

DFSORT/VSE



Reference Summary

Version 3 Release 4

DFSORT/VSE



Reference Summary

Version 3 Release 4

Note!

Before using this information and the product it supports, be sure to read the general information under "Notices" on page v.

Fourth Edition (May 1998)

This edition replaces and makes obsolete the previous edition, SX26-6008-02. The technical changes for this edition are indicated by a vertical bar to the left of a change. A vertical bar to the left of a figure caption indicates that the figure has been changed. Editorial changes that have no technical significance are not noted.

This edition applies to Version 3 Release 4 of DFSORT/VSE, 5746-SM3, and to any subsequent releases until otherwise indicated in new editions or technical newsletters. The information in this summary is compiled from *DFSORT/VSE Application Programming Guide*, SC26-7040-03. Make sure you are using the correct edition for the level of the product.

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Preface

About This Book

This book summarizes the DFSORT/VSE program control statements, ICETOOL operators, and job control language (JCL) detailed in *DFSORT/VSE Application Programming Guide*, order number SC26-7040, which should be referred to for detailed information on DFSORT/VSE program control statements, ICETOOL operators, and the JCL to be used with DFSORT/VSE.

Required Product Knowledge

To use this book effectively, you should be familiar with the concepts and material presented in the *DFSORT/VSE Application Programming Guide*. The *DFSORT/VSE Application Programming Guide* provides general-use programming interfaces which allow you to write programs using DFSORT/VSE. This manual assumes you know how to develop DFSORT/VSE applications.

You should be familiar with:

- DFSORT/VSE program control statements
- ICETOOL operators
- Job control language statements

Required Publications

You should be familiar with the information presented in the following publications:

| Publication | Order Number |
|--|--------------|
| <i>DFSORT/VSE Application Programming Guide</i> | SC26-7040 |
| <i>VSE/ESA System Control Statements (VSE/ESA Version 1 Release 3)</i> | SC33-6513 |
| <i>VSE/ESA System Control Statements (VSE/ESA Version 2)</i> | SC33-6613 |

DFSORT/VSE Publications

The *DFSORT/VSE Reference Summary* is a part of a more extensive DFSORT/VSE library. These books can help you work with DFSORT/VSE more effectively.

| Task | Publication | Order Number |
|--|---|---------------------|
| Evaluating DFSORT/VSE | <i>DFSORT/VSE General Information</i> | GC26-7039 |
| Planning for, installing, customizing, and tuning DFSORT/VSE | <i>DFSORT/VSE Installation and Tuning Guide</i> | SC26-7041 |
| Application programming | <i>DFSORT/VSE Application Programming Guide</i> | SC26-7040 |
| Diagnosing failures and interpreting messages | <i>DFSORT/VSE Messages, Codes and Diagnosis Guide</i> | SC26-7132 |
| Learning to use DFSORT/VSE | <i>Getting Started with DFSORT/VSE</i> | SC26-7101 |

You can order a complete set of DFSORT/VSE publications with the order number SBOF-6130, except for *DFSORT/VSE Licensed Program Specifications* (GC26-7038), which must be ordered separately.

DFSORT/VSE Library Softcopy Information

A softcopy version of the DFSORT/VSE library is available on the CD-ROM shown in the table that follows. The *IBM Online Library VSE Collection* contains all of the DFSORT/VSE books for Releases 2, 3, and 4, with the exception of the *DFSORT/VSE Reference Summary*, and books from other VSE libraries.

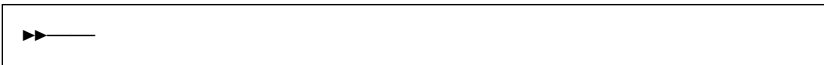
| Order Number | Title |
|---------------------|--|
| SK2T-0060 | <i>IBM Online Library VSE Collection</i> |

Chapter 1. General Coding Information

Notational Conventions

The syntax diagrams in this book are designed to make coding DFSORT/VSE program control statements simple and unambiguous. The lines and arrows represent a path or flowchart that connects operators, parameters, and delimiters in the order and syntax in which they must appear in a completed statement. Construct a statement by tracing a path through the appropriate diagram that includes all the parameters you need, and code them in the order that the diagram requires you to follow. Any path through the diagram gives you a correctly coded statement, if you observe these conventions:

- Read the syntax diagrams from left to right and from top to bottom.
- Begin coding your statement at the spot marked with the double arrowhead.



- A single arrowhead at the end of a line indicates that the diagram continues on the next line or at an indicated spot.

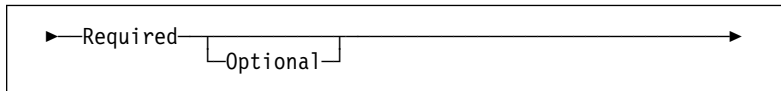


A continuation line begins with a single arrowhead.

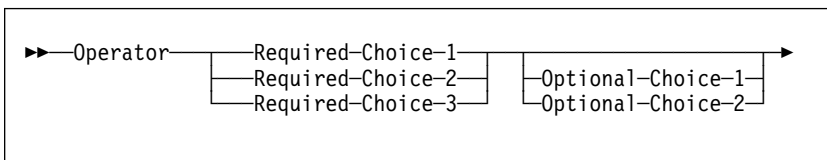


- Strings in upper-case letters, and punctuation (parentheses, apostrophes, and so on), must be coded exactly as shown.
- Strings in all lowercase letters represent information that you supply.
- Required parameters appear on the same horizontal line (the main path) as the operator, while optional parameters appear in a branch below the main path.

Notational Conventions

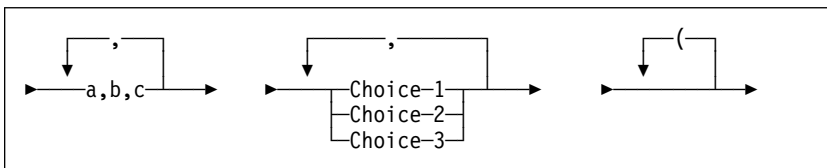


- Where you can make one choice between two or more parameters, the alternatives are stacked vertically.



If one choice within the stack lies on the main path (as in the example above, left), you *must* specify one of the alternatives. If the stack is placed below the main path (as in the example above, right), then selections are optional, and you can choose either one or none of them.

- The repeat symbol shows where you can return to an earlier position in the syntax diagram to specify a parameter more than once (see the first example below), to specify more than one choice at a time from the same stack (see the second example below), or to nest parentheses (see the third example below).



Do not interpret a repeat symbol to mean that you can specify incompatible parameters.

Use any punctuation or delimiters that appear within the repeat symbol to separate repeated items.

- A double arrowhead at the end of a line indicates the end of the syntax diagram.



DFSORT/VSE Control Statement Coding Rules

DFSORT/VSE Control Statement Coding Rules

See *DFSORT/VSE Application Programming Guide* for complete details on coding DFSORT/VSE program control statements.

Coding Restrictions

The following rules apply to control statement preparation:

- Labels, operators, and operands must be in uppercase EBCDIC.
- Column 1 of each control statement can be used only for a label.
- Labels must begin in column 1 and conform to operating system requirements for statement labels.
- The entire operator must be contained on the first line of a control statement.
- The first operand must begin on the first line of a control statement. The last operand in a statement must be followed by at least one blank.
- Blanks are not allowed in operands. Anything following a blank is considered part of the remark field.
- In general, values can contain no more than eight alphanumeric characters. Values that specify record counts (such as those for SKIPREC and STOPAFT option) or storage requirements (such as those for STORAGE, GVSIZE, GVSRLow, and GVSRANY options) can contain up to 10 digits (the maximum value is 2147483647). Values specified for LOCALE can contain up to 32 alphanumeric characters.
- Commas, equal signs, parentheses, and blanks can be used only as delimiters. They can be used in values only if the values are constants.
- Each type of control statement can appear only once for each execution of DFSORT/VSE.

ICETOOL Statement Coding Rules

ICETOOL Statement Coding Rules

See *DFSORT/VSE Application Programming Guide* for complete details on coding ICETOOL statements.

Comment Statements

- A control statement with an asterisk (*) in column 1 is treated as a comment statement. It is printed with the other ICETOOL statements, but otherwise not processed.
- A statement with blanks in columns 1 through 72 is treated as a blank statement. It is ignored since ICETOOL prints blank lines where appropriate.

Operator Statements

The general format for all ICETOOL operator statements is:

```
OPERATOR operand ... operand
```

where each operand consists of KEYWORD(parameter, parameter...) or just KEYWORD. Any number of operators can be specified.

The following rules apply for operator statements:

- The operator and operands must be in uppercase EBCDIC.
- The operator must be specified first.
- One blank is required between the operator and the first operand.
- One blank is required between operands.
- Any number of blanks can be specified before or after the operator or any operand, but blanks cannot be specified anywhere else, except within quoted character strings.
- Parentheses must be used where shown. Commas or semicolons must be used where commas are shown.
- Operands can be in any order.
- Columns 1-72 are scanned; columns 73-80 are ignored.
- Continuation can be indicated by a dash (-) **after** the operator or after any operand. The next operand must then be specified on the next line. For example:

```
SORT FROM(ININ) -  
      TO(OUTPUT1,OUTPUT2,OUTPUT3) -  
      USE
```

ICETOOL Statement Coding Rules

Any characters specified after the dash are ignored. Each operand **must** be completely specified on one line.

DFSORT/VSE Section

A DFSORT/VSE section must be used to supply the DFSORT/VSE control statements for a SORT operation, and can be used to supply DFSORT/VSE control statements for a COPY or COUNT operation. The USE operand must be specified to indicate that a DFSORT/VSE section immediately follows the associated ICETOOL statement in the SYSIPT file or Parameter List.

A DFSORT/VSE section contains the following three parts:

- A USTART delimiter statement
- DFSORT/VSE control statements
- A UEND delimiter statement

The USTART delimiter statement indicates the start of the DFSORT/VSE section. It is required for every DFSORT/VSE section.

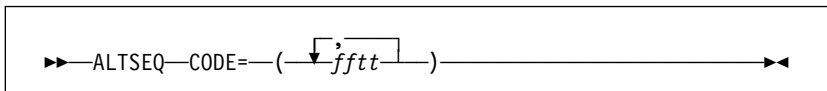
The UEND delimiter statement indicates the end of the DFSORT/VSE section. It is required for every DFSORT/VSE section.

A DFSORT/VSE section can contain comment and blank statements.

ICETOOL Statement Coding Rules

Chapter 2. DFSORT/VSE Program Control Statements

ALTSEQ—Altering EBCDIC Collating Sequence



Example

```
ALTSEQ CODE=(5BEA)
```

The character \$ (X'5B') is to collate at position X'EA', that is, after uppercase Z (X'E9').

| Operand | Description |
|---------|--|
| CODE= | <p>Describes overriding modifications to the default collating sequence. Modifications apply to AQ format fields, and to CH format fields when CHALT has been specified.</p> <p>ff Two hexadecimal digits specifying the character whose position is to be changed in EBCDIC collating sequence.</p> <p>tt Two hexadecimal digits specifying the new position to be occupied by characters ff.</p> |

ANALYZE—Testing DFSORT/VSE Input Control Stream

ANALYZE—Testing DFSORT/VSE Input Control Stream

▶▶—ANALYZE—CALC—————▶◀

Example

```
ANALYZE  CALC
```

Produces all diagnostic messages, issues message ILU029A ANALYZE END, and terminates with a return code of 16.

| Operand | Description |
|---------|---|
| CALC | Tests your DFSORT/VSE control statements before running a sort, merge, or copy application. |

END—Discontinuing Accepting Control Statements

END—Discontinuing Accepting Control Statements

▶—END—▶

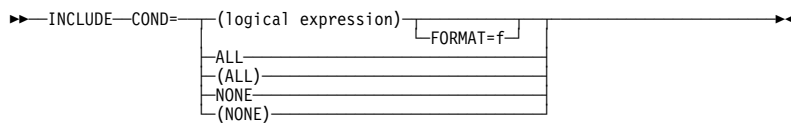
Example

END

Allows DFSORT/VSE to discontinue accepting control statements. Any statements (for example, control statements, JCL statements except /*, and so on) between the END and /* are read by DFSORT/VSE but not processed.

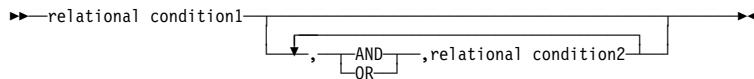
INCLUDE—Including Records in the Output File

INCLUDE—Including Records in the Output File



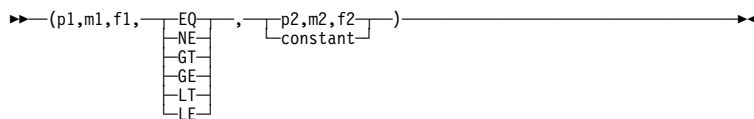
INCLUDE and OMIT control statements are mutually exclusive.

Logical expression is one or more relational conditions:

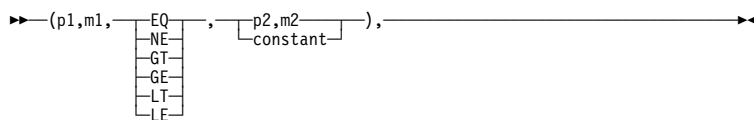


Relational conditions are of three types:

1) Comparison



Or, if FORMAT is used:



INCLUDE—Including Records in the Output File

2) Substring comparison

▶▶ (p1,m1,SS, EQ, —constant—) ▶▶
NE

Or, if FORMAT=SS is used:

▶▶ (p1,m1, EQ, —constant—) ▶▶
NE

3) Bit Logic

Method 1: Bit Operator

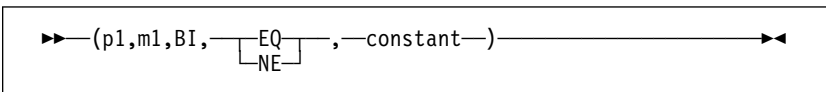
▶▶ (p1,m1,BI, ALL, —mask—) ▶▶
SOME
NONE
NOTALL
NOTSOME
NOTNONE
BO
BM
BZ
BNO
BNM
BNZ

Or, if FORMAT=BI is used:

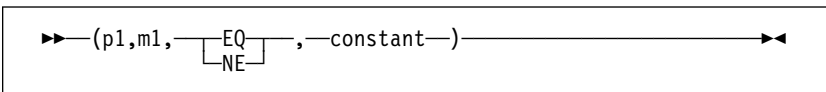
▶▶ (p1,m1, ALL, —mask—) ▶▶
SOME
NONE
NOTALL
NOTSOME
NOTNONE
BO
BM
BZ
BNO
BNM
BNZ

INCLUDE—Including Records in the Output File

Method 2: Bit Comparison



Or, if `FORMAT=BI` is used:



Example

```
INCLUDE COND=(1,10,CH,EQ,C'STOCKHOLM',  
AND,21,8,ZD,GT,+50000,  
OR,31,4,CH,NE,C'HERR')
```

Include in the output file only those records in which:

- The first 10 bytes contain STOCKHOLM (this nine-character string was padded on the right with a blank) AND the zoned-decimal number in bytes 21 through 28 is greater than 50000
- OR
- Bytes 31 through 34 do not contain HERR.

INCLUDE—Including Records in the Output File

| Operand | Description |
|---------|--|
| COND= | <p>Describes relational conditions.</p> <p>logical expression</p> <p>One or more relational conditions.</p> <p>p Position of input field; a byte location within a record that is the first byte of an input field.</p> <p>m Length of input field.</p> <p>f Format of input field.</p> <p>SS Substring comparison format.</p> <p>EQ Equal to.</p> <p>NE Not equal to.</p> <p>GT Greater than.</p> <p>GE Greater than or equal to.</p> <p>LT Less than.</p> <p>LE Less than or equal to.</p> <p>ALL or BO All mask bits are on.</p> <p>SOME or BM Some but not all mask bits are on.</p> <p>NONE or BZ No mask bits are on.</p> <p>NOTALL or BNO Some or no mask bits are on.</p> <p>NOTSOME or BNM All or no mask bits are on.</p> <p>NOTNONE or BNZ All or some mask bits are on.</p> <p>constant Can be decimal, character (C 'string') or hexadecimal (X 'value').</p> <p>mask Can be hexadecimal (X 'value') or bit (B 'value').</p> <p>AND Logical AND.</p> <p>OR Logical OR.</p> <p>ALL (ALL) Include all input records.</p> <p>NONE (NONE) Include no input records.</p> |

INCLUDE—Including Records in the Output File

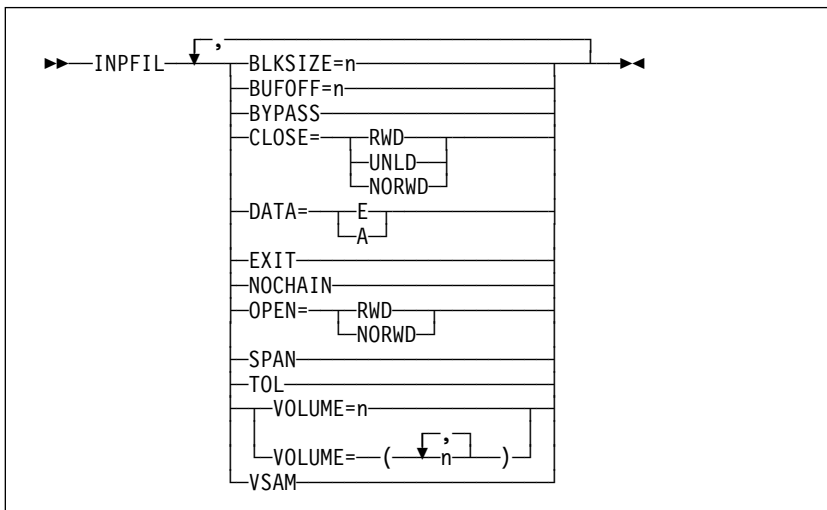
| Operand | Description |
|---------|---|
| FORMAT= | Can be used only when all input fields in the entire logical expression have the same format. |

Compare Field Formats and Lengths for INCLUDE

| Format | Length | Description |
|--------|----------------|--|
| CH | 1 to 256 bytes | Character (if CHALT is in effect, CH is treated as AQ) |
| AQ | 1 to 256 bytes | Character with alternate collating sequence |
| ZD | 1 to 18 bytes | Signed zoned decimal |
| PD | 1 to 16 bytes | Signed packed decimal |
| FI | 1 to 256 bytes | Signed fixed-point |
| BI | 1 to 256 bytes | Unsigned binary |
| AC | 1 to 256 bytes | ISCI/ASCII character |
| CSL | 2 to 256 bytes | Signed numeric with leading separate sign |
| CST | 2 to 256 bytes | Signed numeric with trailing separate sign |
| CLO | 1 to 256 bytes | Signed numeric with leading overpunch sign |
| CTO | 1 to 256 bytes | Signed numeric with trailing overpunch sign |
| ASL | 2 to 256 bytes | Signed ISCI/ASCII numeric with leading separate sign |
| AST | 2 to 256 bytes | Signed ISCI/ASCII numeric with trailing separate sign |

INPFIL—Defining Input Files

INPFIL—Defining Input Files



Example

```
INPFIL VOLUME=(3,5,2,1),BLKSIZE=400,OPEN=NORWD,
      BYPASS,DATA=A,BUFOFF=99
```

The four input files consist of three, five, two, and one unlabeled tape volumes respectively; block size is 400 bytes; the first volume of each input file is not to be rewound before being read; incorrectly read input data blocks are to be ignored; input data is ISCI/ASCII; and each block has a buffer offset of 99 bytes.

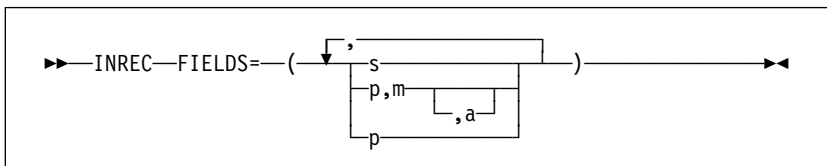
| Operand | Description |
|----------|--|
| BLKSIZE= | Specifies the maximum input block size in bytes. For ISCI/ASCII records, the value must include the length of the block prefix (BUFOFF value). If input files have different block sizes, n must be equal to the largest block size. |
| BUFOFF= | Specifies the block prefix size at the front of each physical record on the input file. Used with ISCI/ASCII data only. |
| BYPASS | Specifies that DFSORT/VSE is to skip incorrectly read input data blocks and wrong-length physical records. |

INPFIL—Defining Input Files

| Operand | Description |
|---------|--|
| CLOSE= | Specifies the procedure to be followed when tape input files are closed. RWD Tapes are to be rewound. UNLD Tapes are to be rewound and unloaded. NORWD Tapes are not to be rewound. |
| DATA= | Specifies the data format. E The input data is EBCDIC. A The input data is ISCI/ASCII. |
| EXIT | Specifies that E15 and E32 user exits will take responsibility for all the input. |
| NOCHAIN | Specifies that DFSORT/VSE should not use command chaining when reading input files. |
| OPEN= | Specifies the procedure to be followed when tape input files are opened. RWD The first volume of each input file is to be rewound before being read. NORWD The first volume of each input file is not to be rewound before being read. |
| SPAN | Specifies that SAM input files consist of variable-length EBCDIC records and that the records may be spanned. The RECORD control statement must specify TYPE=V. |
| TOL | Specifies that DFSORT/VSE will tolerate a warning code from VSAM when opening a VSAM input file. It is only valid for VSAM input. |
| VOLUME= | Specifies the number of volumes in each unlabeled or non-standard labeled input file. |
| VSAM | Specifies that the input files are VSAM. |

INREC—Reformatting Records Before Processing

INREC—Reformatting Records Before Processing



Example

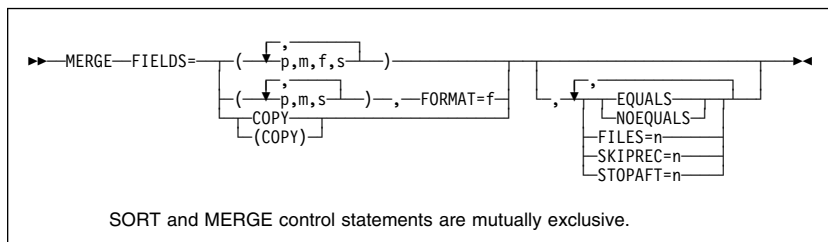
```
INREC FIELDS=(20,4,12,3)
```

Reformats input records, position 20 through 23 and position 12 through 14, into position 1 through 4 and 5 through 7, respectively.

| Operand | Description |
|---------|---|
| FIELDS= | Order of input and separation fields in the reformatted input record. |
| s | Separation field. Permissible values: nX (blank separation); nZ (binary zero separation) |
| p | Position of input field; a byte location within a record that is the first byte of an input field. |
| m | Length of input field. |
| a | Alignment of input field in the reformatted input record. Permissible values: H (halfword aligned); F (fullword aligned); D (doubleword aligned). |
| p | Variable part of input record appears as last field in the reformatted input record. See p above. |

MERGE—Specifying a MERGE or COPY

MERGE—Specifying a MERGE or COPY



Example

```
MERGE  FIELDS=(2,5,CH,A),FILES=3
```

The control field begins on byte 2 of each record in the input files. The field is 5 bytes long and contains character (EBCDIC) data that has been presorted in ascending order.

Three files are merged.

| Operand | Description |
|------------------------------|---|
| FIELDS= | Control fields must be described in descending order of significance. <p>p Position of the control field; a byte location within a record that is the first byte of a control field.</p> <p>m Length of the control field.</p> <p>f Format of the control field.</p> <p>s Sequence of the data. Can be: A — ascending D — descending</p> |
| FORMAT= | Can be used instead of the f subparameter of FIELDS=, if all control field data formats are the same. |
| FIELDS=COPY FIELDS=(COPY) | Copies from 1 to 9 input files to an output file. |
| EQUALS | Specifies that the original sequence of records that collate identically must be preserved. |
| NOEQUALS | Specifies that the original sequence of records that collate identically need not be preserved. |

MERGE—Specifying a MERGE or COPY

| Operand | Description |
|----------|--|
| FILES= | Specifies the number of input files to be merged or copied. Must be specified unless FIELDS=COPY is specified. |
| SKIPREC= | Specifies the number of records you want to skip before starting to copy the input files. |
| STOPAFT= | Specifies the maximum number of records you want accepted for copying. |

Control Field Formats for MERGE

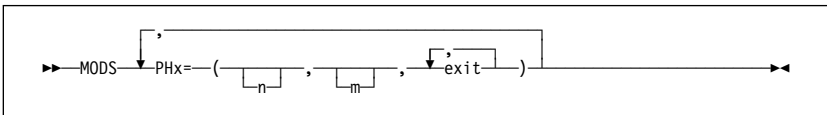
| Format | Length | Description |
|------------|--------------------|---|
| CH | 1 to 256 bytes | Character |
| AQ | 1 to 256 bytes | Character with alternate collating sequence |
| ZD | 1 to 256 bytes | Signed zoned decimal |
| PD | 1 to 32 bytes | Signed packed decimal |
| PD0 | 2 to 8 bytes | Packed decimal with sign and first digit ignored |
| FI | 1 to 256 bytes | Signed fixed-point |
| BI | 1 bit to 256 bytes | Unsigned binary |
| FL | 1 to 256 bytes | Signed floating-point |
| AC | 1 to 256 bytes | ISCI/ASCII character |
| CSL | 2 to 256 bytes | Signed numeric with leading separate sign |
| CST | 2 to 256 bytes | Signed numeric with trailing separate sign |
| CLO | 1 to 256 bytes | Signed numeric with leading overpunch sign |
| CTO | 1 to 256 bytes | Signed numeric with trailing overpunch sign |
| ASL | 2 to 256 bytes | Signed ISCI/ASCII numeric with leading separate sign |
| AST | 2 to 256 bytes | Signed ISCI/ASCII numeric with trailing separate sign |
| Y2C or Y2Z | 2 bytes | Two-digit character or zoned-decimal year data |
| Y2P | 2 bytes | Two-digit packed-decimal year data |

MERGE—Specifying a MERGE or COPY

| Format | Length | Description |
|--------|---------|--|
| Y2D | 1 byte | Two-digit decimal year data |
| Y2S | 2 bytes | Two-digit character or zoned decimal year data with special indicators |
| Y2B | 1 byte | Two-digit binary year data |

MODS—Identifying User Exit Routines

MODS—Identifying User Exit Routines



Example

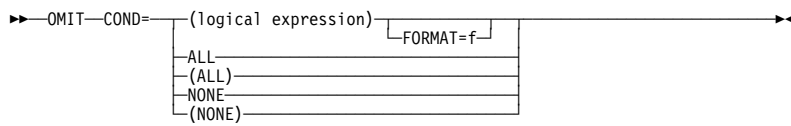
```
MODS PH3=(, ,E31,E35)
```

User exit routines specified for the final merging phase. The user exit routines are already in virtual storage, so the name and loading information for the routines are not included. Preloaded user exit routines (which are executed at user exits E31 and E35) are used only for sort or merge applications that are invoked by another program.

| Operand | Description |
|---------|--|
| PHx | Specifies the DFSORT/VSE phase. Phase 1 and phase 3 user exit routines can be specified. |
| n | Specifies the cataloged name of user exit routines to be executed at the exits specified. |
| m | Specifies loading information, and describes either of two ways the user exit routines may be loaded into virtual storage by DFSORT/VSE. |
| exit | Specifies the user exits that are to be used in the specified DFSORT/VSE phase. |

OMIT—Omitting Records from the Output File

OMIT—Omitting Records from the Output File



INCLUDE and OMIT control statements are mutually exclusive.

See INCLUDE control statement for more detailed syntax, descriptions of operands, and compare field formats.

Example

```
OMIT COND=(1,10,CH,EQ,C'STOCKHOLM',&,(21,8,ZD,GT,+50000,|,
          31,4,CH,NE,C'HERR'))
```

Omit from the output file those records in which:

- The first 10 bytes contain STOCKHOLM (this nine-character string was padded on the right with a blank)
- AND
- The zoned-decimal number in bytes 21 through 28 is greater than 50000 OR bytes 31 through 34 do not contain HERR.

OPTION—Specifying DFSORT/VSE Options

OPTION—Specifying DFSORT/VSE Options

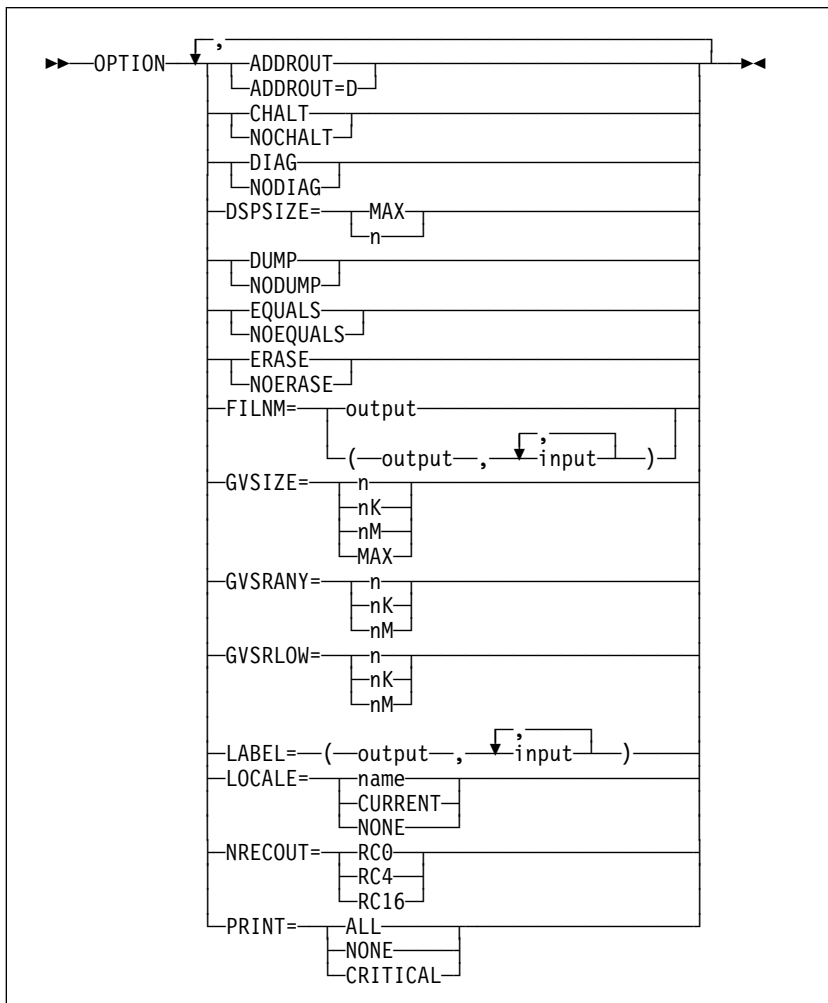


Figure 1 (Part 1 of 2). Syntax Diagram for the Option Control Statement

OPTION—Specifying DFSORT/VSE Options

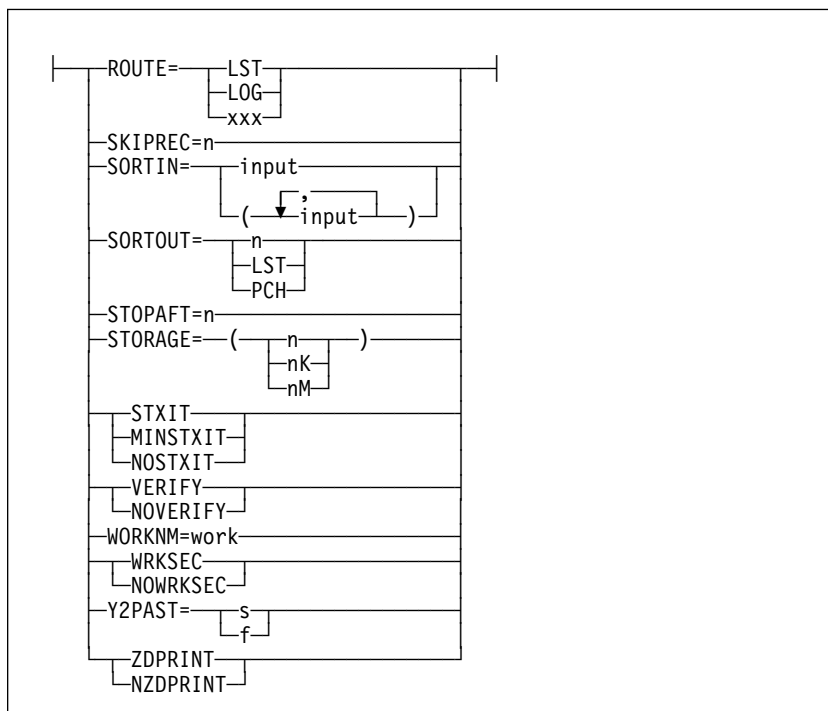


Figure 1 (Part 2 of 2). Syntax Diagram for the Option Control Statement

Example

```
OPTION SKIPREC=1000,STOPAFT=5000
```

1000 records are skipped before processing starts (sorting or copying).
5000 records are accepted for processing (sorting or copying).

| Operand | Description |
|------------|--|
| ADDRROUT | Each output record should contain only the direct-access address of its corresponding sorted input record. These addresses can be used to retrieve the input records in sequence. |
| ADDRROUT=D | Specifies that each output record should contain the direct-access address of its corresponding sorted input record followed by the control fields of the input record (in the order in which you specified the fields in the SORT statement, with no intervening space between them). |

OPTION—Specifying DFSORT/VSE Options

| Operand | Description |
|----------|---|
| CHALT | Translates both AQ and CH format control fields using the alternate collating sequence. |
| NOCHALT | Translates only AQ format control fields using the alternate collating sequence. |
| DIAG | Diagnostic messages are to be produced. |
| NODIAG | Diagnostic messages will not be produced. |
| DSPSIZE= | Specifies the maximum amount of data space to be used with dataspace sorting. MAX Specifies that DFSORT/VSE dynamically determines the maximum amount of data space to be used for dataspace sorting. n Specifies the amount, in megabytes, of data space to be used for dataspace sorting. |
| DUMP | A dump of virtual storage is to be produced when DFSORT/VSE terminates abnormally. |
| NODUMP | A dump of virtual storage is not to be produced when DFSORT/VSE terminates abnormally. |
| ERASE | The sort work files will be erased if they have been used. |
| NOERASE | Work files will not be erased. |
| FILNM= | Specifies the file name or names that are used in the TLBL and DLBL job control language statements for the output and input files. |
| GVSIZE= | Specifies the maximum amount of GETVIS area to be used with getvis sorting. n Specifies that n bytes of GETVIS area are to be used for getvis sorting. nK Specifies that n times 1024 bytes of GETVIS area are to be used for getvis sorting. nM Specifies that n times 1048576 bytes of GETVIS area are to be used for getvis sorting. MAX Specifies that DFSORT/VSE dynamically determines the maximum amount of GETVIS area to be used for getvis sorting. |

OPTION—Specifying DFSORT/VSE Options

| Operand | Description |
|-------------------------------------|--|
| GVS RANY= | <p>Specifies the amount of 31-bit GETVIS area to be reserved for the operating system and user applications when GVSSIZE=MAX is in effect.</p> <p>n Specifies that n bytes of 31-bit GETVIS area are to be reserved.</p> <p>nK Specifies that n times 1024 bytes of 31-bit GETVIS area are to be reserved.</p> <p>nM Specifies that n times 1048576 bytes of 31-bit GETVIS area are to be reserved.</p> |
| GVS RLOW= | <p>Specifies the amount of 24-bit GETVIS area to be reserved for the operating system and user applications when GVSSIZE=MAX is in effect.</p> <p>n Specifies that n bytes of 24-bit GETVIS area are to be reserved.</p> <p>nK Specifies that n times 1024 bytes of 24-bit GETVIS area are to be reserved.</p> <p>nM Specifies that n times 1048576 bytes of 24-bit GETVIS area are to be reserved.</p> |
| L ABEL= | <p>Specifies the type of label associated with the output file and input files, and must be in the order (output,input1...,inputn).</p> <p>N Specifies nonstandard label (including user standard labels).</p> <p>S Specifies standard labels.</p> <p>U Specifies unlabeled.</p> |
| L OCALE= | <p>Designates active locale.</p> <p>name Name of active locale.</p> <p>CURRENT Current locale remains active.</p> <p>NONE Does not use locale processing.</p> |
| N RECOUT= | <p>Specifies the actions to be taken by DFSORT/VSE when it does not write any records to the output file.</p> <p>RC0 Set a return code of 0 and continue processing.</p> <p>RC4 Set a return code of 4 and continue processing.</p> <p>RC16 Set a return code of 16 and terminate processing.</p> |

OPTION—Specifying DFSORT/VSE Options

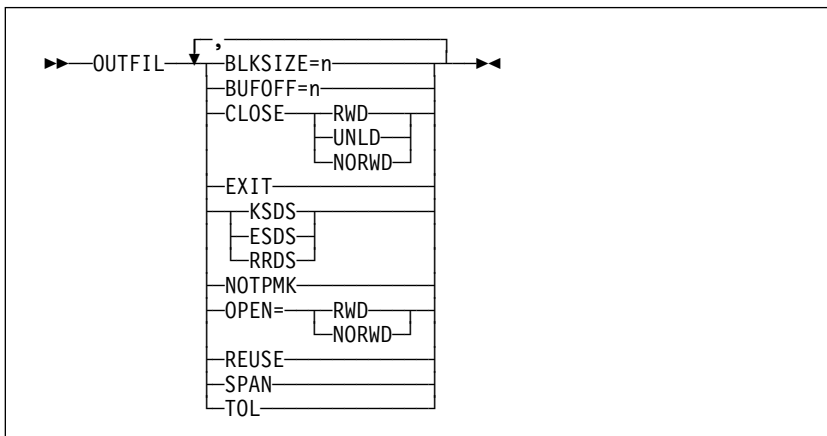
| Operand | Description |
|----------|--|
| PRINT= | <p>Specifies which messages are to be produced by DFSORT/VSE.</p> <p>ALL Specifies that all DFSORT/VSE messages are to be produced, including error and end-of-application messages, various size calculation messages, and other informational messages.</p> <p>NONE Specifies that DFSORT/VSE messages are not to be produced.</p> <p>CRITICAL Specifies that only critical error messages are to be produced.</p> |
| ROUTE= | <p>Specifies where the DFSORT/VSE messages are to be routed.</p> <p>LST Specifies that all DFSORT/VSE messages are to be routed to the SYSLST file. In addition, critical messages are to be routed to the system console.</p> <p>LOG Specifies that all DFSORT/VSE messages are to be routed to the system console.</p> <p>xxx Specifies that all DFSORT/VSE messages are to be routed to SYSxxx. Critical messages will also be routed to SYSLOG, but the system dump (if any) is produced on SYSLST. ROUTE=xxx is in effect for program invoked DFSORT/VSE applications only. If ROUTE=xxx is specified for a directly invoked DFSORT/VSE application, it will be ignored and the default ROUTE value (LST or LOG) will be used instead.</p> |
| SKIPREC= | Specifies the number of records you want to skip before starting to sort or copy the input files. |
| SORTIN= | Specifies the logical unit numbers of the input files. |
| SORTOUT= | <p>Specifies the output device.</p> <p>n Specifies the logical unit number of the output device. The logical unit number is only needed for tape, printer, and punch devices.</p> <p>LST Specifies that output is to be written to SYSLST.</p> <p>PCH Specifies that output is to be written to SYSPCH.</p> |
| STOPAFT= | Specifies the maximum number of records you want accepted for sorting or copying. |

OPTION—Specifying DFSORT/VSE Options

| Operand | Description |
|----------|--|
| STORAGE= | Specifies the amount of virtual storage (partition program area) to be used, if available, by DFSORT/VSE. n Specifies that n bytes are to be used. nK Specifies that n times 1024 bytes are to be used. nM Specifies that n times 1048576 bytes are to be used. |
| STXIT | Specifies that DFSORT/VSE should use its STXIT routine for abend recovery processing, restoring its STXIT every time control is returned from a user exit routine. |
| MINSTXIT | Specifies that DFSORT/VSE should use its STXIT routine for abend recovery processing and not restore its STXIT every time control is returned from a user exit routine. |
| NOSTXIT | Specifies that DFSORT/VSE should not use its STXIT routine. |
| VERIFY | Specifies that each output block is to be checked to ensure that it was written correctly. VERIFY is ignored for VSAM output files. |
| NOVERIFY | Specifies that the output blocks are not checked. |
| WORKNM= | Specifies the first four letters of the name in the DLBL job control language statement for the work files (work file name prefix). |
| WRKSEC | Specifies that secondary allocation of SAM ESDS work files is to be used. |
| NOWRKSEC | Specifies that secondary allocation of SAM ESDS work files is not to be used. |
| Y2PAST= | Specifies the sliding or fixed century window. s Specifies the number of years DFSORT/VSE is to subtract from the current year to set the beginning of the sliding century window. f Specifies the beginning of the fixed century window. |
| ZDPRINT | Converts positive ZD summation results to printable numbers. |
| NZDPRINT | Does not convert positive ZD summation results to printable numbers. |

OUTFIL—Defining the Output File

OUTFIL—Defining the Output File



Example

```
OUTFIL BLKSIZE=300,CLOSE=UNLD,BUFOFF=4
```

The block size for the output records is 300 bytes. The output tape will be rewound (by default) before writing begins and it will be rewound and unloaded at end of file. Data records are ISCI/ASCII, as shown by the BUFOFF operand, and each output block will have a block prefix of length 4.

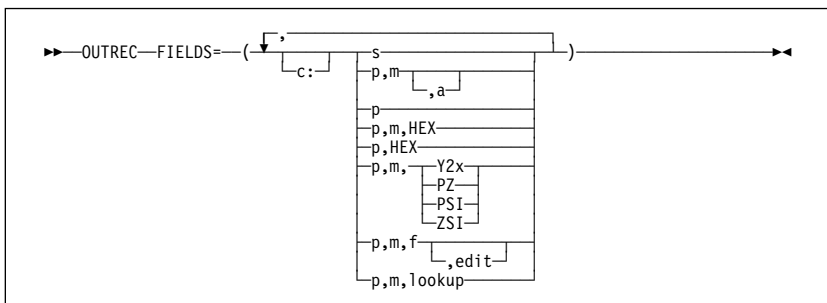
| Operand | Description |
|----------|---|
| BLKSIZE= | Specifies the maximum output block size in bytes. It is not needed if the output file is a VSAM file, or accessed as VSAM, nor if the output file is to be unblocked. For ISCI/ASCII records, the value must include BUFOFF value. |
| BUFOFF= | Specifies the block prefix size at the front of each physical record on the output file. Only used with variable-length ISCI/ASCII data. |
| CLOSE= | Specifies the procedure to be followed when tape output file is closed. <ul style="list-style-type: none"> RWD Specifies that the tape is to be rewound. UNLD Specifies that the tape is to be rewound and unloaded. NORWD Specifies that the tape is not to be rewound. |

OUTFIL—Defining the Output File

| Operand | Description |
|---------|---|
| EXIT | Indicates that, instead of DFSORT/VSE, your own E35 user exit routine will take responsibility for the output. |
| KSDS | Indicates that the VSAM file is to be a key sequenced file. The records must have been sorted into ascending key sequence on the primary VSAM key. |
| ESDS | Indicates that the VSAM file is to be an entry sequenced file. |
| RRDS | Indicates that the VSAM file is to be a relative record file. |
| NOTPMK | Indicates that no tape mark is to be written before the first data record on each volume in the output file. This operand can only be specified for unlabeled tape output files. |
| OPEN= | Specifies the procedure to be followed when tape output file is opened. RWD Specifies that the tape should be rewound before being written. NORWD Specifies that the tape should not be rewound before being written. |
| REUSE | Indicates that you want to write over an existing non-empty VSAM file defined with the REUSE attribute. |
| SPAN | Specifies that output SAM file is to consist of spanned variable-length EBCDIC records. The RECORD control statement must specify TYPE=V. |
| TOL | Indicates that DFSORT/VSE is to tolerate a warning code from VSAM when opening a VSAM output file. It is only valid for VSAM output. |

OUTREC—Reformatting the Output Record

OUTREC—Reformatting the Output Record



Example

```
OUTREC FIELDS=(11,32)
```

This statement specifies that the output record is to contain 32 bytes beginning with byte 11 of the input record. This statement can be used only with fixed-length input records, because it does not include the first 4 bytes.

FIELDS=

Order of separation fields and unedited and edited input fields in the reformatted output record.

| Operand | Description |
|---------|--|
| c: | Column alignment field. Indicates the column in which the first position of the input record or separation field is aligned relative to the start of the reformatted output record. |
| s | Separation field. Permissible values: nX (blank separation); nZ (binary zero separation); nC'xx...x' (character string separation); nX'yy...yy' (hexadecimal string separation). |
| p,m,a | Unedited input field. <ul style="list-style-type: none"> p Position of input field; a byte location within a record that is the first byte of an input field. m Length of input field. a Alignment of input field in the reformatted output record. Permissible values: H (halfword aligned); F (fullword aligned); D (doubleword aligned). |

OUTREC—Reformatting the Output Record

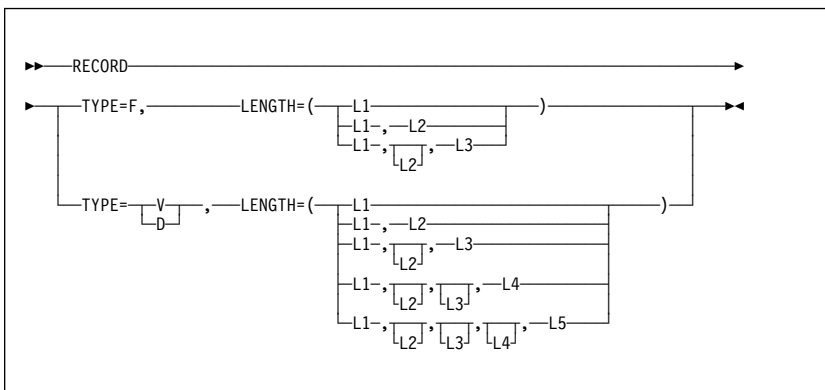
| Operand | Description |
|---------|--|
| p | Unedited variable part of input record appears as last field in the reformatted output record. See p under p,m,a above. |
| p,m,HEX | Hexadecimal representation (EBCDIC) of input field. p See p under p,m,a above. m See m under p,m,a above. HEX Requests hexadecimal representation (EBCDIC) of input field. |
| p,HEX | Hexadecimal representation (EBCDIC) of variable part of input record appears as last field in the reformatted output record. p See p under p,m,a above. HEX Requests hexadecimal representation (EBCDIC) of variable part of input record. |
| p,m,Y2x | Four-digit character year representation of two-digit year input field using the century window. p See p under p,m,a above. m See m under p,m,a above. Y2x Requests four-digit year representation of input field. |
| p,m,PZ | The character representation of a packed decimal input field, with the sign and first digit ignored. p See p under p,m,a above. m See m under p,m,a above. PZ Requests character representation of the input field with the sign and first digit ignored. |
| p,m,PSI | The character representation of a packed decimal input field, with the sign ignored. p See p under p,m,a above. m See m under p,m,a above. PSI Requests character representation of the input field with the sign ignored. |
| p,m,ZSI | The character representation of a zoned decimal input field, with the sign ignored. p See p under p,m,a above. m See m under p,m,a above. ZSI Requests character representation of the input field with the sign ignored. |

OUTREC—Reformatting the Output Record

| Operand | Description |
|------------|---|
| p,m,f,edit | <p>Edited numeric input field.</p> <p>p See p under p,m,a above.</p> <p>m Length of numeric field.</p> <p>f Format of numeric field: BI, FI, PD, PD0, or ZD.</p> <p>edit How numeric field is edited for output.</p> <p style="text-align: center;"><i>See DFSORT/VSE Application Programming Guide for details.</i></p> |
| p,m,lookup | <p>Character or hexadecimal string from lookup table.</p> <p>p See p under p,m,a above.</p> <p>m See m under p,m,a above.</p> <p>lookup How input field is changed to output field using a lookup table.</p> <p style="text-align: center;"><i>See DFSORT/VSE Application Programming Guide for details.</i></p> |

RECORD—Describing the Record Format and Length

RECORD—Describing the Record Format and Length



Example

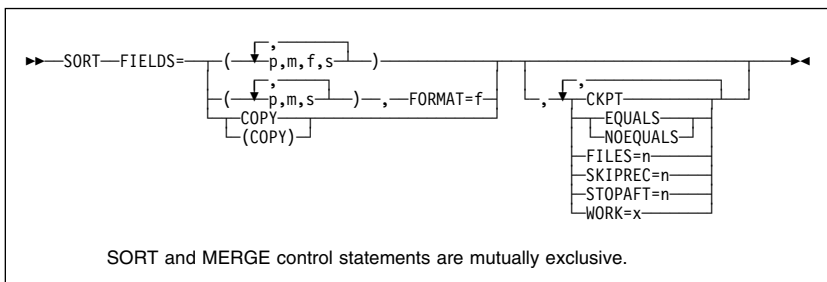
```
RECORD TYPE=F,LENGTH=(80,,50)
```

Input records are fixed-length and 80 bytes long. After the E35 user exit routine, the record length will be 50 bytes.

| Operand | Description |
|---------|---|
| TYPE= | Specifies the record type. Valid values are : F Fixed-length records V Variable-length EBCDIC records D Variable-length ISCI/ASCII records |
| LENGTH= | For fixed-length records: L1 Input record length. L2 Record length after E15 user exit. L3 Output record length after E35 user exit. For variable-length records: L1 Maximum input record length. L2 Maximum input record length after E15 user exit. L3 Maximum output record length after E35 user exit. L4 Minimum input record length. L5 Most frequent input record length. |

SORT—Specifying a SORT or COPY

SORT—Specifying a SORT or COPY



Example

```
SORT  FIELDS=(2,5,CH,A),WORK=1
```

The control field begins on the second byte of each record in the input file, is five bytes long, and contains character (EBCDIC) data. It is to be sorted in ascending order. One work file is used.

| Operand | Description |
|------------------------------|--|
| FIELDS= | Control fields must be described in descending order of significance. <p>p Position of the control field; a byte location within a record that is the first byte of a control field.</p> <p>m Length of the control field.</p> <p>f Format of the control field.</p> <p>s Sequence of the data. Can be: A—ascending D—descending.</p> |
| FORMAT= | Can be used instead of the f subparameter of FIELDS, if all control field data formats are the same. |
| FIELDS=COPY FIELDS=(COPY) | Copies from 1 to 9 input files to an output file. |
| CKPT | Activate the checkpoint facilities of the operating system. |
| EQUALS | Specifies that the original sequence of records that collate identically must be preserved. |
| NOEQUALS | Specifies that the original sequence of records that collate identically need not be preserved. |

SORT—Specifying a SORT or COPY

| Operand | Description |
|----------|--|
| FILES= | Specifies the number of input files to be sorted or copied. |
| SKIPREC= | Specifies the number of records you want to skip before starting to sort or copy the input files. |
| STOPAFT= | Specifies the maximum number of records you want accepted for sorting or copying. |
| WORK= | Describes the work files. DA Specifies that the work file DLBL job control statement defines the file as multiextent (DA). (Not allowed for FBA work files.) n Specifies the number of work file DLBL job control statements supplied, where n can be any number from 0 through 9. If 0 is specified, DFSORT/VSE will not use any work files and will attempt to perform incore sorting. |

Control Field Formats and Lengths for SORT

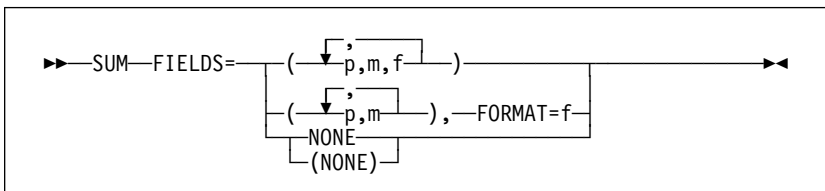
| Format | Length | Description |
|--------|--------------------|--|
| CH | 1 to 256 bytes | Character |
| AQ | 1 to 256 bytes | Character with alternate collating sequence |
| ZD | 1 to 256 bytes | Signed zoned decimal |
| PD | 1 to 32 bytes | Signed packed decimal |
| PD0 | 2 to 8 bytes | Packed decimal with sign and first digit ignored |
| FI | 1 to 256 bytes | Signed fixed-point |
| BI | 1 bit to 256 bytes | Unsigned binary |
| FL | 1 to 256 bytes | Signed floating-point |
| AC | 1 to 256 bytes | ISCI/ASCII character |
| CSL | 2 to 256 bytes | Signed numeric with leading separate sign |
| CST | 2 to 256 bytes | Signed numeric with trailing separate sign |
| CLO | 1 to 256 bytes | Signed numeric with leading overpunch sign |
| CTO | 1 to 256 bytes | Signed numeric with trailing overpunch sign |

SORT—Specifying a SORT or COPY

| Format | Length | Description |
|------------|----------------|--|
| ASL | 2 to 256 bytes | Signed ISCI/ASCII numeric with leading separate sign |
| AST | 2 to 256 bytes | Signed ISCI/ASCII numeric with trailing separate sign |
| Y2C or Y2Z | 2 bytes | Two-digit character or zoned decimal year data |
| Y2P | 2 bytes | Two-digit packed decimal year data |
| Y2D | 1 byte | Two-digit decimal year data |
| Y2S | 2 bytes | Two-digit character or zoned decimal year data with special indicators |
| Y2B | 1 byte | Two-digit binary year data |

SUM—Adding Summary Fields

SUM—Adding Summary Fields



Example

```
SUM FIELDS=(21,8,PD,11,4,FI)
```

This statement designates an 8-byte packed decimal field at byte 21, and a 4-byte fixed-integer field at byte 11, as summary fields.

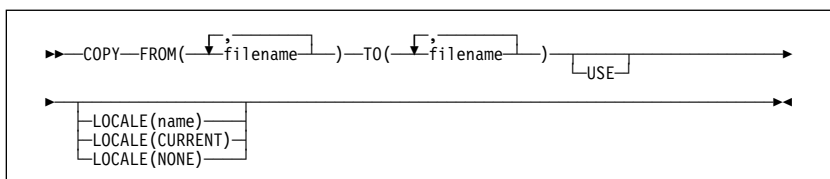
| Operand | Description |
|------------------------------|---|
| FIELDS= | Specifies input record numeric fields as summary fields. <p>p Position of the summary field; a byte location within a record that is the first byte of a summary field.</p> <p>m Length of the summary field.</p> <p>f Format of the summary field.</p> |
| FIELDS=NONE FIELDS=(NONE) | Eliminates records with duplicate keys; no summing is done. |
| FORMAT= | Can be used instead of the f subparameter of FIELDS= if all summary field data formats are the same. |

Summary Field Formats and Lengths for SUM

| Format | Length | Description |
|--------|------------------|-----------------------|
| BI | 2, 4, or 8 bytes | Unsigned binary |
| FI | 2, 4, or 8 bytes | Signed fixed-point |
| PD | 1 to 16 bytes | Signed packed decimal |
| ZD | 1 to 18 bytes | Signed zoned decimal |

Chapter 3. ICETOOL Operators

COPY—Copying Files



Example

```

COPY FROM(IN1,IN2) TO(OUT1,OUT2,OUT3) USE
USTART
  INCLUDE COND=(31,4,CH,EQ,C'HERR')
UEND
COPY FROM(VSAMIN) TO(VSAMOUT)
COPY FROM(INPUT) TO(DASD,TAPE1,TAPE2)

```

The first COPY operator copies the records included from the IN1 and IN2 files to the OUT1 file and then copies the resulting OUT1 file to the OUT2 and OUT3 files. The DFSORT/VSE INCLUDE control statement is used for the first COPY operation.

The second COPY operator copies the entire VSAMIN file to the VSAMOUT file.

The third COPY operator copies the entire INPUT file to the DASD file and then copies the resulting DASD file to the TAPE1 and TAPE2 files. Since the first TO file is processed three times (written, read, read), placing the DASD file first is more efficient than placing the TAPE1 and TAPE2 files first.

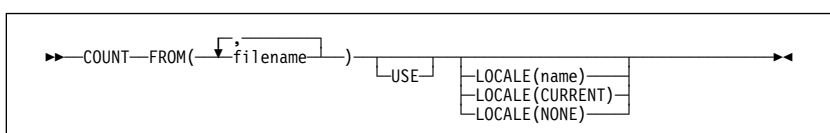
| Operand | Description |
|--------------------|--|
| FROM(filename,...) | Specifies the file names of the input files. |
| TO(filename,...) | Specifies the file names of the output files. |
| USE | Specifies that the DFSORT/VSE section that appears immediately after this COPY statement is to be used for this operation. |

COPY—Copying Files

| Operand | Description |
|-----------------|---|
| LOCALE(name) | Specifies locale processing and designates name of the active locale. |
| LOCALE(CURRENT) | Specifies locale processing and keeps current locale active. |
| LOCALE(NONE) | Specifies locale processing is not used. |

COUNT—Counting Records

COUNT—Counting Records



Example

```

COUNT FROM(IN1,IN2,IN3)
COUNT FROM(IN4) USE
USTART
OMIT COND=(15,2,ZD,GT,32,
           AND,28,8,PD,LT,20000)
UEND
  
```

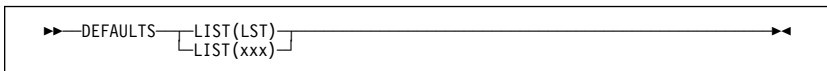
The first COUNT operator prints a message containing the count of records in the IN1, IN2, and IN3 files.

The second COUNT operator prints a message containing the count of records included from the IN4 file.

| Operand | Description |
|--------------------|---|
| FROM(filename,...) | Specifies the file names of the input files. |
| USE | Specifies that the DFSORT/VSE section that appears immediately after this COUNT statement is to be used for this operation. |
| LOCALE(name) | Specifies locale processing and designates name of the active locale. |
| LOCALE(CURRENT) | Specifies locale processing and keeps current locale active. |
| LOCALE(NONE) | Specifies locale processing is not used. |

DEFAULTS—Displaying Installation Defaults

DEFAULTS—Displaying Installation Defaults



Example

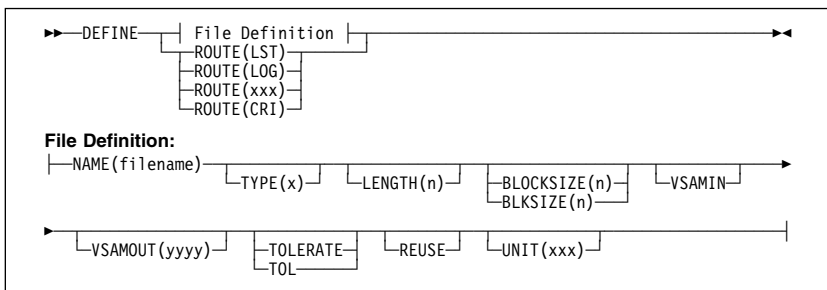
```
DEFAULTS LIST(011)
```

Prints the DFSORT/VSE installation defaults to the printer associated with logical unit SYS011.

| Operand | Description |
|-----------|--|
| LIST(LST) | Specifies that output will be routed to SYSLST. |
| LIST(xxx) | Specifies that output will be routed to the printer associated with logical unit SYSxxx. |

DEFINE—Defining File Characteristics

DEFINE—Defining File Characteristics



Example

```

DEFINE ROUTE(012)
DEFINE NAME(IN1) TYPE(F) LENGTH(173)
COPY FROM(IN1) ...
    
```

- The first DEFINE operator defines that DFSORT/VSE messages are to be routed to the SYS012 printer.
- The second DEFINE operator defines characteristics of the IN1 input file for the COPY operation. The IN1 input file contains fixed-length records and the record length is 173 bytes.

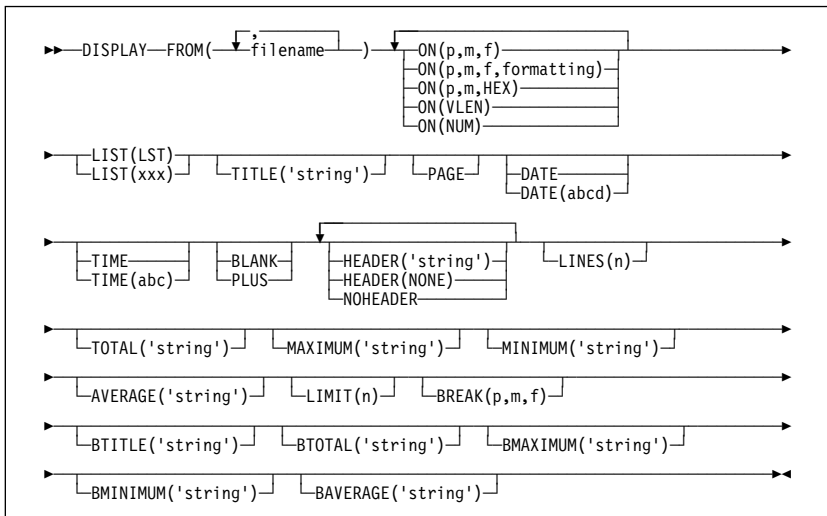
| Operand | Description |
|----------------------------|--|
| NAME(filename) | Specifies the file name of the input or output file being defined with a FROM or TO operand in the COPY, COUNT, DISPLAY, OCCUR, RANGE, SELECT, SORT, STATS, UNIQUE, and VERIFY operators. |
| TYPE(x) | Specifies the format of the records being processed. x must be one of the following: F Indicates that the records to be processed are fixed-length records. V Indicates that the records are EBCDIC variable-length records. |
| LENGTH(n) | Specifies in bytes the input record length. For variable-length records specifies maximum input record length. |
| BLOCKSIZE(n) or BLKSIZE(n) | Specifies in bytes the maximum input block size for the input file or maximum output block size for the output file. |
| VSAMIN | Specifies that the input file is VSAM. This operand must be used for the input VSAM file. |

DEFINE—Defining File Characteristics

| Operand | Description |
|-----------------|--|
| VSAMOUT(yyyy) | Specifies that the output file is to be stored in a VSAM file. This operand must be used for the output VSAM file. yyyy must be ESDS, KSDS, or RRDS. |
| TOLERATE or TOL | Specifies that DFSORT/VSE should tolerate a warning code from VSAM when opening a VSAM file. |
| REUSE | Specifies that you want to write over an existing non-empty VSAM file defined with the REUSE attribute. |
| UNIT(xxx) | Specifies the value for a logical unit number in the range 001 to 221. The UNIT operand must be used for a tape file. |
| ROUTE(LST) | Specifies that all messages are to be routed to SYSLST. In addition, critical messages are to be routed to the system console. |
| ROUTE(LOG) | Specifies that all messages are to be routed to the system console. |
| ROUTE(xxx) | Specifies that all messages are to be routed to the SYSxxx device. |
| ROUTE(CRI) | Specifies that only critical error messages are to be routed to the system console. |

DISPLAY—Printing Reports

DISPLAY—Printing Reports



DISPLAY—Printing Reports

Example

```

DISPLAY FROM(IN) LIST(LST) -
  TITLE('National Accounting Report') -
  PAGE DATE TIME -
  HEADER('Division') HEADER('Revenue') HEADER('Profit/Loss') -
  ON(1,25,CH)          ON(45,10,ZD)      ON(35,10,ZD) -
  BLANK -
  TOTAL('Company Totals') -
  AVERAGE('Company Averages')

```

Prints to SYSLST:

- A title line containing the specified title, the page number, the date and the time
- A heading line containing the specified underlined headings
- Data lines in the BLANK format containing:
 - The characters from positions 1-25 of the IN file
 - The zoned decimal values from positions 45-54 of the IN file
 - The zoned decimal values from positions 35-44 of the IN file
- A TOTAL line containing the specified string and the total for each of the two zoned decimal fields in the BLANK format
- An AVERAGE line containing the specified string and the average for each of the two zoned decimal fields in the BLANK format.

| Operand | Description |
|--------------------|--|
| FROM(filename,...) | Specifies the file names of the input files. |
| ON(p,m,f) | Specifies the position, length, and format of a numeric or character field. <ul style="list-style-type: none"> p Position of the field; the first byte of the field relative to the beginning of the input record. m Length of the field. f Format of the field. |

DISPLAY—Printing Reports

| Operand | Description |
|----------------------|---|
| ON(p,m,f,formatting) | <p>Specifies the position, length, and format of a numeric or character field and how the data is formatted.</p> <p>p,m,f See ON(p,m,f) above.</p> <p>formatting Items that indicate how data is formatted for printing.</p> <p style="text-align: right;"><i>See DFSORT/VSE Application Programming Guide for details.</i></p> |
| ON(p,m,HEX) | <p>Specifies the position and length of a character field to be printed in hexadecimal format (00–FF for each byte).</p> <p>p Position of the field; the first byte of the field relative to the beginning of the input record.</p> <p>m Length of the field.</p> |
| ON(VLEN) | <p>Same as ON(1,2,BI); specifies a two-byte binary field starting at position 1. For variable-length records, ON(VLEN) represents the record length for each input record.</p> |
| ON(NUM) | <p>Record number. Starts at 1 and is incremented by 1 for each input record.</p> |
| LIST(LST) | <p>Specifies that output will be routed to SYSLST.</p> |
| LIST(xxx) | <p>Specifies that output will be routed to the printer associated with logical unit SYSxxx.</p> |
| TITLE('string') | <p>Specifies printing of a title string in the title line.</p> |
| PAGE | <p>Specifies printing of the page number in the title line.</p> |
| DATE | <p>Specifies printing of the date in the title line in the form mm/dd/yy.</p> |
| DATE(abcd) | <p>Specifies printing of the date in the title line in the form aadbdbcc where abc can be any combination of M, D, and Y or 4, and d can be any character.</p> |
| TIME | <p>Specifies printing of the time in the title line in the form hh:mm:ss.</p> |
| TIME(abc) | <p>Specifies printing of the time in the title line in the form hh:mm:ss xx where ab can be 12 or 24 and c can be any character.</p> |
| BLANK | <p>Specifies an alternate format for printing character and numeric data using blank for plus sign, – for minus sign, and no leading zeros. Column widths are dynamically adjusted and headings and numeric values are right justified.</p> |

DISPLAY—Printing Reports

| Operand | Description |
|--------------------|--|
| PLUS | Specifies an alternate format for printing character and numeric data using + for plus sign, – for minus sign, and no leading zeros. Column widths are dynamically adjusted and headings and numeric values are right justified. |
| HEADER('string') | Specifies that a heading is to be printed for the corresponding ON field. |
| HEADER(NONE) | Specifies that a heading is not to be printed for the corresponding ON field. |
| NOHEADER | Specifies that headings for ON fields are not to be printed. |
| LINES(n) | Specifies the number of lines per page. |
| TOTAL('string') | Specifies that an overall TOTAL line is to be printed after the columns of data. |
| MAXIMUM('string') | Specifies that an overall MAXIMUM line is to be printed after the columns of data. |
| MINIMUM('string') | Specifies that an overall MINIMUM line is to be printed after the columns of data. |
| AVERAGE('string') | Specifies that an overall AVERAGE line is to be printed after the columns of data. |
| LIMIT(n) | Specifies the maximum number of invalid decimal values (the default is 200). If n invalid values are found, ICETOOL terminates this operation. |
| BREAK(p,m,f) | Specifies a numeric or character break field dividing the report into sections. p,m,f See ON(p,m,f) above. |
| BTITLE('string') | Specifies a string in the break title line for each section. |
| BTOTAL('string') | Specifies a break TOTAL line for each section. |
| BMAXIMUM('string') | Specifies a break MAXIMUM line for each section. |
| BMINIMUM('string') | Specifies a break MINIMUM line for each section. |
| BAVERAGE('string') | Specifies a break AVERAGE line for each section. |

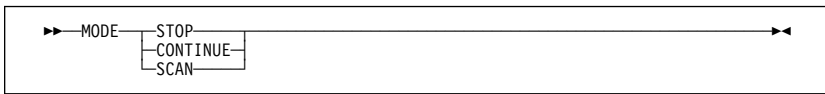
DISPLAY—Printing Reports

Field Formats for DISPLAY

| Format | Length | Description |
|--------|---------------|-----------------------|
| BI | 1 to 4 bytes | Unsigned binary |
| FI | 1 to 4 bytes | Signed fixed-point |
| PD | 1 to 8 bytes | Signed packed decimal |
| ZD | 1 to 15 bytes | Signed zoned decimal |
| CH | 1 to 80 bytes | Character |

MODE—Setting the Mode

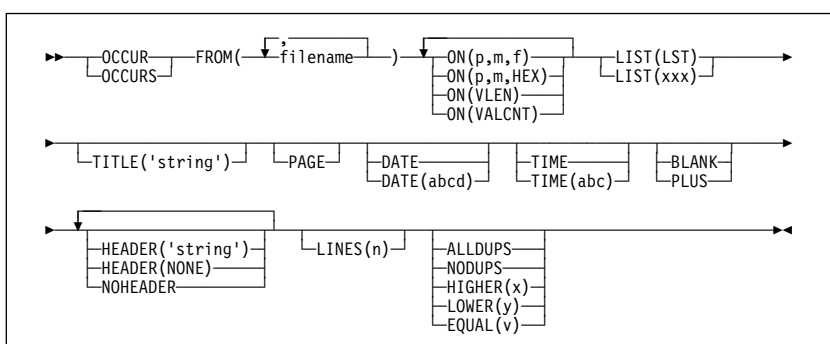
MODE—Setting the Mode



| Operand | Description |
|----------|---|
| STOP | Stops subsequent operations and sets SCAN mode in effect if an operation fails. |
| CONTINUE | Continues with subsequent operations even if an operation fails. |
| SCAN | Checks ICETOOL statements for errors. |

OCCUR—Reporting Counts of Unique Values

OCCUR—Reporting Counts of Unique Values



Example

```
OCCUR FROM(SOURCE,UPDATE) LIST(LST) ON(40,6,CH) ON(VALCNT)
```

Prints to SYSLST:

- A heading line containing the standard headings
- A data line for each unique ON(40,6,CH) value in the standard format containing:
 - The characters from positions 40-45 of SOURCE and UPDATE files for the unique value
 - The count of occurrences in SOURCE and UPDATE files of the unique value

| Operand | Description | | | | | | |
|--------------------|---|---|---|---|----------------------|---|----------------------|
| FROM(filename,...) | Specifies the file names of the input files. | | | | | | |
| ON(p,m,f) | Specifies the position, length, and format of a numeric or character field. <table border="0" style="margin-left: 20px;"> <tr> <td>p</td> <td>Position of the field; the first byte of the field relative to the beginning of the input record.</td> </tr> <tr> <td>m</td> <td>Length of the field.</td> </tr> <tr> <td>f</td> <td>Format of the field.</td> </tr> </table> | p | Position of the field; the first byte of the field relative to the beginning of the input record. | m | Length of the field. | f | Format of the field. |
| p | Position of the field; the first byte of the field relative to the beginning of the input record. | | | | | | |
| m | Length of the field. | | | | | | |
| f | Format of the field. | | | | | | |

OCCUR—Reporting Counts of Unique Values

| Operand | Description |
|------------------|--|
| ON(p,m,HEX) | Specifies the position and length of a character field to be printed in hexadecimal format (00–FF for each byte). p Position of the field; the first byte of the field relative to the beginning of the input record. m Length of the field. |
| ON(VLEN) | Same as ON(1,2,BI); specifies a two-byte binary field starting at position 1. For variable-length records, ON(VLEN) represents the record length for each input record. |
| ON(VALCNT) | Specifies that the number of occurrences of each unique value is to be printed. |
| LIST(LST) | Specifies that output will be routed to SYSLST. |
| LIST(xxx) | Specifies that output will be routed to the printer associated with logical unit SYSxxx. |
| TITLE('string') | Specifies printing of a title string in the title line. |
| PAGE | Specifies printing of the page number in the title line. |
| DATE | Specifies printing of the date in the title line in the form mm/dd/yy. |
| DATE(abcd) | Specifies printing of the date in the title line in the form aadbdbcc where abc can be any combination of M, D, and Y or 4, and d can be any character. |
| TIME | Specifies printing of the time in the title line in the form hh:mm:ss. |
| TIME(abc) | Specifies printing of the time in the title line in the form hhcmmcss xx where ab can be 12 or 24 and c can be any character. |
| BLANK | Specifies an alternate format for printing character and numeric data using blank for plus sign, – for minus sign, and no leading zeros. Column widths are dynamically adjusted and headings and numeric values are right justified. |
| PLUS | Specifies an alternate format for printing character and numeric data using + for plus sign, – for minus sign, and no leading zeros. Column widths are dynamically adjusted and headings and numeric values are right justified. |
| HEADER('string') | Specifies that a heading is to be printed for the corresponding ON field. |
| HEADER(NONE) | Specifies that a heading is not to be printed for the corresponding ON field. |
| NOHEADER | Specifies that headings for ON fields are not to be printed. |

OCCUR—Reporting Counts of Unique Values

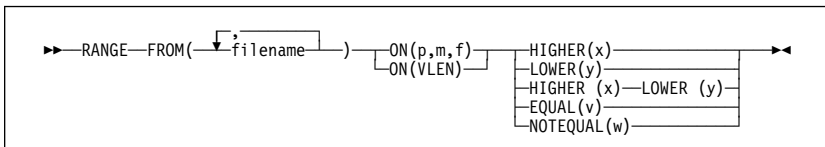
| Operand | Description |
|-----------|---|
| LINES(n) | Specifies the number of lines per page. |
| ALLDUPS | Limits the ON values printed to those that occur more than once. |
| NODUPS | Limits the ON values printed to those that occur only once. |
| HIGHER(x) | Limits the ON values that occur more than x times. |
| LOWER(y) | Limits the ON values printed to those that occur less than y times. |
| EQUAL(v) | Limits the ON values printed to those that occur v times. |

Field Formats for OCCUR

| Format | Length | Description |
|--------|---------------|-----------------------|
| BI | 1 to 4 bytes | Unsigned binary |
| FI | 1 to 4 bytes | Signed fixed-point |
| PD | 1 to 8 bytes | Signed packed decimal |
| ZD | 1 to 15 bytes | Signed zoned decimal |
| CH | 1 to 80 bytes | Character |

RANGE—Counting Values in a Range

RANGE—Counting Values in a Range



Example

```
RANGE FROM(DATA3) ON(29001,4,FI) -
HIGHER(-10000) LOWER(27)
```

Prints a message giving the count of fixed-point values from positions 29001-29004 of the DATA3 file that are higher than -10000 but lower than 27 (-10000<value<27).

| Operand | Description |
|--------------------|---|
| FROM(filename,...) | Specifies the file names of the input files. |
| ON(p,m,f) | Specifies the position, length, and format of the numeric field to be used for this operation. <p>p Position of the field; the first byte of the field relative to the beginning of the input record.</p> <p>m Length of the field.</p> <p>f Format of the field.</p> |
| ON(VLEN) | Same as ON(1,2,BI); specifies a two-byte binary field starting at position 1. For variable-length records, ON(VLEN) represents the record length for each input record. |
| HIGHER(x) | Counts only those values higher than x as being in the range. |
| LOWER(y) | Counts only those values lower than y as being in the range. |
| EQUAL(v) | Counts only those values equal to v as being in the range. |
| NOTEQUAL(w) | Counts only those values not equal to w as being in the range. |

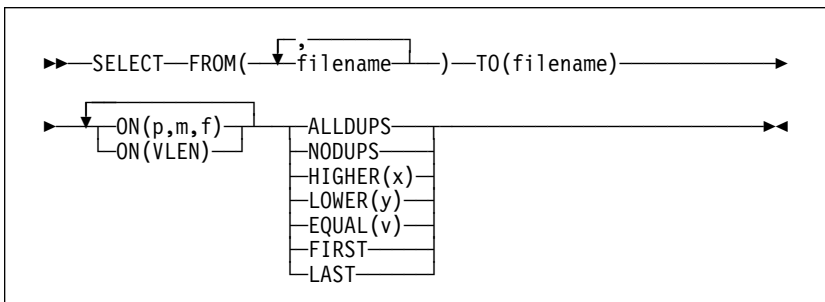
RANGE—Counting Values in a Range

Field Formats for RANGE

| Format | Length | Description |
|--------|---------------|-----------------------|
| BI | 1 to 4 bytes | Unsigned binary |
| FI | 1 to 4 bytes | Signed fixed-point |
| PD | 1 to 8 bytes | Signed packed decimal |
| ZD | 1 to 15 bytes | Signed zoned decimal |

SELECT—Selecting Records by Occurrences of Fields

SELECT—Selecting Records by Occurrences of Fields



Example

```
SELECT FROM(INPUT) TO(DUPS) ON(11,8,CH) ON(30,44,CH) ALLDUPS
```

Sorts the INPUT file to the DUPS file, selecting only the records from INPUT with characters in positions 11-18 and characters in positions 30-73 that occur more than once (that is, only records with duplicate ON field values).

| Operand | Description |
|--------------------|--|
| FROM(filename,...) | Specifies the file names of the input files. |
| TO(filename) | Specifies the file name of the output file. |
| ON(p,m,f) | Specifies the position, length, and format of a numeric or character field. <p>p Position of the field; the first byte of the field relative to the beginning of the input record.</p> <p>m Length of the field.</p> <p>f Format of the field.</p> |
| ON(VLEN) | Same as ON(1,2,BI); specifies a two-byte binary field starting at position 1. For variable-length records, ON(VLEN) represents the record length for each input record. |
| ALLDUPS | Limits the records selected to those with ON values that occur more than once. |
| NODUPS | Limits the records selected to those with ON values that occur only once. |

SELECT—Selecting Records by Occurrences of Fields

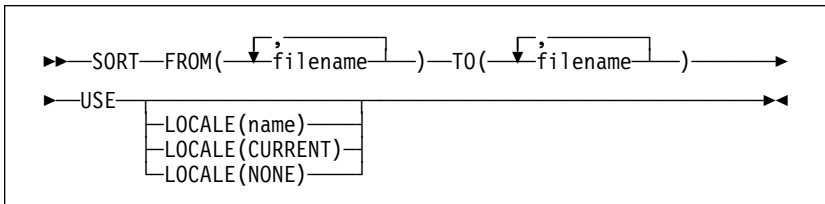
| Operand | Description |
|-----------|--|
| HIGHER(x) | Limits the records selected to those with ON values that occur more than x times. |
| LOWER(y) | Limits the records selected to those with ON values that occur less than y times. |
| EQUAL(v) | Limits the records selected to those with ON values that occur v times. |
| FIRST | Limits the records selected to those with ON values that occur only once and the first record of those with ON values that occur more than once. |
| LAST | Limits the records selected to those with ON values that occur only once and the last record of those with ON values that occur more than once. |

Field Formats for SELECT

| Format | Length | Description |
|--------|---------------|-----------------------|
| BI | 1 to 4 bytes | Unsigned binary |
| FI | 1 to 4 bytes | Signed fixed-point |
| PD | 1 to 8 bytes | Signed packed decimal |
| ZD | 1 to 15 bytes | Signed zoned decimal |
| CH | 1 to 80 bytes | Character |

SORT—Sorting Files

SORT—Sorting Files



Example

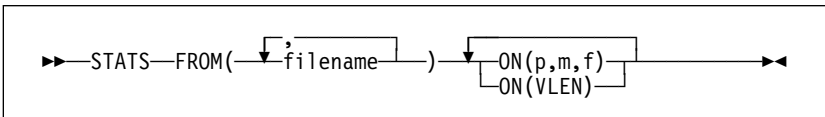
```
SORT FROM(IN1,IN2) TO(OUT1,OUT2,OUT3) USE
USTART
  SORT FIELDS=(1,15,CH,A)
  INCLUDE COND=(45,3,CH,EQ,C'J69')
UEND
```

Sorts the IN1 and IN2 files to the OUT1 file using SORT and INCLUDE statements in the DFSORT/VSE section. Copies the resulting OUT1 file to the OUT2 and OUT3 files.

| Operand | Description |
|--------------------|--|
| FROM(filename,...) | Specifies the file names of the input files. |
| TO(filename,...) | Specifies the file names of the output files. |
| USE | Specifies that the DFSORT/VSE section that appears immediately after this SORT statement is to be used for this operation. |
| LOCALE(name) | Specifies locale processing and designates name of the active locale. |
| LOCALE(CURRENT) | Specifies locale processing and keeps current locale active. |
| LOCALE(NONE) | Specifies locale processing is not used. |

STATS—Computing Statistics

STATS—Computing Statistics



Example

```
STATS FROM(DATA1) ON(VLEN) ON(15,4,ZD)
```

Prints messages giving the minimum, maximum, average, and total of the binary values in positions 1-2 of the DATA1 file. For variable-length records, this gives statistics about the length of the records.

Also prints messages containing the minimum, maximum, average, and total of the zoned decimal values in positions 15-18 of the DATA1 file.

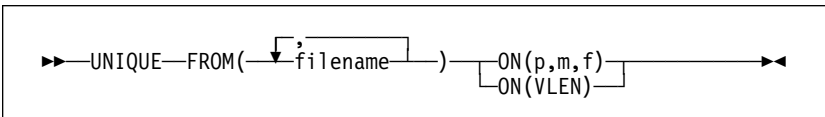
| Operand | Description |
|--------------------|---|
| FROM(filename,...) | Specifies the file names of the input files. |
| ON(p,m,f) | Specifies the position, length, and format of a numeric field to be used for this operation. <p>p Position of the field; the first byte of the field relative to the beginning of the input record.</p> <p>m Length of the field.</p> <p>f Format of the field.</p> |
| ON(VLEN) | Same as ON(1,2,BI); specifies a two-byte binary field starting at position 1. For variable-length records, ON(VLEN) represents the record length for each input record. |

Field Formats for STATS

| Format Code | Length | Description |
|-------------|---------------|-----------------------|
| BI | 1 to 4 bytes | Unsigned binary |
| FI | 1 to 4 bytes | Signed fixed-point |
| PD | 1 to 8 bytes | Signed packed decimal |
| ZD | 1 to 15 bytes | Signed zoned decimal |

UNIQUE—Counting Unique Values

UNIQUE—Counting Unique Values



Example

```
UNIQUE FROM(DATAIN) ON(5,3,CH)
```

Prints a message giving the count of unique character data in positions 5-7 of the DATAIN file.

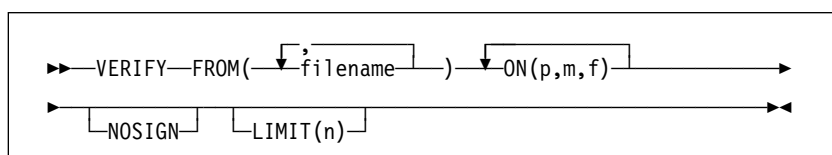
| Operand | Description |
|--------------------|--|
| FROM(filename,...) | Specifies the file names of the input files. |
| ON(p,m,f) | Specifies the position, length, and format of a numeric or character field to be used for this operation. <p>p Position of the field; the first byte of the field relative to the beginning of the input record.</p> <p>m Length of the field.</p> <p>f Format of the field.</p> |
| ON(VLEN) | Same as ON(1,2,BI); specifies a two-byte binary field starting at position 1. For variable-length records, ON(VLEN) represents the record length for each input record. |

Field Formats for UNIQUE

| Format Code | Length | Description |
|-------------|----------------|-----------------------|
| BI | 1 to 256 bytes | Unsigned binary |
| FI | 1 to 256 bytes | Signed fixed-point |
| PD | 1 to 32 bytes | Signed packed decimal |
| ZD | 1 to 32 bytes | Signed zoned decimal |
| CH | 1 to 256 bytes | Character |

VERIFY—Verifying Decimal Values

VERIFY—Verifying Decimal Values



Example

```
VERIFY FROM(NEW) ON(22,16,PD) ON(7,9,ZD)
```

Checks for invalid digits (A-F) and invalid signs (0-9) in the packed decimal values from positions 22-37 and the zoned decimal values from positions 7-15 of the NEW file. A message is printed identifying each value (if any) that contains an invalid digit or sign. If 200 invalid values are found, the operation is terminated.

| Operand | Description |
|--------------------|--|
| FROM(filename,...) | Specifies the file names of the input files. |
| ON(p,m,f) | Specifies the position, length, and format of a decimal field. p Position of the field; the first byte of the field relative to the beginning of the input record. m Length of the field. f Format of the field. |
| NOSIGN | Specifies that the sign of the decimal values is not checked for validity. |
| LIMIT(n) | Specifies the maximum number of valid decimal values (the default is 200). If n invalid values are found ICETOOL terminates this operation. |

Field Formats for VERIFY

| Format Code | Length | Description |
|-------------|---------------|-----------------------|
| PD | 1 to 16 bytes | Signed packed decimal |
| ZD | 1 to 18 bytes | Signed zoned decimal |

VERIFY—Verifying Decimal Values

Chapter 4. DFSORT/VSE Job Control Language

Details on coding VSE/ESA job control language (JCL) for DFSORT/VSE invocation is explained in *VSE/ESA System Control Statements*.

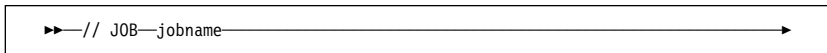


Figure 2. Format of JOB job control statement

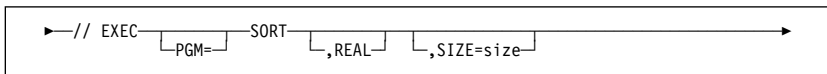


Figure 3. Format of EXEC job control statement

JCL Description

The job control statements and job control commands are described briefly below.

| Operation | Description |
|-----------|---|
| ASSGN | Assigns a logical I/O unit to a physical device. |
| TLBL | Defines tape file label information. |
| DLBL | Defines DASD file label information. |
| EXTENT | Defines DASD file extents. |
| ALLOC | Defines the virtual partition size. |
| SIZE | Defines the size of a GETVIS area partition. |
| SYSDEF | Defines the size of a data space. |
| RSTRT | Defines that it is required to continue execution of an interrupted job from a checkpoint record. |

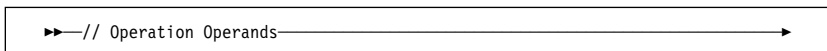


Figure 4. Format of job control statements

JCL Description

ICETOOL Job Control Statements

Chapter 5. ICETOOL Job Control Statements

Details on coding ICETOOL job control language (JCL) statements are explained in *DFSORT/VSE Application Programming Guide*.

```
▶▶// JOB—jobname▶▶
```

```
▶▶// EXEC—PGM=ICETOOL—,REAL—,SIZE=size▶▶
```

JCL Description

| Operation | Description |
|--------------------|---|
| // DLBL infile | Defines an input disk file for a COPY, COUNT, DISPLAY, OCCUR, RANGE, SELECT, SORT, STATS, UNIQUE, or VERIFY operation. |
| // TLBL infile | Defines an input tape file for a COPY, COUNT, DISPLAY, OCCUR, RANGE, SELECT, SORT, STATS, UNIQUE, or VERIFY operation. |
| // DLBL outfile | Defines an output disk file for a COPY, SELECT, or SORT operation. |
| // TLBL outfile | Defines an output tape file for a COPY, SELECT, or SORT operation. |
| // ASSGN SYSnnn,uu | Defines a printer address (uu) for routing DFSORT/VSE messages or ICETOOL reports to a specific printer. (VSE/POWER statement LST can be used for spooling DFSORT/VSE messages or ICETOOL reports to a specific printer queue.) |
| // DLBL sortwk | Defines a work file for DFSORT/VSE for an OCCUR, SELECT, SORT, or UNIQUE operation. |

ICETOOL Job Control Statements

Communicating Your Comments to IBM

DFSORT/VSE

Reference Summary

Version 3 Release 4

Publication No. SX26-6008-03

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Reference Summary
Version 3 Release 4
Publication No. SX26-6008-03

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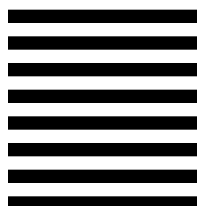
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