being tested for 0010.</p> <p>The last digit to be tested occupies the 5th position from the right end of the field, or relative position 04 (columns 13-14). Thus, since the field is 8 positions long, the first four positions from the beginning of it are to be tested.</p> </div>
03	To route all checks for amounts greater than \$25,000 to the reject stacker (R in column 4)	<ol style="list-style-type: none"> <li>Amount field is present (column 5)*.</li> <li>Amount field contains a value greater than \$25,000 (columns 12-28).</li> </ol> <p>This test is made for all 10 positions of the field. If only 7 positions were tested, the utility program will not be able to recognize many of the amount fields greater than \$25,000; this is because the utility program will not test the eighth, ninth, and tenth positions of the field. For example, if only 7 positions are to be tested, an account field of \$625,000.00 will be considered to be not greater than \$25,000 and will thus satisfy the test; the digit 6 in the eighth position will not be tested.</p>
04	To route all regular account checks (account number format xx7-xxx-x) to stacker 0 (00 in columns 3-4).	<ol style="list-style-type: none"> <li>Amount field (column 5)* and account number field (column 7) are present.</li> <li>5th position from right in account number field contains a 7; this is relative position 04 (columns 12-28).</li> </ol> <div style="text-align: center;">  </div> <p>If satisfied, this test indicates that the check is either a regular account check (xx7-xxx-x) or a special handling document (xxx-07xxxx). Another test is needed to distinguish between the documents.</p> <ol style="list-style-type: none"> <li>8th position from right in account number does not contain a digit; this is relative position 07 (columns 29-45).</li> </ol> <p>By design, the 8th position of a special handling document contains a digit, while the 8th position of a regular account check is blank. If the digit is missing, this test is satisfied which indicates that the check is a regular account check.</p>
05	To route all regular account checks (account number format xx8-xxx-x) to stacker 0 (00 in columns 3-4).	Same conditions as for sequence specification 04, except for condition 2. Here, the 5th position from right in account number field must contain an 8, rather than a 7.

\* Column 5 could be left blank and an entry of P would be assumed (see Chapter 1 under the heading *Field Validity or Presence Check*).

Figure 21 (Part 1 of 2). Description of Entries on Stacker Specification Example



Sequence Number	Purpose	Conditions To Be Satisfied
06	To route special account checks (account number format xx2-xxx-x) to stacker 1 (01 in columns 3-4).	<ol style="list-style-type: none"> <li>1. Amount field (column 5) and account number field (column 7) are present.</li> <li>2. 5th position from right in account number field contains a 2; this is relative position 04 (columns 12-28).</li> </ol>
07	To route special account checks (account number format xx3-xxx-x) to stacker 1 (01 in columns 3-4).	<ol style="list-style-type: none"> <li>1. Amount field (column 5) and account number field (column 7) are present.</li> <li>2. 5th position from right in account number field contains a 3; this is relative position 04 (columns 12-28).</li> </ol>
08	To route business checks (account number format xx1-xxx-x) to stacker 2 (02 in columns 3-4).	<ol style="list-style-type: none"> <li>1. Amount field (column 5) and account number field (column 7) are present.</li> <li>2. 5th position from right in account number field contains a 1; this is relative position 04 (columns 12-28).</li> </ol>
09	To route special handling documents (account number format xxx-07xxxx) to stacker 3 (03 in columns 3-4).	<ol style="list-style-type: none"> <li>1. Amount field (column 5) and account number field (column 7) are present.</li> <li>2. 5th and 6th positions from right in account number field contain a 07 (columns 12-28).</li> </ol>
10	To route special handling documents (account number format xxx-08xxxx) to stacker 3 (03 in columns 3-4).	<ol style="list-style-type: none"> <li>1. Amount field (column 5) and account number field (column 7) are present.</li> <li>2. 5th and 6th positions from right in account number field contain an 08 (columns 12-28).</li> </ol>
11	To route special handling documents (account number formats 01x-xxx-x, 02x-xxx-x, 03x-xxx-x, 04x-xxx-x, 05x-xxx-x, 06x-xxx-x, 07x-xxx-x, 08x-xxx-x) to stacker 4 (04 in columns 3-4).	<ol style="list-style-type: none"> <li>1. Amount field (column 5) and account number field (column 7) are present.</li> <li>2. 6th and 7th positions from right in account number field contain a value greater than 00 but less than 09 (columns 29-45); these positions are relative positions 05 and 06.</li> </ol>
		<p>This type of specification is called a range check. These conditions could have been specified by separate stacker specifications which would test the 6th and 7th positions for 01, 02, 03, 04, 05, 06, 07, and 08 respectively. In that case, eight separate stacker specifications would be necessary to do the same thing done by this one specification.</p>

Figure 21 (Part 2 of 2) Description of Entries on Stacker Specification Example

RECORD		RECORD		RECORD		RECORD	
SK FLD3	FLD1	SK FLD3	FLD1	SK FLD3	FLD1	SK FLD3	FLD1
XX XXXXXXXXX	XXXXXXXXXX	XX XXXXXXXX	XXXXXXXXXX	XX XXXXXXXX	XXXXXXXXXX	XX XXXXXXXX	XXXXXXXXXX
:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:
CONTROL TOTALS		DOCUMENT COUNT-0200		AMOUNT FIELD-		\$25,050.18	
XX XXXXXXXXX	XXXXXXXXXX	XX XXXXXXXX	XXXXXXXXXX	XX XXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:
CONTROL TOTALS		DOCUMENT COUNT-0256		AMOUNT FIELD-		\$31,625.17	
XX XXXXXXXXX	XXXXXXXXXX	XX XXXXXXXX	XXXXXXXXXX	XX XXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:
CONTROL TOTALS		DOCUMENT COUNT-0085		AMOUNT FIELD-		\$1,240.65	
SK COUNT	AMOUNT	FLD TOTALS	SK COUNT	AMOUNT	FLD TOTALS	SK COUNT	AMOUNT
00 0125		\$16,250.00	01 0070		\$3,551.00	02 0200	\$31,500.00
03 0050		\$2,180.00	04 0086		\$4,380.00		
FINAL TOTAL		DOCUMENT COUNT-0531		AMOUNT FIELD-		\$57,917.00	

Figure 22. Typical Printed Output from Example Specifications

Since the 1255 utility program resides on disk, it must be loaded into main storage before it can be executed. Once the 1255 utility program has been loaded into main storage and the 1255 Magnetic Character Reader has been prepared for operation, document processing can begin.

Loading the 1255 utility program into main storage requires writing Operation Control Language (OCL) and utility control statements, combining these statements with system and stacker specifications to form a job stream, and entering the information in the job stream through either the MFCU or the Printer Keyboard. Whenever MFCU is mentioned in this chapter, the 5471 Printer Keyboard can be used.

A *job stream* for the 1255 utility program consists of all OCL statements, utility control statements, and system and stacker specifications necessary to cause the utility program to process the documents being fed from the 1255.

## PREPARING THE OCL JOB STREAM

To load the utility program into storage, you can use any of the following methods:

- Enter both the OCL statements for the utility program and the system and stacker specifications through the primary hopper of the MFCU. The required OCL statements and the sequence in which they must be entered are shown in Figure 23.
- Enter both the OCL statements for the utility program and the system and stacker specifications through the IBM 5471 Printer Keyboard. These statements and specifications must be entered in the same format and sequence shown in Figure 23.
- Store the OCL statements for the utility program and the system and stacker specifications together as a procedure in the Source Library using the Library Maintenance program. A /\* statement must *not* be included in the procedure. Then, to access this procedure, enter CALL and RUN statements through the primary hopper of the MFCU (see Figure 24). The Library Maintenance program is described in the *IBM System/3 Model 10 Disk System Control Programming Reference Manual*, GC21-7512.
- Store the OCL statements for the utility program as a procedure in the Source Library using the Library Maintenance program. Then, to begin job processing, enter the system and stacker specifications and accompanying CALL and RUN statements through the primary hopper of the MFCU (see Figure 25).
- Store the system and stacker specifications as a source member in the Source Library using the Library Maintenance program. Then, either store the OCL statements for the utility program as a procedure in the Source Library or enter these OCL statements through the primary hopper of the MFCU. Next, inform the 1255 utility program that the specifications are a source member. To inform the 1255 utility program that system and stacker specifications are a source member, a SOURCE statement must be read before the system specification for the job is read. The SOURCE statement may point directly to the specifications or to another SOURCE statement (see Figure 26). A maximum of two SOURCE statements can be used. If the specifications are not located after the second SOURCE statement has been read, the program terminates the job.

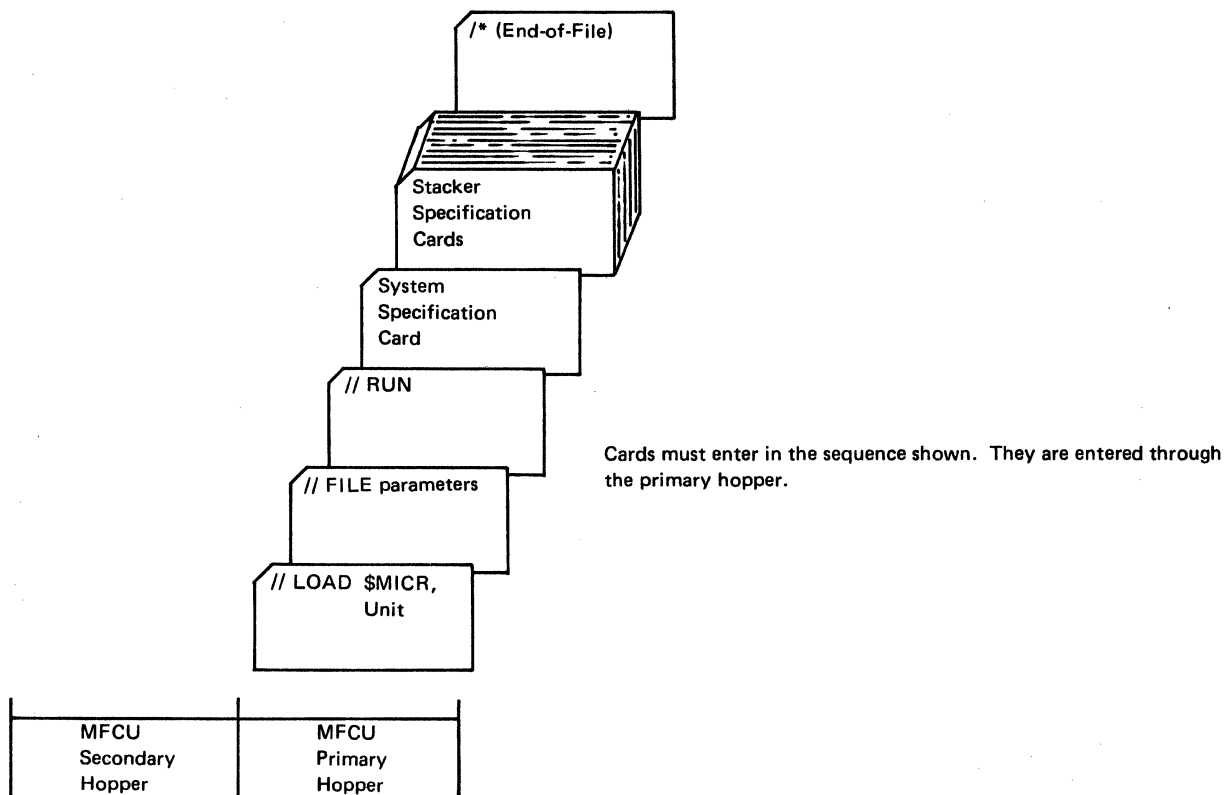
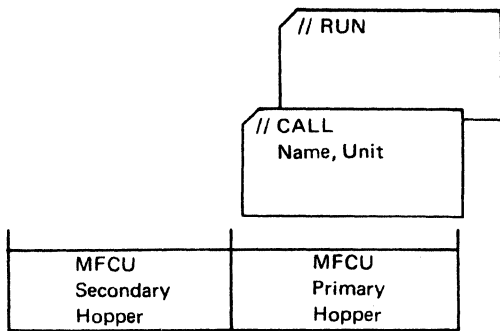
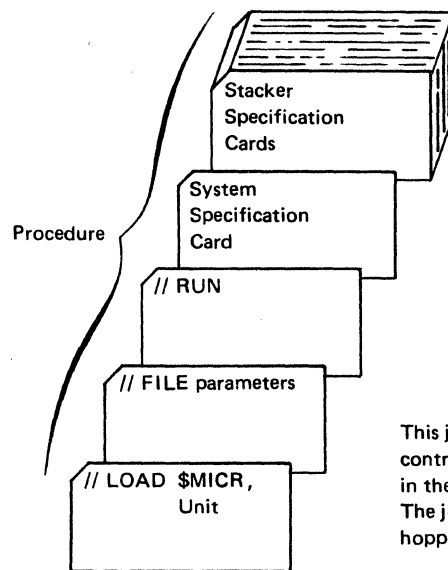
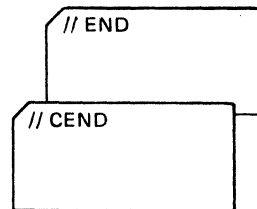


Figure 23. 1255 Utility Specifications and OCL in MFCU.



This job stream is required to access the OCL and utility control statements and the 1255 utility specifications (stored in procedure shown below) from the Source Library. The job stream is entered through the primary hopper of the MFCU.



This job stream stores the OCL statements, utility control statements, and 1255 utility specifications in the Source Library using Library Maintenance. The job stream is entered through the primary hopper of the MFCU.

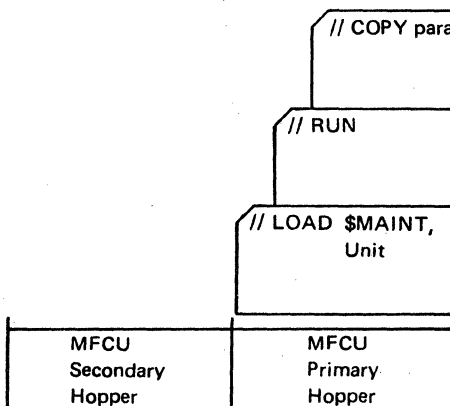


Figure 24. 1255 Utility Specifications as Procedure in Source Library

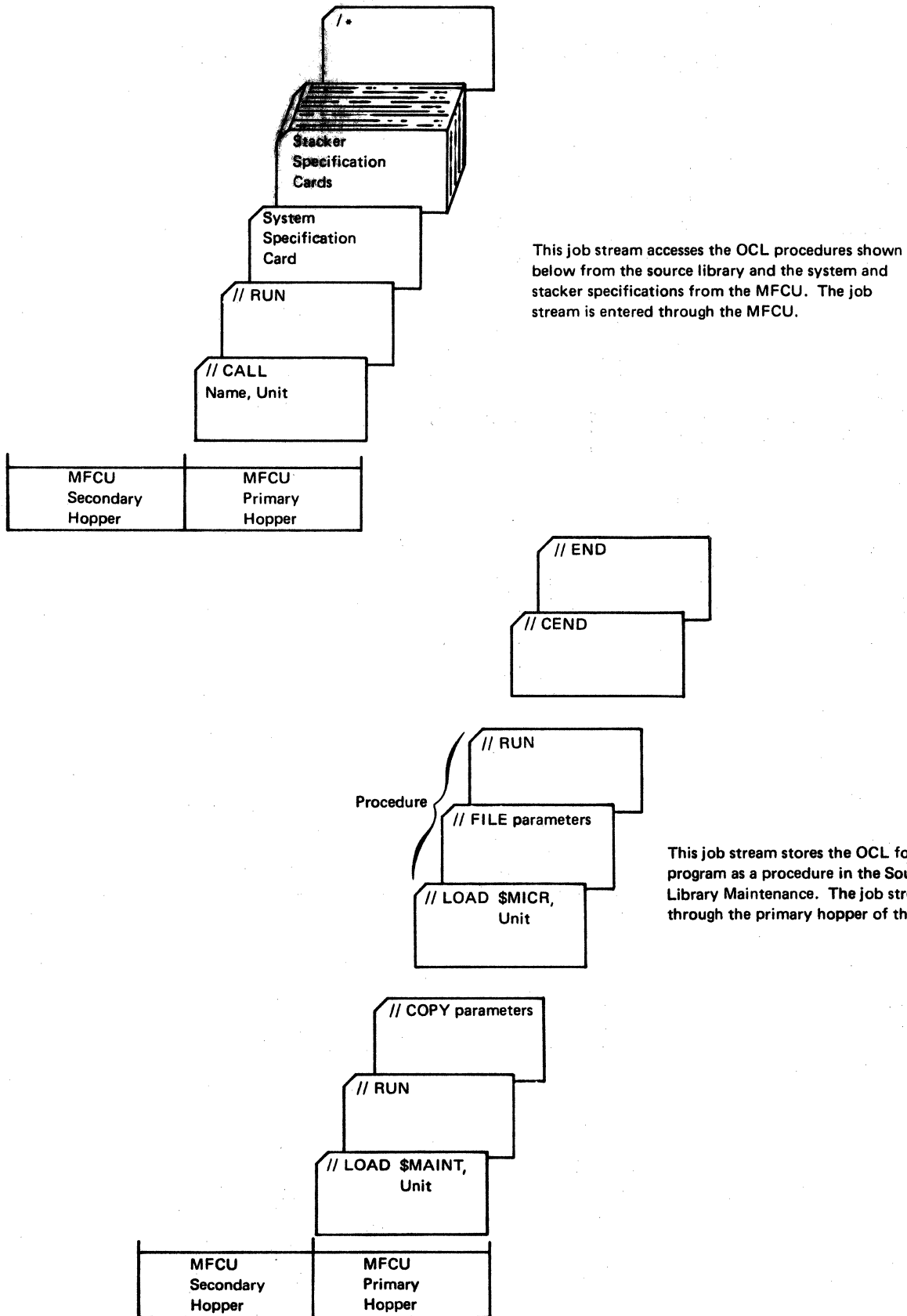


Figure 25. 1255 Utility Specifications in MFCU and OCL Procedures in Source Library

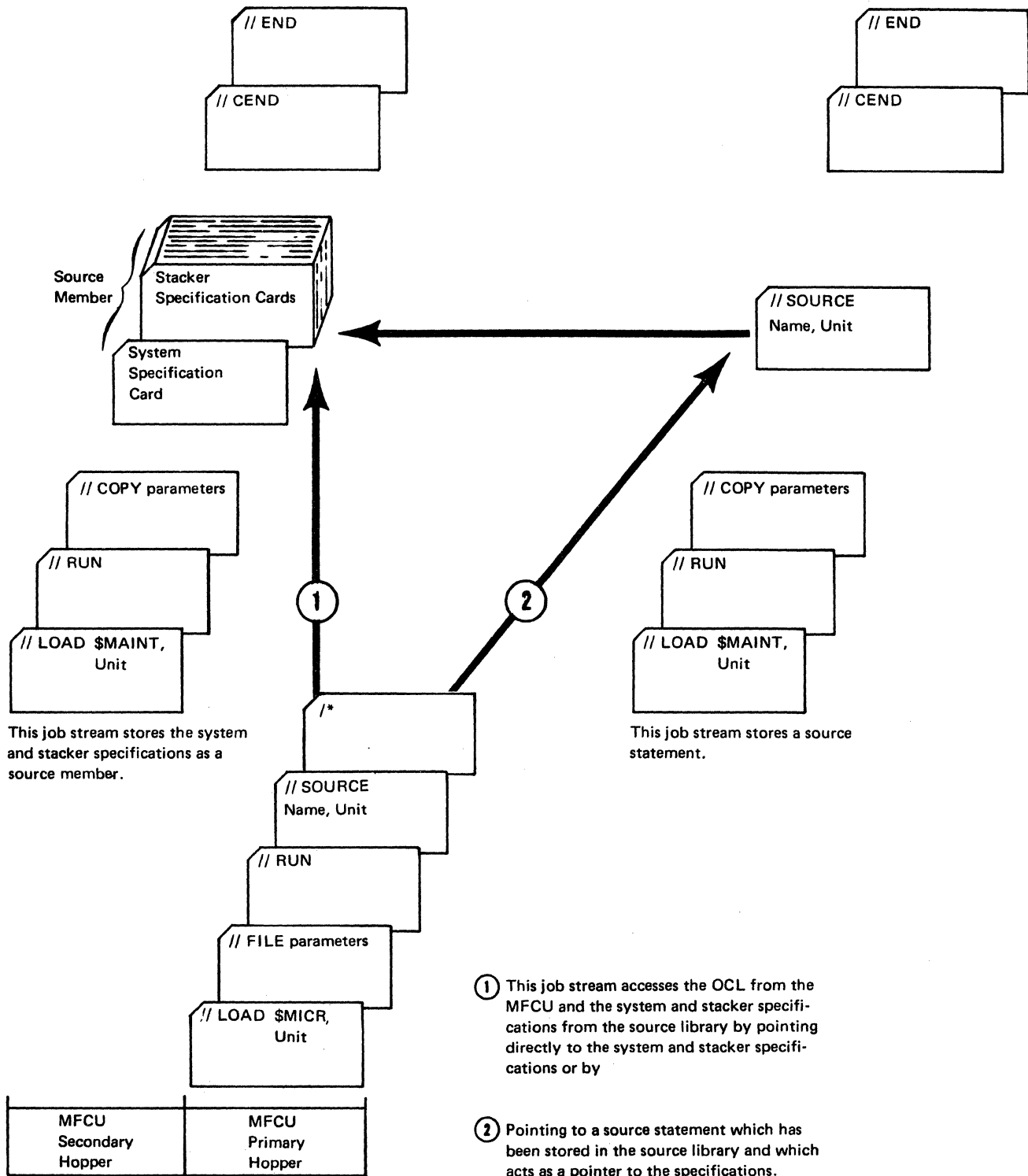


Figure 26. 1255 Utility Specifications as Source Member in Source Library

The format of the SOURCE statement is as follows:

```
// SOURCE program-name, unit
```

*Program-name* is a name of six or fewer characters that identifies either another SOURCE statement in the source library or the system and stacker specifications that are stored as a source member.

*Unit* is a code indicating where the disk containing the source library is located on the disk unit. The allowable codes are as follows:

Code	Meaning
R1	Removable disk on drive 1.
F1	Fixed disk on drive 1.
R2	Removable disk on drive 2.
F2	Fixed disk on drive 2.

### READING JOB STREAM FROM MFCU

The following procedures are required to read the OCL statements and system and stacker specifications by means of the MFCU:

1. Remove card weights, and then remove cards from both hoppers of the MFCU.
2. To remove cards inside the MFCU, press the NPRO key on the MFCU control panel twice.
3. Remove any cards from stackers.
4. Place cards containing the OCL and the system and stacker specifications (if required) in the primary hopper of the MFCU. Load cards face down, top edge to the left. Replace card weights.
5. Press MFCU START. The PRIMARY READY light will turn on.

6. Ready the printer.
7. Ready the 1255 (see *Starting the 1255*).
8. Press console START.

### STARTING THE 1255

In processing a document, the 1255 performs four basic operations: feeding, aligning, reading, and routing.

Documents begin feeding through the 1255 when the operator presses the START key on the 1255. Documents are fed one at a time from the hopper near the top of the 1255.

After a document is fed, it passes through an aligner section where it is positioned so that the imprinted magnetic ink characters can be read.

The document next passes through a write mechanism which magnetizes the encoded characters. It then goes through a read mechanism which reads the characters. Finally, the document is routed to a stacker.

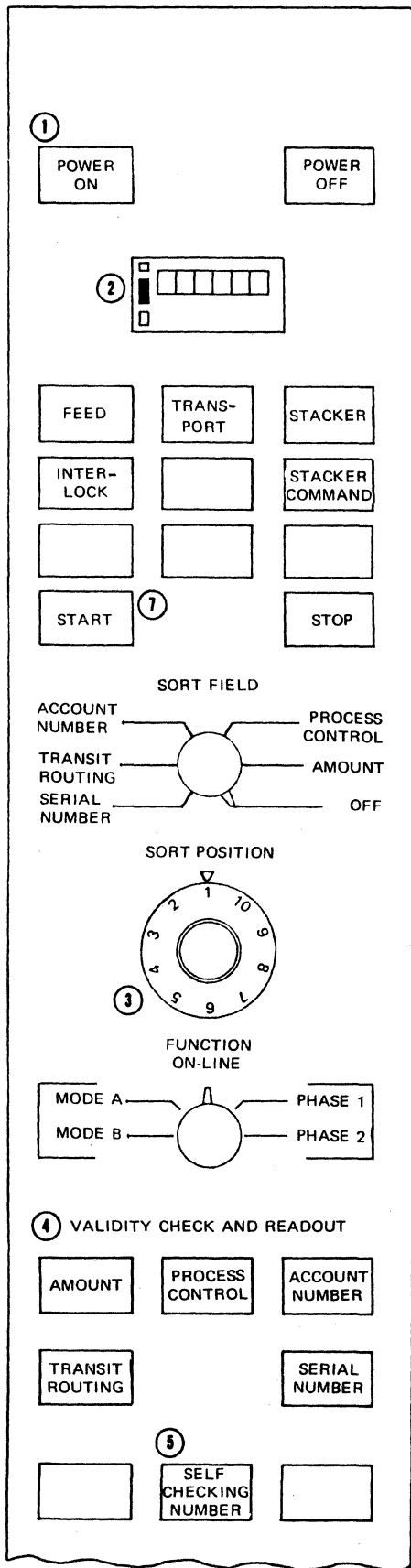
Figure 27 contains the procedure that must be performed to prepare the 1255 for document processing.

Documents continue feeding through the 1255 until one of the following occurs:

- A stacker becomes full (a full-stacker stop).
- The hopper becomes empty (an empty-hopper stop).
- A feed failure or jam occurs (a feed-failure or jam stop).
- The utility program indicates that feeding is to stop.
- The STOP key is pressed (an operator stop).
- The utility program takes too long to select a stacker for a document (a stacker command stop). Late stacker selection is discussed in Chapter 4. *Timing Considerations*.

Figure 28 shows the procedure the operator should follow if one of these 1255 stop conditions should occur.





- 1 Press the POWER ON key.
- 2 Press the document counter reset tab (if required).
- 3 Turn the FUNCTION switch to ON-LINE.
- 4 Press the VALIDITY CHECK AND READOUT keys for only those fields specified on the system specification.
- 5 Press the SELF-CHECKING NUMBER key (if required).
- 6 Joggle documents and place them in the hopper with the MICR-encoded area facing downward.
- 7 Press the START key. The 1255 is ready to read documents, but document feeding may not start immediately.

For more detailed operating information, refer to *IBM 1255 Magnetic Character Reader Component Description, GA24-3542*.

Figure 27. 1255 Start-Up Procedure

**EMPTY-HOPPER STOP**

When all documents have been fed from the hopper, the FEED light turns on and the 1255 stops after all documents reach their designated stackers. Reload the hopper and press the START key to restart.

**STACKER COMMAND STOP**

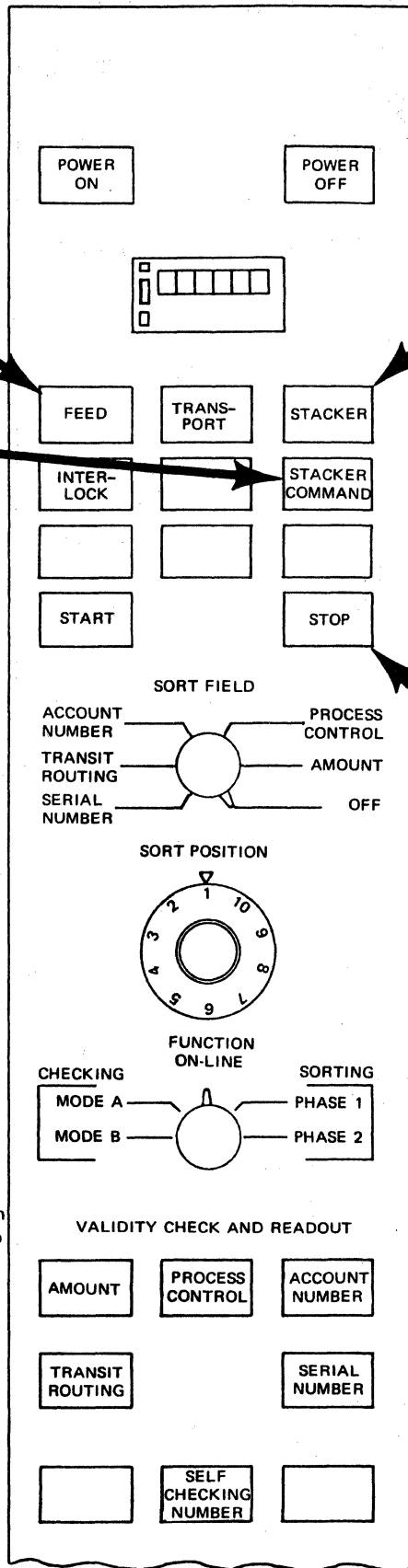
This stop is caused by one of the following:

- The stacker select command issued by the utility program was too late to route the document to a stacker. (See Chapter 4, *Operator Intervention Conditions.*)
- More than one stacker select command was issued for a document.
- The utility program issued a stacker select command to route a document to a non-existent stacker.

When one of these occurs, the STACKER COMMAND light turns on and the 1255 stops feeding documents. When such a stop occurs, one or two documents may be *in-flight*: that is, the documents have been fed into the 1255 but not yet read. These in-flight documents, and the document that caused the stop, are routed to the reject stacker. Data from the document that caused the stop is included in totals accumulated for the job, data from in-flight documents is not included in any totals.

To resume processing, determine (from the printed listing of documents) which document caused the stop. In-flight documents are auto-rejected; they are prefixed by the letters AR on the listing. The document that caused the stop precedes the in-flight document(s). The document that caused the stop condition is prefixed by the number of the stacker that it should have gone to.

Once you have determined (from the listing) which document caused the stop, find it in the reject stacker and remove it. The in-flight document(s) are on top of the document that caused the stop: return them to the feed hopper. Place the document that caused the stop in the stacker to which it should have gone, and press the 1255 START key.



**FULL-STACKER STOP**

When the stacker(s) becomes full, the document feeding stops and the STACKER light turns on. Documents that have left the hopper continue and are stacked under program control. When documents are removed from the full stacker(s), the STACKER light on the operator panel turns off when the START key is pressed. Press the 1255 START key to resume document feeding and sorting under program control.

**OPERATOR STOP**

When the STOP key is pressed, the feeder stops first. The main motor continues to run until all in-flight documents are stacked. Pressing the START key resumes the operation.

**FEED FAILURE OR JAM STOP**

See the procedures in *IBM 1255 Magnetic Character Reader Component Description, GA24-3542.*

Figure 28. 1255 Stop Conditions (model 1 shown above)

There are three types of errors described in this section:

- Errors in the utility program specifications
- Document errors detected by the 1255
- Error conditions that occur during processing

This chapter is divided into three sections, one for each type of error.

### ERRORS IN UTILITY PROGRAM SPECIFICATIONS

This is the first kind of error detected in a job. When the utility program has been loaded, the first operation it performs is to process the specifications and check them for errors.

The program reads and prints one specification at a time. If an error is found in a specification, the word NOTE and a number are printed on the line following the specification. Each note number has a corresponding message. After all the specifications have been read and processed, the utility program prints out the error message for each note produced. If there are Terminal errors (signaled by the message JOB ENDED) the user program is canceled. Otherwise, the program also prints a message that tells the operator which of the VALIDITY CHECK AND READOUT keys should be pressed. The program then issues halt CY; the operator may check error notes and messages and see that the proper VALIDITY CHECK AND READOUT keys are pressed before resuming operations.

In this section each error note number and message are followed by:

- An explanation of the message
- The system action (the effect of the error on program processing)
- The correct operator response

1 FIRST SPEC NOT SYSTEM SPEC. JOB ENDED.

*Explanation:* The job does not have a system specification preceding the stacker specifications in the input stream.

*System Action:* All further specifications are treated as comments. The job is ended.

*Operator Response:* Add a system specification as the first 1255 utility specification in the input stream.

2 IMPROPER SEQUENCING. ENTRY IGNORED.

*Explanation:* The sequence number of this specification is not greater than the sequence number of the previous specification in the job. The entry is ignored.

*System Action:* The job continues processing. This condition does not affect final results.

*Operator Response:* Probable user error. Ensure that the specifications are in desired sequence.

3 DOC. COUNT CONDITION INVALID.  
ENTRY IGNORED.

*Explanation:* The Document Count Condition Entry (columns 3-6) is incorrectly specified. Any of the following conditions may have caused the error:

- Action subentry (column 6) is not S, A, I, or blank.
- Count subentry (columns 3-5) contains invalid digits.
- Action subentry specified with no Count subentry (both of these entries must either be provided or omitted).
- Count subentry specified without Action subentry.

*System Action:* The Document Count Condition entry is ignored, and the program continues processing the job.

*Operator Response:* Probable user error. If action was to have been taken, correct the system specification and process the job again. If no action was to have been taken, the job need not be rerun.

4 PRINT FIELD ENTRY INVALID.  
ENTRY IGNORED.

*Explanation:* One or more of the entries in columns 9-13 of the system specification contains an improper value.

*System Action:* The print request is ignored for the corresponding field(s) and processing continues.

*Operator Response:* Probable user error. Make certain that columns 9-13 of the system specification contain a P if the corresponding field is to be read and printed and a blank if the field is not to be printed. Process the job again.

5 INVALID FIELD DEF. JOB ENDED.

*Explanation:* An invalid entry was placed in columns 16-30 of the system specification.

*System Action:* The job is ended after all system and stacker specifications have been analyzed. No documents are processed.

*Operator Response:* Probable user error. Correct the Field Definition subentries accordingly and rerun the job. Field Definition subentries must be either F, V, or blank.

6 INVALID MODULUS CHECK ENTRY.  
ENTRY IGNORED.

*Explanation:* Either columns 37-47 of the system specification contain invalid entries, or field 3 is not properly defined (columns 22-24 of the system specification).

*System Action:* The utility program continues processing the job, but does not perform modulus checking.

*Operator Response:* Probable user error. If modulus checking is to be performed, first check to ensure that an account number has been specified. If so, correct columns 37-47 of the system specification accordingly. Rerun the job. For more information, refer to *Modulus Check* in Chapter 3.

7 CONTROL FIELD ENTRY INVALID.  
TEST IGNORED.

*Explanation:* Columns 49-58 identify a field formatted differently than that defined by the Field Definition entry of the system specifications, or contain characters that are not numeric characters.

*System Action:* The utility program does not test for control documents. Processing continues as if no control documents are included in the job.

*Operator Response:* Probable user error. Correct the characters in columns 49-58 so that they contain numeric characters in the format defined by the Field Definition entry. Then, rerun the job.

8 EOF FIELD ENTRY INVALID. JOB ENDED.

*Explanation:* The problem is with either column 48 or columns 59-68 of the system specifications. Column 48 can only contain a number (1-5) which defines one of the fields specified by the Field Definition entry (columns 16-30). Columns 59-68 can only identify a field with the same format as the field defined by the Field Definition entry (columns 16-30).

*System Action:* The job is ended after the system specification and stacker specifications have been analyzed. No documents are processed.

*Operator Response:* Probable user error. Either correct column 48 or columns 59-68 to specify a field that is defined in the Field Definition entry (columns 16-30) as a field to be read from the documents. Then, rerun the job.

9 PRINT LINE LENGTH ENTRY INVALID.  
BLANK ASSUMED.

*Explanation:* Columns 69-71 of the system specification contain either a value less than the length of one printer record or greater than the maximum number of characters that can be printed per line by the printer being used, or contain some characters that were erroneously punched.

*System Action:* Each printed line will contain the maximum number of characters that can be printed per line by the printer being used.

*Operator Response:* Probable user error. Enter the desired value in columns 69-71 of the system specification and process the job again.

10 STACKER CODE INVALID. A ASSUMED.  
JOB ENDED.

*Explanation:* Column 72 of the system specification does not contain an entry (4, 8, or A) that corresponds to one of the 1255 stacker configurations.

*System Action:* The utility program assumes that an A has been entered in column 72, analyzes the stacker specifications making up the job, and then ends the job before document processing begins.

*Operator Response:* Probable user error. Enter a proper number in column 72 and rerun the job.

11 MULTIPLE SYSTEM SPEC. FIRST SPEC USED.

*Explanation:* Two or more system specifications have been included in the input stream for the job. Only one system specification is permitted for each job.

*System Action:* The second system specification is ignored and processing continues.

*Operator Response:* Remove the improper system specification from the input stream. If the first system specification is the improper one, rerun the job.

12 INVALID STACKER NO. SPEC IGNORED.

*Explanation:* Columns 3-4 of a stacker specification are blank, invalid, or identified a stacker number that does not coincide with a stacker number on the 1255 being used.

*System Action:* The stacker specification is ignored and the program continues processing with the next stacker specification in the input stream.

*Operator Response:* Probable user error. If the stacker specification that was ignored is pertinent to obtaining desired results, correct columns 3-4 of the stacker specification accordingly and rerun the job.

13 VALIDITY TEST ENTRY INVALID.  
BLANK ASSUMED.

*Explanation:* A Validity or Presence Check entry (columns 5-9 of a stacker specification) does not contain P, N, or a blank.

*System Action:* Validity testing is not performed for this stacker specification and processing continues with the next test on this stacker specification or with the next stacker specification in the job.

*Operator Response:* Probable user error. Change columns 5-9 so that each column contains either P, N, or a blank as appropriate. Then, rerun the job.

14 FIELD NO. SUBENTRY INVALID.  
TEST IGNORED.

*Explanation:* The Field Number subentry of a Field Comparison Test entry contains an invalid number.

*System Action:* The invalid field comparison test is ignored and processing continues with the next test or with the next specification as appropriate.

*Operator Response:* Probable user error. Correct the invalid Field Number subentry and rerun the job.

15 INVALID COMPARISON CONDITION ENTRY.  
E ASSUMED.

*Explanation:* A Compare subentry (column 18, 35, 52, 69, or 86) on a stacker specification contains a letter other than E, L, or G.

*System Action:* The program assumes that E has been specified and continues processing the job.

*Operator Response:* Probable user error. Determine if the test is critical to obtain desired results. If so, correct the Compare subentry accordingly and rerun the job.

16 NEGATE ENTRY INVALID. ENTRY IGNORED.

*Explanation:* A Not subentry (column 17, 34, 51, 68, or 85) on a stacker specification contains a letter other than N or blank.

*System Action:* The program ignores the Not subentry for the corresponding test, and continues processing the job.

*Operator Response:* Probable user error. If a field is to be tested for a not equal, not less than, or not greater than condition, correct the Not subentry accordingly and rerun the job. Otherwise, do not rerun the job but correct the entry so that the message does not appear the next time the job is run.

17 NOT ENOUGH STORAGE FOR SPECS.  
JOB ENDED.

*Explanation:* The job contains more stacker specifications than can fit in main storage reserved for stacker specifications.

*System Action:* The job is ended after the remaining stacker specifications have been analyzed. No documents are processed.

*Operator Response:* If output is stored on tape, the FILE statement BLKL parameter may be reduced to create more storage for the specifications. Otherwise, divide the job into several smaller jobs each of which completes several of the functions required by the total job and requires less stacker specification storage than the maximum storage available. Precede each smaller job with a system specification and run each job. Ways to determine the maximum number of stacker specifications allowable for a job are described in Chapter 3 under *Number of Stacker Specifications*.

18 INVALID // SOURCE STATEMENT.  
JOB ENDED.

*Explanation:* The job stream contains one of the following:

- A SOURCE statement with invalid parameters
- More than two SOURCE statements
- A SOURCE statement following the system specification
- A statement, other than a SOURCE statement, with a // following the // RUN card.
- A SOURCE statement that identifies a source member on a pack that is not mounted.
- A SOURCE statement that identifies a source member that cannot be found.

*System Action:* The job is ended immediately.

*Operator Response:* Probable user error. Either correct the SOURCE statement, remove the extra SOURCE statement, place the SOURCE statement in its proper place or add a /\* after all specifications. Then rerun the job.

19 FIELD LENGTH SUBENTRY INVALID.  
TEST IGNORED.

*Explanation:* The Field Length subentry of a Field Comparison Test entry on a stacker specification is not a value from 1 through the value defined for that field on the system specification.

*System Action:* A comparison test is not performed on the specified field and processing continues with the next comparison test on this stacker specification or with the next stacker specification (if there are no more comparison tests indicated on this stacker specification).

*Operator Response:* Probable user error. To have the comparison test performed, correct the Field Length subentry of the stacker specification and process the job again. The Field Length subentry must be a value that designates the number of positions being tested, and must be a value from 1 through 11.

20 RELATIVE POS. SUBENTRY INVALID.  
TEST IGNORED.

*Explanation:* The Relative Position subentry of a Field Comparison Test entry on a stacker specification is a value that does not define a position within the field to be tested.

*System Action:* The comparison test is ignored, and processing continues.

*Operator Response:* Probable user error. Correct the Relative Position subentry and process the job again. The Relative Position subentry must be a number that defines the relative location of the rightmost digit of the comparison characters in the field to be tested.

21 RELATIVE POS. PLUS FIELD LENGTH GT FIELD  
LENGTH DEF. TEST IGNORED.

*Explanation:* The sum of the Relative Position and Field Length subentries on a stacker specification is greater than the length defined on the system specification for the field to be tested. As a result, the Field Comparison Test entry indicates that a test is to be done on a character that is not within the field to be tested.

*System Action:* The comparison test is ignored, and processing continues.

*Operator Response:* Probable user error. Check the length specified in the Field Definition entry on the system specification and if wrong, correct the values specified as the length. If the Field Definition entry is correct, change the Relative Position and Field Length subentries on the stacker specifications so that the sum of these subentries is within the length defined for the field to be tested.

22 FIELD LENGTH SUBENTRY NOT EQUAL TEST  
CHARACTER LENGTH. FIELD LENGTH  
ASSUMED.

*Explanation:* The Field Length subentry specified on a stacker specification for a field comparison test does not equal the number of test characters designated in the Test Characters subentry.

*System Action:* The number of positions specified by the Field Length subentry are used in the comparison test and the program continues processing. As a result, documents may be routed to improper stackers.

*Operator Response:* Correct either the Field Length subentry or the Test Characters subentry as appropriate to make the Field Length subentry equal to the Test Character length. Then, process the job again.

23 TEST CHARACTERS INVALID. TEST IGNORED.

*Explanation:* The Test Characters subentry for a Field Comparison Test entry on a stacker specification contains a character that is not a numeral or a dash (dash is valid in field 4).

*System Action:* The comparison test is not performed and processing continues.

*Operator Response:* If the comparison test is necessary for satisfactory completion of the job, correct the invalid Test Characters subentry by ensuring that it contains all numerals and process the job again.

24 NOT ENOUGH CORE. REDUCE BLKL PARA-  
METER ON FILE STATEMENT. JOB ENDED.

*Explanation:* There is not enough main storage for the tape device output records.

*System Action:* The job is ended after all error messages have been written. No documents are processed.

*Operator Response:* Check that the processing unit has the required 16,384 bytes of storage. If it does, reduce the size of the BLKL parameter on the FILE statement.



## **DOCUMENT ERRORS DETECTED BY THE 1255**

The 1255 checks documents as they are read. The following checks are performed on each field that is read by the 1255.

- Fixed-length fields are checked for correct length.
- All digits and delimiters are checked to see that they are valid MICR characters (valid MICR characters are shown in Figure 1).
- Delimiter symbols are checked to see that they appear in the proper sequence.
- A modulus check operation is performed on the account number, if the 1255 self-checking feature is active.

If the 1255 finds any errors in a field, an indicator is set that informs the utility program that the field is invalid.

## HALT CODES

Programmed halts are displayed on the console message display unit. These halts indicate incorrect program operation, machine errors, or in some cases, information or instructions. The following halt may be displayed as a result of 1255 system and stacker specifications.

Display:



**Reason:** The utility program specifications have been read and analyzed. This halt is issued every time the utility program is run unless a terminal error has caused the job to end. The operator can check error notes and messages and check the VALIDITY CHECK AND READOUT keys on the 1255 to be sure they are correct.

**Recovery:** Log – UMCYDW

Examine the error note(s) listed on the logging device. If there are no errors, or the indicated errors do not affect document processing:

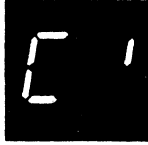
1. Set the rightmost address/data switch on the console to 1.
2. Press 1255 START.
3. Press console START or appropriate HALT RESET key if the system is equipped with the dual programming feature.

If the indicated error(s) are serious requiring correction of the specifications before document processing may be started:

1. Immediately cancel the job by setting the rightmost address/data switch to 3.
2. Correct the specifications.
3. Rerun the job.

## Error Conditions That Occur During Processing

Display:



Reason:

An S (indicating stop) has been entered in column 6 of the system specification.

A stacker indicated in columns 3-4 of a stacker specification has met the Document Count Condition.

Recovery:

Log—UMC'DC

1. Carry out the action indicated by the programmer on the program run sheet.
2. Set the rightmost address/data switch on the console to 1.
3. Press console START or appropriate HALT RESET key if the system is equipped with the dual programming feature.

Display:



Reason:

There is not enough space on disk or tape to accommodate records for all documents being read for the job.

Recovery:

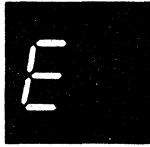
Log—UMEYEX

1. Set the rightmost address/data switch on the console to:
  - 2 to print totals and end the job.
  - 3 to end the job immediately.
2. Press console START or HALT RESET key (if the system is equipped with the dual programming feature).
3. For a disk file, if you want to rerun the entire job, assign more tracks or records to the file in the OCL statements and place all the documents back in the feed hopper.

For a tape file, if you want to rerun the entire job, add or change the FILE statement RECFM and BLKL parameters. Place all the documents back in the feed hopper.

For a disk or tape file, you may wish to rerun the job using only those documents that have not yet been processed. For each stacker, the last document shown on the listing is the last document to be processed. There may be documents on top of the last document processed and these documents should be removed and returned to the feed hopper (these documents have been read and routed to a stacker but they have no disk or print records and are not included in any totals). When you rerun the job, you must create another file.

**Display:**

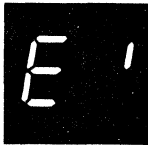


**Reason:** A permanent input/output error occurred when a disk or tape file F1255 was being written.

**Recovery:** Log—UME DE

1. Cancel the job in either of the following ways:
  - Set rightmost address/data switch to 2 (controlled cancel) if end-of-job totals are to be printed.
  - Set rightmost address/data switch to 3 (immediate cancel) if end-of-job totals are not wanted.
2. Rerun the job.

**Display:**



**Reason:** The 1255 is stopped due to one of the following:

- Jam stop.
- Stacker Command stop (see Chapter 6, Figure 28).
- Empty hopper stop.
- Stacker full stop.
- Operator stop.
- 1255 not ready.
- 1255 not attached to the system.

**Recovery:** Log—UME'ST

1. Correct the condition that caused the stop.
2. Set the rightmost address/data switch on the console to:
  - 0 to continue normal processing.
  - 2 to print totals and end the job.
  - 3 to end the job.
3. Press console START or appropriate HALT RESET key if the system is equipped with the dual programming feature.

This chapter explains how to prepare a sample program that can be used for demonstrating use of the 1255 Utility Program on the IBM System/3 Model 10 Disk System.

The sample program will read valid documents, print all fields contained on them, create a disk or tape record for each document (depending on the FILE statement), and route the documents to stacker 0. The sample program can be used with any of the three models of the 1255 available.

### USING THE SAMPLE PROGRAM

To use the sample program, perform the following:

1. Punch the necessary OCL statements and system and stacker specifications and then enter them through the primary hopper of the MFCU as shown in Figure 23, or enter them through the 5471 keyboard. Figure 29 shows the correct system and stacker specifications; Figure 31, the correct OCL statements.
2. Press the 1255 POWER ON key.
3. Turn the 1255 FUNCTION switch to ON-LINE.
4. Set the 1255 SORT FIELD switch to OFF.
5. Press all five 1255 VALIDITY CHECK AND READ-OUT keys.
6. Joggle the documents and place them in the 1255 hopper with the MICR-encoded area facing downward against the back guide.
7. Press the 1255 START key.

### INPUT DOCUMENTS

The documents read by the 1255 using this sample program may be any valid MICR-encoded documents containing E-13B font symbols.

### SYSTEM AND STACKER SPECIFICATIONS

One system specification and one stacker specification are necessary to use the sample program. These specifications are shown in Figure 29 and are described in Figure 30.

### OPERATION CONTROL LANGUAGE

The operation control language statements necessary to process the sample program are shown in Figure 31.

### OUTPUT

Output produced by the sample program will consist of all valid documents being routed to stacker 0, a printed listing of documents resembling the one shown in Figure 32, and the disk or tape file containing the document data. Note that the figure shows that the first document was automatically rejected (AR) by the 1255 because the 1255 could not read it properly; this document is not included in the accumulated totals for the job.



SYSTEM SPECIFICATION	
Columns	Meaning
1-2	The system specification is the first utility program specification in the job.
9-13	All fields of each document are to be printed.
16-18	The amount field is a variable length field of eleven digits.
19-21	The process control field is a variable length field of six digits or less.
22-24	The account number field is a variable length field of ten digits or less.
25-27	The transit-routing field is a variable length field of nine digits. This means that the 1255 dash transmission feature is not being used.
28-30	The serial number field is a variable length field of ten digits or less.
48, 59-68	An amount field of \$99,999,999.99 identifies the end-of-file document. If this is not true in the documents to be processed by this sample program, change these columns accordingly by placing the number of the field to be used as the end-of-file document identifier in column 48 and the placing (right-justified) the contents of that field in columns 59-68.
69-71	A 96-character print line is being used.
72	The 1255 being used has six stackers numbered 0, 1, 2, 3, 4, and R. If this is not true of the 1255 model being used for this sample program, change the entry accordingly by placing either an 8 or an A in column 72.
STACKER SPECIFICATION	
1-2	Sequence number for this specification is 01.
3-4	All valid documents are to be routed to stacker 0.
5-9	Since no validity or presence checks are specified, only the amount field is checked. It must be present and valid for documents to go to stacker 0. (See <i>Field Validity or Presence Check</i> in Chapter 2.)

Figure 30. Explanations of Sample Program System and Stacker Specification Entries

// LOAD	\$MICR,F1
// FILE (disk)	NAME-F1255, LABEL-OUTPUT, UNIT-F1, TRACKS-10, RETAIN-T, PACK-F1F1F1
// FILE (tape)	NAME-F1255, REEL-RLRLRL, UNIT-T2, LABEL-OUT02, RECL-55, BLKL-550, RECFM-FB, RETAIN-30
// RUN	
(System and stacker specifications to be entered here.)	
/*	
Statement	Meaning
// LOAD	The <del>1255</del> utility program (\$MICR) is loaded from the fixed disk on drive 1 (F1). If this is not true on the system being used for the sample program, change the unit code on the // LOAD statement as appropriate.
// FILE (disk)	The disk file is named F1255 and is labeled OUTPUT. This label can be changed to any other valid name.  The disk file is created on the fixed disk on drive 1 (F1). The location can be changed to another disk.  Ten tracks are specified for the disk file. This will handle about 1100 documents. More tracks can be specified if desired.  The disk file is a temporary file (RETAIN-T).  The disk pack that contains the disk file is named F1F1F1. If necessary, this name should be changed.
// FILE (tape)	The tape file is named F1255 and is labeled OUT02. This label can be changed to any other valid name.  The tape file is created on a tape that has the volume label RLRLRL. This label can be changed to any valid name.  The tape file is created on tape drive 2 (T2). This location can be changed to another tape drive.  The tape file contains records that are 55 bytes long. These records are blocked with 10 records per block. The number of records in each block can be changed, RECFM-F can be specified, or the RECL and BLKL parameters can be omitted. Fixed length, unblocked records that are 55 bytes long are created if the RECL and BLKL parameters are omitted.  The tape file is protected from overwriting for 30 days. This number can be changed if desired.
// RUN	The documents are processed using the system and stacker specifications that follow.
/*	
The last stacker specification has been entered.	
<b>Note:</b> Only one FILE statement can be coded for a program.	

● Figure 31. Operation Control Language for Sample Program

RECORD	FLD4	FLD3	FLD2	FLD1
AR				
0	09*2-1672	**2667		**0**001000
0			92	0000010109
0	0912-1672	342667		0000001500
0	0912-1672	342667		0000003300
0	0912-1672	342667		0000002500
0	0912-1672	342667		0000000500
0	0912-1672	342667		0000001000
0	0912-1467	213217	11	0000026910
0	0912-1672	342667		0000005000
0	0912-1467	213217	11	0000028639
0	0912-1467	213217	11	0000018000
0	0912-1467	213217	11	0000017800
0	0912-1672	342667		0000004000
0	0912-1672	342667		0000001500
0			92	0000027253
0	0912-1672	342667		0000000365
0	0912-1672	342667		0000000500
0	0912-1672	342667		0000001664
0	0912-1672	342667		0000003000
0	0912-1672	342667		0000001087
0	0912-1672	342667		0000000600
0	0912-1672	342667		0000003000
0	0912-1672	342667		0000002000
0	0912-1672	342667		0000000600
0	0912-1672	342667		0000002000
0	0912-1672	342667		0000005000
0				0000016150
R				9999999999
CONTROL TOTALS		DOCUMENT COUNT-0027	AMOUNT FIELD-	\$1,839.77
FINAL STACKER TOTALS				
SK COUNT	AMOUNT	FLD TOTALS	SK COUNT	AMOUNT
0 0027		\$1,839.77		
FINAL TOTALS		DOCUMENT COUNT-00027	AMOUNT FIELD-	\$1,839.77

Figure 32. Sample Program Output



## Appendix. Debugging Template

The template in Figure 33 is designed to aid in correcting and diagnosing system and stacker specifications from your printed listing.

To use the template, tear this page out of the manual, fold it so you can place the appropriate headings over the specifications on your listing, and place the headings on the listing lining up columns 1 and 96.

All columns should now be lined up and you should be able to use the template to guide you down the listing.

# 1255 Utility Program Stacker Specification

Sequence Number		Field Definition		Module Check		Stacker Code - 4/B/A		Print Line Length		End-of-file Document Contents		Control Document Contents		EOF/Control Field No.		Weighting Factor (Account Number)		Reserved		
		Field 1	Field 2	Field 3	Field 4	Field 5	Field 6	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6	
1	2	Count	Document Count	Condition																
3	4	Action-S/V/A	Reserved																	
5	6	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
7	8	Reserved	F or V	Length	F or V	Length	F or V	Length	F or V	Length	F or V	Length	F or V	Length	F or V	Length	F or V	Length	F or V	Length
9	10	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
11	12	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
13	14	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
15	16	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
17	18	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
19	20	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
21	22	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
23	24	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
25	26	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
27	28	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
29	30	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
31	32	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
33	34	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
35	36	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
37	38	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
39	40	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
41	42	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
43	44	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
45	46	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
47	48	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
49	50	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
51	52	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
53	54	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
55	56	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
57	58	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
59	60	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
61	62	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
63	64	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
65	66	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
67	68	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
69	70	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
71	72	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
73	74	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
75	76	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
77	78	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
79	80	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
81	82	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
83	84	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
85	86	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
87	88	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
89	90	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
91	92	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
93	94	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
95	96	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
97	98	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													
99	100	Field 1	Field 2	Field 3	Field 4	Field 5	Field 6													

cut along this line

# 1255 Utility Program System Specification

Figure 33. Debugging Template-1255 Utility Program

- account number
  - form of 2
  - modulus checking 11
  - self-checking feature, (1255) 4
- Action subentry 26
- additional devices 5
- allocation, tracks 24
- alternate stackers 14, 26
- amount fields 2, 19
- AR (auto reject) 10, 23
- ASCII parameter in FILE statement 22
- asterisk, substitute character 10
- auto reject (AR) 10, 23
  
- batch separation 13
- BLKL parameter in FILE statement 22, 65
  
- C' Halt 61
- comment lines 7, 9
- Compare subentry 31
- control document
  - contents 17
  - definition of 15
  - routing of 13-14
  - specifying 17
  - totals printed 15
  - use in batch separation 13
  - use with document count condition 13
- control totals 15
- CY Halt 60
  
- dash transmission feature 4, 9
- date, to identify disk or tape file 24
- debugging template 67
- defining fields 9
- devices used with 1255 5
- disk files
  - as input to other programs 22
  - identifying by date and label 24
- disk record, format of 23
- document count condition
  - definition of 12
  - specifying 12-14, 25
  - totals 13
- document processing time 35-37
- documents
  - as input 1-2
  - fields of 2
  - limits and characteristics of 3
  - MICR-encoded 1
  - sorted and stacked 3
- documents per minute (DPM) rates 35-37
- DPM (documents per minute) rates 35-37
- dual program feature 5
  
- E' Halt 62
- E halt 62
- empty hopper stop 52
- end-of-file document
  - contents 17
  - definition of 15
  - specifying 17
  - totals 16
- END parameter in FILE statement 22
- EOF/control field 17, 28
- E-13B font symbols 1
- error messages 54-58
- errors 53-63
- estimating performance 35-38
- example, specifications 39
- EY Halt 61
  
- factor, weighting 11-12
- features, optional for 1255
  - account number self-checking 4
  - dash transmission 4
  - 51-column document 4
- Field Comparison Test entry 20
- field comparison tests
  - field length validity check 20
  - standard 20
  - use in checking serial numbers 22
  - use in routing documents 20
- field definition 9-10
- Field Length subentry 9
- field length validity check 20
- field validity indicators 11-12
- field validity or presence check 11-12
- fields
  - account number 2
  - amount 2
  - printed 10
  - process control 2
  - read 9
  - serial number 2
  - transit-routing 2
- file
  - parameters 22
  - size 24
  - statement 46-49
- font, E-13B symbols 1
- form, system and stacker specifications 8
- formulas for estimating document processing time 35-37
- functions, specifications 7
  
- graphics, MICR 1
  
- halt codes 60-62
- headings
  - control totals 15
  - document count condition totals 13
  - end-of-file totals 16
  
- indicate document count condition 13
- input documents 1-2

- jam stop 52
- job stream 45
  
- LABEL parameter in FILE statement 22, 65
- label, to identify disk file 24
- late stacker selection 38
- length check 20
- length error (LR) 10, 23
- Library Maintenance Program 46
- loading utility program 46
- LOCATION parameter in FILE statement 22
  
- magnetic character reader, 1255
  - description of 4
  - models of 4
  - optional features of 4
- Magnetic Ink Character Recognition (MICR) 1
- messages, error 54-58
- MICR (magnetic ink character recognition) 1
- MICR-encoded documents
  - as input 1-2
  - fields of 2
  - limits and characteristics of 3
  - models of 1255 4
  - modulus check entry 11-12
  - modulus 10 and modulus 11 checking 11-12
  
- NAME parameter in FILE statement 22
  
- operating procedures 45-52
- operational control language (OCL) 45-49
- operator intervention considerations 38
- operator stop 52
- output
  - disk records 3, 23
  - printed listing of documents 3
  - printed listing of specifications 3
  - sorted and stacker documents 3
- overflow, length error (LR) 10, 23
  
- PACK parameter in FILE statement 22, 65
- parity check reject (PR) 10, 23
- performance estimates 35-38
- PR (parity check reject) 10, 23
- presence check 18-19
- print line length 10
- printed listing
  - of documents 3
  - of specifications 3
- printed records 10
- process control field 2
- program sample 63-66
  
- reader, 1255 magnetic character
  - description of 4
  - optional features of 4
- reading fields 9
- RECFM parameter in FILE statement 22
- RECL parameter in FILE statement 22
- records
  - disk 3, 23
  - printed 10
  - tape 3, 23
- RECORDS parameter in FILE statement 22
- REEL parameter in FILE statement 22
- relative position 31
  
- RETAIN parameter in FILE statement 22
- right-justified, definition of 25
- sample program 63-66
- self-check digit 11
- separation, batch 13
- sequence numbers 9
- serial number 2
- sort 18
- sorted and stacker documents 3
- source library 46-48
- SOURCE statement 50
- specifications
  - entering 46-49
  - example of 39
  - form for 8
  - preparing system and stacker 7
  - stacker 29-31
  - summary of entries 32-34
  - system 25-28
- stacker
  - code entry 28
  - numbering 18
  - select stop 52
  - selection 18-22
- stacker selection 18-22
- stacker specifications
  - definition of 29
  - format of 34
  - number of 31
  - preparing 29-31
- standard field comparison tests 20
- start-up procedure 51
- stop document count condition 13, 26
- substitute character 10
- summary, specifications 32-34
- symbols, E-13B font 1
- system specification
  - definition of 25
  - format of 32-33
  - preparing 25-28
  
- tape files, input to other programs 22
- tape record, format of 23
- test characters 20
- timing
  - considerations 35-38
  - document processing time 35-37
- totals
  - control 15
  - document count condition 13
  - end-of-file 16
- TRACKS parameter in FILE statement 22, 65
- transit-routing 2
  
- UNIT parameter in FILE statement 22, 65
  
- validity
  - and readout keys 10, 51
  - of account number 11
  - or presence check 18-19
  
- weighting factor 11-12

## READER'S COMMENT FORM

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