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COMPUTER SYSTEMS

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PUBLICATIONS REVISION

Operating System/3 (OS/3)

Sort/Merge

Programmer Reference
(Series 90)

For System 80 see {UP-8819 / UP-9072}

UP-8054 Rev. 4

This Library Memo announces the release and availability of "SPERRY UNIVAC® Operating System/3 (OS/3) Sort/Merge Programmer Reference", UP-8054 Rev. 4.

This revision documents the following new sort/merge features for the 8.0 release.

- All messages for a job initiated at a workstation are displayed on the workstation.
- UOS parameter of OUTFIL control statement for independent sort/merge now defaults to 100% rather than 0%.
- SORT3 is now compatible with IBM System/32 and 34 sorts as well as with the IBM System/3 sort.
- The record type specification for SORT3 now allows the specification of UDATE, UDAY, UMONTH, and UYEAR for Factor 2.
- The field specification for SORT3 now allows you to specify up to a maximum of 256 bytes for the overflow field length.

All other changes are corrections or expanded descriptions applicable to features present in sort/merge prior to the 8.0 release.

Destruction Notice: If you are going to OS/3 release 8.0, use this revision and destroy all previous copies. If you are not going to OS/3 release 8.0, retain the copy you are now using and store this revision for future use.

Copies of UP-8054 Rev. 3, UP-8054 Rev. 3-A, UP-8054 Rev. 3-B, UP-8054 Rev. 3-C, and UP-8054 Rev. 3-D will be available for 6 months after the release of 8.0. Should you need additional copies of this edition, you should order them within 90 days of the release of 8.0. When ordering the previous edition of a manual, be sure to identify the exact revision and update packages desired and indicate that they are needed to support an earlier release.

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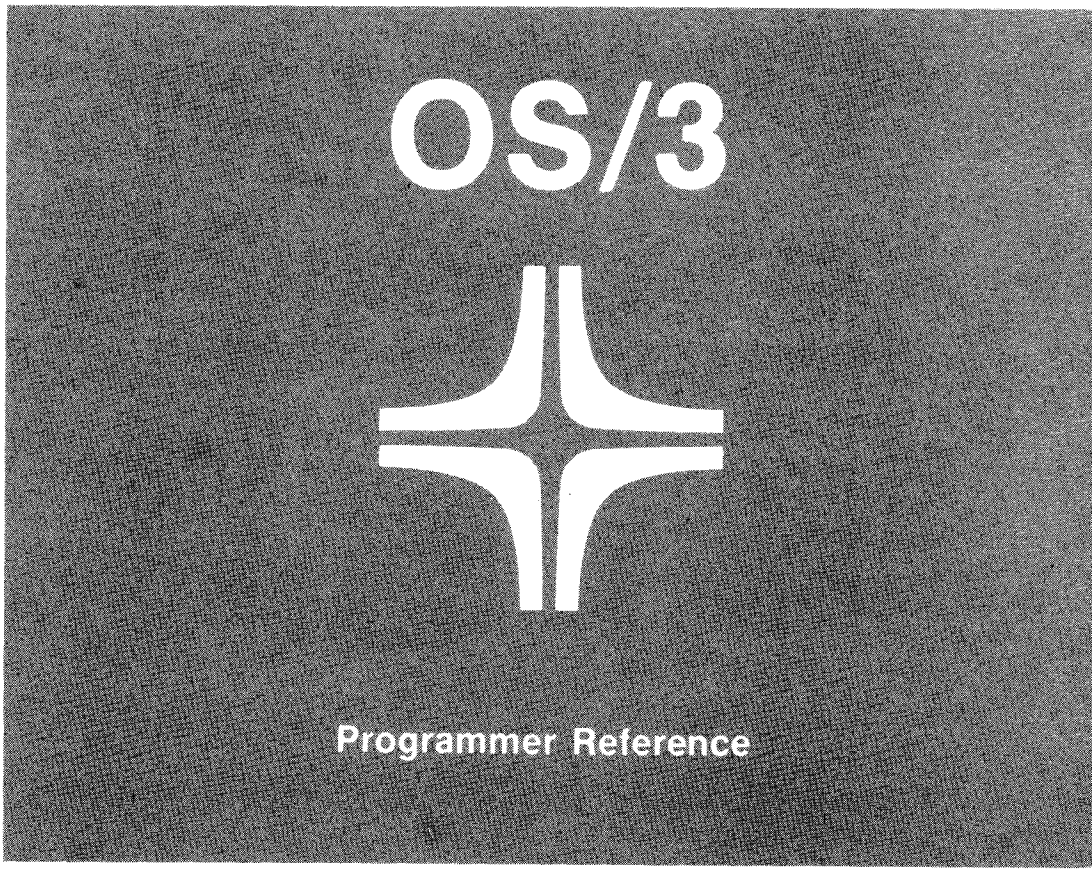
		RELEASE DATE: September, 1982

Sort/Merge



Environment: 90/25, 90/30, 90/30B, 90/40 Systems

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Preface

This programmer reference manual (PRM) is one in a series designed to be used as a quick-reference document by programmers familiar with the SPERRY UNIVAC Operating System/3 (OS/3). This particular manual describes the sort/merge and its effective use.

The information presented here is limited to facts; no extensive introductory information or examples of use are provided. This type of information is presented in two other sort/merge manuals: an introduction to sort/merge, UP-8073 (current version), and a sort/merge user guide, UP-8342 (current version).

The information contained in this manual is presented as follows:

- Section 1. General Information

  Provides a brief overview of sort/merge and describes program requirements, coding conventions, and the functional operation of the three types of sort/merge: independent, subroutine, and SORT3.

- Section 2. Independent Sort/Merge Control Statements

  Gives the function and format of each independent sort/merge control statement, in alphabetical order, with its associated parameters.

- Section 3. User Own-Code Exits

  Describes the function of each user own-code exit in an independent sort/merge program. A branch table, exit parameter table, and general purpose registers used by own-code routines also are included in this section.

- Section 4. Subroutine Sort/Merge Macro Instructions

  Details the function and format or each subroutine sort/merge macro instruction, in alphabetical order, and the keyword parameters associated with the MR$PRM macro instruction.

- Section 5. Subroutine Sort/Merge User Own-Code Routines

  Describes the use of own-code routines for data reduction and record sequencing.

- Section 6. SORT3 Specifications

  Gives the function and format of each SORT3 specification, in alphabetical order, with its associated parameter fields.

- Section 7. SORT3 Alternate Collation Statement

  Gives the function, format, and rules for coding the SORT3 alternate collation statement.

- Appendixes

  Present interfaces, special applications, job stream requirements, requirements for the COBOL programmer, performance factors, and execution time tables for sort/merge.

- Glossary

  Defines the principal terms used in this manual.

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1. General Information

SORT/MERGE OVERVIEW

SPERRY UNIVAC Operating System/3 (OS/3) provides a modular sort/merge package containing coding to handle three alternative uses of sort/merge: independent sort/merge, subroutine sort/merge, and System/3, 32, and 34 compatible sort (SORT3). The independent sort/merge and the SORT3 are a set of "canned" load program modules that process an entire sort/merge job; subroutine sort/merge is a group of interrelated but independent modules that operate as subroutines in the user program. All three methods sort and merge random-order disc or tape records to produce one output file arranged in a specified order; SORT3 is also capable of sorting card files. In addition to performing sort/merge operations, both independent sort/merge and subroutine sort/merge can perform merge-only operations for previously sequenced files. For special applications, independent sort/merge and subroutine sort/merge also allow you to substitute user own-code routines for system supplied sort/merge routines, provided they satisfy the requirements of the sort program and OS/3 programming conventions.

The OS/3 sort/merge offers a wide range of capabilities. It can:

- sort fixed-length or variable-length records;
- sort blocked or unblocked records;
- sort records in ascending or descending sequence;
- sort records with noncontiguous key fields;
- sort characters with same collating value;
- recognize key fields in the following formats:
  - Character
  - Binary (signed or unsigned)
  - Decimal (signed zoned or unsigned zoned)
  - Packed decimal
  - Leading or trailing sign numeric
  - Overpunched leading or trailing sign numeric
  - ASCII leading or trailing sign numeric

  - EBCDIC data in ASCII collating sequence
  - Floating-point (single and double precision)
- sort and create sequential, random access, nonindexed and indexed sequential files;
- sequence files in accordance with a user-specified (alternate) collating sequence;
- perform data validity and data integrity checks during sort;
- merge previously sequenced (sorted) data files (applicable to independent and subroutine sort/merge only);
- perform data reduction and record sequencing and checking (through user own-code routines in independent and subroutine sort/merge);
- tag sort (sorting by key field); and
- perform restart procedures for tape sorts.

PROGRAM REQUIREMENTS

Main Storage

The minimum main storage requirements for sort/merge operations are:

- Independent sort/merge
  - 16,000 bytes for sort/merge procedure, plus sufficient main storage for the larger of either two input blocks or two output blocks. (Additional main storage may be required when using own-code routines.)
  - 16,000 bytes for an independent merge-only procedure, plus sufficient main storage to hold two buffers for each input file and two buffers for the output file.
- Subroutine sort/merge

  12,400 bytes for sort/merge, if the record length is 100 bytes or less. For record lengths greater than 100 bytes, 12,400 bytes plus five times the average input record length is required. (These figures do not include the requirements for the user program, its preamble, or own-code routines.)
- SORT3

  16,000 bytes. Keep in mind that the more sort specifications in your job, the less main storage available for sorting. Each sort specification requires 12 bytes of main storage, an alternate collating sequence requires 280 bytes, field specifications for packed data require 40 bytes each, and include or omit specifications for packed data require 100 bytes each.

Sort/merge is more efficient and can handle larger volume sorts when 50,000 to 150,000 bytes of main storage are allocated.

In addition to their normal main storage requirements, both independent and subroutine sort/merge, when performing internal-only sort/merge operations, require sufficient main storage to hold the entire input file plus eight bytes for each record included in the sort.

Work Areas

Work areas may be assigned as auxiliary storage on tape or disc, but not both. Tape or disc work files are allocated by device assignment sets in the job control stream. If work files are not assigned, an internal (main storage) sort is performed.

- For a disc sort:
  - A maximum of eight disc files may be allocated for independent and subroutine sort/merge and six disc files for SORT3.
  - The standard disc sort file names DM01,...,DM08 or $SCR1,...,$SCR8 for independent and subroutine sort/merge and DM01,...,DM06 or $SCR1,...,$SCR6 for SORT3 must be assigned on LFD job control statements, or WORK jproc calls may be used.
  - To use system scratch space as working storage, identify the files as $SCR1,...,$SCR8 for independent and subroutine sort/merge and as $SCR1,...,$SCR6 for SORT3 on LBL job control statements. The WORK jproc automatically assigns system scratch space. To allocate private work files, use the appropriate file identifier on the LBL statements.
  - All disc volumes containing work files must be the same disc type.
  - The amount of disc space requested must be sufficient to hold the entire volume of data to be sorted, plus 10 to 20 percent additional space for performing the sort. Record sizes that map poorly on a disc track (exceed one-half track in length) may require up to 100 percent additional space or twice the space calculated by multiplying the number of records to be sorted by the record size.
- For a tape sort:
  - Work files may be labeled or unlabeled tapes.
  - Three to six tape units may be allocated.
  - The standard tape sort file names SM01,...,SM06 must be assigned on LFD job control statements.
  - The volume of data that can be sorted is limited to the capacity of the smallest reel of tape assigned to the sort.

Restrictions and Considerations

The following restrictions apply to subroutine sort/merge and independent sort/merge programs:

- All sorting is limited to storage-only, disc-only, or tape-only single-cycle sorts.
- Volume of data sorted and merged is limited by the type and physical capacity of the tape or disc space assigned as auxiliary working storage.
- Independent sort/merge input files must be all on disc or all on tape.
- A maximum of 16 input files can be sorted; from 2 to 16 previously sequenced files can be merged.
- Auxiliary storage work areas can be either disc or tape, but not both, and are limited to eight disc files or six tape files.
- User own-code routines can be substituted for the sort routines provided only if they satisfy the requirements of the program and OS/3 programming conventions.
- Subroutine sort/merge can only be executed in a batch environment; it cannot be initiated from a workstation.

- For independent sort/merge, input may not be from indexed sequential access method (ISAM) files unless a user own-code input routine is provided.
- Independent sort/merge label names specified on the LFD job control statements for tape and disc input files must be assigned in sequence and must be specified as SORTIN1,...,SORTIN9 for the first nine input files assigned and as SORTINA,...,SORTING for the last seven files assigned. The output file is assigned the name SORTOUT. These standard system names are always used unless a user own-code routine is provided.
- Diskette input/output files are not supported by basic data management.

The following restrictions apply to SORT3:

- Input files can be disc, diskette, card, or tape, but not mixed. Output files may be disc, diskette, or tape.
- Input files are assigned the names INPUT1,...,INPUT8 on the LFD job control statements, and the output file is named OUTPUT.
- Input may not be from indexed sequential access method (ISAM) files.
- SORT3 cannot perform a merge-only operation (merging two or more previously sequenced or sorted data files).
- SORT3 does not support data reduction or record sequencing and checking through the use of user own-code exit routines.
- Auxiliary storage work areas can be disc or tape, but not both, and are limited to six disc files or six tape files.

The following restrictions apply to indexed random access method (IRAM) files:

- Records must be fixed length.
- IRAM files to be sorted must have been created by the OS/3 IRAM processor.
- IRAM output files will be created without index.

Multiple indexed random access method (MIRAM) files are not supported in basic data management.

STATEMENT CONVENTIONS

The conventions used to illustrate the coding formats for the specifications and statements applicable to the independent sort/merge and the subroutine sort/merge are different from those used to illustrate the coding formats of the SORT3 specifications. SORT3 specifications are formatted according to field positions (columns) on 80-column punch cards. The parameters for these specifications are interpreted by both field position and the character entered into that field. SORT3 specification formats are described in Section 6 of this manual. The conventions used to illustrate the coding formats for the independent sort/merge and subroutine sort/merge are as follows:

- Information that must be coded exactly as shown is presented in uppercase letters. Commas, equal signs, parentheses, and dollar signs also must be coded as shown.
- Lowercase letters and words are generic terms representing information that must be supplied by the user. Such lowercase terms may contain hyphens and numerals.
- Parameters may be keyword or positional.

— Keyword parameters usually, but not always, are followed by an equal sign and a specification. They can be coded in any sequence unless otherwise indicated. A series of keyword parameters is separated by commas.

— Positional parameters are presented in lowercase letters and require insertion of a value:

MR$OPN { parameter-table-name / **t** }

- When more than one option exists for a given parameter, the various options are listed within braces:

DROC { DELETE / symbol }

- Information that may be included or omitted, depending upon program requirements, is enclosed in brackets:

[BUFOFF=n]

- Optional parameters that have a default specification are shaded:

[OPEN { NORWD / **RWD** }]

- A keyword parameter may contain a sublist of parameters called subparameters, which are separated by commas and enclosed in parentheses. All subparameters presented in this manual are positional. They must be coded in the order shown, and the comma must be retained when a subparameter is omitted, except for trailing commas.

- An ellipsis (a series of three periods) is used to indicate the omission of a variable number of similar entries:

LABEL=(output,input-1[,...,input-n],work)

Coding Rules

- Sort/merge control statements and macro instructions are coded in the operation field, which may begin in any column except column 1.

- Parameters are specified in the operand field. This field is separated from the operation field by one or more blanks and must begin on the same card.

- At least one space must separate the operand field from the comments field, if included.

- Embedded blanks are not allowed. Anything after a blank is regarded as a comment.

- Values can be written with up to eight alphanumeric characters.

- Commas, equal signs, parentheses, and blanks are used only as field delimiters; they may not be used in values.

- Periods are used to separate byte-bit specifications in the FIELD and FIELDS parameters and input and output file-partition-numbers in the COPY parameter.

- Any nonblank character in column 72 indicates that the statement is continued on the following card. The continuation of an operand starts in column 16; the continuation of comments starts in column 17. A continuation statement may not begin with a comma in column 16.

INDEPENDENT SORT/MERGE

The independent sort/merge is a complete service program residing as a set of load modules in the system load library (YLOD). It is directed and executed by sort/merge control statements and job control language (JCL) statements. Independent sort/merge reads the data files, sorts and merges the data according to specification, then writes the data to an output file. Sort/merge control statements define the sort/merge procedure to be performed, the data records to be processed, the input and output file characteristics, and the devices for input, output, and auxiliary work files. User own-code routines can be used to perform specialized functions not provided for by the independent sort/merge.

Functional Operation

The operational phases of the independent sort/merge (Figure 1—1) are initiated by the EXEC SORT job control statement, which causes the root phase of the independent sort/merge to be loaded into main storage. The sort process takes place when control is passed from the root phase (Phase 0) to the initial sort phase (Phase 1). Input files are read, and strings of sequenced data are produced. In Phase 2, the data strings are written to disc or tape work files (if assigned), where they are merged into longer and longer strings. Where the input files require a merge-only operation (previously sequenced records) or are small enough that a final merge will produce the required output file, the independent sort/merge bypasses the intermediate phase. When one final merge pass is needed to create a single sequenced string, control passes to Phase 3 for the final merge and output.

Control Statements

Independent sort/merge uses eight control statements:

- SORT

  Defines sort key fields, sorting sequence, auxiliary storage, and the number and size of the input files.

- MERGE

  Defines a merge-only job.

- RECORD

  Defines the records to be sorted or merged.

- INPFIL

  Defines the input file to the sort/merge processor and specifies the procedures for opening and closing input tape files.

- OUTFIL

  Defines the output file to the sort/merge processor and specifies the procedures for opening and closing output tapes.

- OPTION

  Specifies additional options and information available to the sort/merge program.

- MODS

  Required when user routines are included in a sort/merge application. It defines the program routines with related user own-code exits. Also used to exit to system-supplied DELETE routine when you want independent sort/merge to perform automatic data reduction by deleting duplicate records from your file.

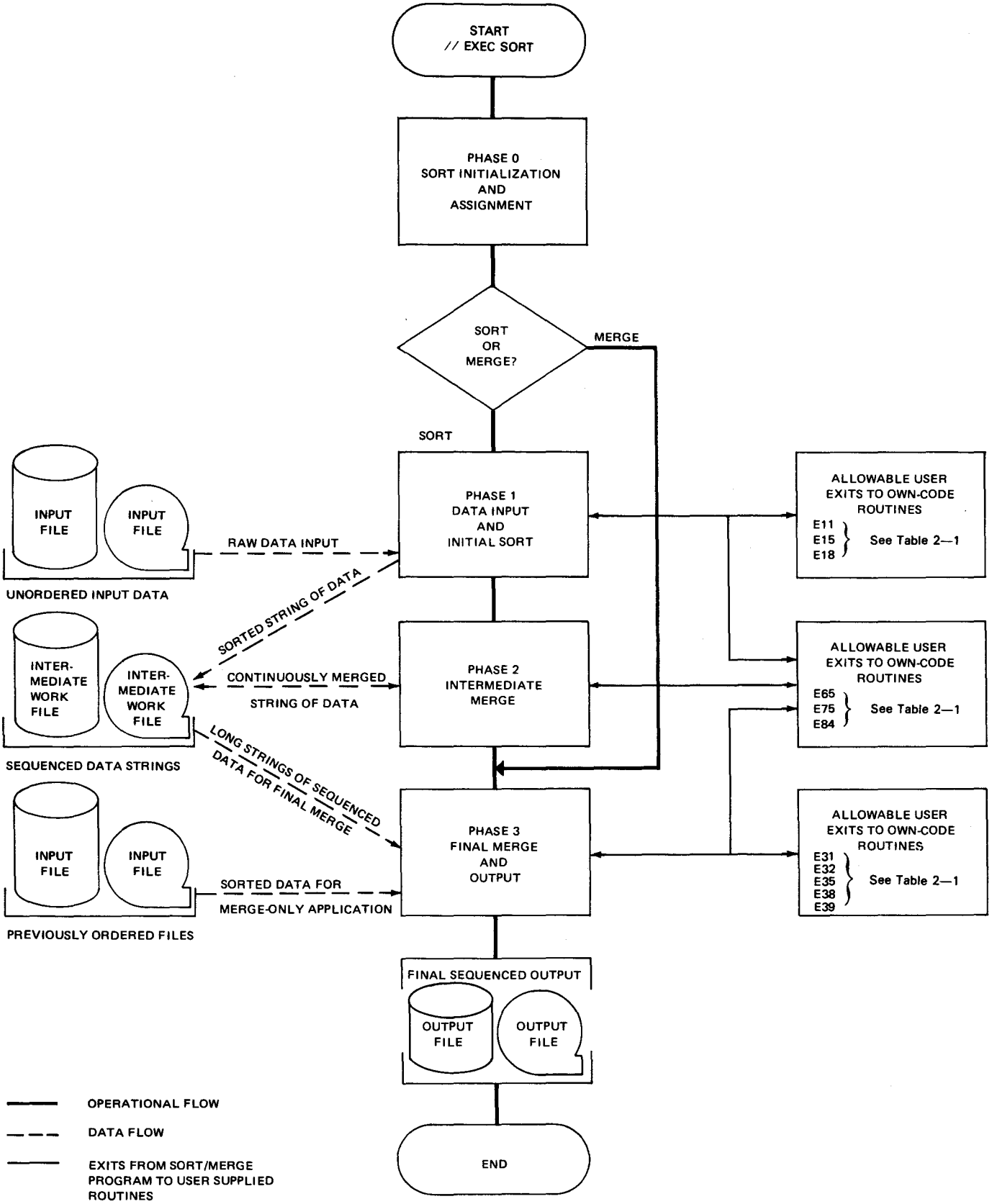


Figure 1—1. Independent Sort/Merge Operational Phases

- END

  Signifies that the last control statement of a related group of sort/merge control statements has been read.

The sort/merge control statements are inserted between the start-of-data (/$) and end-of-data (/*) job control statements, and each appears only once in an independent sort/merge program. The first column of a control statement is left blank. The sort/merge control statements and their associated parameters are described in alphabetical order in Section 2.

SUBROUTINE SORT/MERGE

Subroutine sort/merge consists of a group of interrelated macro definition modules which are called from the user program via macro instructions, an object module which is linked to the user program at link-edit time, and a subset of the load modules comprising independent sort/merge. Unlike the independent sort/merge, the subroutine sort/merge is intended to be executed as part of a user program that must be assembled and linked before it can be executed. Subroutine sort/merge provides flexibility in specifying external input and output record formats, source of input records, disposition of final output records, and record sequencing and data reduction.

Software Framework

Communication between the sort/merge modules and the user program is established through a sort common module and a sort parameter table. The sort common module (SG$ORT) is a standard interface module that resides in the system object library file (YOBJ) and must be linked to the user program in a link edit run. To link the sort common module, the entry point MR$ORT is defined as an external reference (EXTRN) in the user program. The specific requirements of the job are defined to the subroutine sort/merge by the user program through the sort parameter table (Appendix A). Construction of the table is initiated by the expansion of the MR$PRM macro instruction, which takes place during assemble processing. Additions and modifications to the table can be made at execution time by submitting entries from the control stream.

The subroutine sort/merge is composed of four operational phases, similar in structure to the operational phases of the independent sort/merge. The operational phases and user program interface with subroutine sort/merge are illustrated in Figure 1—2. The user interface with subroutine sort/merge is somewhat different in a merge-only application, illustrated in Figure 1—3.

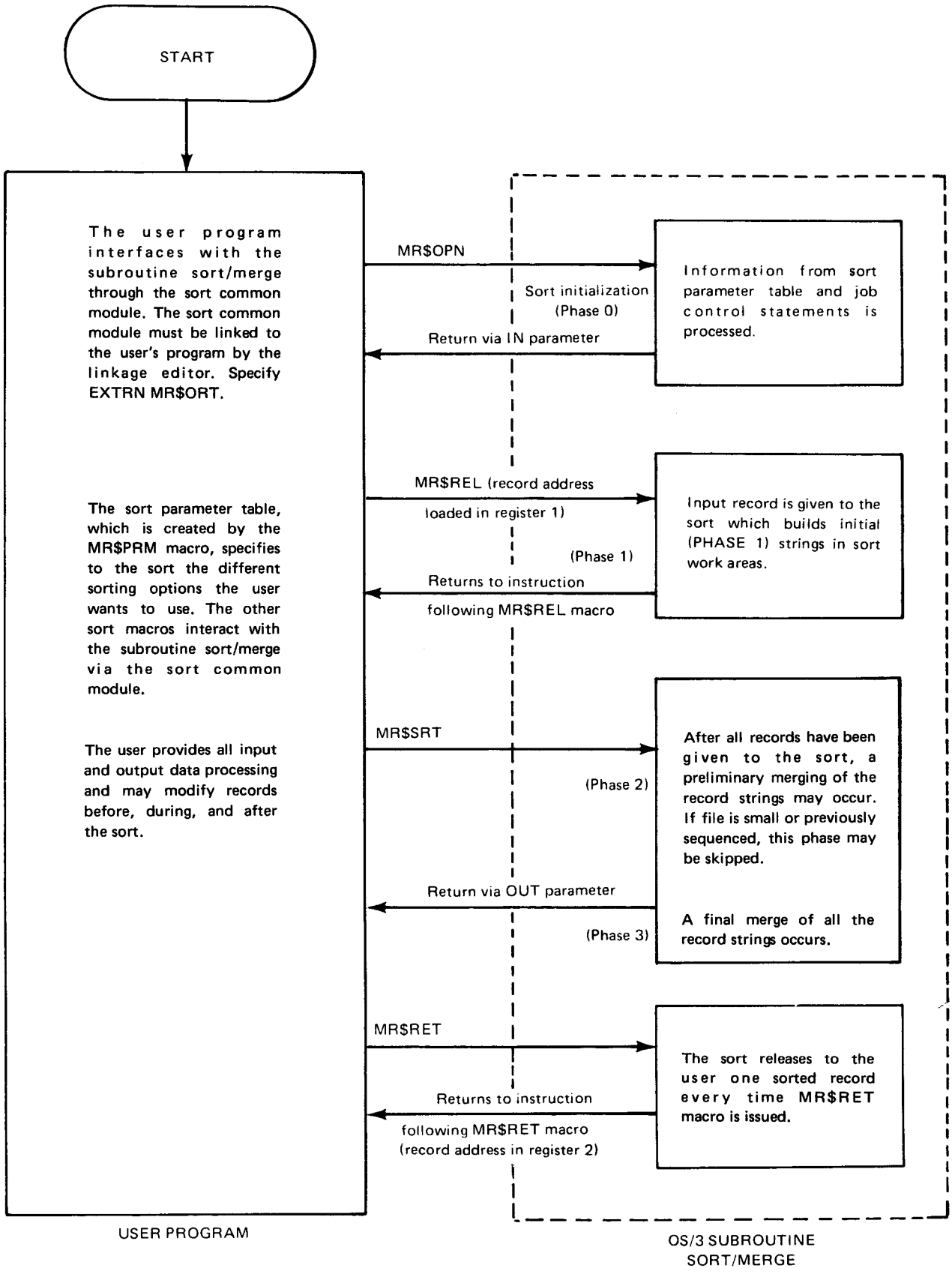


Figure 1—2. User Program Interface with Subroutine Sort/Merge

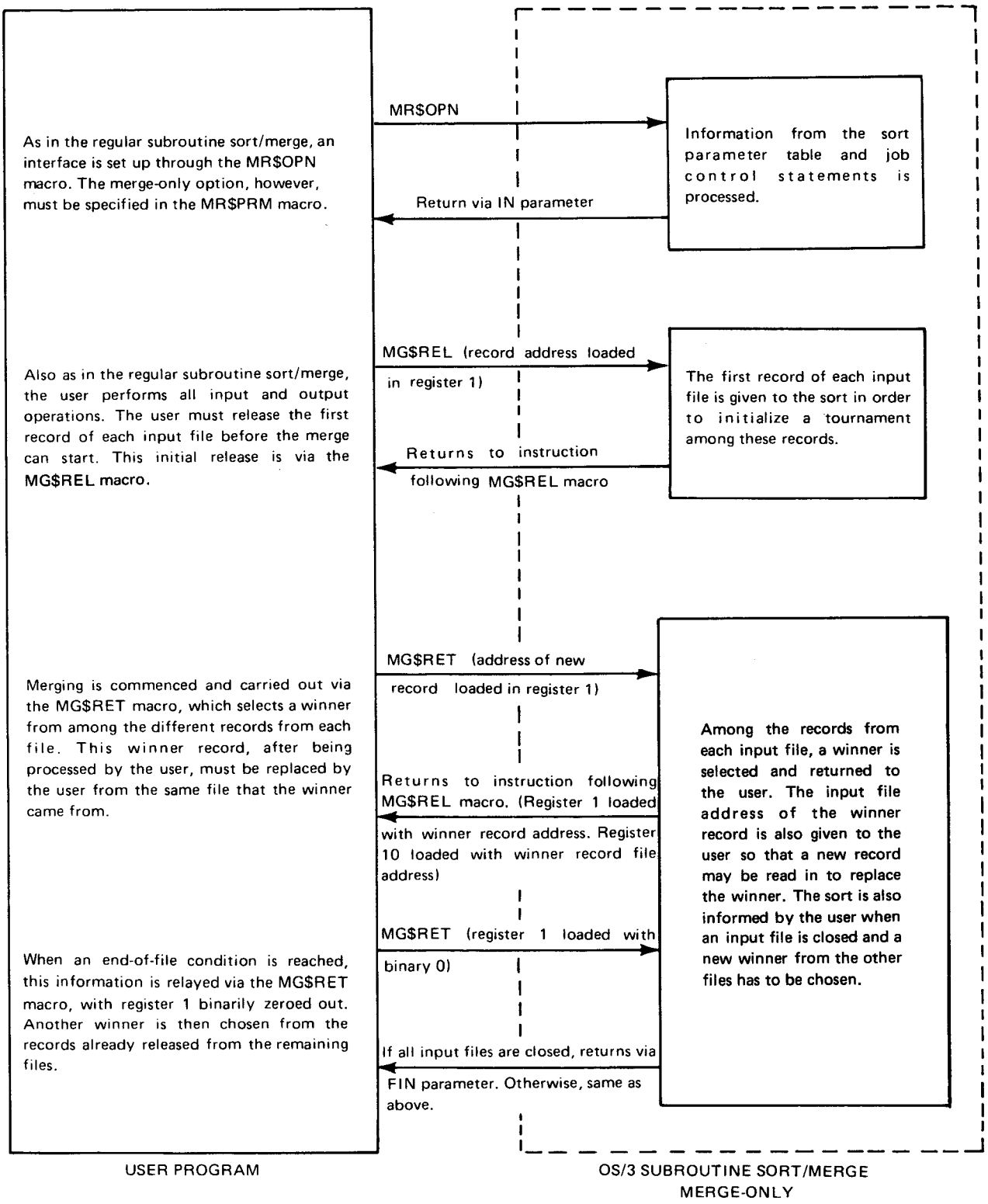


Figure 1—3. User Program Interface with Subroutine Merge-Only

Macro Instructions

The user program defines its requirements and controls the execution of subroutine sort/merge by issuing macro instructions. These macro instructions are described in alphabetical order in Section 4. Briefly, their functions are:

- MR$PRM

  Generates a sort parameter table that defines the requirements of the sort/merge procedure.

- MR$OPN

  Generates the linkage to the sort/merge initialization routine.

- MR$REL

  Generates the code to notify sort/merge that a data record is being released to it, and where that record is located.

- MR$SRT

  Generates code to inform the sort of input end-of-data.

- MR$RET

  Generates the code to request sort/merge to return the sequenced records to the user program.

- MG$REL

  Releases the initial record from each file to the merge phase during a merge-only operation.

- MG$RET

  Releases subsequent records to the merge phase and requests winner records to be returned to the user program. Applicable to a merge-only operation.

USER OWN-CODE ROUTINES

Both independent sort/merge and subroutine sort/merge provide an own-code capability, enabling the user to perform specialized functions other than the normal OS/3-supplied sort/merge operations. *Independent sort/merge* uses exit codes to call in user own-code routines at the appropriate times. These routines give the user additional control over input and output processing, record sequencing, data reduction, and collation sequencing. *Subroutine sort/merge* calls in user own-code routines for record sequencing and data reduction through entries in the sort parameter table.

SYSTEM/3, 32, AND 34 COMPATIBLE SORT (SORT3)

SORT3 also is a complete service program that resides as a set of load modules in the system load library (YLOD). It is directed by sort specifications in the job stream and executed through either job control language (JCL) or operation control language (OCL) processor. It requires only a minimum of user programming to read data files, sort and merge the data, and to write the data to an output file. The sort specifications you supply define the sort/merge process performed, the data records to be included or omitted from the sort, the format of the output records, and the output file characteristics. A few advantages to using SORT3 are that you can selectively include or omit specific record types from the sort through sort specifications and you can establish the format for your output records. The devices used for input, output, and auxiliary work files are allocated through job control statements in the job stream.

Functional Operation

From an operational standpoint, SORT3 is functionally the same as independent sort/merge. That is, it consists of four phases of operation that initialize the sort, input and sort the data, merge the data into a single sequenced string, and output the data to your input file. (See Figure 1—1). The primary differences in operation between the two sort methods are: SORT3 cannot perform merge-only operations, and it does not support the use of exit codes to use own-code routines. It does, however, accept input from card and diskette files, which independent sort/merge does not support.

SORT3 Specifications

SORT3 uses three sort specifications:

- Header specification

  Defines the type of sort you want to do, how you want your output file formatted, and what, if any system information you want printed to assist you in error checking.

- Record type specification

  Defines which records in an input file you want included in or omitted from the sort.

- Field description specification

  Defines how you want your records formatted in the sorted output file.

RUNNING SORT/MERGE FROM A WORKSTATION

OS/3 provides you with the capability of running your independent sort/merge and SORT3 jobs interactively. This means two things:

1. You can build a control stream to execute the sort/merge program at a workstation, as opposed to punching it on cards or writing it to a diskette.

2. You can initiate the running of the control stream from the workstation, as opposed to asking the system operator to run your job for you.

The easiest way to build a job control stream from a workstation is by using the general editor. This allows you to key in your control stream statements and have them stored on a library file. Then at some later time you can initiate the running of the program by keying in the RV system command.

If you are not familiar with job control, use the job control dialog for assistance. The job control dialog is an interactive facility of OS/3 that allows you to describe your job's requirements to it in English, in response to a series of questions, and then produces as its output, the job control stream needed by OS/3 to run your job. The control stream produced by the job control dialog is virtually identical to the control stream that you would have to produce if you were running your job in a batch environment. Only now, you do not have to be concerned with the intricacies of the job control language. The job control dialog eliminates this requirement on your part.

After you have answered all the questions presented to you by the job control dialog, it builds a control stream and stores it in a permanent library file for you. From here, you can initiate its running by simply keying in the appropriate system RUN command, or if you'd rather, you can change the contents of the control stream using the general editor.

The procedures for activating the general editor are detailed in the general editor user guide, UP-8828 (current version).

The procedures for activating the job control dialog and initializing the running of a job are detailed in the job control user guide, UP-8065 (current version).

Note that if a job is initiated from a workstation, all messages will be displayed on the workstation rather than the system console. This includes messages you have specified to be printed on the system printer.

DATA MANAGEMENT CONSIDERATIONS

There are certain restrictions on the types of files that can be sorted by the sort/merge programs, depending on the data management mode being used. Table 1—1 lists the various file types supported by OS/3 and the data management modes required to perform sort jobs using those files.

Table 1—1. File Types and Data Management Modes

File Type	Consolidated Data Management Only	Mixed Mode	Basic Data Management Only
MIRAM Disc	Yes	Yes	No
IRAM Disc	No	Yes	Yes
Nonindexed Disc	No	Yes	Yes
SAM Disc	No	Yes	Yes
ISAM Disc	No	No	No
DAM Disc	No	No	No
Card*	Yes	Yes	Yes
Tape	Yes	Yes	Yes
Data Set Label Diskette*	Yes	Yes	Yes

*SORT3 only.

For more information, refer to the basic data management user guide, UP-8068 (current version), and the consolidated data management concepts and facilities, UP-8825 (current version).

2. Independent Sort/Merge Control Statements

END

Function:

Notifies independent sort/merge that all sort/merge control statements have been processed and that program execution may take place.

Format:

LABEL	△OPERATION△	OPERAND
	END	

The END statement is an optional sort/merge control statement. It is not to be used when sort/merge specifications are embedded in a JPROC. Otherwise, the run processor will mistakenly interpret the END statement as the END directive for the JPROC.

INPFIL

Function:

Defines the input files to the independent sort/merge processor and specifies the procedures to be followed when input tape files are opened and closed. This statement is not required if disc input files are the source of data unless input is from IRAM files. However, if the RECORD control statement is used, the INPFIL statement must also be included.

Format:

LABEL	△OPERATION△	OPERAND
	INPFIL	[BLKSIZE={bytes / (bytes-1[,...,bytes-8])}]
		[,BUFOFF=n]
		[,BYPASS]
		[,CLOSE={NORWD / RWD / RWI / UNLD}]
		[,DATA={A / E}]
		[,EXIT]
		[,INTERLACE={factor / (factor-file-1[,...,factor-file-9])}]
		[,OPEN={NORWD / RWD}]
		[,SKIPBYTE=n]
		[,VOLUME={vol / (vol-1[,...,vol-8])}]
		Provided and accepted for compatibility with other systems; however, no action is performed by OS/3 sort/merge.

Keyword Parameters:

BLKSIZE=bytes

Defines the block size of the input files. For a sort procedure, specify the length of the largest input block. For a merge-only operation, use this format only if all input files have the same block size.

INPFIL

BLKSIZE=(bytes-1[,...,bytes-8])
This format is used for a merge-only operation when multiple input files have different block sizes.

If the BLKSIZE keyword parameter and the RCSZ parameter of the RECORD control statement are both omitted, the size of the first block processed is assumed to be the size of all input blocks.

The BLKSIZE keyword must be coded when input is from IRAM files.

BUFOFF=n
A decimal number of 0 to 99 defining the length of a block prefix for an ASCII data block structure.

BYPASS
Directs the independent sort/merge input phase to ignore or bypass all unreadable blocks of data on the input file. The independent sort/merge maintains no record of the errors encountered.

CLOSE=NORWD
Specifies that input tape files are not to be rewound on closing.

CLOSE=RWD
Specifies that input tape files are to be rewound to load point on closing.

CLOSE=RWI or **CLOSE=UNLD**
Specifies that input tape files are to be rewound with interlock on closing.

DATA=A
Specifies that the data is recorded in ASCII.

DATA=E
Specifies that the data is recorded in EBCDIC.

EXIT
Required when the user provides his own input routine for reading the input file. No other parameters are to be specified when the EXIT keyword parameter is coded.

INTERLACE= { **factor** | **(factor-file-1[,...,factor-file-9])** }

Required if the input data files to the independent sort/merge were created by use of the data management interlace feature. Specify the interlace factor assigned to each file during its creation.

OPEN=NORWD
Specifies that input tape files are not to be rewound to load point on opening.

OPEN=RWD
Specifies that input tape files are to be rewound to load point on opening.

SKIPBYTE=n
Indicates the location of the first data record in relation to the beginning of the block. The *n* is the number of bytes preceding the first data record.

MERGE

Function:

Defines a merge-only operation. This statement is used in place of the SORT statement for merging files that have been previously sequenced. It defines the key fields, their formats, and the number of input files involved.

Format:

LABEL	Δ OPERATION Δ	OPERAND
	MERGE	[FIELDS={([strt-pos-1] [,lgth-1] [,form-1] [seq-1] [,...,strt-pos-n,lgth-n[,form-n] [,seq-n]]) ([strt-pos-1] [,lgth-1] [,seq-1] [,...,strt-pos-n,lgth-n [,seq-n]]),FORMAT=code}]
		[,{FILES / ORDER}={number / 16}]
		[,MERGEP=(output-file-partition-number,input-file-1-partition-number,input-file-2-partition-number [,...,input-file-8-partition-number])]

Keyword Parameters:

FIELDS= {**([strt-pos-1] [,lgth-1] [,form-1] [,seq-1] [,...,strt-pos-n,lgth-n[,form-n] [,seq-n]])**
([strt-pos-1] [,lgth-1] [,seq-1] [,...,strt-pos-n,lgth-n] [,seq-n]]) ,FORMAT=code}

Defines the merge key fields. The data may vary for each key field, or it may be the same for all key fields. A maximum of 12 fields may be specified. If omitted, one key field is assumed, beginning in position 1, the same length as the record up to 256 bytes, with character format. Ascending sequence is assumed.

If any of the subparameters are omitted, their associated commas must be retained, except for trailing commas.

Positional Subparameters:

strt-pos-n
A decimal number specifying the starting point of a key field relative to the beginning of the record.

MERGE

Key fields are numbered consecutively, starting with 1 for the most significant key field, 2 for the next, and so on. All key fields, with the exception of binary key fields, must start on a full byte boundary. The starting point is defined by specifying the number of that byte relative to the beginning of the record. For example, subparameter *strt-pos-1* specified as 9 indicates that the most significant key field begins at byte 9 of the record. This method of referencing a key field differs from that used by the subroutine sort/merge; independent sort/merge specifies byte and bit numbers relative to 1, and subroutine sort/merge references byte and bit position numbers relative to 0. The method used by the independent sort/merge provides compatibility with other systems.

Binary key fields are permitted to start on a bit boundary. In this case, the *strt-pos-n* subparameter is specified in a byte.bit format. As an example, assume that key field 1 starts at bit 2 of byte 9 of the record. The *strt-pos-1* subparameter is specified as 9.2.

lgth-n

A decimal number specifying the length of a key field. Key field lengths are specified in full bytes with the exception of binary key fields, which can begin on a bit boundary. Key field lengths expressed in full bytes are defined by whole numbers written in any of the following formats:

n
n.
n.0

Binary key fields starting on a bit boundary require a byte.bit format for defining key field length. The number of bits specified must not exceed 7. For example, a key field length of 6 bits would be written as 0.6. If the key field extends from bit 2 of byte 10 through bit 5 of byte 12, the *lgth-n* subparameter would be specified as 2.4.

form-n

A code consisting of two or three alphabetic characters specifying the data format of the key field. This subparameter is used when the data format varies for each key field. If this optional subparameter is not specified, the format is assumed to be character (CH). If all key fields have the same format, the FORMAT=code subparameter can be used. The format codes and their maximum allowable field lengths are:

Format Code	Description	Allowable Field Length
AC	EBCDIC data in ASCII collating sequence	1 — 256 bytes
ASL	ASCII numeric data leading sign	2 — 256 bytes
AST	ASCII numeric data trailing sign	2 — 256 bytes
BI	Unsigned binary	1 bit to 256 bytes

MERGE

Format Code	Description	Allowable Field Length
CH	Character (EBCDIC or ASCII)	1 — 256 bytes
CLO	Numeric data overpunched leading sign	1 — 256 bytes
CSL	Leading sign numeric	2 — 256 bytes
CST	Trailing sign numeric	2 — 256 bytes
CTO	Numeric data overpunched trailing sign	1 — 256 bytes
FI	Fixed-point integer	1 — 256 bytes
FL	Floating-point	1 — 256 bytes
MC	Multiple character, user-specified collating sequence	1 — 256 bytes
PD	Packed decimal	1 — 32 bytes
USQ	Character, user-specified collating sequence	1 — 256 bytes
ZD	Zoned decimal	1 — 32 bytes

seq-n

An alphabetic character specifying the sorting sequence of the key field, A for ascending order and D for descending order. If omitted, ascending order (A) is assumed. In a merge-only application, the output file must be sequenced in the same order as the input file.

FORMAT=code

A code consisting of two or three alphabetic characters specifying the data format of the key fields. This subparameter is used when the data format for all key fields is the same. The code specifications for this subparameter are the same as those listed for the *form-n* subparameter. The *form-n* subparameter must not be specified when FORMAT=code is used.

FILES=number or **ORDER=number**

The FILES and ORDER keywords may be used interchangeably. Specifies the number of input files that are to be merged. Independent sort/merge can merge data from 2 to 16 previously sequenced input files. Input files are defined by the LFD job control statement and are assigned the names SORTIN1 through SORTIN9 for the first nine input files and SORTINA through SORTING for the last seven input files.

If FILES and ORDER are both omitted, independent sort/merge assumes that 16 files are being merged.

MERGEP=(output-file-partition-number,input-file-1-partition-number,input-file-2-partition-number [,...,input-file-8-partition-number])

Identifies the specific partition of each file from which data records are read and to which the merged records are written. Data from only one partition of each input file can be merged. The position of the partition number in the MERGEP keyword parameter identifies the file with which it is associated.

If the MERGEP parameter is omitted, partition 1 is assumed for all files.

MODS

Function:

Defines to independent sort/merge the user own-code routines that are to be included in the sort/merge operation. Also causes independent sort/merge to load and execute the system-supplied DELETE routine to perform automatic data reduction.

Format 1:

LABEL	△OPERATION△	OPERAND
	MODS	**PHn=(module-name,[length],exit-code[,...,exit-code])** **[,...,PHn=(module-name,[length],exit-code[,...,exit-code])]**

Keyword Parameters:

PHn=(module-name,[length],exit-code[,...,exit-code])
Identifies a load module containing one or more user own-code routines to be accessed during a specific operational phase or during all operational phases.

This keyword parameter must be repeated for each phase requiring user own-code exits and for those routines which are accessed during all phases. Multiple calls of the keyword are separated by commas, with a continuation character coded in column 72, if necessary.

PHn
Specifies the sort/merge phase in which the user own-code exit routine is to be executed or an identifying code for an exit routine which is to be accessed from all operational phases. The values for *n* are:

n	Description
1	Phase 1 (input-internal initial sort used with E11, E15, and E18 exit codes)
3	Phase 3 (final merge-output used with E31, E32, E35, E38, and E39 exit codes)
6	All phases (record sequencing routine used with E65 exit code)
7	All phases (data reduction routine used with E75 exit code)
8	All phases (user-defined collation sequencing used with E84 exit code)

Positional Subparameters:

module-name
Specifies the name of the load module for the user own-code routine. The module name may be one to eight characters in length.

length
A decimal number specifying the length (in bytes) of the user own-code load module.

If omitted, the length is obtained from the load module header record.

exit-code
Specifies the program modification exit code to be used; for example, E11, E35, etc. All exit codes applicable to a particular phase must be specified as subparameters to that phase. Exit codes are listed in Table 2—1.

MODS

Table 2—1. User Exit Codes and Associated Phase Application

Phase	Exit-Code	Function
1①	E11	Input File Label Processing
	E15	Input File Processing: — Reading input files — Counting input records — Inserting records — Deleting records — Modifying record size — Modifying record content — Modifying control fields
	E18	Read Error Processing
3②	E31	Output File Label Processing
	E32	Input File Processing During Merge-Only Application: — Modifying record content — Modifying control fields — Record substitution
	E35	Output File Processing (same as for E15 except applicable to output files)
	E38	Read Error Processing During Merge-Only Application
	E39	Write Error Processing for Direct Access Devices
1—3③	E65	Record Sequencing
	E75	Data Reduction
	E84	User-Defined Collation Sequencing

① Specified by PH1.
② Specified by PH3.
③ Specified by PH6 for exit code E65, PH7 for exit code E75, and PH8 for exit code E84.

Format 2:

LABEL	△OPERATION△	OPERAND
	MODS	PH7=(DELETE,,E75)

Keyword parameters:

PH7=(DELETE,,E75)

Identifies a system-supplied automatic data reduction routine to delete record duplication from your files.

PH7

Specifies the identifying code that allows the routine to be accessed from all operational phases of the sort program.

Positional Subparameters:

DELETE

Specifies the name of the routine.

E75

Specifies the exit code that SORT3 used to exit from the sort program and pass control to the DELETE routine.

OPTION

Function:

Specifies sort/merge options that do not apply to any of the other control statements. These are tag sort specification, key length specifications for direct access input records, label specifications for input, output, and work files, working storage specifications, error message printing options, restart specification, output block verification for direct access devices, and calculation of the working storage requirements by the sort/merge.

Format:

LABEL	Δ OPERATION Δ	OPERAND
	OPTION	[ADDROUT={A|D}]
		[,{CALCAREA | CALCAREA={NO|YES}}]
		[,CSPRAM={NO|OPTION|YES}]
		[,KEYLEN=bytes]
		[,LABEL=(output,input-1[,...,input-n],work)]
		[,PRINT={ALL|CRITICAL|NONE}]
		[,RESERV={work-file-name|(work-file-name[,output-file-name])}]
		[,RESTART]
		[,SHARE={work-file-name|(work-file-name[,input-file-name])}]
		[,STORAGE=bytes]
		[,VERIFY]
		[,ALTWK] [,DUMP] [,ERASE] [,ROUTE] [,SORTIN] [,SORTOUT] [,SORTWK] Provided and accepted for compatibility with other systems; however, no action is performed by OS/3 sort/merge.

OPTION

Keyword Parameters:

ADDROUT=$\left\{\begin{matrix}\mathbf{A}\\\mathbf{D}\end{matrix}\right\}$

Specifies that a tag sort is to be performed. If the user is providing the input through an own-code routine, each record must be preceded by a 10-byte field containing its direct access address. A tag sort may be specified only when input is from nonindexed or IRAM disc files.

ADDROUT=A

Specifies that only the direct access addresses of the input records are to appear in the output file.

ADDROUT=D

Specifies that both the direct access addresses and the sort key fields of each record are to comprise the final output.

The following restrictions apply when ADDROUT is used:

1. Output block size must be a multiple of:

   a. 10 bytes for ADDROUT=A

   b. The sum of the sort key field lengths plus 10 bytes for ADDROUT=D

2. The *lgth-2* and *lgth-3* values in the LENGTH keyword of the RECORD control statement must be used. The *lgth-2* value must be 10 bytes plus the sum of the sort key field lengths. The *lgth-3* value must be:

   a. 10 bytes for ADDROUT=A

   b. 10 bytes plus the sum of the sort key field lengths (after any user modification at exit E35) for ADDROUT=D

CALCAREA or **CALCAREA=NO**

Specifies that independent sort/merge is to calculate the optimum working storage area in a disc sort, display the estimated sort time in minutes and the number of cylinders required for work space, and then terminate the job step.

CALCAREA=YES

Specifies that independent sort/merge is to calculate optimum working storage area, display information, and then execute the sort.

If the CALCAREA parameter is used, the SIZE parameter on the SORT control statement should be specified; otherwise, the default value of 25,000 records will be used in calculating the working storage area.

CSPRAM=OPTION or **CSPRAM=YES**

Specifies that sort/merge parameters may be accepted from the job control stream at run time through PARAM control statements. The keyword parameters that can be entered through the control stream are BIN, DISC, NOCKSM, RESERV, RESUME, SHARE, and TAPE. (See Appendix A.)

If CSPRAM is omitted, sort/merge parameters will not be accepted from the control stream.

OPTION

KEYLEN=bytes
Required by data management when direct access input blocks have leading keys. Defines the length of the key field.

LABEL=(output,input-1[,...,input-n],work)
Indicates the type of labels for output, input, and work files: S for standard, N for nonstandard, or U for unlabeled tapes. Files with nonstandard labels must be opened and closed by the user via user exits E11 and E31.

If omitted, independent sort/merge assumes standard output, input, and work file labels.

PRINT=ALL
Specifies that all error messages are to be written to the job log for subsequent printing.

PRINT=CRITICAL
Specifies that only fatal error messages are to be written to the job log.

PRINT=NONE
Specifies that no error messages are to be written to the job log. The sort control statements will always be written, however.

RESERV= { **work-file-name** | **(work-file-name[,output-file-name])** }

Allows a tape unit to function as a work file device during the input and intermediate phases of sort/merge operation and as the device for the output data file during the output phase. Messages instructing the operator when to unload the scratch tape and mount the output tape are displayed on the system console. The same device cannot be used for both RESERV and SHARE.

Positional Subparameters:

work-file-name
Identifies the reserved tape unit by a standard sort work file name (SM01,...,SM06). The tape unit is associated with this file name by an LFD statement in the job control stream.

output-file-name
Identifies the reserved tape unit by the standard output file name SORTOUT or, if the user is supplying his own output routine, by the user-specified file name assigned on the LFD job control statement. If this subparameter is coded, the information displayed on the console will include the name of the output file the operator is to mount.

RESTART
Required when an interrupted tape sort is to be restarted at the last check point. Restart information identifying each check point is displayed on the system console. To restart an interrupted sort/merge, the control stream must be updated and resubmitted. The updated control stream must include the PARAM job control statement containing the proper specification for the RESUME keyword parameter.

OPTION

SHARE= { **work-file-name** | **(work-file-name[,input-file-name])** }

Allows a tape unit assigned to the independent sort/merge as an input device to be used for a sort work file during the intermediate and output phases. Messages instructing the operator when to unload the input tape and mount a scratch tape are displayed on the system console. The same device cannot be used for RESERV and SHARE.

Positional Subparameters:

work-file-name
Identifies the shared tape unit by a standard sort work file name (SM01,...,SM06). The tape unit is associated with this file name by an LFD statement in the job control stream.

input-file-name
Identifies the shared tape unit by the standard input file name SORTINn or, if the user is supplying his own input routine, by a user-specified file name assigned on an LFD job control statement. If this subparameter is coded, the information displayed on the system console will include the name of the input file the operator is to demount.

STORAGE=bytes
Specifies the number of bytes of main storage allocated to sort/merge. If this parameter is omitted, independent sort/merge obtains this information from job control.

VERIFY
Specifies that each output block is to be checked to ensure that it is written correctly when the output file is on a direct access device.

OUTFIL

Function:

Defines the output file to the independent sort/merge processor and specifies the procedures for opening and closing output tapes. The OUTFIL control statement is not required if:

- both input and output files are on disc;
- the output file is to have the same block size and record size as the input file; and
- the output file is a single partition file or a predefined multipartitioned file.

If the output file has been predefined, the first optional parameter of the LFD statement, specifying the maximum number of extents in the file, should be omitted.

If the OUTFIL control statement is used to define a predefined output file, all file specifications must be the same as when the file was created, or an error will result.

Format:

LABEL	△OPERATION△	OPERAND
	OUTFIL	[BLKSIZE={bytes / (bytes-partition-1,bytes-partition-2 [,...,bytes-partition-7])}]
		[,BUFOFF=n]
		[,CLOSE={NORWD / RWD / RWI / **UNLD**}]
		[,EXIT]
		[,FILTYPE={IRAM / NI / SAM}]
		[,INTERLACE={factor / (factor-partition-1,factor-partition-2 [,...,factor-partition-7])}]
		[,NOTPMK]
		[,NPTN={number-of-partitions / **1**}]
		[,OPEN={NORWD / **RWD**}]
		[,RCSZ=(max-bytes-partition-1,max-bytes-partition-2 [,...,max-bytes-partition-7])]
		[,SIZE={percentage / (percentage-partition-1,percentage-partition-2 [,...,percentage-partition-7])}]
		[,TYPE=(partition-1-type,partition-2-type [,...,partition-7-type])]
		[,UOS=(ext-percent-partition-1,ext-percent-partition-2 [,...,ext-percent-partition-7])]

OUTFIL

Keyword Parameters:

BLKSIZE=bytes
Defines the output file block size when the output file is a tape or single partition disc file.

BLKSIZE=(bytes-partition-1,bytes-partition-2[,...,bytes-partition-7]
Defines the output file block size of each partition in a multipartitioned output disc file.

If the BLKSIZE keyword parameter is omitted and the RCSZ parameter is not specified elsewhere, independent sort/merge assumes a block size equal to the first output block.

BUFOFF=n
A decimal number from 0 to 99 defining the length of a block prefix for an ASCII data block structure.

CLOSE=NORWD
Specifies that the tape output file is not to be rewound on closing.

CLOSE=RWD
Specifies that the tape output file is to be rewound on closing.

CLOSE=RWI or **CLOSE=UNLD**
Specifies that the tape output file is to be rewound with interlock on closing.

EXIT
Required when a user output routine is provided for writing the output file. No other parameters should be specified when the EXIT parameter is used.

FILTYPE=IRAM
Specifies that an indexed random access method (IRAM) output file is to be created. The IRAM output file will be created without an index.

FILTYPE=NI
Specifies that a nonindexed output file is to be created.

FILTYPE=SAM
Specifies that a sequential access method (SAM) output file is to be created.

If the FILTYPE keyword parameter is omitted, the output file will be the same type as the input file.

INTERLACE= { **factor** | **(factor-partition-1,factor-partition-2[,...,factor-partition-7])** }
Required when the output file for the independent sort/merge is to be created by use of the data management interlace feature. Specifies the interlace factor for a single partition disc output file or for each partition of a multipartitioned disc output file. A detailed explanation of interlace, its function, and computation of the interlace factor are provided in the data management programmer reference, UP-8159 (current version).

NOTPMK
Specifies that no tape mark is to be written before the first data record on each volume in the tape output file.

OUTFIL

NPTN=number-of-partitions
Specifies the number of partitions to be created in a disc output file.

If NPTN is omitted, a single partition output file is assumed.

OPEN=NORWD
Specifies that the tape output file is not to be rewound to load point on opening.

OPEN=RWD
Specifies that the tape output file is to be rewound to load point on opening.

RCSZ=(max-bytes-partition-1,max-bytes-partition-2[,...,max-bytes-partition-7])
Indicates the maximum size of the records written to each partition of a multipartitioned disc output file.

If this keyword parameter is omitted, independent sort/merge assumes a single partition output file is being used and the output record size is the same number of bytes as the input file record size.

SIZE=percentage
Specifies the percentage of available output file space assigned to a single partition output disc file.

SIZE=(percentage-partition-1,percentage-partition-2[,...,percentage-partition-7])
Specifies the percentage of available file space assigned to each partition of a multipartitioned output disc file.

If SIZE is omitted, independent sort/merge assumes that a single partition disc output file is to occupy 100 percent of the available file space.

TYPE=(partition-1-type,partition-2-type[,...,partition-7-type])
Defines the type of data written to a specific partition in the output file: D for ASCII variable-length records; F for fixed-length records; V for variable-length records.

If omitted, fixed-length records are assumed.

UOS=(ext-percent-partition-1,ext-percent-partition-2[,...,ext-percent-partition-7])
Specifies the percentage of secondary storage allocation assigned to each partition of a multipartitioned disc output file when the limits of the partition are exceeded. Up to 100 percent may be suballocated for each partition. The secondary storage allocation is specified in the third parameter of the EXT job control statement for the output file.

If omitted, the partition will be automatically extended by 100 percent.

RECORD

Function:

Defines the type and length of the data records to be sorted or merged and provides the capability of deleting records from a file by character identification. This statement is required if input is from a tape file. It is not required for disc input files unless files contain variable-length records, length modifications are to be made, files have IRAM form of organization, or input is by a user exit routine. However, if the INPFIL control statement is included, the RECORD control statement must also be included.

Format:

LABEL	△OPERATION△	OPERAND
	RECORD	{LENGTH=(lgth-1[,lgth-2] [,lgth-3] [,lgth-4] [,lgth-5]) {RCSZ=bytes [,TYPE={D { {V}] [,BIN={bytes {(min-bytes,size-1,freq-1[,...,size-n,freq-n])}] [,DEBLANK=(delete-char,byte-position)]

Keyword Parameters:

LENGTH=(lgth-1[,lgth-2][,lgth-3][,lgth-4][,lgth-5])
Establishes a sublist that specifies record length information. This sublist can describe either fixed-length or variable-length records for input, internal sort, and output phases of sort/merge operation.

Positional Subparameters:

lgth-1
A decimal number specifying the input record length in bytes for fixed-length records or the maximum input record length for variable records. The length specified must not exceed 32,767 bytes.

lgth-2
A decimal number specifying the length (in bytes) of each record released to the internal sort phase for fixed-length records or the maximum length record for variable-length records.

If omitted, sort/merge assumes *lgth-1* by default.

This subparameter should not be specified for a merge-only operation. However, its associated comma must be retained.

lgth-3
A decimal number specifying the output record length in bytes for fixed-length records or maximum output record length for variable-length records written to tape or single partition disc output files. Output record lengths written to multipartitioned disc files are specified by use of the RCSZ keyword parameter in the OUTFIL control statement.

RECORD

If omitted, *lgth-2* is assumed for sort operations, and *lgth-1* is assumed for merge-only operations by default.

lgth-4
A decimal number specifying the minimum input record length in bytes for variable-length records.

If omitted, this information is obtained from the BIN specification.

lgth-5
A decimal number specifying the input record length (in bytes) for the variable-length records that appear most frequently in the input file.

If omitted, this information is obtained from the BIN specification.

RCSZ=bytes
Specifies the record length for fixed-length records or the maximum record size for variable-length records.

If input is from tape files or IRAM disc files, either the LENGTH or RCSZ parameter must be specified. If input is from sequential or nonindexed disc files and both of these parameters are omitted along with the BLKSIZE parameter on the INPFIL sort control statement, independent sort/merge defaults to the input record size supplied by data management.

TYPE= { **D** / **F** / **V** }
Specifies the type of data records to be processed by the independent sort/merge. The specifications provided in this keyword parameter apply only to tape and single partition disc files. The specifications for data record types contained in multipartitioned disc files are defined in the TYPE keyword parameter of the OUTFIL control statement.

TYPE=D
Specifies that the data records are ASCII format variable-length records.

TYPE=F
Specifies that the data records are fixed length.

TYPE=V
Specifies that the data records are variable length.

BIN= { **bytes** / **(min-bytes,size-1,freq-1[,...,size-n,freq-n])** }
Specifies the size of fixed-length subrecords (BIN size) when variable-length records are to be sorted, or provides the information from which independent sort/merge can calculate the subrecord size. The BIN keyword parameter should be coded if the *lgth-4* and *lgth-5* subparameters of the LENGTH keyword are omitted or if RCSZ is used in place of the LENGTH keyword.

BIN=bytes
Specifies the number of bytes into which variable-length records are to be subdivided. The BIN size must be large enough to contain all sort key fields within each record, plus the 4-byte record length field.

RECORD

BIN=(min-bytes,size-1,freq-1[,...,size-n,freq-n])

Positional Subparameters:

min-bytes
Specifies the minimum number of bytes into which variable-length records may be subdivided. The number must be large enough to accommodate all sort key fields within each record, plus the 4-byte record length field.

size-1
Defines the record length (in bytes) that appears most frequently in the file.

freq-1
Specifies either the frequency (percentage) or estimated number of size-1 records in the file. If the number is less than 100, the independent sort/merge assumes that it is a percentage; if greater than 100, it is assumed to be an estimate of the number of records in the file.

size-n
Optionally defines additional record lengths (in bytes) that appear frequently in the file. Up to six record lengths may be defined.

freq-n
Specifies either the frequency (percentage) or estimated number of size-n records in the file. The sum of the records specified does not have to equal 100 percent of the file.

If the BIN keyword is omitted, BIN size is calculated from *lgth-4* of the LENGTH parameter or from the FIELDS parameter on the SORT statement.

DEBLANK=(delete-char,byte-position)
Deletes specific records from the file. The deleted records are identified by defining a specific character contained within a particular byte of the record.

Positional Subparameters:

delete-char
The identifying character that, when found in the byte specified by the *byte-position* subparameter, causes the record to be deleted from the file.

byte-position
The position of the character (in bytes) relative to the start of the record; for example, 1, indicating the first byte of the record, 2, the second byte, and so on.

SORT

Function:

Defines the sort key fields and their sorting sequence. It also defines the type and number of auxiliary storage devices to be used, the approximate number of records to be sorted, and the number of input files.

Format:

LABEL	Δ OPERATION Δ	OPERAND
	SORT	[FIELDS={([strt-pos-1] [,lgth-1] [,form-1] [,seq-1] [,...,strt-pos-n,lgth-n[,form-n] [,seq-n]]) ([strt-pos-1] [,lgth-1] [,seq-1] [,...,strt-pos-n,lgth-n [,seq-n]]),FORMAT=code}]
		[,COPY={ALL (input-file-partition-number-output-file-partition-number[,...,input-file-partition-number-output-file-partition-number])}]
		[,{DISC TAPE WORK}=number]
		[,FILE={number 1}]
		[,NOCKSM={D T}]
		[,SIZE=number]
		[,SORTP=(output-file-partition-number,input-file-1-partition-number [,...,input-file-9-partition-number])]
		[,{CHPT CHKPT}] Provided and accepted for compatibility with other systems; however, no action will be performed by sort/merge.

Keyword Parameters:

FIELDS= {([strt-pos-1][,lgth-1][,form-1][,seq-1][,...,start-pos-n,lgth-n[,form-n][,seq-n]])
([strt-pos-1][,lgth-1][,seq-1][,...,strt-pos-n,lgth-n[,seq-n]]),FORMAT=code}

Defines the sort key fields. The data format may vary for each key field, or it may be the same for all key fields. A maximum of 12 key fields may be specified. If omitted, one key field is assumed, beginning in position 1, the same length as the record up to 256 bytes, with character format. Sorting is in ascending sequence.

If any of the subparameters are omitted, their associated commas must be retained, except for trailing commas.

SORT

Positional Subparameters:

strt-pos-n

A decimal number specifying the starting point of a key field relative to the beginning of the record.

Key fields are numbered consecutively, starting with 1 for the most significant key field, 2 for the next, and so on. All key fields, with the exception of binary key fields, must start on a full byte boundary. The starting point is defined by specifying the number of that byte relative to the beginning of the record. For example, subparameter *strt-pos-1* specified as 9 indicates that the most significant key field begins at byte 9 of the record. This method of referencing a key field differs from that used by the subroutine sort/merge; independent sort/merge specifies byte and bit numbers relative to 1, and subroutine sort/merge references byte and bit position numbers relative to 0. The method used by the independent sort/merge provides compatibility with other systems.

Binary key fields are permitted to start on a bit boundary. In this case, the *strt-pos-n* subparameter is specified in a byte.bit format. As an example, assume that key field 1 starts at bit 2 of byte 9 of the record. The *strt-1* subparameter is specified as 9.2.

lgth-n

A decimal number specifying the length of a key field. Key field lengths are specified in full bytes, with the exception of binary key fields, which can begin on a bit boundary. Key field lengths expressed in full bytes are defined by whole numbers written in any of the following formats:

n
n.
n.0

Binary key fields starting on a bit boundary require a byte.bit format for defining key field length. The number of bits specified must not exceed 7. For example, a key field length of 6 bits would be written as 0.6. If the key field extends from bit 2 of byte 10 through bit 5 of byte 12, the *lgth-n* subparameter would be specified as 2.4.

form-n

A code consisting of two or three alphabetic characters specifying the data format of the key field. This subparameter is used when the data format varies for each key field. If this optional subparameter is not specified, the format is assumed to be character (CH). If all key fields have the same format, the *FORMAT=code* subparameter can be used. The format codes and their maximum allowable field lengths are:

Format Code	Description	Allowable Field Length
AC	EBCDIC data in ASCII collating sequence	1 — 256 bytes
ASL	ASCII numeric data leading sign	2 — 256 bytes
AST	ASCII numeric data trailing sign	2 — 256 bytes

SORT

Format Code	Description	Allowable Field Length
BI	Unsigned binary	1 bit to 256 bytes
CH	Character (EBCDIC or ASCII)	1 — 256 bytes
CLO	Numeric data overpunched leading sign	1 — 256 bytes
CSL	Leading sign numeric	2 — 256 bytes
CST	Trailing sign numeric	2 — 256 bytes
CTO	Numeric data overpunched trailing sign	1 — 256 bytes
FI	Fixed-point integer	1 — 256 bytes
FL	Floating point	1 — 256 bytes
MC	Multiple character, user-specified collating sequence	1 — 256 bytes
PD	Packed decimal	1 — 32 bytes
USQ	Character, user-specified collating sequence	1 — 256 bytes
ZD	Zoned decimal	1 — 32 bytes

seq-n

An alphabetic character specifying the sorting sequence of the key field, A for ascending order and D for descending order. If omitted, ascending order is assumed.

FORMAT=code

A code consisting of two or three alphabetic characters specifying the data format of the key fields. This subparameter is used when the data format for all key fields is the same. The code specifications are the same as those listed for the *form-n* subparameter. The *form-n* subparameter must not be specified when *FORMAT=code* is used.

COPY={**ALL** / **(input-file-partition-number.output-file-partition-number** / **[,...,input-file-partition-number.output-file-partition-number])**}

Allows the data records contained in one or more partitions of a multipartitioned disc input file to be copied directly into the output file without becoming involved in the sort. This keyword parameter may be used only when a single input file is defined.

COPY=ALL

Specifies that the data records contained in all partitions of the input file not involved in the sort are to be copied in the corresponding partitions of the output file.

SORT

COPY=(input-file-partition-number.output-file-partition-number
[,...,input-file-partition-number.output-file-partition-number])

Identifies (by a decimal number from 1 to 7) each input file partition from which data records are to be copied and the output file partition into which the data is to be written. Corresponding input and output file partition numbers are separated by a period.

DISC=number

Indicates the number of disc files available to the independent sort/merge for working storage. Disc files are assigned in LFD job control statements or in WORK jproc calls by means of the standard disc file names DM01,...,DM08 or $SCR1,...,$SCR8.

TAPE=number

Indicates the number of tape files available to independent sort/merge for working storage. Tape files are assigned in the LFD job control statements by means of the standard sort tape file names SM01,...,SM06.

WORK=number

May alternately be used for specifying the number of disc or tape files available to independent sort/merge for working storage.

A maximum of eight disc files or six tape files may be assigned for working storage. If the DISC, TAPE, and WORK keyword parameters are omitted, independent sort/merge determines the number and type of work files assigned from the PUBS list generated by job control when devices are assigned to the job. If no work files are assigned to the job, an internal (main storage) sort is performed.

FILE=number

Indicates the total number of input files to be sorted. The input files must be specified as SORTIN1,...,SORTIN9 in the LFD job control statements, unless a user input routine is provided.

If omitted, one input file is assumed.

NOCKSM=D

Suppresses the calculation of a checksum word for disc work files. The checksum word is normally calculated and written for each output data block, then verified for each input block read to ensure data integrity.

NOCKSM=T

Suppresses the checksum calculation for tape work files.

SIZE=number

Specifies the approximate number of records in the input file. This information is used for optimizing sort performance and for calculating optimum working storage area when the CALCAREA parameter is specified on the sort/merge OPTION control statement. If SIZE is omitted, a file of 25,000 records is assumed.

SORT

SORTP=(output-file-partition-number,input-file-1-partition-number[,...,input-file-9-partition-number])
Identifies the specific partition of each file from which data records are read and to which the sorted records are written. The location of each positional subparameter in the format identifies the file associated with the partition number specified.

Each input file may be subdivided into a maximum of seven partitions. If two or more multipartitioned files are being sorted, the sort can include only one partition from each input file. If more than one partition is to be included in the sort, the user program must redefine a second file to job control before that partition can be submitted to the sort. Because the sort operation is limited to a maximum of nine input files, the SORTP keyword parameter can be used to specify the partition numbers for one output file and up to nine input files.

If SORTP is omitted, partition 1 is assumed for all files.

3. Independent Sort/Merge User Own-Code Exits

GENERAL

The independent sort/merge has a provision, within its executable code, that allows control to be passed from a particular program phase of operation to one or more user own-code routines. The point at which control is transferred to own-code routines is called a program exit. It is specified by the MODS control statement (Section 2) and is issued from the job control stream. The program exit extends the versatility of the independent sort/merge by permitting specialized file processing of user own-code routines.

Each exit allows only specific functions to be performed, and these functions may occur only during a particular phase or phases of the sort/merge operation. The exits to user own-code routines, the function each allows to be performed, and their associated phase applications are listed in Table 2—1.

E11 — Input File Label Processing

Provides access to a user own-code routine for processing both standard and nonstandard labeled tape input files. If nonstandard labels are specified for input files on the OPTION control statement, these files must be opened by the E11 exit code. This exit is essentially the same as the LABADDR keyword parameter routine in DTF mode, or the ULABEL keyword parameter routine in cosolidated data management mode. If you omit exit 11 (you do not specify E11 on the MODS control statement) for input files that contain nonstandard or user labels, the labels are bypassed. However, you must specify the input files as unlabeled on the OPTION control statement. For more information on the use of these routines, basic data management users should consult the basic data management user guide, UP-8068 (current version); consolidated data management users should consult the consolidated data management macroinstructions, UP-8826 (current version). ←

There is a conflict with the use of register 15 between sort/merge exit conventions, in which register 15 is used as the base register for each exit module, and data management, which places the DTF address in register 15 for the label processing routine in DTF mode. For this exit, register 1 will contain the address of the DTF or, if consolidated data management is being used, the CDIB. In DTF mode, after the user has established a new base register other than 15, the following instructions must be issued:

```
LR   15,1          Puts DTF address in 15

L    1,176(0,15)   Puts buffer address in 1
```

This will set up the registers so that the LBRET macros can be issued. The consolidated data management user label routine must be executed without adding this code.

E15 — Input File Processing

Enables independent sort/merge to enter a user own-code routine to perform any of the following functions during phase 1:

- Read input files
- Count input records
- Insert records
- Delete records
- Lengthen or shorten records
- Modify record contents or control fields

Exit code E15 receives control each time an input record passes to the internal sort phase. The user program tells the sort what action to take by placing an action code in the action word, a 4-byte area in main storage that independent sort/merge sets up when it detects the EXIT parameter on the INPFIL control statement. The following options are available.

Action Code	Action Taken
0	Accept the record by modifying it prior to entering the internal sort or by taking no action
4	Delete the record from the sort
8	Request no return to exit code (E15 in this case) because exit use is completed
12	Create a new record and insert it into the sort

E18 — Read Error Processing

Provides access to a user own-code read error processing routine for the input file. Independent sort/merge takes the address of the error routine and places it in the sort input DTF. This supplies to data management the ERROR keyword parameter that names the own-code routine, and control is returned to the sort via the BR 14 instruction. For more information about the ERROR instruction, refer to the data management programmer reference, UP-8159 (current version). You write only the BR 14 instruction to return to the sort. Independent sort/merge dynamically activates the ERROR keyword parameter. If the BYPASS keyword parameter is specified on the INPFIL control statement and exit E18 on the MODS control statement, the E18 specification overrides the BYPASS.

E31 — Output File Label Processing

Enables independent sort/merge to enter an own-code nonstandard label processing routine for the output file. Functionally, it corresponds with the E11 exit for input files and interfaces the output file via the LABADDR data management DTF keyword parameter and the LBRET imperative macro instruction. As in exit 11, there is a conflict with the use of register 15. The user must establish a new base register and then load registers 15 and 1 as required for exit 11.

In consolidated data management, there is no register conflict. Register 1 will contain the address of the CDIB as required by the consolidated data management user label routine. Refer to the consolidated data management macroinstructions, UP-8826 (current version).

E32 — Merge-Only Input File Processing

Provides entry to a user own-code routine that modifies the contents, including control fields, of each record of the merge-only input files. This routine may not be used to change the record size or to insert or delete records. It can be used, however, to replace one record with another. Care must be taken to avoid changing the sequence of the record, or a sequence error will result.

E35 — Output File Processing

Enables independent sort/merge to enter a user own-code routine for output file processing during phase 3. Any of the following functions may be used in the own-code output routine:

- Write output records
- Count output records
- Insert records
- Lengthen or shorten records
- Modify record contents or control fields

E35 receives control each time an output record passes to final merge phase 3. The sort performs the function indicated by the action code placed in the action word. Four action codes are permissible:

Action Code	Action Taken
0	No change
4	Delete the record from the sort
8	Request no return to exit
12	Insert and accept a new record for output

Action codes 4 and 8 are valid only when the EXIT parameter is specified in the OUTFIL control statement (3.2.4). If the EXIT parameter is not specified, then all of the action codes listed are valid until sort/merge passes the last record to the exit 35 routine. At this time, 8 and 12 are the only valid action codes.

After the last record is written, control is passed to the end-of-file routine. In this case, the first entry in the exit parameter table is zero contained in a 1-word (4-byte) field which normally contains the address of the next record to be sent to the output buffer.

Exit code E35 is not valid in a merge-only application.

E38 — Merge-Only Read Error Processing

Processes input file read errors during a merge-only operation. The data management keyword parameter ERROR on the DTF statement and the BR 14 instruction provide the interface between independent sort/merge and the own-code routine. The user writes only the BR 14 instruction to return to the merge. Independent sort/merge dynamically activates the ERROR keyword parameter. For more information about the ERROR instruction, refer to the data management programmer reference, UP-8159 (current version).

E39 — Write Error Processing

Provides entry to a user own-code routine to handle a direct-access-device writing error. To interface with the output file, the own-code routine uses the same approach as data management error handling via the ERROR keyword parameter of the DTF declarative macro and the BR 14 instruction. The ERROR keyword parameter specifies the name of the error processing routine, and the BR 14 instruction returns control from the own-code routine to the independent sort/merge. Refer to the data management programmer reference, UP-8159 (current version) for more information about the ERROR keyword parameter. The user writes only the BR 14 instruction. Independent sort/merge dynamically activates the ERROR keyword parameter by taking the error processing routine address and placing it in the sort input DTF.

E65 — Record Sequencing

Handles sort sequences that involve more than a comparison for ascending or descending order. Independent sort/merge enters the user own-code routine at exit E65 each time two records are compared to determine which should precede the other.

The first instruction in the own-code routine should be the USING assembler directive, assigning register 15 as the base register. The user program receives the addresses of the two records to be compared in registers 11 and 12. For variable-length records, the addresses supplied are those of the first BIN of each record. The 4-byte length field is part of the first BIN. The user routine passes the result of the comparison to independent sort/merge via condition code settings. If the record for the address in register 11 is first, the condition code should be set to low (cc=1). If the record for the address in register 12 is first, the condition code is set to high (cc=2). If the sequence of the two records is arbitrary, the condition code is set to equal (cc=0).

Control is returned to independent sort/merge via a branch to register 14.

E75 — Data Reduction

Determines the final disposition of fixed-length records with equal key values. Each time two records with equal keys are encountered, independent sort/merge enters the user own-code routine at exit E75. In this routine, the user has the option of:

- deleting one of each pair of records containing equal keys;
- combining records with duplicate keys to form a new record; or
- a combination of retaining, deleting, and combining records with equal keys.

The first instruction in the own-code routine should be the USING assembler directive specifying register 15 as a base register. Registers 11 and 12 contain the addresses of the two records with equal keys. If only one record is to be retained, the retained record address is in register 11 and the deleted record address is in register 12 unless the user program overlays the address in register 11, thereby forcing the deletion of the address in register 11 and saving the address in register 12. Control is returned to independent sort/merge four bytes beyond the address specified in register 14.

If the contents of both records are to be saved, control must be returned to independent sort/merge at the address specified in register 14.

E84 — User-Defined Collation Sequencing

Exit code E84 is used whenever you want to specify an alternate collating sequence to the one supplied by independent sort/merge or to sort two or more different characters that have the same collating values. To determine which operation you wish to perform, E84 is used in conjunction with the character format code (USQ and MC) specified in the FIELDS keyword parameter of the SORT and MERGE control statements. Because both USQ (user-specified collating sequence) and MC (multiple character) specifications use the E84 exit code, they are mutually exclusive within a sort or merge operation. The distinction between the two is that the USQ specification for character code format requires you to provide independent sort/merge with two 256-byte translation tables at exit code E84 when control is passed to your own-code routine. (The first eight bytes of the exit routine must contain the addresses of the translation tables.) The first table (input) must translate and collate the input record key fields, and the second table (output) must return the fields to their original format. You only require one table (the input table) when you use the MC specification. The translation table is used only for comparison purposes and not to change the actual data in the record. (See Appendix D for OS/3 EBCDIC and ASCII standard collating sequences.)

BRANCH TABLE FOR USER OWN-CODE EXITS

Independent sort/merge locates and enters each own-code routine via a branch table entry which must also be the first coding of the own-code load module. Table 3—1 lists the table format and the phases with which each exit code is associated. The right half of Table 3—1 represents the actual user coding required to build the branch table.

Table 3—1. Branch Table Format

Applicable Phase of Sort/Merge Operation	Typical Table Format
1	entry B E11 B E15 B E18
3	entry B E31 B E32 B E35 B E38 B E39

When independent sort/merge gives control to a user own-code routine, it loads register 15 with the address of the first branch table entry and then enters the routine at the appropriate branch table entry. Own-code routines for the same phase of the sort must be linked together as one common load module. Each routine used at a given exit must have its own point of entry (exit code) listed in the branch table.

Several exit codes (E65, E75, E84) link the sort to own-code routines differently. Because functions provided at these exits are common to all phases of independent sort/merge, they are linked as independent load modules rather than as one common load module by phase association. The point of entry for exit codes E65 and E75 is the first position in the load module. Exit code E84 requires a 2-entry table as the first code of the load module. Each entry is the address of a conversion table. If one conversion table can accomplish both conversions, both entries in the table will be the same. The format for exit code E84 is:

```
entry    DC    A(convto-address)
         DC    A(convfrm-address)
```

EXIT PARAMETER LIST

The exit parameter list is a table built by independent sort/merge containing the location of records and information affecting record processing. Each entry is one word (four bytes) in length. The parameter list is used by three exits: E15, E32, and E35. These exits provide access to user own-code routines for input file processing, merge-only input file processing, and output file processing. All other exits use other interface conventions.

Independent sort/merge uses information it finds in the parameter list to locate the user's response (action code). The action code placed in the action word tells independent sort/merge how the records are to be processed. When control passes to the own-code routine, register 1 points to the first entry in the parameter list.

Table 3—2 describes the parameter list information required and the parameter positions it occupies in the list.

Table 3—2. Parameter List Format

Exits	Parameter Position No.	Function of Parameter
E11, E31	None	Interfaces conform to data management conventions for user label routines.*
E15	1	Address of record in the input buffer
	2	Address of action word
E32	1	Address of record in input buffer
E35	1	Address of record next scheduled for the output buffer
	2	Address of last record in the output buffer
	3	Address of action word
	4	Address of sequence check word
E18, E38	None	See data management conventions for ERROR routines.*
E39	None	See data management conventions for ERROR routines.*
E65	None	See E65 description.
E75	None	See E75 description.
E84	None	No executable code at this exit

* Refer to the data management programmer reference, UP-8159 (current version) or the consolidated data management macroinstructions user guide/programmer reference, UP-8826 (current version).

GENERAL PURPOSE REGISTERS

Four general purpose registers are used by the independent sort/merge to communicate with the user own-code routines and to provide the linkage between the two programs.

- Register 1

  The independent sort/merge places the address of the user own-code parameter list in this register whenever it requires the return of an action code from the user routine. During the performance of sort/merge operations at various user exits, sort/merge may require that the user routine respond with an action code informing it what to do with the record or how to handle the situation at hand. The possible action code response the routine must make depends upon the particular exit-code function being performed.

- Register 13

  The independent sort/merge places into register 13 the address of an 18-word save area in which the user own-code routine is required to save the contents of any register it uses during its execution. At conclusion of execution, the user routine must restore the contents of the registers to their original values prior to returning control to the independent sort/merge.

- Register 14

  Sort/merge places the address of the next instruction to be executed at the conclusion of the user own-code routine in register 14. This is referred to as the return address to the independent sort/merge.

- Register 15

  Contains the address of the first instruction contained in the user own-code branch table. This address is the entry point into the table. The independent sort/merge goes to this address upon execution of an exit-code in the job control stream to determine which user own-code routine is to receive control.

Exit-codes E11, E18, E31, E38, and E39 conform to the conventions for data management user exits. For information concerning data management user exits, refer to the data management programmer reference, UP-8159 (current version).

4. Subroutine Sort/Merge Macro Instructions

MG$REL

Function:

Releases the initial record of a previously sequenced data file to the subroutine sort/merge for merge-only processing. Since two or more input files are required for a merge-only process, the MG$REL macro instruction must be executed for each input file involved in the merge. After the initial record of each input file has been released and the merge process begun, the MG$REL is not to be used for releasing subsequent records to the subroutine sort/merge.

Prior to issuing the MG$REL macro instruction, the user program must:

- define the input and output files and assign the devices on which they are located;
- establish the interface (EXTRN MR$ORT) between subroutine sort/merge and the user program;
- define the conditions (MR$PRM) under which subroutine sort/merge is to perform the merge-only processing;
- open the input and output files; and
- initiate (MR$OPN) subroutine sort/merge for merge-only processing.

Before releasing the initial record of an input file to subroutine sort/merge, the user program must identify both the record to be released and the file to which it belongs. This is done by loading the address of the first byte of the record into register 1 and the identifier for the file into register 10. Upon the release of the initial record of the first file involved in the merge, subroutine sort/merge returns control to the user program at the line of code immediately following the MG$REL macro instruction. The user program must point to the next input file from which the initial record is to be accessed and released to subroutine sort/merge for merge-only processing. The procedure is repeated until the initial record of each input file involved in the merge is released to subroutine sort/merge.

Format:

LABEL	Δ OPERATION Δ	OPERAND
[symbol]	MG$REL	

No parameters are associated with the MG$REL macro instruction.

MG$RET

Function:

Requests the return of a record processed by the subroutine sort/merge in a merge-only application. The execution of this macro instruction also initiates the process for merging data records and, with the exception of the initial record for each input file involved in the merge, releases subsequent records from these files to the subroutine sort/merge for merge-only processing.

Prior to executing the MG$RET macro instruction, the user program must release the initial record of each input file to subroutine sort/merge by execution of the MG$REL macro instruction.

After the initial record of each input file has been released for merging, the MG$RET macro instruction is issued, initiating the merging process. The record which meets the sequencing requirements of the program is declared the "winner". The address of the winner record is placed into register 1 and control is returned to the user program at the line of code immediately following the MG$RET macro instruction. Make certain that the winner record is not overlayed before it is returned to your program. This can occur since register 1 is the same register in which the user program identifies the address of the next record to be released to the merge. To avoid this error, place the winner record into the output file or work area before placing the address of the next record to be released into register 1.

After the winner record is written to the output file, it must be replaced in the merge with another record from the same input file. Subroutine sort/merge places the identifier of the winner record input file into register 10 at the same time it returns the winner record address to the user program. This file identifier is used as a pointer to locate the file from which the next record is to be released to the merge. It is important not to alter the contents of register 10; otherwise, the merge will be in error. To obtain the next record from the selected file, the user program must load the address of the record into register 1. Execution of the MG$RET macro instruction releases the record to the merge for processing.

The entire cycle repeats itself until an end-of-file condition is encountered for one of the input files (identified by the file identifier in register 10). The user program must close this file and inform subroutine sort/merge of the end-of-file condition by loading a binary 0 into register 1 before releasing additional records to the merge.

Format:

LABEL	△OPERATION△	OPERAND
[symbol]	MG$RET	

No parameters are associated with the MG$RET macro instruction.

MR$OPN

Function:

Generates the linkage necessary to activate the sort initialization module. This module performs the actual initialization procedures required prior to subroutine sort/merge execution. The subroutine sort/merge must be opened before data records are delivered to it for sorting and merging. Once the subroutine is opened, control is returned to the user program at the address specified by the IN keyword parameter of the MR$PRM macro instruction. Before executing the MR$OPN macro instruction, the user program must:

- define the input and output files;
- establish a communications interface (EXTRN MR$ORT) for modules of the subroutine sort/merge;
- generate the sort parameter table (MR$PRM) to define the requirements of the sort;
- establish input and output data areas; and
- open the input data files for processing. The input file can also be opened after the subroutine sort/merge has been opened; however, no attempt must be made to release records to the sort until the input data files are opened.

Format:

LABEL	Δ OPERATION Δ	OPERAND
[symbol]	MR$OPN	{ parameter-table-name (1) }

Positional Parameter:

parameter-table-name
Specifies the symbolic label of the address of the sort parameter table (MR$PRM macro instruction).

(1)
Indicates that register 1 has been loaded with the address of the parameter table.

MR$PRM

Function:

Generates a sort parameter table that defines the requirements of a particular sort/merge run to subroutine sort/merge. The specifications governing the operations to be performed are defined by the keyword parameters associated with this macro instruction. Each keyword parameter specified becomes an entry in the sort parameter table to be used by the subroutine sort/merge during program execution. All table entries pertaining to a particular sort/merge operation must be properly defined before attempting program execution.

Format:

LABEL	Δ OPERATION Δ	OPERAND
[symbol]	MR$PRM	{FIELD=(strt-pos-1,lgth-1[,form-1] [,seq-1] [,order-1] [,...,strt-pos-n,lgth-n[,form-n] [,seq-n] [,order-n]]) / RSOC=symbol}
		FIN=symbol,
		IN=symbol,
		OUT=symbol,
		RCSZ=max-bytes,
		STOR={symbol / (symbol,number-of-bytes)}
		[,ADDROUT={A / D}]
		[,ADTABL=symbol]
		[,BIN={bytes / (min-bytes,size-1,freq-1[,...,size-n,freq-n])}]
		[,CALC={NO / YES}]
		[,CSPRAM={NO / OPTION / YES}]
		[,{DISC={(address,max-disc-file-number) / max-disc-file-number} / TAPE={label-type / (label-type,max-file-number)}}]

MR$PRM

LABEL	△OPERATION△	OPERAND
	MR$PRM (cont)	[,DROC={DELETE / symbol}]
		[,MERGE={NO / YES}]
		[,NOCKSM={D / T}]
		[,PAD=bytes]
		[,PRINT={ALL / CRITICAL / NONE}]
		[,RESERV=sort-filename]
		[,RESUME=(PASS,recovery-number)]
		[,SHARE=sort-filename]
		[,SIZE=number]
		[,USEQ=(to-address,from-address)]

Keyword Parameters:

FIELD=(strt-pos-1,lgth-1[,form-1][,seq-1][,order-1][,...,strt-pos-n,lgth-n[,form-n][,seq-n][,order-n]])

Defines the sort key fields to the subroutine. Key field definition includes starting position, length, data format, sorting sequence, and order of significance. A maximum number of 255 key fields can be specified. When variable-length records are involved, the 4-byte record length field is considered a part of the record. All key fields of the record must be contained within the first bin of the record.

This keyword parameter should not be coded if an own-code routine is supplied for record sequencing; in this case, RSOC must be specified.

Positional Subparameters:

strt-pos-n

A decimal number specifying the starting point of a key field relative to the beginning of a record.

Key fields, with the exception of binary key fields, start at a full byte boundary, and their starting point is defined by specifying their byte position within the record. Byte positions are numbered from 0 while byte numbers begin at 1, so the byte position of a key field is always 1 less than its byte number. For example, if the first key field begins at byte 10 of a record, the *strt-pos-1* subparameter would be specified as 9.

MR$PRM

The starting position for a binary key field is not limited to a byte boundary but can start at a bit position within a byte. In this case, the key field starting position is defined in a byte·bit form of reference. For example, if a key field starts at bit position 2 of byte 10 of the record, its starting position would be defined as 9.2.

lgth-n

A decimal number specifying the length of the key field. Key field length is defined in full bytes beginning and ending on a byte boundary except for binary key fields. A binary key field may be specified in the byte·bit format, based upon the number of bits that the field occupies. For example, assume that the binary key field extends from bit position 2 of byte 10 through bit position 5 of byte 12, a total of 20 bits. This would be specified as 2.4.

form-n

A 2- or 3-character code specifying the data format of the key field. If omitted, the format is assumed to be character (CH). The format codes and their maximum allowable field lengths are as follows:

Format Code	Description	Maximum Allowable Field Length (Bytes)
AC	Character (EBCDIC in ASCII collation sequence)	1—256
ASL	ASCII leading sign numeric	2—256
AST	ASCII trailing sign numeric	2—256
BI	Unsigned binary	1 bit—256
CH	Character (EBCDIC or ASCII)	1—256
CLO	Overpunched leading sign numeric	1—256
CSL	Leading sign numeric	2—256
CST	Trailing sign numeric	2—256
CTO	Overpunched trailing sign numeric	1—256
FI	Fixed-point integer	1—256
FL	Floating point	1—256
MC	Multiple character, user-specified collating sequence	1—256
PD	Packed decimal	1—32
USQ	Character, user-specified collation sequence	1—256
ZD	Zoned decimal	1—32

seq-n

Defines the sorting sequence for the key fields, A for ascending and D for descending sequence. If omitted, ascending sequence is assumed.

MR$PRM

order-n
A decimal number specifying the significance of the record key fields from major to minor. The major key field is numbered 1, the next most significant is 2, and so on. The maximum number of key fields that can be specified is 255.

If omitted, the subroutine assumes the order of key field definition as the order of significance; that is, the first key field defined is the major key field, etc. However, if this subparameter is specified for one key field, it must be specified for all key fields.

RSOC=symbol
Required when key field comparisons for record sequencing are to be performed through a user own-code routine. This keyword parameter specifies the symbolic address of the own-code routine and overrides the specifications of the FIELD keyword parameter if both are coded.

FIN=symbol
Defines the symbolic address in the user program to which control is returned when the output end-of-data has been reached.

IN=symbol
Defines the location within the user program to which control is returned after subroutine sort/merge has been initiated.

OUT=symbol
Defines the location within the user program to which control is returned when subroutine sort/merge is ready to return records to the program.

RCSZ=max-bytes
Defines the size of fixed-length records or the maximum size of variable-length records of the data to be sorted. The size specified for variable-length records must include the 4-byte record length field that precedes each record. If a tag sort has been specified (ADDROUT keyword parameter), the record size must equal the combined length of all key fields specified plus the 10-byte record access address field. The maximum allowable record size specified by this keyword parameter is dependent upon the hardware configuration.

STOR=symbol
Specifies the symbolic address of the main storage area available to subroutine sort/merge. When this form is used, the sort will utilize all main storage in the job region from the location specified by the symbol to the end of the job region as defined in the job prologue.

STOR=(symbol,number-of-bytes)

Positional Subparameters:

symbol
Specifies the symbolic address of the available main storage.

number-of-bytes
A decimal number indicating the maximum number of bytes available in main storage starting at the address specified.

MR$PRM

ADDROUT= { **A** / **D** }

Specifies that a tag sort is to be performed. The first 10 bytes of the record to be released must contain the record access address field. A tag sort may be specified only when input is from nonindexed or IRAM disc files.

ADDROUT=A

Specifies that only the direct access addresses of the input records are to appear in the output file.

ADDROUT=D

Specifies that both the direct access addresses and the sort key fields of each record are to comprise the final output.

ADTABL=symbol

Specifies the symbolic address of an additional sort parameter table within the user program which is to be linked to the existing sort parameter table. Any number of tables may be linked in this manner. ADTABL should be coded as the last parameter on the MR$PRM macro; any subsequent parameter entries are ignored.

BIN= { **bytes** / **(min-bytes,size-1,freq-1[,...,size-n,freq-n])** }

Required when variable-length records are to be sorted. Defines the size of fixed-length subrecords (bin size), or provides the information from which subroutine sort/merge can calculate the bin size.

BIN=bytes

Specifies the number of bytes (bin size) into which variable-length records are to be subdivided. The bin size must be large enough to contain all sort key fields within each record plus the 4-byte record length field.

BIN=(min-bytes,size-1,freq-1[,...,size-n,freq-n])

Positional Subparameters:

min-bytes

Specifies the minimum number of bytes into which variable-length records may be subdivided. The number must be large enough to accommodate all sort key fields within each record plus the 4-byte record length field.

size-1

Defines the record length (in bytes) that appears most frequently in the file.

freq-1

Specifies either the frequency (percentage) or estimated number of size-1 records in the file. If the number is less than 100, the independent sort/merge assumes that it is a percentage; if greater than 100, it is assumed to be an estimate of the number of records in the file.

size-n

Optionally defines additional record lengths (in bytes) that appear frequently in the file. Up to six record lengths may be defined.

freq-n

Specifies either the frequency (percentage) or estimated number of size-n records in the file. The sum of the records specified does not have to equal 100 percent of the file.

MR$PRM

CALC=NO
Specifies that subroutine sort/merge is to calculate the optimum working storage area in a disc sort, display the estimated sort time in minutes and the number of cylinders required for work space, and then terminate the job step.

CALC=YES
Specifies that subroutine sort/merge is to calculate optimum working storage area, display information, and then exeucte the sort.

If the CALC parameter is used, the SIZE keyword parameter and all record description keyword parameters must be specified.

CSPRAM=OPTION or **CSPRAM=YES**
Specifies that sort/merge parameters may be accepted from the job control stream at run time through PARAM control statements. The keyword parameters that can be entered through the control stream are BIN, DISC, NOCKSM, RESERV, RESUME, SHARE, and TAPE. (See Appendix A.)

If CSPRAM is omitted, sort/merge parameters will not be accepted from the control stream.

DISC=(address,max-disc-file-number)
Indicates the symbolic address of a list of user-supplied file names for disc work files and the maximum number of file names in the list.

DISC=max-disc-file-number
Indicates the maximum number of standard disc files (DM01 through DM08 or $SCR1 through $SCR8) assigned to subroutine sort/merge as working storage.

TAPE=label-type
Identifies tape work files as unlabeled or standard labeled. For unlabeled tapes, specify NO; for standard labeled tapes, specify STD.

TAPE=(label-type,max-file-number)
Identifies tape work files as unlabeled (NO) or standard labeled (STD) and specifies the maximum number of tape files assigned to subroutine sort/merge as working storage. Three to six tape files may be assigned.

If the DISC and TAPE keyword parameters are omitted, subroutine sort/merge determines the type and number of work files from job control. If work files are not assigned, an internal (main storage) sort is performed.

DROC=DELETE
Specifies that subroutine sort/merge is to perform automatic data reduction; i.e., eliminate or combine records with equal key fields.

DROC=symbol
Specifies the symbolic address of a user own-code routine for data reduction.

MERGE=YES
Specifies a merge-only application. If omitted, a sort/merge operation is assumed.

MR$PRM

NOCKSM=D
Suppresses the calculation of a checksum word for disc work files. The checksum word is normally calculated and written for each output data block, then verified for each input block read to ensure data integrity.

NOCKSM=T
Suppresses the checksum calculation for tape work files.

PAD=bytes
Augments the parameter table beyond its generated length, allowing the user to enter additional parameters into the table at run time. The number of additional bytes must be specified in multiples of 4.

PRINT=ALL
Specifies that all error messages are to be written to the job log for subsequent printing.

PRINT=CRITICAL
Specifies that only fatal error messages are to be written to the job log.

PRINT=NONE
Specifies that no error messages are to be written to the job log.

NOTE:

Regardless of PRINT option, all error messages are displayed on the system console.

RESERV=sort-filename
Allows a tape unit to function as a work file device during the input and intermediate phases of sort/merge operation and as the device for the output data file during the output phase. The reserved tape file is identified by a standard sort work file name (SMnn) and is associated with this name through an LFD job control statement. Messages instructing the operator when to unload the scratch tape and mount the output tape are displayed on the system console. The same device cannot be used for both RESERV and SHARE.

RESUME=(PASS,recovery-number)
Restarts an interrupted tape sort/merge operation. The interrupted sort can be resumed at a tape collation pass.

Positional Subparameters:

PASS
Specifies resumption of a sort that was interrupted during tape collation.

recovery-number
Specifies the most recent collation pass number displayed on the system console for recovery of a tape sort.

MR$PRM

SHARE=sort-filename

Allows a tape unit assigned to subroutine sort/merge as an input device to be used as a sort work file during the intermediate and output phases. The shared tape file is identified by a standard sort tape file name (SMnn) and is associated with this name through an LFD job control statement. Messages instructing the operator when to unload the input tape and mount the scratch tape are displayed on the system console. The same device cannot be used for RESERV and SHARE.

SIZE=number

Specifies the approximate number of records in the input file. This information is used for calculating optimum working storage area when the CALC parameter is specified. If SIZE is omitted, a file of 25,000 records is assumed.

USEQ=(to-address,from-address)

Required to perform a collation sequence for 8-bit character data differing from EBCDIC or ASCII representation. Both positional subparameters must be specified regardless of whether or not two translation tables are used. Usually one table is sufficient to perform the necessary translations. In such cases, both subparameters are coded with the same address. This keyword must be included if USQ is specified in the *form* subparameter of the FIELD keyword parameter.

Positional Subparameters:

to-address

Specifies the address of a 256-byte translation table that translates the record field or fields into the user collation character format for the desired sequence.

from-address

Specifies the address of a 256-byte translation table that translates the field or fields back to the original data format for output.

MR$REL

Function:

Releases unsorted records to the subroutine sort/merge for processing. The user program must identify each record before it is released. To do this, precede the MR$REL macro instruction with an instruction to load register 1 (R1) with the address of the first byte of the record to be transferred. Execution of the MR$REL macro instruction generates the linkage required to release the record identified in R1. After the transfer has taken place, the subroutine sort/merge returns control to the user program at the line of coding immediately following the MR$REL macro instruction. The user program may now get the next record to be released to the sort. The process of releasing records to the sort repeats itself until an end-of-file condition is detected, indicating that all records are released to the sort; the input may now be closed. The user program must then execute the MR$SRT macro instruction to request subroutine sort/merge to complete the sort.

If work files are on disc, a routine can be included which will check on the availability of work space before each record is passed to the subroutine sort/merge. When control is returned to the user program after the MR$REL instruction, R1 will be set to a positive value if more records can be accepted, or to a negative value if work space is insufficient to complete the sort. The user program can check R1 and branch to end-of-file or an error routine.

Format:

LABEL	△ OPERATION △	OPERAND
[symbol]	MG$REL	

No parameters are associated with the MR$REL macro instruction.

MR$RET

Function:

Requests the return of sorted records to the user program. Subroutine sort/merge notifies the user program that it is ready to return the sorted records by returning control at the address specified by the OUT keyword parameter in the sort parameter table. At this time, the user program may open its output data file and then request the return records by executing the MR$RET macro instruction. Since the records are released one at a time, the user program must request the return of each record.

One method of accomplishing this is to set up a loop within the program that requests the return of a record and handles the disposition of that record to the output data file. The loop functions in the following manner: The MR$RET macro instruction requests the return of a record from subroutine sort/merge. After MR$RET is executed, subroutine sort/merge places the address of the record being returned into register 1 and returns control to the user program at the line of code immediately following the MR$RET macro instruction. The user program, at this point, must move the record into the user output buffer area; final disposition of the records in the output buffer area is the responsibility of the user. The program can then branch back to the MR$RET macro instruction and request subroutine sort/merge to return the next record. This loop process repeats itself until an end-of-data condition is encountered indicating that all of the sorted records have been returned to the user program. Control at this point is returned to the user program at the address specified by the FIN keyword parameter in the sort parameter table. This address is the line of code following the record request loop and usually pertains to closing the output data file.

Format:

LABEL	Δ OPERATION Δ	OPERAND
[symbol]	MR$RET	

No parameters are associated with the MR$RET macro instruction.

MR$SRT

Function:

Notifies subroutine sort/merge that the end of input data has been reached and that it may now proceed to complete the sort/merge processing of the input data records.

The MR$SRT macro instruction should not be executed until all of the input data records have been released to subroutine sort/merge. The user program may then close the input data file, but this is not required for continuing the program. When all the records are sequenced, subroutine sort/merge returns control to the user program at the address specified by the OUT keyword parameter in the sort parameter table. The output data file can now be opened, and return of the sorted records to the program can be requested. The request for the return of the sorted data records is made by use of the MR$RET macro instruction.

Format:

LABEL	△OPERATION△	OPERAND
[symbol]	MR$SRT	

No parameters are associated with the MR$SRT macro instruction.

5. Subroutine Sort/Merge User Own-Code Routines

GENERAL

The subroutine sort/merge provides for two types of user own-code routines during sort processing: record sequencing and data reduction. The addresses of these routines are specified in the MR$PRM macro instruction by the keyword parameters RSOC and DROC, respectively, and appear as entries in the sort parameter table. The user own-code routines receive control from the subroutine sort/merge at the appropriate time when either of these keywords is supplied. The subroutine sort/merge linkages must not be executed from the user own-code routines. Both user own-code routines require registers 11, 12, 14, and 15 for communications. The information contained in the registers and the action to be performed depend on the specific own-code routine.

DROC — Data Reduction Own-Code Routine

Determines the final disposition of fixed-length records with equal key values. Data reduction may be accomplished by:

- deleting one of each pair of records containing equal keys;
- combining records with duplicate keys to form a new record; or
- a combination of retaining, deleting, and combining records with equal keys.

Register 15 contains the address specified on the DROC keyword parameter, and register 14 contains the subroutine sort/merge return address. The first instruction in the DROC routine should be the USING assembler directive specifying register 15 as a base register. Registers 11 and 12 contain the addresses of the two records with equal keys. If only one record is to be retained, the retained record address is in register 11 and the deleted record address is in register 12 unless the user program overlays the address in register 11, thereby forcing the deletion of the address in register 11 and saving the address in register 12. Control is returned to the subroutine sort/merge four bytes beyond the address specified in register 14. If the contents of both records are to be saved, control must be returned to subroutine sort/merge at the address specified in register 14.

Records with equal keys can be deleted automatically by the subroutine sort/merge by specifying the keyword parameter DROC=DELETE in the MR$PRM macro instruction. If this is specified, the subroutine sort/merge performs automatic data reduction by arbitrarily deleting one of the records with equal keys. The user program does not receive control in this instance.

RSOC — Record Sequence Own-Code Routine

Handles sort sequences that involve more than a comparison for ascending or descending order. When two records are ready to be compared to determine which should precede the other, subroutine sort/merge transfers control to the user own-code routine at the address specified on the RSOC keyword parameter. Subroutine sort/merge places the RSOC address in register 15 and stores the subroutine sort/merge return address in register 14.

The first instruction in the own-code routine must be the USING assembler directive, assigning register 15 as the base register. The user program receives the addresses of the two records to be compared in registers 11 and 12. For variable-length records, the addresses supplied are those of the first BIN of each record. The 4-byte length field is part of the first BIN. The user routine passes the result of the comparison to subroutine sort/merge via condition code settings. If the record for the address in register 11 is first, the condition code should be set to low (cc=1). If the record for the address in register 12 is first, the condition code is set to high (cc=2). If the sequence of the two records is arbitrary, the condition code is set to equal (cc=0). Control is returned to subroutine sort/merge via a branch to register 14.

RSOC overrides the FIELD keyword parameter on the MR$PRM macro instruction if both are specified.

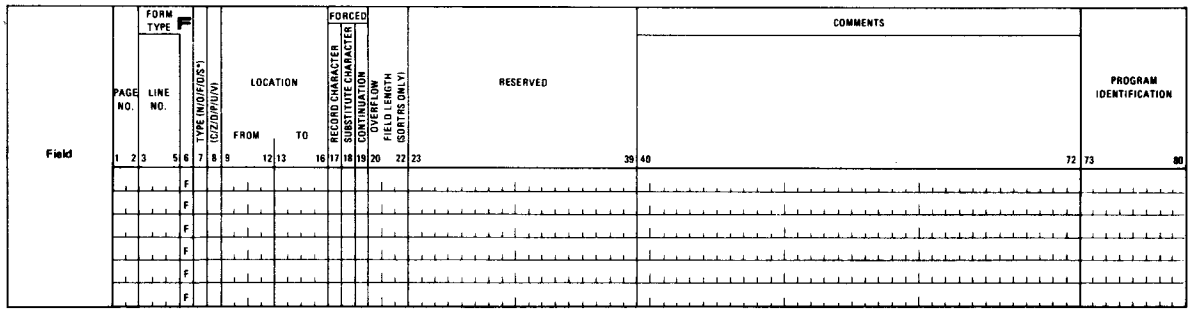
6. SORT3 Specifications

FIELD DESCRIPTION

Function

Defines how you want the records formatted in the sorted output file. For tag-along and summary sort jobs, the field descriptions appearing in your job stream define the fields used to create the output records. For address-out sort jobs, the field descriptions define the control fields used to sort the record addresses for the output file. Field descriptions are required for every sort job.

Format



Column Summary

Column Number	Allowable Entries	Explanation
1—2	00—99	Page number
3—5	01n—06n	Line number of the specification. (Leave column 5 blank or enter any value to keep each line of the specification in ascending sequence.)
6	F	Identifies this specification as a field description

Column Number	Allowable Entries	Explanation
7	N	Tells SORT3 that this is a normal control field description and that it is to be used to sort records in the normal sequence as specified by the entry in column 18 of the header specification
	0	Tells SORT3 that this is an opposite control field description and that it is to be used to sort records in a sequence opposite to that specified by the entry in column 18 of the header specification
	F	Tells SORT3 that this is a forced control field description and that it is to be used to force the addition of a character or the modification of a given field in the work records constructed for the sort
	D	Tells SORT3 that this is a data field description and that it is to be included in the output record. (Applicable only to tag-along and summary sorts. Data field descriptions for address-out sorts are processed as comments.)
	S	Tells SORT3 that this is a summary data field description and that it is to be summarized when used in a summary type sort. (Summary data fields are processed as normal data fields when specified for tag-along sorts and as comments when specified for address-out sorts.)
	*	Tells SORT3 that this specification line is a comment
8	P	Tells SORT3 that the data defined is numeric and consists of packed signed decimal numbers
	U	Tells SORT3 that the data defined is numeric and consists of unpacked signed decimal numbers
	C	Tells SORT3 to use both the zone and digit portions of each byte in the input record field defined to build sort work records
	Z	Tells SORT3 to use only the zone portion of each byte in the input record field defined to build sort work records
	D	Tells SORT3 to use only the digit portion of each byte in the input record field defined to build sort work records
	V	Tells SORT3 to force the character defined in column 18 into the data field specified in the specification
9—12	1—4096	Specifies the position at which the field begins in the output record. Entry must be right-justified.
	Blank	Specifies that the field is only one byte long
13—16	1—4096	Specifies the position at which the field ends in the output record. Entry must be right-justified.

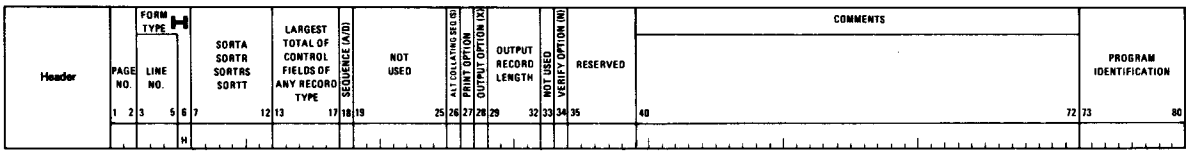
Column Number	Allowable Entries	Explanation
17	Any character	Defines the character to be replaced in the input record (replacement or forced character specified in column 18)
18	Any character	Specifies the character that replaces the character defined in column 17. Character substitution actually takes place in the work and output records and not in the input record.
19	Blank	Tells SORT3 that the forced control field described in this specfiication line is not a continuation of the preceding specification line
	Any character	Tells SORT3 that the forced control field described in this specification line is a continuation of the preceding specification line
20—22	1—256	Specifies overflow field length for summary sort jobs. Entry must be right-justified.
23—39	Not used	
40—80	Blank or any OS/3 characters	Not used by SORT3. May be used for comments or program identification

HEADER

Function

Defines the type of sort operation you want SORT3 to perform. It also defines the criteria for formatting the sorted output file. Only one header specification is permitted for each sort job.

Format



Column Summary

Column Number	Allowable Entries	Explanation
1—2	00	Page number
3—5	000	Line number of specification
6	H	Identifies specification as the header specification. This is a mandatory entry.
7—12	SORTA	Identifies the job as an address out sort (disc files only)
	SORTR	Identifies the job as a tag-along sort
	SORTRS	Identifies the job as a summary tag-along sort
	SORTT	Provided for System/3 compatibility. If specified, SORT3 performs a tag-along sort.
	An entry in this field is mandatory. If omitted, SORT3 will not execute.	
13—17	1—256	Specifies the longest control field used in sorting your input records. An entry in this field is mandatory and must be right-justified within the field.
18	A	Tells SORT3 to arrange records in ascending order in the output file
	D	Tells SORT3 to arrange records in descending order in the output file
19—25	Blank	Not used
26	Blank	Tells SORT3 to use the standard OS/3 collating sequence in compare operations
	S	Tells SORT3 to use an alternate collating sequence in compare operations. You are responsible for providing the ALTSEQ statements needed for defining the collating sequence to be used.
27	0 or blank	Tells SORT3 to print and display: Sort specifications Diagnostic messages Program status messages Action messages Other system messages
	1	Tells SORT3 to print and display: Program status messages Action messages Other system messages
	2	Tells SORT3 to print and display action messages and other system messages only.
	3	Print and display other system messages only.

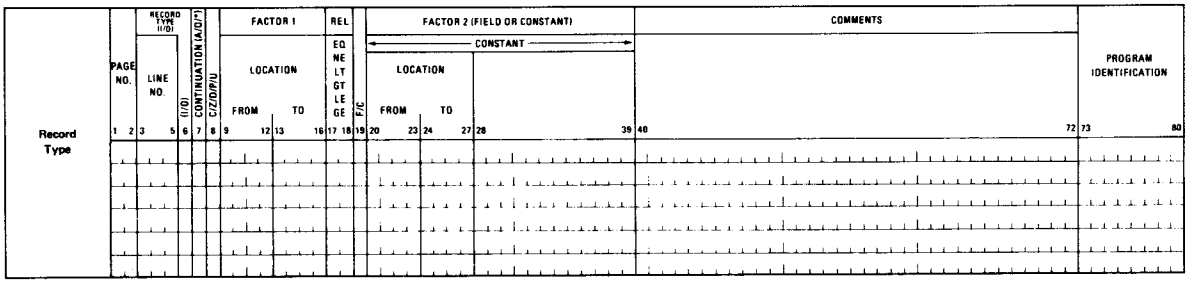
Column Number	Allowable Entries	Explanation
28	Blank	Tells SORT3 to retain control fields in the output records for tag-along sort jobs
	X	Tells SORT3 not to retain control fields in the output record for tag-along sort jobs
29—32	1—4096	Specifies the length of the output records in a tag-along sort job. An entry in this field is mandatory for tag-along sorts. The entry must be right-justified.
33	Blank	Not used
34	Blank	Tells SORT3 to verify the data written on the work file
	N	Tells SORT3 not to verify the data written on the work file
35—39	Blank	Reserved
40—80	Blank or any OS/3 characters	Not used by SORT3. May be used for comments or program identification

RECORD TYPE

Function

Defines the criteria that SORT3 must use in determining which records in your input file are to be included or omitted from the sort. It is not necessary to prepare record type specifications when your sort job includes all the records in your file and they all have the same format.

Format



Column Summary

Column Number	Allowable Entries	Explanation
1—2	00—99	Page number
3—5	01n—06n	Line number of the specification. (Leve column 5 blank or enter any value to keep each line of the specification in ascending sequence.)
6	I	Tells SORT3 that the record defined in this specification is to be included in the sort
	O	Tells SORT3 that the record defined in this specification is to be omitted from the sort
7	Blank	Tells SORT3 that this is the first line of an include (I) or omit (O) record type specification
	A	Tells SORT3 that this specification line is a continuation of the record definition described in the previous specification line (AND function)
	O	Tells SORT3 that this specification line defines a record type different from that described in the previous specification line (OR function)
	*	Tells SORT3 that this is a comment line
8	C	Tells SORT3 to use both zone and digit portions of characters during compare operations
	Z	Tells SORT3 to use only the zone portion of 1-character fields during compare operations
	D	Tells SORT3 to use only the digit portion of characters during compare operations
	P	Tells SORT3 that data is signed packed decimal
	U	Tells SORT3 that data is signed unpacked decimal
9—12	1—4096	Specifies the position at which the Factor 1 field begins in the input record. Entry must be right-justified.
	Blank	Factor 1 field is one character long.
13—16	1—4096	Specifies the position at which the Factor 1 field ends in the input record. Entry must be right-justified.

Column Number	Allowable Entries	Explanation
17—18	EQ	Tells SORT3 that the results of the comparison between the Factor 1 and Factor 2 fields must be equal
	NE	Tells SORT3 that the results of the comparison between the Factor 1 and Factor 2 fields must not be equal
	LT	Tells SORT3 that the Factor 1 field must be less than Factor 2 field
	GT	Tells SORT3 that the Factor 1 field must be greater than the Factor 2 field
	LE	Tells SORT3 that the Factor 1 field must be less than or equal to the Factor 2 field
	GE	Tells SORT3 that the Factor 1 field must be greater than or equal to the Factor 2 field
19	C	Defines Factor 2 as a constant
	F	Defines Factor 2 as another field in the same input record
	K	Defines Factor 2 as a keyword: UDATE, UDAY, UMONTH, or UYEAR
20—23	1—4096	Specifies the position at which the Factor 2 field begins in the input record. Entry must be right-justified.
	Blank	Factor 2 field is one character long.
24—27	1—4096	Specifies the position at which the Factor 2 ends in the input record. Entry must be right-justified.
20—39	Any characters	Defines the constant for Factor 2 field. Entry must be left-justified when Factor 2 is alphanumeric constant, right-justified when numeric constant. The length of the Factor 2 field must be the same as the length specified for the Factor 1 field. If Factor 1 field is a packed number, the Factor 2 field length must be twice the length of the Factor 1 field.
40—80	Blank or any OS/3 characters	Not used by SORT3. May be used for comments or program identification

7. SORT3 Alternate Collation Statements

GENERAL

When a user elects to establish a collating sequence other than the standard collating sequence provided by the SORT3 program, he is required to define the alternate sequence. This is accomplished by use of alternate collation (ALTSEQ) statements that are prepared in 80-column punch card format and located immediately after the header specification in the control stream for the job. The end of the ALTSEQ statements in the control stream are marked by a punch card with double asterisks (**) in columns 1 and 2. As many ALTSEQ statements as needed to define the alternate collating sequence may be used; each statement must begin in column 1 and must begin with ALTSEQ.

CODING RULES

1. Enter ALTSEQ in columns 1 through 6.

2. Leave columns 7 and 8 blank.

3. Enter into columns 9 and 10 the hexadecimal equivalent of the character being moved from its normal position of the collating sequence.

4. Enter into columns 11 and 12 the hexadecimal equivalent of the character whose position in the collating sequence is to be assumed by the character specified in step 3.

5. Repeat steps 3 and 4 for as many pairs as required to define the characters that must be taken out of the normal sequence. Do not leave spaces between sets of hexadecimal entries.

6. End the series of statements by placing a card with double asterisks (**) in columns 1 and 2 after the last ALTSEQ statement.

CONSIDERATIONS

Although ALTSEQ statements do not affect data fields or forced control field characters, they do affect Factor 1 and Factor 2 fields, normal and opposite control fields, and control field characters before they are replaced or added to by forced fields.

Before using an alternate collating sequence, consider what affect it will have on these fields for each particular job. In addition, packed and unpacked Factor 1 and 2 fields must not be sepcified when an alternate collating sequence is used.

Another consideration when using an alternate collating sequence is whether the characters moved in the sequence are considered equal or unequal. When a character is moved into the sequence position normally assigned to another character, both the new and original character occupy the same position and they are considered equal. If they are not to be considered equal, the character that originally occupied the position must be moved to another position.

Appendix A. Interfaces

SORT PARAMETER TABLE

The sort parameter table is the primary interface between independent sort/merge or subroutine sort/merge and the user program. The entries defined in this table inform the program of the specifications to which it must perform sort/merge functions and output file sequencing. Independent sort/merge structures the table from sort control statements, and subroutine sort/merge structures the table from the execution of a macro instruction at assembly time. In both cases, the table can be modified or added to through entries submitted on PARAM statements issued from the job control stream. The format of the sort parameter table and a description of its entries are given in Table A—1.

Table A—1. Sort Parameter Table (Part 1 of 3)

Code	Value	Keyword Parameter	Description of Values
00	000000		000000 — Indicates the end of a parameter table
00	aaaaaa	ADTABL	aaaaaa — Is the address of an additional parameter table containing information which applies to this sort
01	aaaaaa	IN	aaaaaa — The address specified by IN keyword. This address identifies the location to which control returns following the opening of the sort/merge.
02	aaaaaa	OUT	aaaaaa — The address specified by the OUT keyword. This address specifies the location to which control returns when the sequenced records are ready to be returned.
03	aaaaaa	FIN	aaaaaa — Specifies the location to which control returns after the last record has been returned to the user
04	aaaaaa	RSOC	aaaaaa — Specifies the address at which the user own-code record sequencing routine is located
05	aaaaaa	DROC	aaaaaa — Specifies the address at which the user own-code, data-reduction routine is located
07	aaaaaa	STOR	aaaaaa — The address of the first byte of the work area reserved for the sort
FF	nnnnnn		nnnnnn — A binary value indicating the number of bytes available for sort usage in the work area. This value is zero if the number of bytes is absent.
08	00 nnnn	RCSZ	nnnn — A binary value specifying size of the record to be sorted. This specifies the maximum record size for variable-length records and includes the 4-byte record length field.
09	000000	MERGE	09 — Indicates a merge-only application
0A	00 nnnn	BIN (form 1)	nnnn — A binary number specifying the BIN size for variable-length records
0A	00 nnnn	BIN (form 2)	nnnn — A binary number specifying the minimum BIN size for variable-length records
FF	ssssss		ssssss — A binary number specifying a record size within the file to be sorted
FF	00 vvvv . . .		vvvv — A binary number specifying the number of times this record size occurs in the file or percentage of occurrences
FF FF	ssssss 00 vvvv		Each size-n and freq-n parameter pair requires two BIN continuation words in the parameter table.

Table A—1. Sort Parameter Table (Part 2 of 3)

Code	Value	Keyword Parameter	Description of Values
0B FF FF	ii pppp cc qq rr 00 ll bb	FIELD	ii — A binary number specifying the length of the field in bytes represented as length-1 for all but binary fields that are in the byte bit format where it is defined as true length. (0 ≤ ii ≤ 255) pppp — The location of the first byte of the key field relative to the start of the record. (0 ≤ pppp ≤ 32767) cc — Binary code of the FIELD form parameter 00 = CH — character 01 = BI — unsigned binary 02 = FI — fixed pointer integer 03 = PD — packed decimal 04 = ZD — zoned decimal 05 = FL — floating point 06 = MC — multiple character, user-specified collating sequence 07 = AC — EBCDIC data in ASCII collation sequence 08 = CSL — leading sign numeric 09 = CST — trailing sign numeric 0A = CLO — numeric data overpunched leading sign 0B = CTO — numeric data overpunched trailing sign 0C = ASL — ASCII numeric data leading sign 0D = AST — ASCII numeric data trailing sign 0E = USQ — user specified collation sequence qq — Binary code of the field sequence parameter 00 = ascending sequence, A 01 = descending sequence, D rr — Binary value specifying the order of significance of this field (01 ≤ rr ≤ 255) ll — A binary value, used only when BI is specified. Specifies a number of bits when the length of a 'BI' field is not an even multiple of bytes (00 ≤ ll ≤ 07) bb — A binary value used only in BI fields to specify the first bit location of a BI field within the byte location specified by pppp. (00 ≤ bb ≤ 07)
0C FF	0000 nn aaaaaa	DISC	nn — A binary value specifying the maximum number of disc file names which may be assigned (0 ≤ nn ≤ 8) aaaaaa — The address of the list of user-supplied disc file names
0D	00 nn xx	TAPE	nn — A binary value specifying the maximum number of tape file names which may be assigned (0 ≤ nn ≤ 6) xx — A binary code indicating the tapes label parameter 00 = standard labels, STD 01 = no labels, NO
0E	0000 bb	SHARE	bb — Two unsigned decimal digits representing the last two characters of the file name of the tape unit to be shared. (SM06, bb = 6 or less)
0F	0000 bb	RESERV	bb — Two unsigned decimal digits representing the last two characters of the file name of the tape unit to be reserved, (SM06, bb = 6 or less)
14	rrrrrr	RESUME=(PASS,..)	rrrrrr — Three-character pass recovery-number parameter

Table A—1. Sort Parameter Table (Part 3 of 3)

Code	Value	Keyword Parameter	Description of Values
1A	00 gg hh	NOCKSM	gg–hh – Binary code indicating checksum to be omitted gg = 01 – omit tape checksum hh = 01 – omit disc checksum
1B FF	aaaaaa dddddd	USEQ	aaaaaa – The address of a 256-byte translation table specifying the desired collation sequence dddddd – The address of a 256-byte translation table specifying the inverse of the first table
20	000000	PAD	The null PAD entry is used to reserve space in the parameter table. The entry is repeated (bytes+3)/4 times, where bytes (in bytes+3) represent the PAD 'bytes' parameter.
21	0000 jj	CSPRAM	jj – Binary code indicating the CSPRAM option 01 – OPTION 02 – YES 03 – NO
22	0000 nn	ADDROUT	nn – A binary code specifying the tag-sort option. 00 – A – return only the direct access address of record 01 – D – return the disc address and the record key fields
25	0000 nn	CALC	nn – A binary code signifying that sort optimization information is to be calculated and displayed. The sort may be executed or terminated. 00 – NO – no execution 01 – YES – execution
26	nnnnnn	SIZE	nnnnnn – A binary number indicating the approximate number of records to be sorted
29	0000 nn	PRINT	nn – A binary code indicating the type of messages to be displayed 00 – ALL 01 – CRITICAL 02 – NONE

SUBMITTING SORT PARAMETER TABLE ENTRIES VIA THE JOB CONTROL STREAM

Both independent and subroutine sort/merge permit the user to add or override sort parameter table entries from the control stream at run time. This is done by coding PARAM job control statements and by including CSPRAM=OPTION or CSPRAM=YES on the OPTION control statement or the MR$PRM macro instruction. If you omit CSPRAM or code CSPRAM=NO, control stream processing is bypassed.

Only the following keyword parameters can be accepted from the control stream at run time:

BIN

Bin size

DISC

Disc work file allocation

NOCKSM

Checksum elimination

RESERV

Reserve tape unit for output file

RESUME

Resumption of interrupted tape sort

SHARE

Shared input tape unit

TAPE

Tape work file allocation

The format and description of these keyword parameters are listed under the MR$PRM macro instruction.

The PARAM job control statement has the following format:

// PARAM parameter-1,...,parameter-n

Keyword parameters may be coded through column 71 and are separated by commas. A nonblank character in column 72 indicates that the statement is to be continued. A continuation line must start with // separated by one or more blanks from the continuation portion of the control statement. Alternatively, keyword parameters may be coded on separate PARAM job control statements.

In independent sort/merge, PARAM job control statements are coded immediately following the /* statement for the sort/merge control statements. In subroutine sort/merge, PARAM statements are coded immediately following the EXEC statement for the sort/merge program.

Appendix B. Special Applications

RESTARTING AN INTERRUPTED INDEPENDENT OR SUBROUTINE TAPE SORT

When an independent or subroutine tape sort is interrupted, it may be resumed at the latest check point by updating and resubmitting the job control stream. To restart the job, code the RESUME parameter, specifying the latest recovery point number, on a PARAM job control statement. The format is:

```
// PARAM RESUME=(PASS,recovery-number)
```

To restart an independent tape sort, the RESTART and CSPRAM keyword parameters must be coded on the sort/merge OPTION control statement in addition to submitting a PARAM job control statement containing the RESUME parameter.

CSPRAM=YES must be coded on the MR$PRM macro instruction if a subroutine tape sort is to be restarted by resubmitting the job control stream. Alternatively, a subroutine tape sort may be restarted by coding the RESUME keyword parameter on the MR$PRM macro instruction and reassembling the program.

TAG SORT FOR INDEPENDENT OR SUBROUTINE SORT/MERGE

A tag sort processes only the addresses or the addresses and key fields of records from a nonindexed or IRAM disc file. A tag sort is performed when the ADDROUT parameter is specified on the independent sort/merge OPTION control statement or the subroutine sort/merge MR$PRM macro instruction. If ADDROUT=A is coded, only the 10-byte direct access addresses comprise the final output; if ADDROUT=D is coded, the final output consists of both the direct access addresses and the sort key fields. The length of a tag sort record cannot exceed 256 bytes.

In a subroutine sort/merge, or if the user provides the input routine in an independent sort/merge, the user must obtain the disc address of the input record being reconstructed and place it into the 10-byte address field of the new tag sort record. To do this, define the file using the DTFNI data management macro instruction, and immediately after reading each record (GET macro), issue the NOTE imperative macro to place the address of the record into a program-addressable field of the DTFNI file table, designated *filenameB*. This area can be addressed by concatenating the letter B to the 7-character logical file name. Refer to data management programmer reference, UP-8159 (current version) for the uses of the NOTE macro and the *filenameB* field.

Tag sort records are not available to the subroutine sort/merge user own-code routines RSOC and DROC.

Appendix C. Job Stream Requirements

JOB CONTROL STREAM FOR INDEPENDENT SORT/MERGE

Figure C—1 illustrates a typical job control stream required to assign input, output, and work files and execute an independent sort/merge program.

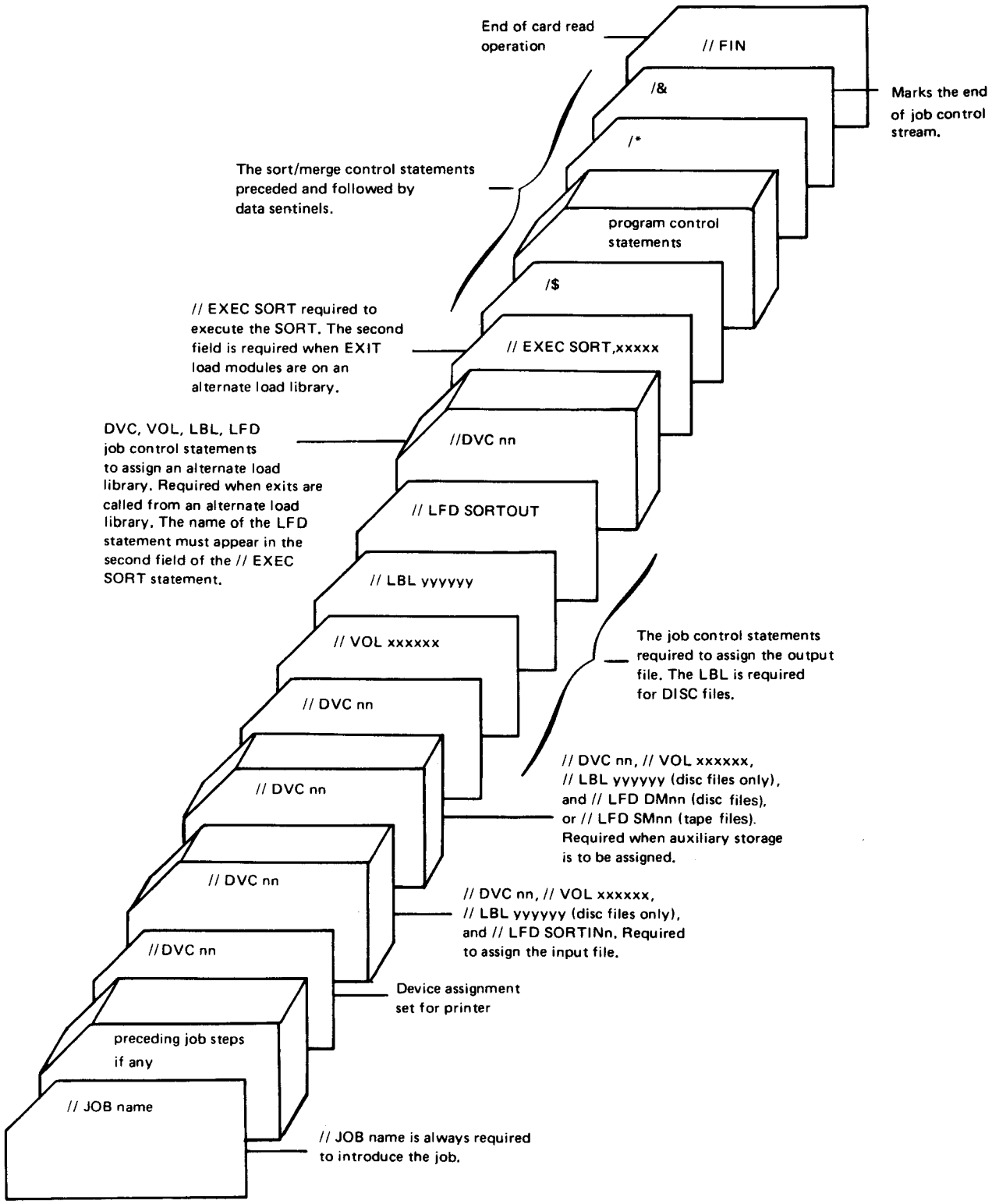


Figure C—1. Typical Job Control Stream for an Independent Sort/Merge Application

JOB CONTROL STREAM FOR SUBROUTINE SORT/MERGE

Figure C—2 illustrates a typical job control stream for assembling, link editing, and executing a subroutine sort/merge program.

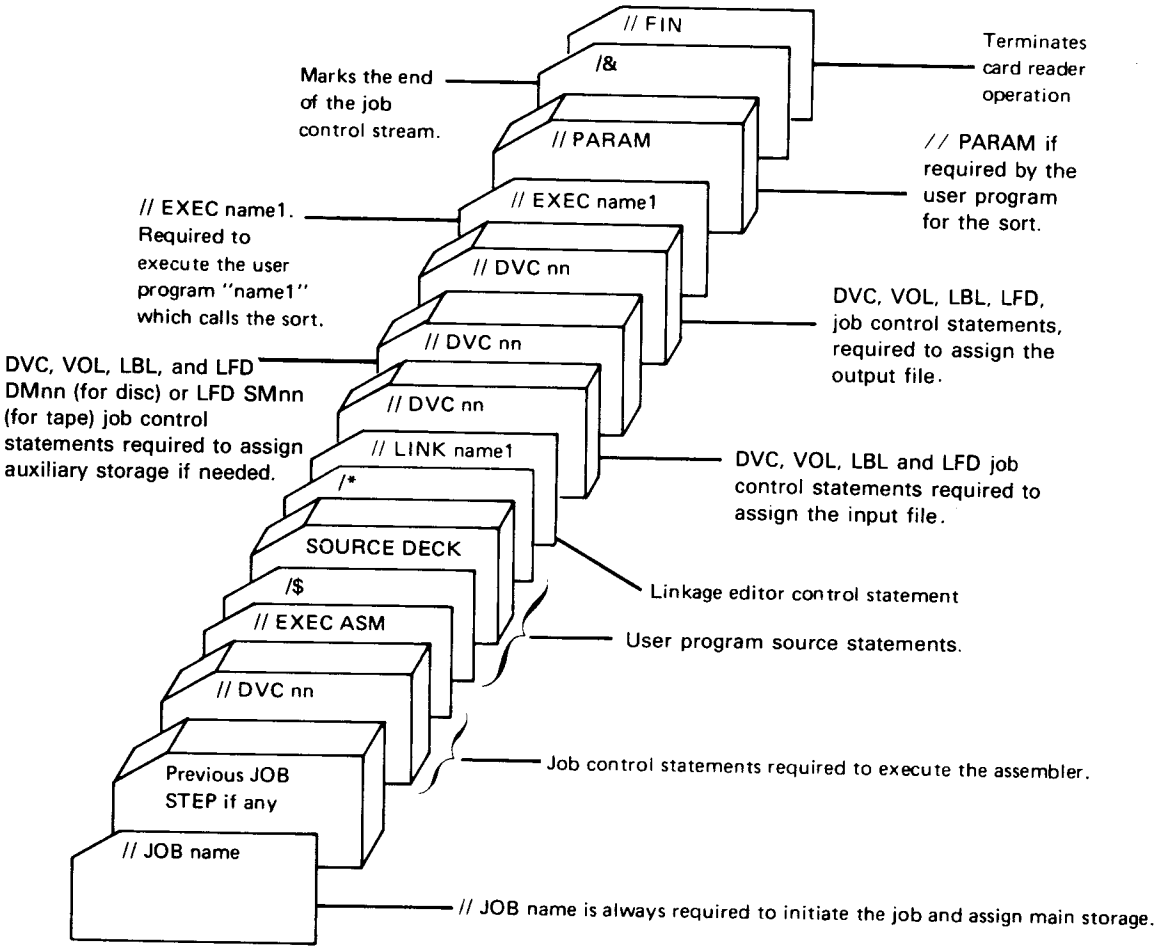


Figure C—2. Typical Job Control Stream for a Subroutine Sort/Merge Application

JOB CONTROL STREAM FOR SORT3

Figure C—3 illustrates a typical job control stream required to execute SORT3.

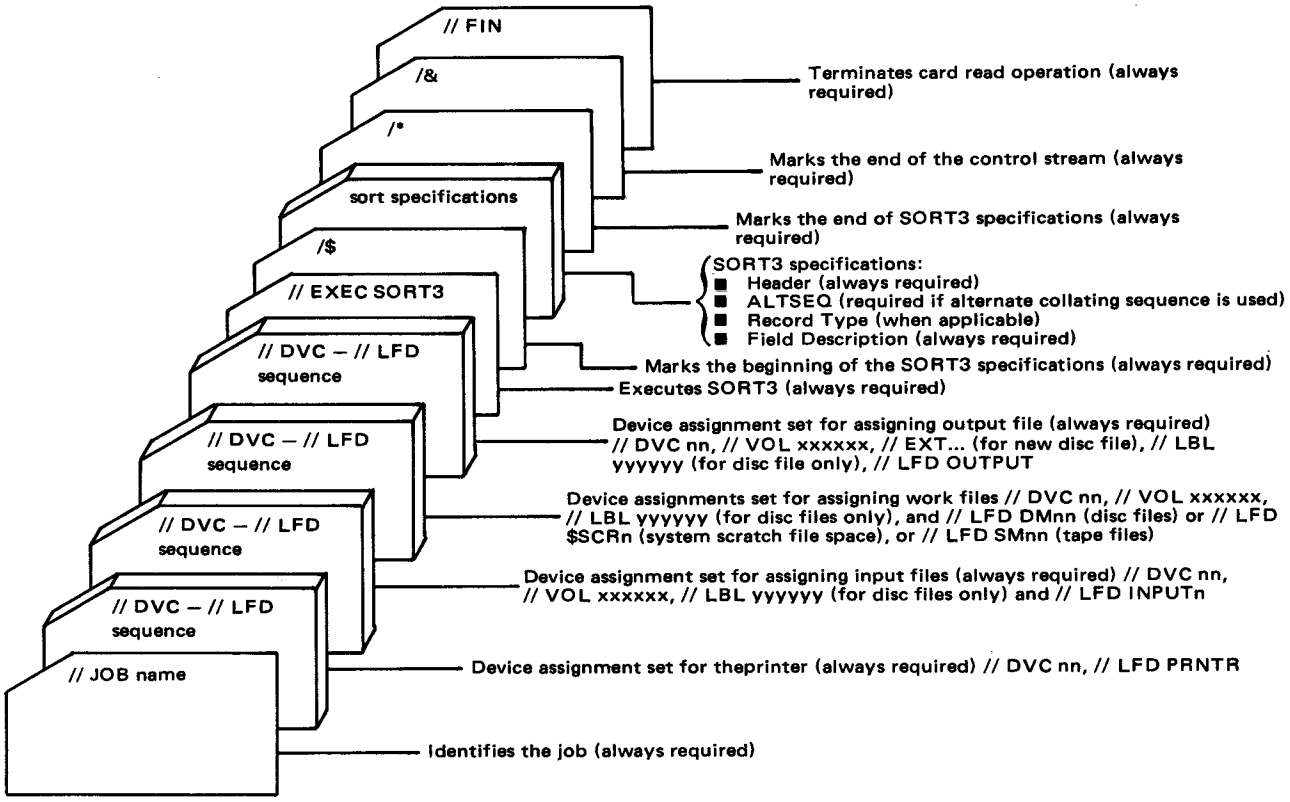


Figure C—3. Typical Job Control Stream for SORT3 Application

OPERATION CONTROL LANGUAGE (OCL) FOR SORT3

Figure C—4 illustrates a typical OCL job stream required to execute SORT3 via the OS/3 OCL processor.

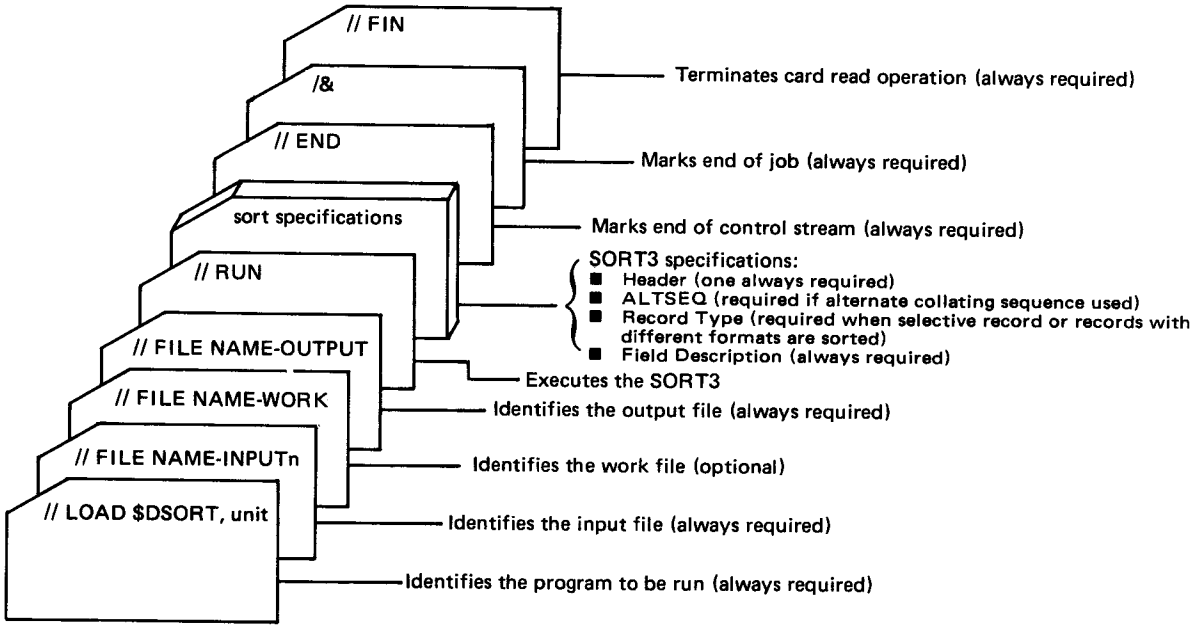


Figure C—4. Typical OS/3 OCL Job Stream for SORT3 Application

Appendix D. Subroutine Sort/Merge Interface Requirements for the COBOL Programmer

The SPERRY UNIVAC Operating System/3 (OS/3) COBOL sort facility utilizes the capabilities of the subroutine sort/merge for sorting the data files involved in a COBOL program. The method of defining the requirements for the initialization and execution of the subroutine sort/merge from a COBOL program are specified according to OS/3 COBOL conventions. During compilation the OS/3 COBOL extended compiler expands the COBOL program sort statements into the parameter information required by the subroutine sort/merge for defining the various sort/merge entries of the sort parameter table and for executing the modular elements comprising the subroutine sort/merge routine. If it is necessary to change the requirements of the sort prior to its execution, some, but not all, of the compiler-generated parameter information can be redefined by inserting parameter control statements in the program job control stream. Certain additional parameters can be added to the subroutine sort/merge in the same manner.

During program execution, a message that questions the presence of parameter statements in the program control stream is displayed on the system console. (This display will not occur if the compiler output option //△PARAM△OUT=S is specified to disable the display feature.) Response to the question determines whether or not the parameter statements are accessed by the subroutine sort/merge during execution of the sort. Parameters inserted into the job control stream allow the user to designate the type of sort desired, to reserve or share the use of magnetic tape devices assigned as auxiliary working storage to the sort, to replace the arbitrary BIN size provided by the compiler, to resume an interrupted tape sort, or to inhibit the calculation of a summation check for files written to tape or disc.

Table D—1 summarizes the parameters supplied by the extended COBOL compiler and indicates those which may be inserted in the job control stream. Figure D—1 depicts a typical job deck for a COBOL program executing a sort and shows the placement of sort parameter statements in the job control stream. Further details of the use of subroutine sort/merge through the OS/3 COBOL sort facility are given in the extended COBOL supplementary reference manual, UP-8059 (current version).

Table D—1. Extended COBOL Interface With OS/3 Subroutine Sort/Merge (Part 1 of 2)

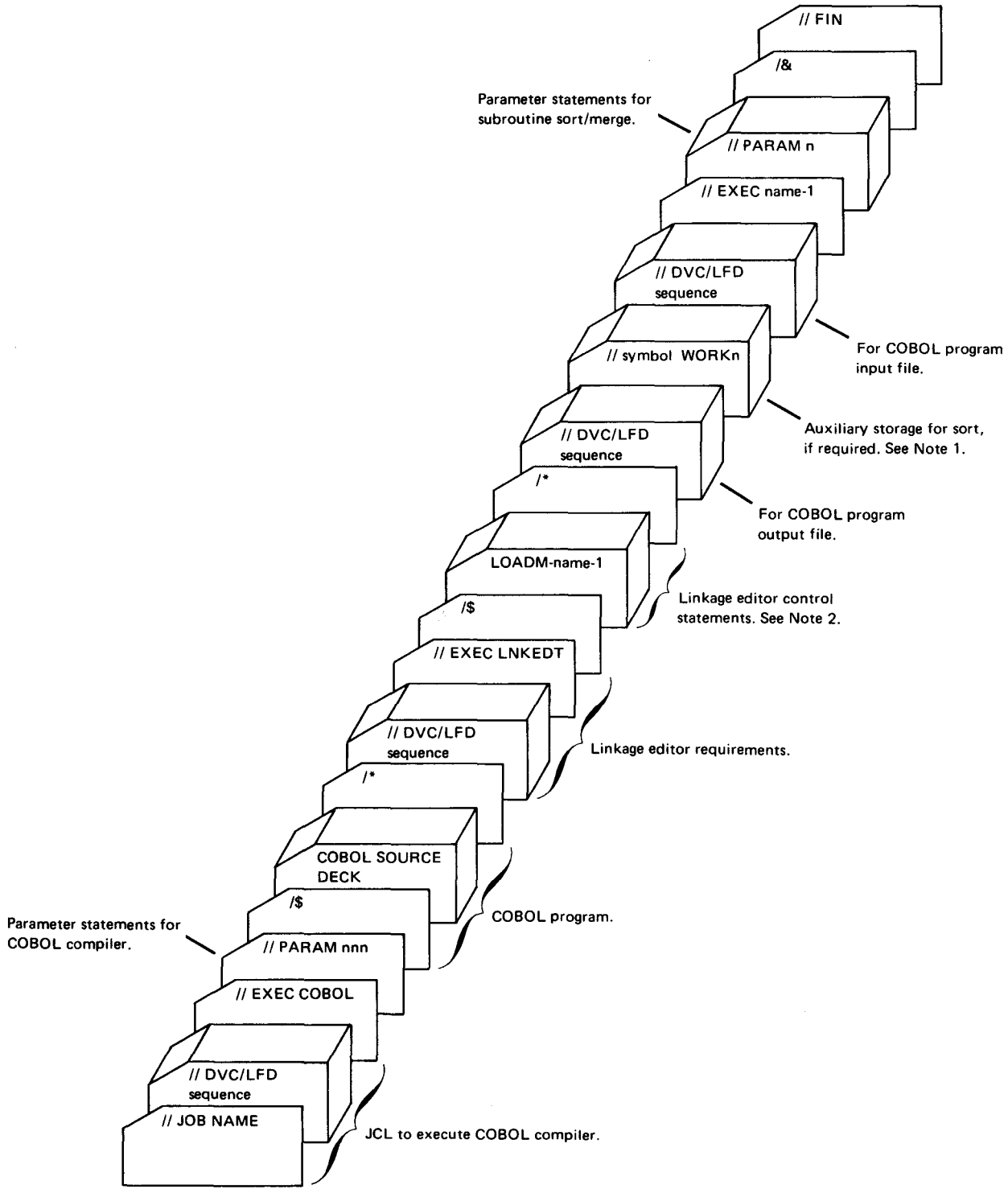
Use of Parameter	Parameter	Execution Requirement for Sort/Merge*	Parameter May Be Passed in Job Control Stream	Compiler Action and COBOL Programmer's Options
Normal Sort Linkage	DROC	O	No	None. Neither automatic nor user own-code data reduction (DROC) is available to the COBOL programmer.
	FIN	X	No	Provides FIN from the AT END imperative statement of COBOL program RETURN statement.
	IN	X	No	Provides address to which sort/merge returns control to the COBOL program after being initialized; this is the address immediately before the file named in the COBOL USING statement has been opened, or immediately before the PERFORM statement resulting from the INPUT procedure of the SORT statement.
	OUT	X	No	Provides address immediately before the opening of the file named in the GIVING statement, or the PERFORM statement resulting from the OUTPUT procedure in the COBOL SORT statement.
	RSOC	O	No	None. User own-code exit for record sequencing (RSOC) is not available to the COBOL programmer.

* X = Required for execution
O = Optional

Table D—1. Extended COBOL Interface With OS/3 Subroutine Sort/Merge (Part 2 of 2)

Use of Parameter	Parameter	Execution Requirement for Sort/Merge*	Parameter May Be Passed in Job Control Stream	Compiler Action and COBOL Programmer's Options
Facility Assignment	DISC	X	Yes	Enters the maximum (DISC=8). May be overridden by the COBOL programmer. Must be overridden by setting DISC=0 when an internal-only sort is specified.
	TAPE	X	Yes	Enters the maximum (TAPE=6). May be overridden by the COBOL programmer. Must be overridden by setting TAPE=0 when an internal-only sort is specified.
	STOR	X	No	Provides externally defined address KE$ALP, which is defined by linkage editor as the end of the longest phase in the load module. Also provides the amount of memory available for the sort to use; the sort uses memory from KE$ALP to the end of job region.
	RESERV	O	Yes	None. COBOL programmer may pass in job control stream.
	SHARE	O	Yes	None. COBOL programmer may pass in job control stream.
Record Definition	ADDROUT	O	No	None. Tag sorting is not available to a COBOL program.
	BIN	O	Yes	Provides the length of shortest record described in the sort file description (SD). COBOL programmer may override when the lengths and positions of the key fields in his records justify using a different BIN length to improve the efficiency of the sort.
	FIELD	X	No	Provides FIELD from the information on sort key fields contained in SORT statement in COBOL program.
	RCSZ	X	No	Provides RCSZ from the maximum record size described in 01-level entries following sort file description (SD).
	USEQ	O	No	None. To sort data in other than ASCII or EBCDIC, the COBOL programmer will need to use format 3 of the TRANSFORM verb before presenting his data to the sort and afterwards to retranslate it.
Tape Sort	RESUME	O	Yes	None. COBOL programmer specifies when required.
Miscel-laneous	ADTABLE	O	No	Uses ADTABLE to dynamically link parameter table to program.
	CALCAREA	O	No	None. The CALCAREA option is not available to the COBOL programmer.
	CSPRAM	O	No	Enters CSPRAM=OPTION, thus permitting the COBOL programmer to make decision at execution time whether to pass parameters to sort/merge in job control stream.
	NOCKSUM	O	Yes	None. COBOL programmer may pass in job control stream.
	PAD	O	No	Uses PAD to reserve space for parameter table dynamically linked by compiler.
	PRINT	O	No	None. Default value (PRINT=ALL) is assumed by subroutine sort/merge, and all messages generated by the sort are displayed on the system printer.
	SIZE	O	No	None. No means available to COBOL programmer to specify.

*
X = Required for execution
O = Optional



NOTES:

1. Symbol specified is either DMnn for disc or SMnn for tape auxiliary storage. If the user specifies the // WORK jproc, the DVC/LFD sequence may be omitted. The // WORK jproc or the DVC/LFD sequence set is omitted when an internal sort is specified by // PARAM DISC=0 or // PARAM TAPE=0.

2. Linkage editor control statements prepared by COBOL programmer should not include a RES statement (as this statement is generated by OS/3 extended COBOL compiler) unless the programmer has specified the compiler output option //ΔPARAMΔOUT=L to inhibit generation of linkage editor control statements in the object module.

Figure D—1. Typical Job Deck for OS/3 COBOL Program Executing a Sort via OS/3 Subroutine Sort/Merge

Appendix E. Performance Factors

There are several factors that affect OS/3 sort/merge performance. Generally, performance improves when the hardware/software configuration is greater than the minimum. Considerations for the hardware/software configuration include available main storage, number of auxiliary storage devices, and use of own-code routines. Increasing main storage allocation improves sort/merge performance. If more than one disc device is available for sort work files, at least two should be assigned. The minimum work area assigned for disc files should be slightly larger (about 10%) than the data set size. Exceeding this minimum increases sort/merge performance. Including own-code routines in a sort/merge application increases job run time because execution time and main storage, otherwise available to the sort, must be used by own-code routines.

File simplification results in faster sorts that require less central processor time and reduces the number of I/O functions. Performance is improved by decreasing the number and size of key fields, blocking input and output records, and decreasing record size. Specifying accurate information about the size of the file to be processed and the type and length of its records also improves performance.

Sort/merge efficiency can be improved by selecting auxiliary storage devices with faster data transfer rates. Access speeds for direct access devices are listed in Table E—1, and transfer rates for magnetic tape devices are listed in Table E—2.

Table E—1. Comparison of Data Capacities and Access Speeds for Direct Access Devices

Characteristics	Disc Subsystem Type								
	8411	8414	8415	8416	8418–92/93	8418–94/95	8424	8425	8430
Maximum data capacity (8-bit bytes per disc pack)	7,250,000	29,170,000	32,200,000	28,958,720	28,958,720	57,917,440	58,300,000	58,352,000	100,018,280
Maximum track capacity (bytes)	3625	7294	13,030	10,240	10,240	10,240	7294	7294	13,030
Minimum cylinder access time (ms)	25	20	10	10	10	10	10	7.5	7
Average cylinder access time (ms)	75	60	33	30	27	33	30	41.5	27
Maximum cylinder access time (ms)	135	130	60	60	45	60	55	80	50

Table E—2. Comparison of Transfer Rates for Magnetic Tape Devices

Tape Density	Data Transfer Rate					
	UNISERVO 10	UNISERVO 12	UNISERVO 14	UNISERVO 16	UNISERVO 20	UNISERVO VI-C
9-track (phase encoded)						
1600 bpi*	40,000 bps**	68,320 bps	96,000 bps	192,000 bps	320,000 bps	–
9-track (NRZI)						
800 bpi	20,000 bps	34,160 bps	48,000 bps	96,000 bps	–	34,160 bps
7-track (NRZI)						
200 bpi	5,000 bps	8,540 bps	12,000 bps	24,000 bps	–	8,540 bps
556 bpi	13,900 bps	23,740 bps	33,400 bps	66,700 bps	–	23,740 bps
800 bpi	20,000 bps	34,160 bps	40,000 bps	96,000 bps	–	34,160 bps

* bpi = bits per inch
**bps = bits per second

Appendix F. Execution Time Tables

SORT TIME ESTIMATES

Both independent sort/merge and subroutine sort/merge provide a program capability that estimates the sort time (in minutes) and the amount of disc working storage needed to perform a sort operation for a given hardware/software configuration. To use this feature, the CALCAREA parameter is specified on the OPTION control statement for independent sort/merge, and the CALC parameter is specifed on the MR$PRM macro for subroutine sort/merge. The information is useful in determining the near optimal configuration for a sort application. If this feature is not used, the sort time tables supplied in this appendix may be used. Although the time tables are not specifically for SORT3 application, they can be used to give reasonably accurate estimates for sorts performed by this program. SORT3 does not contain the sort estimate calculation feature.

The entries in the tables were calculated from a model using fixed length records. Input and output block sizes used in the tables are not necessarily the most efficient for a given configuration but are intended to represent typical applications. The midpoint of the record size range was used for the compilation.

The following assumptions were made in estimating the execution times shown in the table:

- Time estimates are given for the independent sort/merge. Estimates for comparable subroutine sort/merge and SORT3 runs are close to the table values if the user program performs I/O on the same devices with the same block sizes, and additional CPU usage is limited.
- Tape input and output files are 9-track 1600 bpi except the UNISERVO VI-C Magnetic Tape Subsystem, which is 9-inch track 800 bpi.
- The sort key is a 5-character alphanumeric field.
- The input records are in random order. If the input file sequence is somewhat biased and the desired output sequence is similarly ordered, the actual run time will be less than the table entry. If the desired output sequence is opposite to the bias of the input file, run times will generally be greater than table values.
- No user-own-code routines are included in the execution of the sort.
- The sort is not multiprogrammed; i.e., no other job is using the CPU or input/output devices.
- There is no operator intervention.
- Each work file is on a separate device.
- Disc input and output files, if present, are not located on the same disc drives as the sort work files.
- The SORT control statement contains the NOCKSM=D parameter.
- The SIZE keyword is included in the SORT control statement, and the number of records specified in that keyword is exact.
- All work files are on a single channel.
- User input and user output files are on the same channel as work files, with the following exceptions:
  - User input and output files on devices connected to a selector channel and sectorized disc work files are on separate channels. For example, UNISERVO 16 Magnetic Tape user input and output files and 8418 disc work files are on separate channels.

— UNISERVO VI-C Magnetic Tape Subsystem user input and output files are assumed to be on a multiplexer channel and, consequently, are always on a separate channel from any work disc.

HOW TO USE SORT TIME TABLES

The discussion in this appendix refers to the time table example in Figure F—1. The same steps of interpretation can be applied to any table which comes closest to a particular hardware/software configuration.

```
                                WORK UNIT TYPE          8430
                               INPUT UNIT TYPE           U20
                              INPUT BLOCK SIZE          4800
                              OUTPUT UNIT TYPE           U20
                             OUTPUT BLOCK SIZE          4800
                       APPLICABLE RECORD LENGTHS     320-  639

                        ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT      NO.      -----SIZE OF DATA SET IN MEGABYTES (MB.) ------ MAX
MAIN      WORK      4.8    9.6   14.4   19.2   28.8   57.6   76.8  153.6 CAPAC.
STORAGE   UNITS                                                          (MB.)

 20480      1      9.7     20     33     46     74    161    230     **   91.9
 20480      2      9.6     20     32     45     71    153    217    481  183.8
 20480      3      9.7     21     33     45     70    156    218    466  275.7
 20480      4       10     22     33     45     73    163    224    493  352.6

 49152      1      4.1    5.0     14     19     29     69     99     **   95.6
 49152      2      3.9    8.2     13     17     27     63     87    187  176.4
 49152      3      3.8    6.2     13     17     27     61     86    182  264.6
 49152      4      3.9    8.1     12     17     27     60     83    176  352.8

 81910      1      2.5    5.4    8.7     12     19     40     57     **   95.6
 81910      2      2.5    5.2    8.2     11     18     37     52    123  191.1
 81910      3      2.4    5.1    8.0     11     17     36     50    118  286.7
 81910      4      2.4    5.0    7.8     11     17     35     50    115  382.2

102400      1      2.4    4.8    7.2    9.8     17     38     53     **   95.6
102400      2      2.3    4.6    6.9    9.4     16     35     49    104  191.1
102400      3      2.3    4.5    6.7    9.2     15     34     47     99  286.7
102400      4      2.3    4.5    6.7    9.1     15     34     46     97  382.2

151552      1      1.9    4.0    6.1    8.5     14     29     40     **   99.2
151552      2      1.9    3.8    5.8    8.2     13     28     37     84  198.5
151552      3      1.9    3.8    5.8    8.1     13     27     36     82  297.7
151552      4      1.9    3.8    5.8    8.0     13     27     36     81  396.9
```

Figure F—1. Example Time Table for 8430 Disc Sort

The information located at the upper right in Figure F—1 lists the work unit type, input and output unit types with corresponding input and output block sizes, and a record size range. The data indicates that an 8430 disc drive unit is being used for auxiliary storage where actual sorting and string manipulations take place. Input records are on tape, read from the UNISERVO 20 Magnetic Tape Unit, and input block size is 4800 bytes. Output records will be written to tape on a UNISERVO 20 Magnetic Tape Unit, and output block size will be 4800 bytes. Record lengths for input and output files may range from 320 bytes to 639 bytes.

The leftmost column of Figure F—1, captioned *SORT MAIN STORAGE*, indicates the total memory allocated to the sort job. The second column lists one to four 8430 disc drive units for each amount of sort main storage allocated. The rightmost column of numbers, captioned *MAX CAPAC.(MB.)*, lists the maximum number of megabytes in the input file that can be sorted on the assigned work devices. For example, using 151,552 bytes of main storage and three 8430 discs for auxiliary work units, the input file may have a maximum of 297.7 megabytes or 297,700,000 bytes. This capacity is calculated from the disc work file block size selected by the sort initialization phase for the last configuration having a time estimate printed. The double asterisk indicates that the sort configuration exceeds the disc capacity.

Figure F—1 does not show a disc input file size less than the number of megabytes in the maximum capacity column, which in some cases may still cause disc capacity to be exceeded; however, the double asterisk in the table under time estimates indicates that disc capacity is exceeded when only one disc work unit and 20,480 bytes of main storage are allocated for an input file of 153.6 megabytes.

To determine a time estimate for a particular configuration of input, output, and work devices, locate the configuration most closely resembling yours and use that time table.

NOTE:

For variable-length records, a reasonable approximation of sort execution time can be made by using the most frequent record length as the record size. If actual block size is smaller than the value used in the table heading, estimated time may exceed actual time. Conversely, if the actual block size is larger than the value used in the table, estimated time may be less than the actual time.

Determine the data set size of the input file (in megabytes) by multiplying the record length by the number of records in the file and dividing by 1 million.

NOTE:

If the data set size is not in the table heading under the SIZE OF DATA SET IN MEGABYTES (MB.) *caption, and sort capacity is not exceeded (double asterisk in any of the eight time columns), linear interpolation can be used to approximate between data set sizes listed in the table.*

If most of the records in the input file are 480 bytes long and there are 160,000 records to be sorted, multiplying the number of records by the record length and dividing by 1 million would result in the following data set size:

$$\frac{48}{\frac{480 \cdot 1.6 \cdot 10^5}{10^6}} = 76.8 \text{ megabytes}$$

Now, locate the main storage size available (leftmost column) and the number of work units. Read the estimated time on the line below the column headed by the appropriate data set size. This value is the estimated sort execution time in minutes needed to sort the data set. Using 151,552 bytes of main storage and three work units, the sort would need 36 minutes to execute.

NOTE:

If the amount of sort main storage you are using is not listed in the table, you can use linear interpolation to approximate between data set sizes listed in the table.

SECTORIZED DISC TIME AND CAPACITY CONSIDERATIONS

Figure F—2 is an execution time table for an 8416 sectorized disc. The maximum capacity column gives the maximum number of megabytes in the input file that can be sorted on the assigned work devices. This capacity is calculated from the disc work file block size selected by the sort initialization phase for the last configuration having a time estimate printed.

A sort configuration may exceed the disc capacity even though the number of bytes in the file is less than the maximum capacity. This condition is caused by partially filled blocks at the end of strings and is more noticeable in small main storage cases where several strings are created.

Maximum capacity may be considerably smaller than the actual capacity on sectorized discs (8416 and 8418 disc subsystems). A sectorized disc block size must contain an integral number of 256-byte sectors. For example, in Figure F—2 where the disc work block size (like input) is 1024 bytes, there are four 256-byte sectors. With a block size of 1024 bytes and a record size of 256 bytes, user bytes/track are calculated as follows:

Records/block = (block size — 16) / record size
where 16 is the number of bytes required for sort control information in each block

= (1024 — 16) / 256 = 3 records

Blocks/track = track capacity / block size
where track capacity is the hardware-dependent capacity of Table F—1 (10240 bytes for the 8416 disc) and block size is 1024.

= 10240 / 1024 = 10 blocks

Bytes of user data/track = (blocks/track) (records/block) (record size)
where blocks/track is 10, records/block is 3, and record size is 256 bytes

= (10) (3) (256) = 7680 bytes/track

WORK UNIT TYPE	8416
INPUT UNIT TYPE	8416
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	8416
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	171- 340

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.6	5.1	7.7	10.2	15.4	30.7	41.0	81.9	MAX CAPAC. (MB.)
20480	1	6.7	15	22	31	50	**	**	**	25.3
20480	2	6.3	14	22	29	48	105	142	**	50.6
20480	3	6.3	13	22	30	48	104	141	**	75.8
20480	4	6.2	13	20	29	47	101	136	301	101.1
49152	1	3.5	7.2	11	16	25	**	**	**	27.4
49152	2	3.4	7.0	11	15	24	50	**	**	40.4
49152	3	3.3	6.9	11	15	24	49	67	**	78.0
49152	4	3.3	6.6	11	15	23	48	66	149	109.8
81910	1	2.9	6.2	9.3	12	19	**	**	**	27.4
81910	2	2.7	6.0	9.0	12	18	40	54	**	52.0
81910	3	2.6	6.0	9.0	12	18	40	53	**	78.0
81910	4	2.6	5.7	8.9	12	18	39	53	119	104.0
102400	1	2.8	5.9	8.8	12	19	**	**	**	27.4
102400	2	2.7	5.6	8.7	12	18	36	52	**	54.9
102400	3	2.6	5.6	8.7	12	18	36	50	**	78.0
102400	4	2.7	5.3	8.7	12	18	35	49	107	104.0
151552	1	2.6	5.1	8.0	11	17	**	**	**	28.2
151552	2	2.6	5.1	7.8	11	17	33	47	**	56.3
151552	3	2.6	5.0	7.8	11	17	33	46	**	82.3
151552	4	2.6	4.9	7.6	11	17	33	46	98	112.7

Figure F—2. Example Time Table for 8416 Sectored Disc

As a general rule, track utilization improves as memory increases. Table F—1 supplies track capacities in bytes for all OS/3 disc devices.

Table F—1. Disc Track Capacities

Disc Type	Track Capacity (bytes)
8411	3625
8414	7294
8415	13,030
8416	10,240*
8418—92/93	10,240*
8418—94/95	10,240*
8424	7294
8425	7294
8430	13,030

*In fixed 256-byte sectors, 40 sectors per track

SORT TIME TABLES

The following tables represent a variety of hardware/software configurations.

WORK UNIT TYPE	8418
INPUT UNIT TYPE	U16
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	U16
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	21- 42

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	1.0	1.3	1.9	3.8	5.1	10.2	MAX CAPAC. (MB.)
20480	1	1.5	2.8	4.1	5.4	8.5	17	24	50	49.3
20480	2	1.5	2.8	4.0	5.3	8.2	17	23	48	112.6
20480	3	1.5	2.7	4.0	5.3	8.1	17	23	48	169.2
20480	4	1.5	2.8	4.0	5.4	8.1	17	23	46	197.4
49152	1	1.2	2.0	2.9	3.9	6.1	12	16	34	56.9
49152	2	1.2	2.0	2.9	3.9	6.0	12	16	33	113.9
49152	3	1.2	2.0	2.9	3.9	6.0	12	16	33	170.8
49152	4	1.2	2.0	2.9	3.9	6.0	12	16	33	227.6
81910	1	1.1	1.9	2.7	3.4	5.0	11	15	30	57.5
81910	2	1.1	1.8	2.6	3.4	5.0	11	15	30	115.0
81910	3	1.1	1.8	2.6	3.4	5.0	11	15	30	172.5
81910	4	1.1	1.8	2.6	3.4	5.0	11	15	30	229.9
102400	1	1.1	1.8	2.6	3.4	5.0	10	14	30	57.5
102400	2	1.1	1.8	2.6	3.4	5.0	10	14	29	115.0
102400	3	1.1	1.8	2.6	3.4	5.0	10	14	29	172.5
102400	4	1.1	1.8	2.6	3.4	5.0	10	14	29	229.9
151552	1	1.1	1.9	2.7	3.4	4.9	9.8	13	29	57.5
151552	2	1.1	1.9	2.7	3.4	4.9	9.8	13	29	115.0
151552	3	1.1	1.9	2.6	3.4	4.9	9.8	13	29	172.5
151552	4	1.1	1.9	2.6	3.4	4.9	9.8	13	29	229.9

WORK UNIT TYPE	8416
INPUT UNIT TYPE	U14
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U14
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	21- 42

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	1.0	1.3	1.9	3.8	5.1	10.2	MAX CAPAC. (MB.)
20480	1	1.4	2.5	3.6	5.0	7.7	15	22	45	50.4
20480	2	1.4	2.5	3.5	4.9	7.4	15	21	43	112.1
20480	3	1.4	2.5	3.7	4.9	7.4	15	21	44	152.9
20480	4	1.4	2.5	3.7	4.9	7.4	15	21	44	203.9
49152	1	1.2	2.0	2.8	3.7	5.9	12	16	33	56.9
49152	2	1.2	2.0	2.8	3.7	5.9	12	16	33	113.9
49152	3	1.2	2.0	2.9	3.7	5.9	12	16	33	170.8
49152	4	1.2	2.0	2.9	3.7	5.9	12	16	33	227.8
81910	1	1.2	2.0	2.8	3.6	5.3	11	15	31	57.5
81910	2	1.2	2.0	2.8	3.6	5.3	11	15	31	115.0
81910	3	1.2	2.0	2.8	3.6	5.3	11	15	31	172.5
81910	4	1.2	2.0	2.8	3.6	5.3	11	15	31	229.9
102400	1	1.2	2.0	2.8	3.7	5.3	11	15	32	57.5
102400	2	1.2	2.0	2.8	3.7	5.3	11	15	32	115.0
102400	3	1.2	2.0	2.8	3.7	5.3	11	15	32	172.5
102400	4	1.2	2.0	2.8	3.7	5.3	11	15	31	229.9
151552	1	1.2	2.0	2.8	3.7	5.3	11	14	30	57.5
151552	2	1.2	2.0	2.8	3.7	5.3	11	14	30	115.0
151552	3	1.2	2.0	2.8	3.7	5.3	11	14	30	172.5
151552	4	1.2	2.0	2.8	3.7	5.3	11	14	30	229.9

WORK UNIT TYPE	8418
INPUT UNIT TYPE	U12
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U12
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	21- 42

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	1.0	1.3	1.9	3.8	5.1	10.2	MAX CAPAC. (MB.)
20480	1	1.4	2.5	3.7	5.1	7.8	16	22	45	50.4
20480	2	1.4	2.5	3.6	5.0	7.5	15	21	43	112.1
20480	3	1.4	2.5	3.8	5.0	7.5	15	21	45	152.9
20480	4	1.4	2.5	3.8	5.0	7.5	15	21	45	203.9
49152	1	1.2	2.0	2.9	3.8	6.0	12	16	34	56.9
49152	2	1.2	2.0	2.9	3.8	6.0	12	16	34	113.9
49152	3	1.2	2.0	2.9	3.8	6.0	12	16	34	170.8
49152	4	1.2	2.0	2.9	3.8	6.0	12	16	34	227.8
81910	1	1.2	2.0	2.8	3.6	5.4	11	16	32	57.5
81910	2	1.2	2.0	2.8	3.6	5.4	11	16	32	115.0
81910	3	1.2	2.0	2.8	3.6	5.4	11	16	32	172.5
81910	4	1.2	2.0	2.8	3.6	5.4	11	16	32	229.9
102400	1	1.2	2.0	2.8	3.7	5.4	11	15	32	57.5
102400	2	1.2	2 0	2.8	3.7	5.3	11	15	32	115.0
102400	3	1.2	2.0	2.8	3.7	5.3	11	15	32	172.5
102400	4	1.2	2.0	2.8	3.7	5.3	11	15	32	229.9
151552	1	1.2	2.0	2.8	3.7	5.3	11	14	31	57.5
151552	2	1.2	2.0	2.8	3.7	5.3	11	14	31	115.0
151552	3	1.2	2.0	2.8	3.7	5.3	11	14	31	172.5
151552	4	1.2	2.0	2.8	3.7	5.3	11	14	31	229.9

WORK UNIT TYPE	8418
INPUT UNIT TYPE	U10
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U10
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	21- 42

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	1.0	1.3	1.9	3.8	5.1	10.2	MAX CAPAC. (MB.)
20480	1	1.5	2.7	3.9	5.4	8.3	17	23	48	50.4
20480	2	1.5	2.7	3.8	5.3	8.1	16	23	46	112.1
20480	3	1.5	2.7	4.0	5.4	8.0	16	22	47	152.9
20480	4	1.5	2.7	4.1	5.4	8.0	16	22	48	203.9
49152	1	1.2	2.1	3.0	4.0	6.4	13	18	36	56.9
49152	2	1.2	2.1	3.0	4.0	6.4	13	18	36	113.9
49152	3	1.2	2.1	3.0	4.0	6.3	13	18	36	170.8
49152	4	1.2	2.1	3.0	4.0	6.3	13	18	36	227.8
81910	1	1.2	2.1	3.0	3.8	5.7	12	17	35	57.5
81910	2	1.2	2.1	3.0	3.8	5.7	12	17	35	115.0
81910	3	1.2	2.1	3.0	3.8	5.7	12	17	34	172.5
81910	4	1.2	2.1	3.0	3.8	5.6	12	17	34	229.9
102400	1	1.2	2.1	3.0	3.9	5.7	11	16	34	55.9
102400	2	1.2	2.1	3.0	3.9	5.6	11	16	34	115.0
102400	3	1.2	2.1	3.0	3.9	5.6	11	16	34	172.5
102400	4	1.2	2.1	3.0	3.9	5.6	11	16	34	229.9
151552	1	1.3	2.1	3.0	3.9	5.7	11	15	33	57.5
151552	2	1.3	2.1	3.0	3.9	5.7	11	15	32	115.0
151552	3	1.3	2.1	3.0	3.9	5.7	11	15	32	172.5
151552	4	1.3	2.1	3.0	3.9	5.7	11	15	32	229.9

WORK UNIT TYPE	8418
INPUT UNIT TYPE	8416
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8418
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	21- 42

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	1.0	1.3	1.9	3.8	5.1	10.2	MAX CAPAC. (MB.)
20480	1	1.6	2.9	4.4	5.8	8.7	19	25	55	56.4
20480	2	1.5	2.8	4.2	5.6	8.3	18	24	51	112.1
20480	3	1.6	2.8	4.2	5.7	8.7	18	24	51	169.2
20480	4	1.6	2.9	4.3	5.7	8.8	18	24	52	225.6
49152	1	1.2	2.0	2.9	4.0	6.1	12	16	34	56.9
49152	2	1.2	2.0	2.9	3.9	6.1	12	16	34	113.9
49152	3	1.2	2.0	2.9	3.9	6.1	12	16	34	170.8
49152	4	1.2	2.0	2.9	3.9	6.1	12	16	34	227.8
81910	1	1.1	1.9	2.7	3.5	5.2	11	15	31	57.5
81910	2	1.1	1.9	2.7	3.5	5.2	11	15	31	115.0
81910	3	1.1	1.9	2.7	3.5	5.2	11	15	31	172.5
81910	4	1.1	1.9	2.7	3.5	5.2	11	15	31	229.9
102400	1	1.1	1.9	2.7	3.5	5.2	11	15	31	57.5
102400	2	1.1	1.9	2.7	3.5	5.2	11	15	30	115.0
102400	3	1.1	1.9	2.7	3.5	5.2	11	15	30	172.5
102400	4	1.1	1.9	2.7	3.5	5.2	11	15	30	229.9
151552	1	1.2	2.0	2.7	3.5	5.1	10	13	30	57.5
151552	2	1.2	2.0	2.7	3.5	5.1	10	13	30	115.0
151552	3	1.2	2.0	2.7	3.5	5.1	10	13	30	172.5
151552	4	1.2	2.0	2.7	3.5	5.1	10	13	30	229.9

WORK UNIT TYPE	8416
INPUT UNIT TYPE	8414
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8414
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	21- 42

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	1.0	1.3	1.9	3.8	5.1	10.2	MAX CAPAC. (MB.)
20480	1	1.6	2.9	4.4	5.8	8.7	19	25	55	56.4
20480	2	1.5	2.9	4.2	5.5	8.3	18	24	51	112.1
20480	3	1.6	2.9	4.3	5.7	8.6	18	24	52	169.2
20480	4	1.6	2.9	4.3	5.7	8.9	18	24	52	225.6
49152	1	1.2	2.1	3.0	4.0	6.2	12	17	34	56.9
49152	2	1.2	2.1	2.9	4.0	6.2	12	17	34	113.9
49152	3	1.2	2.1	2.9	4.0	6.2	12	17	34	170.8
49152	4	1.2	2.1	2.9	4.0	6.2	12	17	34	227.8
81910	1	1.1	1.9	2.7	3.5	5.2	11	15	31	57.5
81910	2	1.1	1.9	2.7	3.5	5.2	11	15	31	115.0
81910	3	1.1	1.9	2.7	3.5	5.2	11	15	31	172.5
81910	4	1.1	1.9	2.7	3.5	5.2	11	15	31	229.9
102400	1	1.1	1.9	2.7	3.5	5.2	11	15	31	57.5
102400	2	1.1	1.9	2.7	3.5	5.2	11	15	31	115.0
102400	3	1.1	1.9	2.7	3.5	5.2	11	15	31	172.5
102400	4	1.1	1.9	2.7	3.5	5.2	11	15	31	229.9
151552	1	1.2	2.0	2.8	3.5	5.1	10	13	30	57.5
151552	2	1.2	2.0	2.8	3.5	5.1	10	13	30	115.0
151552	3	1.2	2.0	2.8	3.5	5.1	10	13	30	172.5
151552	4	1.2	2.0	2.8	3.5	5.1	10	13	30	229.9

WORK UNIT TYPE	8418
INPUT UNIT TYPE	U16
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	U16
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	43- 84

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.3	1.9	2.6	3.8	7.7	10.2	20.5	MAX CAPAC. (MB.)
20480	1	2.1	4.0	6.3	8.6	13	28	38	89	55.0
20480	2	2.0	3.9	6.0	8.0	12	26	35	81	99.6
20480	3	2.1	3.9	6.0	8.4	13	26	35	80	149.7
20480	4	2.1	4.0	6.0	8.4	13	26	36	79	219.8
49152	1	1.3	2.4	3.7	4.8	7.1	15	21	44	55.3
49152	2	1.3	2.4	3.6	4.8	7.2	14	20	43	110.6
49152	3	1.3	2.4	3.6	4.7	7.1	14	20	42	165.9
49152	4	1.3	2.4	3.6	4.8	7.1	14	20	42	221.3
81910	1	1.1	2.0	2.9	3.8	6.0	12	16	34	55.3
81910	2	1.1	2.0	2.9	3.8	6.0	12	16	33	110.6
81910	3	1.1	2.0	2.9	3.8	6.0	12	16	33	165.9
81910	4	1.1	2.0	2.8	3.8	6.0	12	16	33	221.3
102400	1	1.1	1.9	2.8	3.6	5.6	12	16	32	57.1
102400	2	1.1	1.9	2.8	3.6	5.6	12	16	32	114.2
102400	3	1.1	1.9	2.8	3.6	5.6	12	16	32	171.4
102400	4	1.1	1.9	2.8	3.6	5.6	12	16	32	228.5
151552	1	1.2	1.9	2.7	3.6	5.2	11	15	31	57.5
151552	2	1.2	1.9	2.7	3.6	5.2	11	15	31	115.0
151552	3	1.2	1.9	2.7	3.6	5.2	11	15	31	172.5
151552	4	1.2	1.9	2.7	3.6	5.2	11	15	31	229.9

WORK UNIT TYPE	8416
INPUT UNIT TYPE	U14
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U14
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	43- 84

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.3	1.9	2.6	3.8	7.7	10.2	20.5	MAX CAPAC. (MB.)
20480	1	1.8	3.4	5.4	7.3	11	24	33	76	55.0
20480	2	1.7	3.4	5.1	6.9	10	23	31	69	109.9
20480	3	1.7	3.4	5.1	6.8	10	23	31	67	144.3
20480	4	1.7	3.4	5.1	6.8	10	22	31	67	219.8
49152	1	1.3	2.3	3.5	4.6	6.8	14	20	41	55.3
49152	2	1.3	2.3	3.4	4.5	6.6	14	19	40	110.6
49152	3	1.3	2.3	3.4	4.5	6.6	14	19	40	165.9
49152	4	1.3	2.3	3.4	4.5	6.6	14	19	40	221.3
81910	1	1.2	2.1	3.2	4.2	6.4	13	17	36	57.1
81910	2	1.2	2.2	3.2	4.2	6.4	13	17	36	114.2
81910	3	1.2	2.2	3.2	4.2	6.4	13	17	36	171.4
81910	4	1.2	2.2	3.2	4.2	6.4	13	17	37	226.5
102400	1	1.2	2.2	3.1	4.2	6.0	13	18	36	57.1
102400	2	1.2	2.2	3.1	4.2	6.1	13	18	36	114.2
102400	3	1.2	2.2	3.1	4.1	6.0	13	18	36	171.4
102400	4	1.2	2.2	3.1	4.1	6.0	13	18	36	228.5
151552	1	1.3	2.2	3.0	3.9	6.0	12	17	35	57.5
151552	2	1.3	2.2	3.0	3.9	6.0	12	17	35	115.0
151552	3	1.3	2.2	3.0	3.9	6.0	12	17	35	172.5
151552	4	1.3	2.1	3.0	3.9	6.0	12	17	35	229.9

WORK UNIT TYPE	8418
INPUT UNIT TYPE	U12
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U12
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	43- 84

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.3	1.9	2.6	3.8	7.7	10.2	20.5	MAX CAPAC. (MB.)
20480	1	1.9	3.6	5.7	7.7	12	26	35	78	55.0
20480	2	1.8	3.6	5.4	7.3	11	24	33	72	109.9
20480	3	1.8	3.6	5.4	7.2	11	24	33	70	144.3
20480	4	1.8	3.6	5.4	7.2	11	24	33	70	219.8
49152	1	1.3	2.4	3.7	5.0	7.4	15	20	43	56.0
49152	2	1.3	2.4	3.6	4.9	7.3	15	20	43	112.1
49152	3	1.3	2.4	3.7	4.9	7.3	15	20	43	168.1
49152	4	1.3	2.4	3.7	4.9	7.3	15	20	43	224.2
81910	1	1.3	2.3	3.3	4.3	6.7	14	19	39	55.3
81910	2	1.3	2.3	3.3	4.3	6.7	14	19	38	110.6
81910	3	1.3	2.3	3.3	4.3	6.6	14	19	39	165.9
81910	4	1.3	2.3	3.3	4.3	6.6	14	19	39	221.3
102400	1	1.3	2.3	3.3	4.3	6.3	14	19	38	57.1
102400	2	1.3	2.3	3.3	4.3	6.3	14	19	38	114.2
102400	3	1.3	2.3	3.2	4.3	6.3	14	19	38	171.4
102400	4	1.3	2.3	3.2	4.3	6.3	14	19	38	228.5
151552	1	1.3	2.3	3.2	4.2	6.3	13	18	37	57.5
151552	2	1.3	2.3	3.2	4.2	6.3	13	18	37	115.0
151552	3	1.3	2.3	3.2	4.2	6.2	13	18	37	172.5
151552	4	1.3	2.3	3.2	4.2	6.2	13	18	37	229.9

WORK UNIT TYPE	8416
INPUT UNIT TYPE	U10
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U10
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	43- 84

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.3	1.9	2.6	3.8	7.7	10.2	20.5	MAX CAPAC. (MB.)
20480	1	2.4	4.7	7.3	9.9	15	32	44	93	54.2
20480	2	2.4	4.6	7.0	9.5	14	31	42	89	109.9
20480	3	2.4	4.7	7.0	9.5	14	31	42	88	164.9
20480	4	2.4	4.7	7.0	9.5	14	31	41	88	219.8
49152	1	1.8	3.3	5.0	7.1	11	21	29	60	56.0
49152	2	1.8	3.3	5.0	7.0	10	21	28	60	112.1
49152	3	1.8	3.3	5.0	7.0	10	21	28	59	168.1
49152	4	1.8	3.3	5.0	7.0	10	21	28	59	224.2
81910	1	1.8	3.2	4.6	6.1	9.4	20	27	55	55.3
81910	2	1.8	3.2	4.6	6.1	9.3	20	27	54	110.6
81910	3	1.8	3.2	4.6	6.1	9.3	20	27	55	165.9
81910	4	1.8	3.2	4.6	6.1	9.3	20	27	55	221.3
102400	1	1.8	3.2	4.6	6.0	8.9	20	27	54	57.1
102400	2	1.8	3.2	4.6	6.0	8.9	20	27	54	114.2
102400	3	1.8	3.2	4.6	6.0	8.9	19	27	54	171.4
102400	4	1.8	3.2	4.6	6.0	8.9	19	27	54	228.5
151552	1	1.8	3.2	4.6	6.0	8.9	18	25	53	57.5
151552	2	1.8	3.2	4.6	6.0	8.9	18	25	53	114.2
151552	3	1.8	3.2	4.6	6.0	8.9	18	25	53	171.4
151552	4	1.8	3.2	4.6	6.0	8.8	18	25	53	228.5

WORK UNIT TYPE	8418
INPUT UNIT TYPE	U12
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U12
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	43- 84

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.3	1.9	2.6	3.8	7.7	10.2	20.5	MAX CAPAC. (MB.)
20480	1	1.9	3.6	5.7	7.7	12	26	35	78	55.0
20480	2	1.8	3.6	5.4	7.3	11	24	33	72	109.9
20480	3	1.8	3.6	5.4	7.2	11	24	33	70	144.3
20480	4	1.8	3.6	5.4	7.2	11	24	33	70	219.8
49152	1	1.3	2.4	3.7	5.0	7.4	15	20	43	56.0
49152	2	1.3	2.4	3.6	4.9	7.3	15	20	43	112.1
49152	3	1.3	2.4	3.7	4.9	7.3	15	20	43	168.1
49152	4	1.3	2.4	3.7	4.9	7.3	15	20	43	224.2
81910	1	1.3	2.3	3.3	4.3	6.7	14	19	39	55.3
81910	2	1.3	2.3	3.3	4.3	6.7	14	19	38	110.6
81910	3	1.3	2.3	3.3	4.3	6.6	14	19	39	165.9
81910	4	1.3	2.3	3.3	4.3	6.6	14	19	39	221.3
102400	1	1.3	2.3	3.3	4.3	6.3	14	19	38	57.1
102400	2	1.3	2.3	3.3	4.3	6.3	14	19	38	114.2
102400	3	1.3	2.3	3.2	4.3	6.3	14	19	38	171.4
102400	4	1.3	2.3	3.2	4.3	6.3	14	19	38	228.5
151552	1	1.3	2.3	3.2	4.2	6.3	13	18	37	57.5
151552	2	1.3	2.3	3.2	4.2	6.3	13	18	37	115.0
151552	3	1.3	2.3	3.2	4.2	6.2	13	18	37	172.5
151552	4	1.3	2.3	3.2	4.2	6.2	13	18	37	229.9

WORK UNIT TYPE	8416
INPUT UNIT TYPE	U10
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U10
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	43- 84

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.3	1.9	2.6	3.8	7.7	10.2	20.5	MAX CAPAC. (MB.)
20480	1	2.4	4.7	7.3	9.9	15	32	44	93	54.2
20480	2	2.4	4.6	7.0	9.5	14	31	42	89	109.9
20480	3	2.4	4.7	7.0	9.5	14	31	42	88	164.9
20480	4	2.4	4.7	7.0	9.5	14	31	41	88	219.8
49152	1	1.8	3.3	5.0	7.1	11	21	29	60	56.0
49152	2	1.8	3.3	5.0	7.0	10	21	28	60	112.1
49152	3	1.8	3.3	5.0	7.0	10	21	28	59	168.1
49152	4	1.8	3.3	5.0	7.0	10	21	28	59	224.2
81910	1	1.8	3.2	4.6	6.1	9.4	20	27	55	55.3
81910	2	1.8	3.2	4.6	6.1	9.3	20	27	54	110.6
81910	3	1.8	3.2	4.6	6.1	9.3	20	27	55	165.9
81910	4	1.8	3.2	4.6	6.1	9.3	20	27	55	221.3
102400	1	1.8	3.2	4.6	6.0	8.9	20	27	54	57.1
102400	2	1.8	3.2	4.6	6.0	8.9	20	27	54	114.2
102400	3	1.8	3.2	4.6	6.0	8.9	19	27	54	171.4
102400	4	1.8	3.2	4.6	6.0	8.9	19	27	54	228.5
151552	1	1.8	3.2	4.6	6.0	8.9	18	25	53	57.5
151552	2	1.8	3.2	4.6	6.0	8.9	18	25	53	114.2
151552	3	1.8	3.2	4.6	6.0	8.9	18	25	53	171.4
151552	4	1.8	3.2	4.6	6.0	8.8	18	25	53	228.5

WORK UNIT TYPE	8418
INPUT UNIT TYPE	8418
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8418
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	43- 84

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.3	1.9	2.6	3.8	7.7	10.2	20.5	MAX CAPAC. (MB.)
20480	1	2.2	4.4	6.6	8.8	14	30	43	94	56.0
20480	2	2.1	4.1	6.1	8.3	13	28	39	84	108.5
20480	3	2.1	4.1	6.6	8.9	13	28	39	85	164.9
20480	4	2.1	4.2	6.6	8.9	13	28	40	83	219.8
49152	1	1.3	2.5	3.6	4.8	7.1	15	21	43	55.3
49152	2	1.3	2.5	3.6	4.7	7.1	14	20	42	110.6
49152	3	1.3	2.4	3.6	4.7	7.1	14	20	42	165.9
49152	4	1.3	2.5	3.6	4.7	7.1	14	20	42	221.3
81910	1	1.2	2.0	3.0	3.9	6.2	12	16	35	55.3
81910	2	1.2	2.0	2.9	3.9	6.1	12	16	34	110.6
81910	3	1.2	2.0	2.9	3.9	6.1	12	16	34	165.9
81910	4	1.2	2.0	2.9	4.0	6.1	12	16	34	221.3
102400	1	1.2	2.0	2.9	3.8	5.8	12	16	33	57.1
102400	2	1.2	2.0	2.9	3.8	5.8	12	16	33	114.2
102400	3	1.2	2.0	2.9	3.8	5.8	12	16	33	171.4
102400	4	1.2	2.0	2.9	3.8	5.8	12	16	33	228.5
151552	1	1.2	2.0	2.8	3.7	5.4	11	16	32	57.5
151552	2	1.2	2.0	2.8	3.7	5.4	11	16	32	115.0
151552	3	1.2	2.0	2.8	3.7	5.4	11	16	32	172.5
151552	4	1.2	2.0	2.8	3.7	5.4	11	16	32	229.9

WORK UNIT TYPE	8416
INPUT UNIT TYPE	8414
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8414
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	43- 84

ESTIMATED SORT EXECUTION TIME IN MINUTES

SCRT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.3	1.9	2.6	3.8	7.7	10.2	20.5	MAX CAPAC. (MB.)
20480	1	2.2	4.4	6.5	8.7	14	30	43	93	54.2
20480	2	2.1	4.1	6.1	8.2	13	28	39	84	108.5
20480	3	2.1	4.1	6.7	9.0	14	28	40	85	164.9
20480	4	2.1	4.3	6.7	9.0	14	28	40	84	219.8
49152	1	1.3	2.5	3.7	4.9	7.2	15	21	44	55.3
49152	2	1.3	2.5	3.7	4.9	7.3	14	20	43	110.6
49152	3	1.3	2.5	3.7	4.9	7.2	14	20	43	165.9
49152	4	1.3	2.5	3.7	4.8	7.2	14	20	43	221.3
81910	1	1.2	2.0	3.0	4.0	6.2	12	16	35	55.3
81910	2	1.2	2.0	3.0	3.9	6.2	12	16	34	110.6
81910	3	1.2	2.0	2.9	4.0	6.2	12	16	34	165.9
81910	4	1.2	2.0	2.9	4.0	6.2	12	16	34	221.3
102400	1	1.2	2.0	2.9	3.8	5.8	12	16	33	57.1
102400	2	1.2	2.0	2.9	3.8	5.8	12	16	33	114.2
102400	3	1.2	2.0	2.9	3.8	5.8	12	16	33	171.4
102400	4	1.2	2.0	2.9	3.8	5.8	12	16	33	228.5
151552	1	1.2	2.0	2.8	3.8	5.5	11	16	32	57.5
151552	2	1.2	2.0	2.8	3.8	5.5	11	16	32	115.0
151552	3	1.2	2.0	2.8	3.8	5.5	11	16	32	172.5
151552	4	1.2	2.0	2.8	3.8	5.5	11	16	32	229.9

WORK UNIT TYPE	8418
INPUT UNIT TYPE	U16
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	U16
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	85- 170

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.3	2.6	3.8	5.1	7.7	15.4	20.5	41.0	MAX CAPAC. (MB.)
20480	1	3.5	7.6	12	16	26	56	76	175	54.2
20480	2	3.4	7.2	11	15	24	51	72	165	101.2
20480	3	3.4	7.3	11	15	23	52	71	161	156.2
20480	4	3.4	7.2	11	15	23	51	70	156	208.2
49152	1	1.7	3.4	5.1	6.9	10	23	32	65	54.2
49152	2	1.7	3.4	4.9	6.9	10	23	31	64	108.5
49152	3	1.7	3.4	4.9	6.8	10	22	31	63	162.7
49152	4	1.7	3.4	4.9	6.8	10	22	31	65	216.9
81910	1	1.3	2.4	3.7	5.0	7.4	16	22	49	56.4
81910	2	1.3	2.4	3.7	4.8	7.2	16	22	46	108.5
81910	3	1.3	2.4	3.7	4.8	7.2	16	21	46	169.2
81910	4	1.3	2.4	3.6	4.8	7.1	15	21	45	225.6
102400	1	1.2	2.2	3.4	4.8	7.2	15	20	44	56.4
102400	2	1.2	2.2	3.4	4.7	7.1	14	19	42	112.8
102400	3	1.2	2.2	3.4	4.7	7.0	14	19	41	169.2
102400	4	1.2	2.2	3.4	4.6	7.0	14	19	41	225.6
151552	1	1.2	2.1	3.1	3.9	6.4	13	18	39	57.1
151552	2	1.2	2.1	3.1	3.9	6.3	13	17	38	114.2
151552	3	1.2	2.1	3.1	3.9	6.3	13	17	37	171.4
151552	4	1.2	2.1	3.1	3.9	6.3	13	17	37	228.5

WORK UNIT TYPE	8418
INPUT UNIT TYPE	U14
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U14
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	85- 170

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.3	2.6	3.8	5.1	7.7	15.4	20.5	41.0	MAX CAPAC. (MB.)
20480	1	3.1	6.5	9.8	14	22	50	69	149	54.2
20480	2	2.9	6.0	9.0	13	20	46	63	141	104.1
20480	3	2.9	6.0	9.0	13	20	44	61	136	143.2
20480	4	3.0	6.0	9.0	13	20	45	60	133	190.9
49152	1	1.7	3.5	5.1	6.8	11	23	32	68	54.2
49152	2	1.7	3.4	5.0	6.8	10	22	31	64	108.5
49152	3	1.6	3.4	5.0	6.7	10	22	31	63	162.7
49152	4	1.7	3.4	5.0	6.7	10	22	30	63	216.9
81910	1	1.6	2.8	4.4	6.2	9.3	19	26	54	54.2
81910	2	1.6	2.8	4.3	6.1	9.1	19	26	52	108.5
81910	3	1.6	2.8	4.3	6.0	9.0	19	25	51	162.7
81910	4	1.6	2.8	4.3	6.0	9.0	18	25	51	216.9
102400	1	1.6	2.8	4.0	5.6	8.9	18	24	51	56.4
102400	2	1.6	2.8	4.0	5.6	8.9	18	24	50	112.8
102400	3	1.6	2.8	4.0	5.6	8.8	18	24	50	169.2
102400	4	1.6	2.8	4.0	5.6	8.8	18	24	50	225.6
151552	1	1.6	2.7	4.0	5.2	8.0	17	23	48	57.1
151552	2	1.6	2.7	4.0	5.2	8.0	17	23	48	114.2
151552	3	1.6	2.7	4.0	5.2	8.0	17	23	47	171.4
151552	4	1.6	2.7	4.0	5.1	7.9	17	23	47	228.5

WORK UNIT TYPE	8418
INPUT UNIT TYPE	U12
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U12
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	85- 170

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.3	2.6	3.8	5.1	7.7	15.4	20.5	41.0	MAX CAPAC. (MB.)
20480	1	3.5	7.1	11	15	24	52	73	161	54.2
20480	2	3.4	6.9	10	14	23	49	69	147	104.1
20480	3	3.4	6.9	10	14	23	49	68	144	156.2
20480	4	3.4	6.9	10	14	23	49	68	145	208.2
49152	1	2.1	4.4	6.5	8.6	13	28	38	82	54.2
49152	2	2.1	4.3	6.3	8.5	13	27	38	78	108.5
49152	3	2.1	4.3	6.3	8.5	13	27	37	78	162.7
49152	4	2.1	4.3	6.3	8.5	13	27	37	77	216.9
81910	1	2.0	3.6	5.6	7.8	12	24	33	67	54.2
81910	2	2.0	3.6	5.6	7.7	12	24	32	65	108.5
81910	3	2.0	3.6	5.5	7.7	12	24	32	65	162.7
81910	4	2.0	3.6	5.5	7.6	12	24	32	65	216.9
102400	1	2.0	3.6	5.2	7.3	11	23	31	65	56.4
102400	2	2.0	3.6	5.2	7.2	11	23	31	64	112.8
102400	3	2.0	3.6	5.2	7.2	11	23	31	63	169.2
102400	4	2.0	3.6	5.2	7.2	11	23	31	63	225.6
151552	1	2.0	3.6	5.2	6.8	10	22	30	62	57.1
151552	2	2.0	3.6	5.2	6.8	10	22	29	61	114.2
151552	3	2.0	3.6	5.2	6.8	10	22	29	61	171.4
151552	4	2.0	3.6	5.2	6.8	10	22	29	61	228.5

WORK UNIT TYPE	8418
INPUT UNIT TYPE	U10
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U10
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	85- 170

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.3	2.6	3.8	5.1	7.7	15.4	20.5	41.0	MAX CAPAC. (MB.)
20480	1	4.6	9.5	14	20	30	65	90	192	47.7
20480	2	4.6	9.4	14	19	30	64	88	184	104.1
20480	3	4.5	9.4	14	19	30	63	87	182	156.2
20480	4	4.6	9.4	14	19	30	64	87	182	216.9
49152	1	3.3	6.9	10	14	21	43	58	122	54.2
49152	2	3.2	6.8	10	13	20	42	58	118	108.5
49152	3	3.3	6.8	10	13	20	42	57	118	162.7
49152	4	3.2	6.8	10	13	20	42	57	117	216.9
81910	1	3.2	6.0	9.2	13	19	39	53	107	54.2
81910	2	3.2	6.0	9.2	13	19	38	52	105	108.5
81910	3	3.2	6.0	9.2	13	19	39	52	105	162.7
81910	4	3.2	6.0	9.2	13	19	39	52	105	216.9
102400	1	3.2	6.0	8.8	12	19	38	51	105	56.4
102400	2	3.2	6.0	8.9	12	19	38	51	103	112.6
102400	3	3.2	6.0	8.8	12	19	38	51	103	169.2
102400	4	3.2	6.0	8.8	12	19	38	51	103	225.6
151552	1	3.2	6.0	8.8	12	18	37	50	102	57.1
151552	2	3.2	6.0	8.8	12	18	37	49	101	114.2
151552	3	3.2	6.0	8.8	12	17	37	49	101	171.4
151552	4	3.2	6.0	8.8	12	18	37	49	101	228.5

WORK UNIT TYPE	8418
INPUT UNIT TYPE	8418
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8418
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	85- 170

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.3	2.6	3.8	5.1	7.7	15.4	20.5	41.0	MAX CAPAC. (MB.)
20480	1	3.7	7.5	12	16	26	55	75	174	54.2
20480	2	3.7	7.3	12	16	25	53	74	165	108.5
20480	3	3.7	7.5	12	16	25	53	74	165	162.7
20480	4	3.7	7.3	12	15	25	51	72	160	208.2
49152	1	1.7	3.4	5.0	6.8	10	24	32	67	54.2
49152	2	1.7	3.3	5.0	6.8	10	22	31	66	108.5
49152	3	1.7	3.3	5.0	6.7	9.9	22	31	65	162.7
49152	4	1.7	3.3	5.0	6.7	9.9	22	30	64	216.9
81910	1	1.3	2.5	3.8	5.1	7.6	17	23	50	56.4
81910	2	1.3	2.5	3.7	5.0	7.3	16	22	47	112.8
81910	3	1.3	2.4	3.7	5.0	7.3	16	22	47	169.2
81910	4	1.3	2.4	3.7	4.9	7.3	16	21	46	225.6
102400	1	1.3	2.3	3.6	4.9	7.4	15	20	45	56.4
102400	2	1.3	2.3	3.5	4.8	7.3	15	20	43	112.8
102400	3	1.3	2.3	3.5	4.8	7.2	15	19	43	169.2
102400	4	1.3	2.3	3.5	4.7	7.2	14	19	42	225.6
151552	1	1.3	2.2	3.1	4.1	6.6	14	18	40	57.1
151552	2	1.3	2.2	3.1	4.1	6.5	13	18	39	114.2
151552	3	1.3	2.2	3.1	4.1	6.5	13	18	38	171.4
151552	4	1.3	2.2	3.1	4.1	6.5	13	18	38	228.5

WORK UNIT TYPE	8416
INPUT UNIT TYPE	8414
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8414
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	85- 170

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.3	2.6	3.8	5.1	7.7	15.4	20.5	41.0	MAX CAPAC. (MB.)
20480	1	3.8	7.6	12	17	26	56	77	178	54.2
20480	2	3.7	7.5	12	16	25	53	75	168	108.5
20480	3	3.8	7.5	12	16	25	53	75	165	156.2
20480	4	3.7	7.4	12	16	25	53	74	158	208.2
49152	1	1.7	3.4	5.0	6.9	10	23	31	65	54.2
49152	2	1.7	3.3	5.0	6.9	10	22	31	64	108.5
49152	3	1.7	3.3	5.0	6.9	10	22	31	65	164.9
49152	4	1.7	3.3	5.0	6.8	10	22	31	65	219.8
81910	1	1.3	2.5	3.9	5.2	7.6	17	23	50	54.2
81910	2	1.3	2.5	3.8	5.0	7.4	16	22	47	112.8
81910	3	1.3	2.5	3.8	5.0	7.4	16	22	47	169.2
81910	4	1.3	2.5	3.8	5.0	7.4	16	21	46	219.6
102400	1	1.3	2.3	3.6	4.9	7.5	15	20	45	56.4
102400	2	1.3	2.3	3.5	4.9	7.3	15	20	43	112.8
102400	3	1.3	2.3	3.5	4.8	7.3	15	20	43	169.2
102400	4	1.3	2.3	3.5	4.8	7.3	15	20	43	225.6
151552	1	1.3	2.2	3.2	4.1	6.6	14	18	40	57.1
151552	2	1.3	2.2	3.2	4.1	6.6	14	18	39	114.2
151552	3	1.3	2.2	3.2	4.1	6.5	13	18	39	171.4
151552	4	1.3	2.2	3.2	4.1	6.5	13	18	39	228.5

WORK UNIT TYPE	8418
INPUT UNIT TYPE	U16
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	U16
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	171- 340

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.6	5.1	7.7	10.2	15.4	30.7	41.0	81.9	MAX CAPAC. (MB.)
20480	1	6.8	15	24	33	51	116	**	**	40.5
20480	2	7.0	15	24	32	50	113	159	343	101.2
20480	3	6.8	15	23	32	48	109	153	329	151.8
20480	4	6.8	15	23	31	48	107	150	323	202.5
49152	1	2.7	5.4	8.9	12	20	41	56	**	52.1
49152	2	2.6	5.5	8.4	12	19	39	54	123	109.9
49152	3	2.6	5.4	8.2	12	18	38	54	120	164.9
49152	4	2.6	5.4	8.2	12	18	38	53	118	219.8
81910	1	1.7	3.4	5.2	7.0	12	27	39	**	55.0
81910	2	1.7	3.3	4.9	6.5	11	25	35	75	109.9
81910	3	1.7	3.3	4.9	6.5	11	24	34	72	164.9
81910	4	1.7	3.3	4.9	6.4	11	24	33	71	219.8
102400	1	1.5	3.2	5.0	6.8	10	22	33	**	56.4
102400	2	1.5	3.1	4.7	6.4	9.7	21	31	68	112.8
102400	3	1.5	3.1	4.7	6.3	9.5	20	30	67	169.2
102400	4	1.5	3.1	4.6	6.2	9.4	20	29	67	225.6
151552	1	1.4	2.4	4.1	5.7	8.5	18	26	**	56.4
151552	2	1.4	2.5	4.2	5.5	8.3	17	25	55	112.8
151552	3	1.4	2.5	4.1	5.5	8.3	17	25	54	169.2
151552	4	1.4	2.5	4.1	5.5	8.3	17	25	54	225.6

WORK UNIT TYPE	8418
INPUT UNIT TYPE	U14
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U14
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	171- 340

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.6	5.1	7.7	10.2	15.4	30.7	41.0	81.9	MAX CAPAC. (MB.)
20480	1	6.1	13	21	28	46	105	144	**	50.6
20480	2	6.2	13	20	28	45	99	135	304	101.2
20480	3	6.1	13	20	28	44	97	132	295	151.6
20480	4	6.1	13	20	27	44	95	130	290	202.5
49152	1	3.3	6.4	10	14	22	48	65	**	52.1
49152	2	3.2	6.3	9.8	13	21	45	61	139	104.1
49152	3	3.2	6.3	9.6	13	21	45	60	135	156.2
49152	4	3.2	6.3	9.6	13	20	44	60	134	208.2
81910	1	2.6	5.7	8.5	11	17	37	50	**	52.1
81910	2	2.6	5.6	8.3	11	17	36	48	108	104.1
81910	3	2.6	5.5	8.2	11	17	36	48	106	164.9
81910	4	2.6	5.5	8.2	11	17	36	48	104	208.2
102400	1	2.5	5.1	8.2	11	17	34	48	**	55.0
102400	2	2.5	5.0	8.0	11	16	33	46	98	104.1
102400	3	2.5	5.0	8.0	11	16	33	45	98	156.2
102400	4	2.5	5.0	8.0	11	16	33	45	96	208.2
151552	1	2.5	4.6	7.1	9.9	15	31	43	**	56.4
151552	2	2.5	4.6	7.0	9.7	15	30	43	89	109.9
151552	3	2.5	4.6	7.1	9.8	15	30	42	87	164.9
151552	4	2.5	4.6	7.0	9.8	15	30	42	87	219.8

WORK UNIT TYPE	8418
INPUT UNIT TYPE	U12
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U12
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	171- 340

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.6	5.1	7.7	10.2	15.4	30.7	41.0	81.9	MAX CAPAC. (MB.)
20480	1	6.7	15	23	31	49	113	156	**	50.6
20480	2	6.8	14	22	30	48	108	148	323	101.2
20480	3	6.7	14	22	30	47	105	144	312	151.8
20480	4	6.7	14	22	29	47	103	141	305	202.5
49152	1	4.3	8.4	13	18	28	60	81	**	52.1
49152	2	4.2	8.2	13	17	27	57	77	173	104.1
49152	3	4.2	8.2	13	17	27	57	77	169	156.2
49152	4	4.2	8.2	13	17	27	57	76	167	208.2
81910	1	3.6	7.7	12	15	24	50	67	**	52.1
81910	2	3.6	7.6	11	15	23	48	65	141	104.1
81910	3	3.6	7.6	11	15	23	48	64	139	164.9
81910	4	3.5	7.6	11	15	23	48	64	137	208.2
102400	1	3.5	7.1	11	15	23	46	64	**	55.0
102400	2	3.5	7.1	11	15	23	45	62	131	104.1
102400	3	3.5	7.0	11	15	22	45	62	130	156.2
102400	4	3.5	7.0	11	15	22	45	62	129	208.2
151552	1	3.5	6.6	10	14	22	43	60	**	56.4
151552	2	3.5	6.6	10	14	21	43	59	121	109.9
151552	3	3.5	6.6	10	14	21	43	59	121	164.9
151552	4	3.5	6.6	10	14	21	43	59	120	219.8

WORK UNIT TYPE	8418
INPUT UNIT TYPE	U10
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U10
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	171- 340

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.6	5.1	7.7	10.2	15.4	30.7	41.0	81.9	MAX CAPAC. (MB.)
20480	1	9.3	19	30	40	63	139	189	**	50.6
20480	2	9.3	19	30	40	63	135	184	388	101.2
20480	3	9.3	19	29	40	62	133	181	381	151.8
20480	4	9.2	19	29	39	62	132	179	376	202.5
49152	1	6.8	13	20	28	43	91	122	**	52.1
49152	2	6.7	13	20	27	42	87	117	245	104.1
49152	3	6.7	13	20	27	42	87	117	243	156.2
49152	4	6.7	13	20	27	42	87	117	243	208.2
81910	1	6.0	13	19	26	38	80	107	**	52.1
81910	2	6.0	13	19	25	38	78	105	221	109.9
81910	3	6.0	13	19	25	38	78	104	219	164.9
81910	4	6.0	13	19	25	38	78	104	218	208.2
102400	1	6.0	12	19	25	38	76	103	**	55.0
102400	2	6.0	12	19	25	38	75	102	211	104.1
102400	3	6.0	12	18	25	37	75	101	210	156.2
102400	4	6.0	12	18	25	37	75	101	209	208.2
151552	1	6.0	12	17	24	36	73	99	**	56.4
151552	2	6.0	12	17	24	36	73	99	201	109.9
151552	3	6.0	12	17	24	36	73	98	200	164.9
151552	4					36	73	98	200	219.8

WORK UNIT TYPE	8418
INPUT UNIT TYPE	8418
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8418
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	171- 340

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.6	5.1	7.7	10.2	15.4	30.7	41.0	81.9	MAX CAPAC. (MB.)
20480	1	6.7	15	24	33	51	118	165	**	50.6
20480	2	6.8	15	23	32	49	114	157	338	101.2
20480	3	6.7	15	23	31	48	108	152	325	151.8
20480	4	6.6	15	23	31	47	107	149	316	202.5
49152	1	2.7	5.4	8.9	12	20	43	58	**	52.1
49152	2	2.6	5.4	8.3	12	19	39	56	128	109.9
49152	3	2.6	5.5	8.2	12	18	39	54	125	164.9
49152	4	2.6	5.4	8.2	12	18	38	53	122	219.8
8191C	1	1.9	3.6	5.8	7.7	13	29	40	**	55.0
8191C	2	1.8	3.5	5.2	6.9	12	27	38	78	109.9
8191C	3	1.8	3.5	5.2	6.9	11	27	37	76	164.9
8191C	4	1.8	3.5	5.1	6.8	11	25	36	75	219.8
1C24CC	1	1.6	3.4	5.6	7.5	11	23	35	**	55.0
1C24CC	2	1.6	3.3	5.1	6.8	11	23	33	73	112.8
1C24CC	3	1.6	3.3	5.0	6.7	10	22	32	72	169.2
1C24CC	4	1.6	3.3	5.0	6.7	10	22	32	71	225.6
151552	1	1.5	2.6	4.5	6.0	9.1	19	28	**	56.4
151552	2	1.5	2.6	4.2	5.9	8.9	19	27	59	112.8
151552	3	1.5	2.6	4.2	5.8	8.8	18	26	58	169.2
151552	4	1.5	2.6	4.2	5.8	8.8	18	26	57	225.6

WORK UNIT TYPE	8418
INPUT UNIT TYPE	8414
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8414
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	171- 340

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.6	5.1	7.7	10.2	15.4	30.7	41.0	81.9	MAX CAPAC. (MB.)
20480	1	6.7	15	24	33	51	118	166	**	50.6
20480	2	6.9	15	24	33	50	116	160	344	101.2
20480	3	6.7	15	23	32	49	110	154	326	151.8
20480	4	6.8	15	23	31	49	110	152	324	202.5
49152	1	2.7	5.3	8.5	12	19	41	56	**	52.1
49152	2	2.6	5.3	8.1	12	18	38	54	122	109.9
49152	3	2.6	5.4	8.0	12	18	37	52	119	164.9
49152	4	2.6	5.4	8.0	12	18	37	52	117	219.8
81910	1	1.8	3.6	5.3	7.1	12	28	39	**	55.0
81910	2	1.8	3.5	5.1	6.8	11	26	36	77	109.9
81910	3	1.8	3.4	5.0	6.7	11	25	35	73	164.9
81910	4	1.8	3.4	5.0	6.6	11	24	34	72	219.8
102400	1	1.5	3.3	5.0	6.8	11	22	34	**	55.0
102400	2	1.5	3.2	4.9	6.6	9.9	21	31	70	112.8
102400	3	1.5	3.2	4.9	6.5	9.8	20	30	69	169.2
102400	4	1.5	3.2	4.8	6.5	9.7	20	29	68	225.6
151552	1	1.4	2.5	4.1	5.8	8.8	18	27	**	56.4
151552	2	1.4	2.5	4.1	5.7	8.6	18	26	57	112.6
151552	3	1.4	2.5	4.1	5.7	8.6	18	26	56	169.2
151552	4	1.4	2.5	4.0	5.7	8.6	18	25	55	219.8

WORK UNIT TYPE	8418
INPUT UNIT TYPE	8418
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8418
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	171- 340

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.6	5.1	7.7	10.2	15.4	30.7	41.0	81.9	MAX CAPAC. (MB.)
20480	1	6.7	15	24	33	51	118	165	**	50.6
20480	2	6.8	15	23	32	49	114	157	338	101.2
20480	3	6.7	15	23	31	48	108	152	325	151.8
20480	4	6.6	15	23	31	47	107	149	316	202.5
49152	1	2.7	5.4	8.9	12	20	43	58	**	52.1
49152	2	2.6	5.4	8.3	12	19	39	56	128	109.9
49152	3	2.6	5.5	8.2	12	18	39	54	125	164.9
49152	4	2.6	5.4	8.2	12	18	38	53	122	219.8
81910	1	1.9	3.6	5.8	7.7	13	29	40	**	55.0
81910	2	1.8	3.5	5.2	6.9	12	27	38	78	109.9
81910	3	1.8	3.5	5.2	6.9	11	27	37	76	164.9
81910	4	1.8	3.5	5.1	6.8	11	25	36	75	219.8
1C24CC	1	1.6	3.4	5.6	7.5	11	23	35	**	55.0
1C24CC	2	1.6	3.3	5.1	6.8	11	23	33	73	112.8
1C24CC	3	1.6	3.3	5.0	6.7	10	22	32	72	169.2
1C24CC	4	1.6	3.3	5.0	6.7	10	22	32	71	225.6
151552	1	1.5	2.6	4.5	6.0	9.1	19	28	**	56.4
151552	2	1.5	2.6	4.2	5.9	8.9	19	27	59	112.8
151552	3	1.5	2.6	4.2	5.8	8.8	18	26	58	169.2
151552	4	1.5	2.6	4.2	5.8	8.8	18	26	57	225.6

WORK UNIT TYPE	8418
INPUT UNIT TYPE	8414
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8414
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	171- 340

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.6	5.1	7.7	10.2	15.4	30.7	41.0	81.9	MAX CAPAC. (MB.)
20480	1	6.7	15	24	33	51	118	166	**	50.6
20480	2	6.9	15	24	33	50	116	160	344	101.2
20480	3	6.7	15	23	32	49	110	154	326	151.8
20480	4	6.8	15	23	31	49	110	152	324	202.5
49152	1	2.7	5.3	8.5	12	19	41	56	**	52.1
49152	2	2.6	5.3	8.1	12	18	38	54	122	109.9
49152	3	2.6	5.4	8.0	12	18	37	52	119	164.9
49152	4	2.6	5.4	8.0	12	18	37	52	117	219.8
81910	1	1.8	3.6	5.3	7.1	12	28	39	**	55.0
81910	2	1.8	3.5	5.1	6.8	11	26	36	77	109.9
81910	3	1.8	3.4	5.0	6.7	11	25	35	73	164.9
81910	4	1.8	3.4	5.0	6.6	11	24	34	72	219.8
102400	1	1.5	3.3	5.0	6.8	11	22	34	**	55.0
102400	2	1.5	3.2	4.9	6.6	9.9	21	31	70	112.8
102400	3	1.5	3.2	4.9	6.5	9.8	20	30	69	169.2
102400	4	1.5	3.2	4.8	6.5	9.7	20	29	68	225.6
151552	1	1.4	2.5	4.1	5.8	8.8	18	27	**	56.4
151552	2	1.4	2.5	4.1	5.7	8.6	18	26	57	112.6
151552	3	1.4	2.5	4.1	5.7	8.6	18	26	56	169.2
151552	4	1.4	2.5	4.0	5.7	8.6	18	25	55	219.8

WORK UNIT TYPE	8418
INPUT UNIT TYPE	U16
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	U16
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	341- 682

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	-----SIZE OF DATA SET IN MEGABYTES (MB.)------ 5.1	10.2	15.4	20.5	30.7	61.4	81.9	163.8	MAX CAPAC. (MB.)
20480	1	16	35	55	76	126	**	**	**	43.4
20480	2	16	34	52	74	122	268	**	**	86.8
20480	3	16	33	51	72	118	259	354	**	130.2
20480	4	16	33	50	71	115	253	344	**	173.5
49152	1	4.9	11	18	25	38	**	**	**	52.1
49152	2	5.0	11	17	23	35	84	117	**	104.1
49152	3	4.9	11	17	23	35	82	113	**	156.2
49152	4	5.0	11	17	23	35	80	110	238	208.2
81910	1	3.1	6.3	11	16	26	**	**	**	52.1
81910	2	3.0	5.9	10	14	23	52	71	**	104.1
81910	3	2.9	5.8	9.7	14	22	50	68	**	156.2
81910	4	2.9	5.7	9.5	14	22	48	66	152	208.2
102400	1	2.9	6.1	9.4	13	20	**	**	**	52.1
102400	2	2.7	5.7	8.8	12	19	45	62	**	109.9
102400	3	2.7	5.6	8.5	11	18	44	60	**	164.9
102400	4	2.7	5.6	8.4	11	18	43	60	126	219.8
151552	1	2.0	4.8	7.2	9.6	15	**	**	**	55.0
151552	2	2.0	4.6	7.0	9.3	15	35	48	**	109.9
151552	3	2.0	4.6	6.9	9.2	15	34	47	**	156.2
151552	4	2.0	4.6	6.9	9.2	15	34	47	98	219.8

WORK UNIT TYPE	8418
INPUT UNIT TYPE	U14
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U14
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	341- 682

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 5.1	10.2	15.4	20.5	30.7	61.4	81.9	163.8	MAX CAPAC. (MB.)
20480	1	14	29	48	68	109	**	**	**	52.1
20480	2	13	29	47	66	102	231	**	**	81.0
20480	3	13	28	46	64	99	220	314	**	156.2
20480	4	13	28	46	63	98	217	309	**	162.0
49152	1	6.3	14	22	31	47	**	**	**	52.1
49152	2	6.3	14	21	29	44	98	140	**	104.1
49152	3	6.3	13	21	29	44	97	138	**	156.2
49152	4	6.3	13	21	29	44	97	137	294	208.2
81910	1	5.7	11	17	24	37	**	**	**	52.1
81910	2	5.5	11	17	24	36	80	109	**	104.1
81910	3	5.5	11	17	23	35	78	106	**	156.2
81910	4	5.5	11	17	23	35	78	105	217	208.2
102400	1	5.0	11	17	22	34	**	**	**	52.1
102400	2	5.0	11	16	22	33	72	97	**	104.1
102400	3	5.0	11	16	22	33	72	97	**	164.9
102400	4	5.0	11	16	22	33	71	96	210	219.8
151552	1	4.6	10	15	20	30	**	**	**	55.0
151552	2	4.6	9.8	15	20	30	66	89	**	104.1
151552	3	4.6	9.7	15	20	30	65	88	**	156.2
151552	4	4.6	9.7	15	20	30	65	88	179	208.2

WORK UNIT TYPE	8418
INPUT UNIT TYPE	U12
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U12
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	341- 682

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 5.1	10.2	15.4	20.5	30.7	61.4	81.9	163.8	MAX CAPAC. (MB.)
20480	1	15	32	52	74	120	**	**	**	43.4
20480	2	15	31	51	72	111	243	**	**	81.0
20480	3	14	31	50	70	108	234	332	**	156.2
20480	4	14	30	49	69	107	228	322	**	162.0
49152	1	8.4	18	28	39	60	**	**	**	52.1
49152	2	8.2	17	28	37	57	121	170	**	104.1
49152	3	8.2	17	27	37	57	120	165	**	156.2
49152	4	8.1	17	27	37	56	119	164	359	208.2
81910	1	7.7	16	23	33	50	**	**	**	52.1
81910	2	7.6	15	23	32	48	104	142	**	104.1
81910	3	7.5	15	23	31	48	102	139	**	156.2
81910	4	7.5	15	23	31	47	101	138	281	208.2
102400	1	7.1	15	23	31	46	**	**	**	52.1
102400	2	7.0	15	23	30	45	97	130	**	104.1
102400	3	6.9	15	22	30	45	97	129	**	164.9
102400	4	6.9	15	22	30	45	96	128	276	219.8
151552	1	6.6	14	21	28	43	**	**	**	55.0
151552	2	6.6	14	21	28	42	91	122	**	104.1
151552	3	6.6	14	21	28	42	90	121	**	156.2
151552	4	6.6	14	21	28	42	90	120	243	208.2

WORK UNIT TYPE	8418
INPUT UNIT TYPE	U1C
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U1C
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	341- 682

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 5.1	10.2	15.4	20.5	30.7	61.4	81.9	163.8	MAX CAPAC. (MB.)
20480	1	20	41	65	92	144	**	**	**	43.4
20480	2	20	41	65	90	141	292	402	**	92.6
20480	3	20	41	65	89	138	286	392	**	130.2
20480	4	19	40	64	88	137	282	387	**	173.5
49152	1	13	27	43	58	90	**	**	**	52.1
49152	2	13	27	43	57	87	180	241	**	104.1
49152	3	13	27	42	57	87	178	238	**	156.2
49152	4	13	27	42	57	86	178	238	512	208.2
81910	1	13	26	38	52	79	**	**	**	52.1
81910	2	13	25	38	52	78	162	222	**	92.6
81910	3	13	25	38	51	78	161	219	**	156.2
81910	4	13	25	38	51	77	160	218	442	208.2
102400	1	12	25	38	51	76	**	**	**	52.1
102400	2	12	25	38	50	75	157	210	**	104.1
102400	3	12	25	37	50	75	156	209	**	164.9
102400	4	12	25	37	50	75	156	208	437	219.8
151552	1	12	24	36	49	73	**	**	**	55.0
151552	2	12	24	36	48	73	151	202	**	104.1
151552	3	12	24	36	48	72	150	201	**	156.2
151552	4	12	24	36	48	72	150	200	404	208.2

WORK UNIT TYPE	8416
INPUT UNIT TYPE	8416
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8416
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	341- 682

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 5.1	10.2	15.4	20.5	30.7	61.4	81.9	163.8	MAX CAPAC. (MB.)
20480	1	16	35	54	79	129	**	**	**	43.4
20480	2	15	33	51	73	118	261	**	**	86.8
20480	3	15	32	50	70	116	255	346	**	130.2
20480	4	15	32	49	69	113	246	339	**	173.5
49152	1	5.2	11	18	26	41	**	**	**	52.1
49152	2	5.0	11	18	24	37	85	115	**	104.1
49152	3	5.0	11	17	23	37	84	113	**	156.2
49152	4	5.0	11	17	23	37	82	111	255	208.2
81910	1	3.5	7.4	12	17	27	**	**	**	55.0
81910	2	3.2	6.4	11	16	26	56	75	**	104.1
81910	3	3.3	6.4	11	16	24	55	74	**	156.2
81910	4	3.3	6.2	10	15	24	53	72	161	208.2
102400	1	3.0	6.7	11	14	23	**	**	**	55.0
102400	2	3.0	6.2	10	14	21	47	67	**	109.9
102400	3	3.0	6.2	9.3	14	21	47	66	**	164.9
102400	4	3.0	6.0	9.1	12	21	46	65	138	219.8
151552	1	2.3	5.4	8.2	11	17	**	**	**	55.0
151552	2	2.2	5.0	8.0	11	17	39	54	**	109.9
151552	3	2.3	4.9	7.4	11	17	38	53	**	164.9
151552	4	2.3	4.9	7.4	9.9	17	38	52	110	219.8

WORK UNIT TYPE	8416
INPUT UNIT TYPE	8414
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8414
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	341- 682

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 5.1	10.2	15.4	20.5	30.7	61.4	81.9	163.8	MAX CAPAC. (MB.)
20480	1	16	36	55	80	131	**	**	**	43.4
20480	2	16	33	52	73	120	264	**	**	86.8
20480	3	16	33	50	72	117	258	351	**	130.2
20480	4	15	32	49	70	114	249	342	**	173.5
49152	1	5.1	11	18	25	39	**	**	**	52.1
49152	2	5.1	11	17	23	35	84	117	**	104.1
49152	3	5.1	11	17	23	35	82	113	**	156.2
49152	4	5.0	11	17	22	34	81	111	242	208.2
81910	1	3.2	6.5	11	16	26	**	**	**	52.1
81910	2	3.1	6.1	10	15	23	53	72	**	104.1
81910	3	3.1	6.0	10	15	22	51	69	**	156.2
81910	4	3.1	5.9	10	14	22	49	67	156	208.2
102400	1	3.0	6.3	9.7	13	21	**	**	**	52.1
102400	2	2.9	5.9	8.9	12	19	46	63	**	109.9
102400	3	2.9	5.8	8.7	12	19	45	62	**	164.9
102400	4	2.8	5.8	8.7	12	18	45	62	130	219.8
151552	1	2.1	5.0	7.5	10	16	**	**	**	55.0
151552	2	2.1	4.9	7.3	9.8	15	36	50	**	109.9
151552	3	2.1	4.8	7.2	9.7	15	35	49	**	156.2
151552	4	2.0	4.8	7.2	9.6	15	35	48	102	219.8

WORK UNIT TYPE	8416
INPUT UNIT TYPE	U14
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U14
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	21- 42

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	1.0	1.3	1.9	3.8	5.1	10.2	MAX CAPAC. (MB.)
20480	1	1.4	2.5	3.6	4.9	7.6	15	22	45	28.0
20480	2	1.4	2.4	3.5	4.8	7.5	15	20	42	50.4
20480	3	1.4	2.4	3.6	4.9	7.5	15	21	43	84.5
20480	4	1.4	2.4	3.7	5.0	7.5	15	20	43	112.7
49152	1	1.2	2.0	2.8	3.7	5.9	12	16	33	28.4
49152	2	1.2	2.0	2.8	3.7	5.9	12	16	33	56.9
49152	3	1.2	2.0	2.9	3.7	5.8	12	16	33	85.3
49152	4	1.2	2.0	2.9	3.7	5.9	12	16	33	113.7
81910	1	1.2	2.0	2.8	3.6	5.3	11	15	31	28.7
81910	2	1.2	2.0	2.8	3.6	5.3	11	15	31	57.4
81910	3	1.2	2.0	2.8	3.6	5.3	11	15	31	86.1
81910	4	1.2	2.0	2.8	3.6	5.3	11	15	31	114.8
102400	1	1.2	2.0	2.8	3.7	5.3	11	15	32	28.7
102400	2	1.2	2.0	2.8	3.7	5.3	11	15	32	57.4
102400	3	1.2	2.0	2.8	3.7	5.3	11	15	31	86.1
102400	4	1.2	2.0	2.8	3.7	5.3	11	15	31	114.8
151552	1	1.2	2.0	2.8	3.7	5.3	11	14	31	28.7
151552	2	1.2	2.0	2.8	3.7	5.3	11	14	30	57.4
151552	3	1.2	2.0	2.8	3.7	5.3	11	14	30	86.1
151552	4	1.2	2.0	2.8	3.7	5.3	11	14	30	114.8

WORK UNIT TYPE	8416
INPUT UNIT TYPE	U12
INPUT BLOCK SIZE	256
OUTPUT UNIT TYPE	U12
OUTPUT BLOCK SIZE	256
APPLICABLE RECORD LENGTHS	21- 42

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	1.0	1.3	1.9	3.8	5.1	10.2	MAX CAPAC. (MB.)
20480	1	1.7	3.1	4.6	6.1	9.4	20	26	56	28.0
20480	2	1.7	3.1	4.6	6.0	9.2	19	26	54	50.4
20480	3	1.7	3.1	4.5	6.0	9.4	19	26	53	84.0
20480	4	1.7	3.1	4.5	6.0	9.4	19	26	53	100.7
49152	1	1.5	2.6	3.8	5.0	7.7	16	21	43	28.5
49152	2	1.5	2.6	3.8	5.0	7.6	16	21	43	57.1
49152	3	1.5	2.6	3.8	5.0	7.6	16	21	43	85.3
49152	4	1.5	2.6	3.8	5.0	7.6	16	21	43	113.7
81910	1	1.5	2.6	3.7	4.9	7.2	15	20	42	28.7
81910	2	1.5	2.6	3.7	4.9	7.2	15	20	42	57.4
81910	3	1.5	2.6	3.7	4.8	7.2	15	20	42	86.1
81910	4	1.5	2.6	3.7	4.8	7.1	15	20	42	114.8
102400	1	1.5	2.6	3.8	4.9	7.2	14	20	42	27.9
102400	2	1.5	2.6	3.8	4.9	7.2	14	20	42	55.8
102400	3	1.5	2.6	3.7	4.9	7.1	14	20	42	83.7
102400	4	1.5	2.6	3.7	4.9	7.1	14	20	42	111.6
151552	1	1.5	2.6	3.8	4.9	7.2	14	19	41	28.7
151552	2	1.5	2.6	3.8	4.9	7.2	14	19	40	57.4
151552	3	1.5	2.6	3.8	4.9	7.2	14	19	40	86.1
151552	4	1.5	2.6	3.8	4.9	7.2	14	19	40	114.8

WORK UNIT TYPE	8416
INPUT UNIT TYPE	U10
INPUT BLOCK SIZE	256
OUTPUT UNIT TYPE	U10
OUTPUT BLOCK SIZE	256
APPLICABLE RECORD LENGTHS	21- 42

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	1.0	1.3	1.9	3.8	5.1	10.2	MAX CAPAC. (MB.)
20480	1	2.6	5.0	7.3	9.7	15	31	41	85	28.0
20480	2	2.6	4.9	7.3	9.6	15	30	40	83	50.4
20480	3	2.6	4.9	7.3	9.6	15	30	41	82	84.0
20480	4	2.6	4.9	7.3	9.6	15	30	41	82	100.7
49152	1	2.4	4.4	6.4	8.4	13	27	36	72	28.5
49152	2	2.4	4.4	6.4	8.4	13	27	36	72	57.1
49152	3	2.4	4.4	6.4	8.4	13	27	36	72	85.6
49152	4	2.4	4.4	6.4	8.4	13	27	36	72	114.1
81910	1	2.4	4.4	6.4	8.4	12	25	34	71	28.5
81910	2	2.4	4.4	6.4	8.4	12	25	34	71	57.1
81910	3	2.4	4.4	6.4	8.4	12	25	34	71	85.6
81910	4	2.4	4.4	6.4	8.4	12	25	34	71	114.1
102400	1	2.4	4.4	6.4	8.4	12	24	33	70	27.9
102400	2	2.4	4.4	6.4	8.4	12	24	33	70	55.8
102400	3	2.4	4.4	6.4	8.4	12	24	33	70	83.7
102400	4	2.4	4.4	6.4	8.4	12	24	33	70	111.6
151552	1	2.4	4.3	6.4	8.4	12	24	32	68	28.7
151552	2	2.4	4.3	6.3	8.3	12	24	32	68	57.4
151552	3	2.4	4.3	6.3	8.3	12	24	32	67	86.1
151552	4	2.4	4.3	6.3	8.4	12	24	32	67	114.8

WORK UNIT TYPE	8416
INPUT UNIT TYPE	VI-C
INPUT BLOCK SIZE	256
OUTPUT UNIT TYPE	VI-C
OUTPUT BLOCK SIZE	256
APPLICABLE RECORD LENGTHS	21- 42

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	-----SIZE OF DATA SET IN MEGABYTES (MB.) ----- 0.3	0.6	1.0	1.3	1.9	3.8	5.1	10.2	MAX CAPAC. (MB.)
20480	1	1.8	3.3	4.9	6.4	10	21	28	59	28.0
20480	2	1.8	3.3	4.8	6.4	9.7	20	27	56	50.4
20480	3	1.8	3.3	4.8	6.4	10	20	27	56	84.0
20480	4	1.8	3.3	4.8	6.4	9.9	20	27	56	100.7
49152	1	1.6	2.8	4.0	5.3	8.2	17	23	46	28.5
49152	2	1.6	2.8	4.0	5.3	8.2	17	23	46	57.1
49152	3	1.6	2.8	4.0	5.3	8.1	17	23	46	85.3
49152	4	1.6	2.8	4.0	5.3	8.1	17	23	46	113.7
81910	1	1.6	2.8	4.0	5.2	7.6	16	22	45	28.7
81910	2	1.6	2.8	3.9	5.2	7.6	16	22	45	57.4
81910	3	1.6	2.8	4.0	5.2	7.6	16	22	45	86.1
81910	4	1.6	2.8	3.9	5.1	7.6	16	22	45	114.8
102400	1	1.6	2.7	3.9	5.1	7.6	15	21	44	27.9
102400	2	1.6	2.7	3.9	5.1	7.5	15	21	44	55.8
102400	3	1.6	2.7	3.9	5.1	7.5	15	21	44	83.7
102400	4	1.6	2.7	3.9	5.1	7.5	15	21	44	111.6
151552	1	1.6	2.7	3.9	5.1	7.5	15	20	42	28.7
151552	2	1.6	2.7	3.9	5.1	7.5	15	20	42	57.4
151552	3	1.6	2.7	3.9	5.1	7.5	15	20	42	86.1
151552	4	1.6	2.7	3.9	5.1	7.5	15	19	42	114.8

WORK UNIT TYPE	8416
INPUT UNIT TYPE	8416
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	8416
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	21- 42

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	1.0	1.3	1.9	3.8	5.1	10.2	MAX CAPAC. (MB.)
20480	1	1.5	2.7	3.9	5.3	8.2	17	23	49	28.0
20480	2	1.5	2.7	3.9	5.4	8.2	17	23	46	56.0
20480	3	1.5	2.7	4.1	5.5	8.2	17	23	48	73.9
20480	4	1.5	2.7	4.1	5.5	8.3	17	23	47	112.7
49152	1	1.2	2.1	3.0	3.9	6.1	12	17	34	28.5
49152	2	1.2	2.1	3.0	3.9	6.2	12	17	34	56.9
49152	3	1.2	2.1	3.0	3.9	6.1	12	17	34	85.3
49152	4	1.2	2.1	3.0	3.9	6.1	12	17	34	113.7
81910	1	1.2	2.1	2.9	3.8	5.6	12	16	33	28.7
81910	2	1.2	2.1	2.9	3.8	5.6	12	16	33	57.4
81910	3	1.2	2.1	2.9	3.8	5.6	12	16	33	86.1
81910	4	1.2	2.1	2.9	3.8	5.6	12	16	33	114.8
102400	1	1.2	2.0	2.9	3.8	5.6	11	16	33	28.7
102400	2	1.2	2.0	2.9	3.8	5.6	11	16	33	57.4
102400	3	1.2	2.0	2.9	3.8	5.5	11	15	33	86.1
102400	4	1.2	2.0	2.9	3.8	5.5	11	15	33	114.8
151552	1	1.2	2.1	2.9	3.8	5.5	11	15	32	28.7
151552	2	1.2	2.1	2.9	3.8	5.5	11	15	32	57.4
151552	3	1.2	2.1	2.9	3.8	5.5	11	15	32	86.1
151552	4	1.2	2.1	2.9	3.8	5.5	11	15	32	114.8

WORK UNIT TYPE	8416
INPUT UNIT TYPE	8411
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	8411
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	21- 42

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	1.0	1.3	1.9	3.8	5.1	10.2	MAX CAPAC. (MB.)
20480	1	1.5	2.7	4.0	5.4	8.3	17	23	48	28.0
20480	2	1.5	2.6	3.9	5.3	8.1	17	22	45	56.0
20480	3	1.5	2.6	4.0	5.4	8.2	17	22	48	73.9
20480	4	1.5	2.6	4.0	5.5	8.2	17	22	47	112.7
49152	1	1.2	2.1	3.0	3.9	6.2	13	17	35	28.4
49152	2	1.2	2.1	3.0	4.0	6.2	12	17	35	56.9
49152	3	1.2	2.1	3.0	4.0	6.2	12	17	35	85.3
49152	4	1.2	2.1	3.0	4.0	6.2	12	17	35	113.7
81910	1	1.2	2.1	2.9	3.9	5.6	12	16	33	28.7
81910	2	1.2	2.1	2.9	3.9	5.6	12	16	33	57.4
81910	3	1.2	2.1	2.9	3.9	5.6	12	16	33	86.1
81910	4	1.2	2.1	2.9	3.9	5.6	12	16	33	114.8
102400	1	1.2	2.0	2.9	3.8	5.6	11	16	33	28.7
102400	2	1.2	2.0	2.9	3.8	5.6	11	16	33	57.4
102400	3	1.2	2.0	2.9	3.8	5.5	11	16	33	86.1
102400	4	1.2	2.0	2.9	3.8	5.5	11	16	33	114.8
151552	1	1.2	2.1	2.9	3.8	5.5	11	15	32	28.7
151552	2	1.2	2.1	2.9	3.8	5.5	11	15	32	57.4
151552	3	1.2	2.1	2.9	3.8	5.5	11	15	32	86.1
151552	4	1.2	2.1	2.9	3.8	5.5	11	15	32	114.8

WORK UNIT TYPE	8416
INPUT UNIT TYPE	U14
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U14
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	43- 84

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.3	1.9	2.6	3.8	7.7	10.2	20.5	MAX CAPAC. (MB.)
20480	1	1.8	3.4	5.3	7.1	11	25	33	78	27.4
20480	2	1.7	3.3	5.0	6.7	10	22	30	68	54.9
20480	3	1.7	3.3	5.0	6.6	9.9	22	30	66	82.3
20480	4	1.7	3.3	5.0	6.6	9.9	22	30	66	109.8
49152	1	1.3	2.3	3.5	4.5	6.8	14	20	42	28.0
49152	2	1.3	2.3	3.4	4.5	6.7	14	19	40	55.2
49152	3	1.3	2.3	3.4	4.5	6.7	14	19	40	82.9
49152	4	1.3	2.3	3.5	4.5	6.7	14	19	40	110.5
81910	1	1.2	2.1	3.2	4.2	6.4	13	17	36	28.5
81910	2	1.2	2.2	3.2	4.2	6.4	13	17	36	57.1
81910	3	1.2	2.2	3.2	4.2	6.4	13	17	36	85.6
81910	4	1.2	2.2	3.2	4.2	6.4	13	17	37	114.1
102400	1	1.2	2.2	3.1	4.2	6.1	13	18	36	28.5
102400	2	1.2	2.2	3.1	4.1	6.1	13	18	36	57.1
102400	3	1.2	2.2	3.1	4.1	6.0	13	18	36	85.6
102400	4	1.2	2.2	3.1	4.1	6.0	13	18	36	114.1
151552	1	1.3	2.2	3.0	4.0	6.1	12	17	35	28.7
151552	2	1.3	2.2	3.0	3.9	6.0	12	17	35	57.4
151552	3	1.3	2.1	3.0	3.9	6.0	12	17	35	86.1
151552	4	1.3	2.1	3.0	3.9	6.0	12	17	35	114.8

WORK UNIT TYPE	8416
INPUT UNIT TYPE	U12
INPUT BLOCK SIZE	256
OUTPUT UNIT TYPE	U12
OUTPUT BLOCK SIZE	256
APPLICABLE RECORD LENGTHS	43- 84

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.3	1.9	2.6	3.8	7.7	10.2	20.5	MAX CAPAC. (MB.)
20480	1	3.0	5.8	8.9	12	19	39	54	113	27.1
20480	2	2.9	5.7	8.8	12	18	37	51	107	49.8
20480	3	2.9	5.7	8.8	12	18	37	50	107	74.7
20480	4	2.9	5.7	8.8	12	18	37	50	106	99.7
49152	1	2.5	4.7	7.1	9.8	15	29	39	80	28.0
49152	2	2.5	4.7	7.1	9.7	15	29	39	80	56.0
49152	3	2.5	4.7	7.1	9.7	15	29	39	80	84.0
49152	4	2.5	4.7	7.1	9.6	15	29	39	80	111.9
81910	1	2.5	4.7	6.9	9.0	14	28	38	77	27.6
81910	2	2.5	4.7	6.9	9.0	14	28	38	77	55.2
81910	3	2.5	4.7	6.9	9.0	14	28	38	77	82.9
81910	4	2.5	4.7	6.9	9.0	14	28	38	77	110.5
102400	1	2.5	4.7	6.8	9.0	13	28	38	76	28.5
102400	2	2.5	4.7	6.8	9.0	13	28	37	76	57.1
102400	3	2.5	4.7	6.8	9.0	13	28	37	76	85.6
102400	4	2.5	4.7	6.8	9.0	13	28	37	76	114.1
151552	1	2.5	4.7	6.8	9.0	13	27	36	75	28.5
151552	2	2.5	4.7	6.8	9.0	13	27	36	75	57.1
151552	3	2.5	4.7	6.8	9.0	13	27	36	74	85.6
151552	4	2.5	4.7	6.8	9.0	13	27	36	74	114.1

WORK UNIT TYPE	8416
INPUT UNIT TYPE	U10
INPUT BLOCK SIZE	256
OUTPUT UNIT TYPE	U10
OUTPUT BLOCK SIZE	256
APPLICABLE RECORD LENGTHS	43- 84

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.3	1.9	2.6	3.8	7.7	10.2	20.5	MAX CAPAC. (MB.)
20480	1	4.9	9.5	14	19	30	61	83	171	27.1
20480	2	4.8	9.4	14	19	29	60	81	164	54.2
20480	3	4.8	9.4	14	19	29	59	80	165	74.7
20480	4	4.8	9.4	14	19	29	59	80	165	99.7
49152	1	4.4	8.4	12	17	26	52	69	139	28.0
49152	2	4.4	8.4	12	17	26	51	69	139	56.0
49152	3	4.4	8.4	12	17	26	51	68	139	84.0
49152	4	4.4	8.4	13	17	26	51	68	139	111.9
81910	1	4.4	8.4	12	16	25	51	68	137	27.6
81910	2	4.4	8.4	12	16	25	50	68	136	55.2
81910	3	4.4	8.4	12	16	25	50	67	136	82.9
81910	4	4.4	8.4	12	16	25	50	67	136	110.5
102400	1	4.4	8.3	12	16	24	50	67	135	28.5
102400	2	4.4	8.3	12	16	24	50	67	135	57.1
102400	3	4.4	8.3	12	16	24	50	67	135	85.6
102400	4	4.4	8.3	12	16	24	50	67	135	114.1
151552	1	4.3	8.3	12	16	24	49	66	134	28.5
151552	2	4.3	8.3	12	16	24	49	66	134	57.1
151552	3	4.3	8.3	12	16	24	49	66	133	85.6
151552	4	4.3	8.3	12	16	24	49	66	133	110.5

WORK UNIT TYPE	8416
INPUT UNIT TYPE	VI-C
INPUT BLOCK SIZE	256
OUTPUT UNIT TYPE	VI-C
OUTPUT BLOCK SIZE	256
APPLICABLE RECORD LENGTHS	43- 84

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.3	1.9	2.6	3.8	7.7	10.2	20.5	MAX CAPAC. (MB.)
20480	1	3.2	6.2	9.4	13	20	42	57	118	27.1
20480	2	3.2	6.1	9.3	13	19	40	55	113	54.2
20480	3	3.2	6.2	9.5	13	19	40	54	113	74.7
20480	4	3.2	6.1	9.5	13	19	40	54	112	99.7
49152	1	2.8	5.1	7.7	11	16	32	43	87	28.0
49152	2	2.8	5.1	7.7	11	16	32	42	87	56.0
49152	3	2.8	5.1	7.7	11	16	32	42	87	84.0
49152	4	2.8	5.1	7.7	11	16	32	42	86	111.9
81910	1	2.7	5.1	7.5	9.9	15	31	41	84	27.6
81910	2	2.7	5.1	7.5	9.9	15	31	41	83	55.2
81910	3	2.7	5.1	7.5	9.9	15	31	41	83	82.9
81910	4	2.7	5.1	7.5	9.8	15	31	41	83	110.5
102400	1	2.7	5.1	7.5	9.9	15	30	41	83	28.5
102400	2	2.7	5.1	7.5	9.8	15	30	41	82	57.1
102400	3	2.7	5.1	7.4	9.8	15	30	41	82	85.6
102400	4	2.7	5.1	7.4	9.8	15	30	41	82	114.1
151552	1	2.7	5.1	7.4	9.8	15	29	40	81	26.5
151552	2	2.7	5.1	7.4	9.8	15	29	40	81	57.1
151552	3	2.7	5.1	7.4	9.8	15	29	40	81	85.6
151552	4	2.7	5.1	7.4	9.8	15	29	40	81	114.1

WORK UNIT TYPE	8416
INPUT UNIT TYPE	8416
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	8416
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	43- 84

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.3	1.9	2.6	3.8	7.7	10.2	20.5	MAX CAPAC. (MB.)
20480	1	1.9	3.7	6.1	8.3	12	27	39	85	28.0
20480	2	1.9	3.8	5.8	7.7	12	26	35	78	54.9
20480	3	1.9	3.8	5.7	7.6	12	25	35	76	82.3
20480	4	1.9	3.8	5.7	7.6	12	25	35	74	109.8
49152	1	1.3	2.3	3.6	4.8	7.1	15	20	44	27.6
49152	2	1.3	2.3	3.5	4.7	7.1	14	20	42	55.2
49152	3	1.3	2.3	3.5	4.7	6.9	14	20	42	82.9
49152	4	1.3	2.3	3.5	4.7	6.9	14	20	42	110.5
81910	1	1.3	2.2	3.2	4.2	6.6	13	18	38	27.6
81910	2	1.3	2.2	3.1	4.0	6.5	13	18	37	55.2
81910	3	1.3	2.2	3.1	4.1	6.3	13	18	37	82.9
81910	4	1.3	2.2	3.1	4.0	6.3	13	18	37	110.5
102400	1	1.2	2.2	3.1	4.1	6.0	13	18	37	28.5
102400	2	1.2	2.2	3.1	4.1	6.0	13	18	36	57.1
102400	3	1.2	2.2	3.1	4.1	5.9	13	18	36	85.6
102400	4	1.2	2.2	3.1	4.1	5.9	13	18	36	114.1
151552	1	1.3	2.2	3.1	4.0	5.9	12	17	35	28.7
151552	2	1.3	2.2	3.1	4.0	5.9	12	17	35	57.4
151552	3	1.3	2.2	3.0	3.9	5.9	12	17	35	86.1
151552	4	1.3	2.2	3.0	3.9	5.9	12	17	35	114.8

WORK UNIT TYPE	8416
INPUT UNIT TYPE	8411
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	8411
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	43- 84

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.3	1.9	2.6	3.8	7.7	10.2	20.5	MAX CAPAC. (MB.)
20480	1	2.0	3.8	6.0	8.2	13	27	37	83	24.0
20480	2	2.0	4.0	6.0	8.0	12	26	36	78	54.9
20480	3	2.0	4.0	6.0	7.9	12	26	36	76	82.3
20480	4	2.0	4.0	6.0	7.9	12	26	36	75	109.8
49152	1	1.3	2.3	3.7	4.9	7.2	15	20	43	28.0
49152	2	1.3	2.3	3.6	4.9	7.2	14	20	43	49.8
49152	3	1.3	2.3	3.6	4.9	7.2	14	20	42	84.0
49152	4	1.3	2.3	3.6	4.8	7.2	14	20	42	111.9
81910	1	1.3	2.3	3.2	4.2	6.6	14	18	39	27.6
81910	2	1.3	2.3	3.2	4.2	6.5	14	18	38	55.2
81910	3	1.3	2.2	3.2	4.2	6.5	14	18	38	82.9
81910	4	1.3	2.2	3.2	4.2	6.5	14	18	38	110.5
102400	1	1.3	2.3	3.2	4.2	6.1	14	18	37	28.5
102400	2	1.3	2.3	3.2	4.2	6.1	13	18	37	57.1
102400	3	1.3	2.3	3.2	4.2	6.1	13	18	37	85.6
102400	4	1.3	2.3	3.2	4.2	6.1	13	18	37	114.1
151552	1	1.3	2.2	3.2	4.1	6.2	13	17	36	28.7
151552	2	1.3	2.2	3.2	4.1	6.2	13	17	36	57.4
151552	3	1.3	2.2	3.2	4.1	6.2	13	17	36	86.1
151552	4	1.3	2.2	3.2	4.1	6.2	13	17	36	114.8

WORK UNIT TYPE	8416
INPUT UNIT TYPE	U14
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U14
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	85- 170

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.3	2.6	3.8	5.1	7.7	15.4	20.5	41.0	MAX CAPAC. (MB.)
20480	1	3.0	6.4	9.7	14	22	50	70	**	27.1
20480	2	2.8	5.8	8.7	13	20	45	64	141	54.2
20480	3	2.8	5.8	8.7	12	20	44	61	136	71.5
20480	4	2.9	5.8	8.7	12	20	44	60	134	95.3
49152	1	1.7	3.5	5.1	6.7	11	23	32	**	27.1
49152	2	1.7	3.4	5.0	6.7	10	22	31	65	54.2
49152	3	1.6	3.4	5.0	6.7	10	22	31	63	81.2
49152	4	1.6	3.4	5.0	6.7	10	22	30	62	108.3
81910	1	1.6	2.8	4.4	6.2	9.2	19	27	**	28.2
81910	2	1.6	2.8	4.3	6.0	9.0	19	25	52	54.2
81910	3	1.6	2.8	4.3	6.0	9.0	18	25	51	81.2
81910	4	1.6	2.8	4.3	5.9	9.0	18	25	51	108.3
102400	1	1.6	2.8	4.0	5.6	9.1	18	25	**	28.2
102400	2	1.6	2.8	4.0	5.6	8.9	18	24	50	56.3
102400	3	1.6	2.8	4.0	5.5	8.8	18	24	49	84.5
102400	4	1.6	2.8	4.0	5.5	8.8	18	24	49	112.7
151552	1	1.6	2.7	4.0	5.2	8.0	17	23	**	28.5
151552	2	1.6	2.7	4.0	5.2	8.0	17	23	48	57.1
151552	3	1.6	2.7	4.0	5.2	8.0	17	22	47	85.6
151552	4	1.6	2.7	4.0	5.1	7.9	17	22	47	114.1

WORK UNIT TYPE	8416
INPUT UNIT TYPE	U12
INPUT BLOCK SIZE	256
OUTPUT UNIT TYPE	U12
OUTPUT BLOCK SIZE	256
APPLICABLE RECORD LENGTHS	85- 170

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.3	2.6	3.8	5.1	7.7	15.4	20.5	41.0	MAX CAPAC. (MB.)
20480	1	5.8	12	19	25	39	82	112	**	27.1
20480	2	5.7	12	18	24	37	78	106	227	52.0
20480	3	5.6	12	18	24	37	77	105	224	78.0
20480	4	5.7	12	18	24	36	77	105	219	104.0
49152	1	4.7	9.6	14	19	29	59	80	**	27.1
49152	2	4.7	9.5	14	19	29	58	79	164	54.2
49152	3	4.7	9.5	14	19	29	58	78	162	81.2
49152	4	4.7	9.5	14	19	28	58	78	161	108.3
81910	1	4.6	8.9	13	18	28	55	75	**	28.2
81910	2	4.6	8.9	13	18	27	55	74	149	54.2
81910	3	4.6	8.9	13	18	27	55	74	149	81.2
81910	4	4.6	8.9	13	18	27	55	74	148	108.3
102400	1	4.6	8.9	13	18	27	55	74	**	28.2
102400	2	4.6	8.9	13	18	27	55	73	147	56.3
102400	3	4.6	8.8	13	18	27	54	73	147	84.5
102400	4	4.6	8.8	13	18	27	54	73	147	112.7
151552	1	4.6	8.8	13	17	26	54	72	**	28.5
151552	2	4.6	8.8	13	17	26	54	72	146	56.3
151552	3	4.6	8.8	13	17	26	54	72	145	84.5
151552	4	4.6	8.8	13	17	26	53	72	145	112.7

WORK UNIT TYPE	8416
INPUT UNIT TYPE	U10
INPUT BLOCK SIZE	256
OUTPUT UNIT TYPE	U10
OUTPUT BLOCK SIZE	256
APPLICABLE RECORD LENGTHS	85- 170

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.3	2.6	3.8	5.1	7.7	15.4	20.5	41.0	MAX CAPAC. (MB.)
20480	1	9.4	19	30	39	60	125	169	**	27.1
20480	2	9.4	19	29	39	60	123	165	347	52.0
20480	3	9.3	19	29	39	59	122	164	342	78.0
20480	4	9.4	19	29	39	59	121	164	339	104.0
49152	1	8.3	17	25	34	51	104	139	**	27.1
49152	2	8.4	17	25	34	51	103	137	282	54.2
49152	3	8.4	17	25	34	51	102	137	280	81.2
49152	4	8.3	17	25	34	51	102	137	280	108.3
81910	1	8.3	16	24	33	50	100	134	**	28.2
81910	2	8.3	16	24	33	50	99	133	268	54.2
81910	3	8.3	16	24	33	50	99	133	267	81.2
81910	4	8.3	16	24	33	50	99	133	267	108.3
102400	1	8.3	16	24	32	49	100	133	**	28.2
102400	2	8.3	16	24	32	49	99	132	265	56.3
102400	3	8.3	16	24	32	49	99	132	265	84.5
102400	4	8.3	16	24	32	49	99	132	264	112.7
151552	1	8.3	16	24	32	48	98	131	**	28.5
151552	2	8.3	16	24	32	48	98	131	264	57.1
151552	3	8.3	16	24	32	48	98	131	263	84.5
151552	4	8.3	16	24	32	48	98	131	263	112.7

WORK UNIT TYPE	8416
INPUT UNIT TYPE	VI-C
INPUT BLOCK SIZE	256
OUTPUT UNIT TYPE	VI-C
OUTPUT BLOCK SIZE	256
APPLICABLE RECORD LENGTHS	85- 170

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.3	2.6	3.8	5.1	7.7	15.4	20.5	41.0	MAX CAPAC. (MB.)
20480	1	6.2	13	20	27	41	87	118	**	27.1
20480	2	6.1	12	19	26	40	83	112	241	52.0
20480	3	6.0	12	19	25	39	82	112	237	78.0
20480	4	6.1	12	19	25	39	82	111	233	104.0
49152	1	5.1	10	16	21	31	65	86	**	27.1
49152	2	5.1	10	16	21	31	64	85	177	54.2
49152	3	5.1	10	15	21	31	63	85	176	81.2
49152	4	5.1	10	15	21	31	63	85	174	108.3
81910	1	5.0	9.7	15	20	30	60	82	**	28.2
81910	2	5.0	9.7	15	20	30	60	81	163	54.2
81910	3	5.0	9.7	15	20	30	60	81	162	81.2
81910	4	5.0	9.7	15	20	30	60	81	162	108.3
102400	1	5.0	9.7	14	19	30	60	80	**	28.2
102400	2	5.0	9.7	14	19	30	60	80	161	56.3
102400	3	5.0	9.7	14	19	30	59	79	160	84.5
102400	4	5.0	9.7	14	19	30	59	79	160	112.7
151552	1	5.0	9.7	14	19	29	59	79	**	28.5
151552	2	5.0	9.7	14	19	29	59	78	159	56.3
151552	3	5.0	9.7	14	19	29	59	78	158	84.5
151552	4	5.0	9.7	14	19	29	58	78	158	112.7

WORK UNIT TYPE	8416
INPUT UNIT TYPE	8416
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	8416
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	85- 170

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.3	2.6	3.8	5.1	7.7	15.4	20.5	41.0	MAX CAPAC. (MB.)
20480	1	3.3	7.0	11	14	23	54	73	**	27.1
20480	2	3.2	6.7	10	14	22	50	69	144	54.2
20480	3	3.1	6.6	10	14	21	49	68	142	81.2
20480	4	3.2	6.5	10	14	22	48	67	141	108.3
49152	1	1.7	3.8	5.6	7.4	12	26	36	**	27.1
49152	2	1.6	3.5	5.4	7.3	11	25	34	69	54.2
49152	3	1.6	3.5	5.1	7.2	11	24	33	67	81.2
49152	4	1.6	3.5	5.1	6.8	11	24	33	67	108.3
81910	1	1.6	3.2	4.9	6.5	9.7	20	29	**	28.2
81910	2	1.6	2.8	4.8	6.4	9.6	20	28	56	54.2
81910	3	1.6	2.8	4.3	6.4	9.5	20	27	56	81.2
81910	4	1.6	2.8	4.3	5.9	9.6	20	27	56	108.3
102400	1	1.6	3.0	4.4	6.2	9.7	20	28	**	28.2
102400	2	1.6	2.8	4.3	6.1	9.4	19	25	55	56.3
102400	3	1.6	2.8	4.0	6.1	9.3	19	25	52	84.5
102400	4	1.6	2.8	4.0	5.6	9.3	19	25	52	112.7
151552	1	1.6	2.8	4.3	5.6	8.7	18	24	**	28.5
151552	2	1.6	2.8	4.2	5.5	8.6	18	24	51	57.1
151552	3	1.6	2.8	4.1	5.4	8.5	18	24	51	85.6
151552	4	1.6	2.8	4.1	5.4	8.4	18	24	50	114.1

WORK UNIT TYPE	8416
INPUT UNIT TYPE	8411
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	8411
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	85- 170

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.3	2.6	3.8	5.1	7.7	15.4	20.5	41.0	MAX CAPAC. (MB.)
20480	1	3.2	7.0	11	15	24	54	75	**	27.1
20480	2	3.2	6.4	9.6	14	21	48	66	147	54.2
20480	3	3.1	6.3	9.6	14	21	47	64	141	81.2
20480	4	3.1	6.4	9.8	14	21	47	63	141	108.3
49152	1	1.9	4.0	5.9	7.8	12	26	36	**	27.1
49152	2	1.9	4.0	5.8	7.8	12	25	36	73	54.2
49152	3	1.9	3.9	5.8	7.7	12	25	35	72	81.2
49152	4	1.9	3.9	5.8	7.7	12	24	35	71	108.3
81910	1	1.8	3.3	5.1	7.1	11	22	31	**	27.1
81910	2	1.8	3.2	5.0	7.0	11	22	29	59	54.2
81910	3	1.8	3.1	5.0	6.9	11	22	29	59	81.2
81910	4	1.8	3.1	5.0	6.9	11	22	29	59	108.3
102400	1	1.8	3.3	4.7	6.6	11	22	29	**	28.2
102400	2	1.7	3.1	4.5	6.5	10	21	28	58	56.3
102400	3	1.7	3.1	4.5	6.3	10	21	28	58	84.5
102400	4	1.7	3.1	4.5	6.3	10	21	28	58	112.7
151552	1	1.7	3.2	4.7	6.1	9.3	20	27	**	28.5
151552	2	1.7	3.1	4.5	6.1	9.3	20	27	56	57.1
151552	3	1.7	3.1	4.5	5.8	9.3	20	27	55	85.6
151552	4	1.7	3.1	4.5	5.8	8.9	20	26	55	114.1

WORK UNIT TYPE	8416
INPUT UNIT TYPE	U14
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U14
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	171- 340

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.6	5.1	7.7	10.2	15.4	30.7	41.0	81.9	MAX CAPAC. (MB.)
20480	1	6.1	14	21	29	47	**	**	**	25.3
20480	2	6.0	13	20	27	45	100	137	**	50.6
20480	3	5.9	13	19	27	44	97	132	**	75.8
20480	4	5.8	13	19	27	43	95	129	**	80.9
49152	1	3.2	6.4	10	14	22	**	**	**	25.3
49152	2	3.2	6.3	9.7	13	21	46	62	**	52.0
49152	3	3.2	6.3	9.7	13	21	45	60	**	78.0
49152	4	3.2	6.2	9.5	13	21	44	59	136	104.0
81910	1	2.6	5.7	8.5	11	17	**	**	**	27.4
81910	2	2.6	5.6	8.3	11	17	36	48	**	52.0
81910	3	2.6	5.5	8.2	11	17	35	48	**	78.0
81910	4	2.6	5.5	8.2	11	17	35	47	104	104.0
102400	1	2.5	5.1	8.3	11	17	**	**	**	27.4
102400	2	2.5	5.0	8.0	11	16	33	46	**	54.9
102400	3	2.5	5.0	8.0	11	16	33	45	**	78.0
102400	4	2.5	5.0	7.9	11	16	32	45	96	104.0
151552	1	2.5	4.6	7.1	10	15	**	**	**	28.2
151552	2	2.5	4.6	7.0	9.8	15	30	43	**	56.3
151552	3	2.5	4.6	7.1	9.8	15	30	42	**	82.3
151552	4	2.5	4.6	7.0	9.7	15	30	42	88	109.8

WORK UNIT TYPE	8416
INPUT UNIT TYPE	U12
INPUT BLOCK SIZE	256
OUTPUT UNIT TYPE	U12
OUTPUT BLOCK SIZE	256
APPLICABLE RECORD LENGTHS	171- 340

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.6	5.1	7.7	10.2	15.4	30.7	41.0	81.9	MAX CAPAC. (MB.)
20480	1	12	25	39	53	82	**	**	**	25.3
20480	2	12	25	38	52	80	174	**	**	40.4
20480	3	12	24	37	51	78	171	231	**	75.6
20480	4	12	24	38	51	78	168	229	477	101.1
49152	1	9.6	19	29	39	60	**	**	**	25.3
49152	2	9.5	19	29	38	59	122	163	**	52.0
49152	3	9.5	19	29	38	58	120	161	**	78.0
49152	4	9.5	19	28	38	58	120	160	337	104.0
81910	1	8.9	18	27	37	55	**	**	**	27.4
81910	2	8.8	18	27	36	54	111	149	**	52.0
81910	3	8.8	18	27	36	54	111	148	**	78.0
81910	4	8.8	18	27	36	54	111	148	305	104.0
102400	1	8.8	18	27	36	55	**	**	**	27.4
102400	2	8.8	18	27	36	54	108	145	**	54.9
102400	3	8.8	17	27	36	54	108	145	**	78.0
102400	4	8.8	17	27	36	54	108	145	297	104.0
151552	1	8.8	17	26	35	53	**	**	**	28.2
151552	2	8.8	17	26	35	53	106	143	**	56.3
151552	3	8.8	17	26	35	53	106	143	**	82.3
151552	4	8.7	17	26	35	53	106	143	288	109.8

WORK UNIT TYPE	8416
INPUT UNIT TYPE	U10
INPUT BLOCK SIZE	256
OUTPUT UNIT TYPE	U10
OUTPUT BLOCK SIZE	256
APPLICABLE RECORD LENGTHS	171- 340

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.6	5.1	7.7	10.2	15.4	30.7	41.0	81.9	MAX CAPAC. (MB.)
20480	1	19	40	60	82	124	**	**	**	25.3
20480	2	19	39	60	81	123	259	351	**	50.6
20480	3	19	39	59	80	122	256	344	**	75.8
20480	4	19	39	59	80	122	255	342	704	101.1
49152	1	17	34	51	68	104	**	**	**	26.0
49152	2	17	34	51	68	103	211	282	**	52.0
49152	3	17	34	51	68	102	209	280	**	78.0
49152	4	17	34	51	67	102	209	279	573	104.0
81910	1	16	33	50	66	99	**	**	**	27.4
81910	2	16	33	49	66	99	200	267	**	52.0
81910	3	16	33	49	66	99	199	266	**	78.0
81910	4	16	33	49	66	99	199	266	541	104.0
102400	1	16	32	49	66	99	**	**	**	27.4
102400	2	16	32	49	65	98	197	263	**	54.9
102400	3	16	32	49	65	98	197	262	**	78.0
102400	4	16	32	49	65	98	197	262	533	104.0
151552	1	16	32	48	65	98	**	**	**	28.2
151552	2	16	32	48	64	97	195	262	**	56.3
151552	3	16	32	48	64	97	195	261	**	82.3
151552	4	16	32	48	64	97	195	261	524	109.8

WORK UNIT TYPE	8416
INPUT UNIT TYPE	VI-C
INPUT BLOCK SIZE	256
OUTPUT UNIT TYPE	VI-C
OUTPUT BLOCK SIZE	256
APPLICABLE RECORD LENGTHS	171- 340

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.6	5.1	7.7	10.2	15.4	30.7	41.0	81.9	MAX CAPAC. (MB.)
20480	1	13	27	42	57	87	**	**	**	25.3
20480	2	13	26	40	55	85	184	**	**	40.4
20480	3	13	26	40	54	83	180	244	**	75.8
20480	4	13	26	40	54	83	178	242	501	101.1
49152	1	10	21	31	42	65	**	**	**	25.3
49152	2	10	21	31	41	64	132	177	**	52.0
49152	3	10	20	31	41	63	131	175	**	78.0
49152	4	10	20	31	41	63	130	174	364	104.0
81910	1	9.7	20	30	40	60	**	**	**	27.4
81910	2	9.7	20	30	40	59	122	162	**	52.0
81910	3	9.7	20	30	40	59	121	162	**	78.0
81910	4	9.7	20	30	40	59	121	161	332	104.0
102400	1	9.6	19	30	40	60	**	**	**	27.4
102400	2	9.6	19	29	39	59	118	159	**	54.9
102400	3	9.6	19	29	39	59	118	158	**	78.0
102400	4	9.6	19	29	39	59	118	159	324	104.0
151552	1	9.6	19	28	38	58	**	**	**	28.2
151552	2	9.6	19	28	38	58	116	157	**	56.3
151552	3	9.6	19	28	38	58	116	157	**	82.3
151552	4	9.6	19	28	38	58	116	157	315	109.8

WORK UNIT TYPE	8416
INPUT UNIT TYPE	8416
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	8416
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	171- 340

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.6	5.1	7.7	10.2	15.4	30.7	41.0	81.9	MAX CAPAC. (MB.)
20480	1	6.7	15	22	31	50	**	**	**	25.3
20480	2	6.3	14	22	29	48	105	142	**	50.6
20480	3	6.3	13	22	30	48	104	141	**	75.8
20480	4	6.2	13	20	29	47	101	136	301	101.1
49152	1	3.5	7.2	11	16	25	**	**	**	27.4
49152	2	3.4	7.0	11	15	24	50	**	**	40.4
49152	3	3.3	6.9	11	15	24	49	67	**	78.0
49152	4	3.3	6.6	11	15	23	48	66	149	109.8
81910	1	2.9	6.2	9.3	12	19	**	**	**	27.4
81910	2	2.7	6.0	9.0	12	18	40	54	**	52.0
81910	3	2.6	6.0	9.0	12	18	40	53	**	78.0
81910	4	2.6	5.7	8.9	12	18	39	53	119	104.0
102400	1	2.8	5.9	8.8	12	19	**	**	**	27.4
102400	2	2.7	5.6	8.7	12	18	36	52	**	54.9
102400	3	2.6	5.6	8.7	12	18	36	50	**	78.0
102400	4	2.7	5.3	8.7	12	18	35	49	107	104.0
151552	1	2.6	5.1	8.0	11	17	**	**	**	28.2
151552	2	2.6	5.1	7.8	11	17	33	47	**	56.3
151552	3	2.6	5.0	7.8	11	17	33	46	**	82.3
151552	4	2.6	4.9	7.6	11	17	33	46	98	112.7

WORK UNIT TYPE	8416
INPUT UNIT TYPE	8411
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	8411
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	171- 340

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.6	5.1	7.7	10.2	15.4	30.7	41.0	81.9	MAX CAPAC. (MB.)
20480	1	6.8	15	23	33	53	**	**	**	25.3
20480	2	6.6	14	22	29	48	108	150	**	50.6
20480	3	6.5	14	22	29	48	105	145	**	75.8
20480	4	6.5	14	21	29	47	101	141	320	101.1
49152	1	3.9	7.6	12	16	26	**	**	**	25.3
49152	2	3.8	7.6	12	16	25	54	73	**	52.0
49152	3	3.8	7.5	11	16	25	53	71	**	78.0
49152	4	3.8	7.6	12	15	25	52	70	158	104.0
81910	1	3.1	6.8	11	14	21	**	**	**	27.4
81910	2	3.1	6.7	10	14	21	44	59	**	52.0
81910	3	3.1	6.7	10	14	20	43	58	**	78.0
81910	4	3.1	6.7	10	14	20	43	58	125	104.0
102400	1	3.1	6.2	10	14	21	**	**	**	27.4
102400	2	3.1	6.1	9.9	13	20	41	56	**	54.9
102400	3	3.1	6.1	9.8	13	20	41	56	**	78.0
102400	4	3.1	6.1	9.8	13	20	41	55	117	104.0
151552	1	3.1	5.8	9.1	13	20	**	**	**	28.2
151552	2	3.1	5.8	8.7	12	19	39	54	**	56.3
151552	3	3.1	5.8	8.7	12	19	38	53	**	82.3
151552	4	3.1	5.8	8.7	12	19	38	53	109	109.8

WORK UNIT TYPE	8416
INPUT UNIT TYPE	U14
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	U14
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	341- 682

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 5.1	10.2	15.4	20.5	30.7	61.4	81.9	102.4	MAX CAPAC. (MB.)
20480	1	14	30	49	**	**	**	**	**	20.2
20480	2	13	29	47	66	104	**	**	**	46.2
20480	3	13	28	46	65	101	**	**	**	69.3
20480	4	12	28	45	62	96	218	**	**	92.4
49152	1	6.3	14	23	31	**	**	**	**	26.0
49152	2	6.3	14	22	30	45	**	**	**	52.0
49152	3	6.2	14	21	29	44	97	**	**	78.0
49152	4	6.2	13	21	29	44	97	137	**	92.4
81910	1	5.7	11	17	25	**	**	**	**	26.0
81910	2	5.6	11	17	24	36	**	**	**	52.0
81910	3	5.5	11	17	23	35	79	**	**	69.3
81910	4	5.5	11	17	23	35	78	106	**	104.0
102400	1	5.1	11	17	23	**	**	**	**	26.0
102400	2	5.0	11	16	22	33	**	**	**	52.0
102400	3	5.0	11	16	22	33	72	**	**	78.0
102400	4	5.0	11	16	22	33	71	95	120	104.0
151552	1	4.6	10	15	20	**	**	**	**	27.4
151552	2	4.6	9.9	15	20	30	**	**	**	54.9
151552	3	4.6	9.8	15	20	30	66	**	**	78.0
151552	4	4.6	9.7	15	20	30	65	88	110	104.0

WORK UNIT TYPE	8416
INPUT UNIT TYPE	8416
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	8416
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	341- 682

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 5.1	10.2	15.4	20.5	30.7	61.4	81.9	102.4	MAX CAPAC. (MB.)
20480	1	15	33	51	72	**	**	**	**	26.0
20480	2	14	31	49	68	107	**	**	**	52.0
20480	3	14	28	48	67	106	**	**	**	65.0
20480	4	14	28	48	66	106	227	**	**	86.7
49152	1	7.0	16	24	33	**	**	**	**	26.0
49152	2	6.9	15	23	32	50	**	**	**	52.0
49152	3	6.8	15	23	32	49	109	**	**	78.0
49152	4	6.8	15	23	31	48	107	146	**	92.4
81910	1	6.3	13	19	27	**	**	**	**	27.4
81910	2	6.1	12	18	26	40	**	**	**	52.0
81910	3	6.0	12	18	26	39	89	**	**	69.3
81910	4	6.0	12	18	25	39	85	120	**	92.4
102400	1	5.6	12	19	26	**	**	**	**	27.4
102400	2	5.6	12	18	24	36	**	**	**	52.0
102400	3	5.5	12	18	24	36	79	**	**	78.0
102400	4	5.5	12	18	24	35	78	106	**	92.4
151552	1	5.2	11	17	22	**	**	**	**	27.4
151552	2	5.0	11	16	22	33	**	**	**	54.9
151552	3	5.0	11	16	22	33	72	**	**	78.0
151552	4	4.9	11	16	22	33	71	97	123	109.8

WORK UNIT TYPE	8416
INPUT UNIT TYPE	8411
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	8411
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	341- 682

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 5.1	10.2	15.4	20.5	30.7	61.4	81.9	102.4	MAX CAPAC. (MB.)
20480	1	15	33	55	**	**	**	**	**	20.2
20480	2	14	31	51	71	114	**	**	**	46.2
20480	3	13	31	49	67	107	**	**	**	65.0
20480	4	14	30	48	66	101	242	**	**	92.4
49152	1	7.5	16	27	36	**	**	**	**	26.0
49152	2	7.5	16	25	35	54	**	**	**	52.0
49152	3	7.4	16	25	33	52	115	**	**	78.0
49152	4	7.4	16	24	34	52	114	159	**	92.4
81910	1	6.8	14	21	30	**	**	**	**	26.0
81910	2	6.7	14	21	29	44	**	**	**	52.0
81910	3	6.7	14	20	29	43	95	**	**	69.3
81910	4	6.7	14	20	28	43	94	128	**	92.4
102400	1	6.2	14	21	28	**	**	**	**	26.0
102400	2	6.1	13	20	27	41	**	**	**	52.0
102400	3	6.1	13	20	27	41	88	**	**	78.0
102400	4	6.1	13	20	27	41	87	116	146	104.0
151552	1	5.8	12	19	26	**	**	**	**	27.4
151552	2	5.8	12	19	25	38	**	**	**	54.9
151552	3	5.8	12	19	25	38	82	**	**	78.0
151552	4	5.8	12	19	25	38	81	109	137	104.0

WORK UNIT TYPE	8430
INPUT UNIT TYPE	U20
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U20
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	20- 39

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	0.9	1.2	1.8	3.6	4.8	9.6	MAX CAPAC. (MB.)
20480	1	1.4	2.6	3.8	5.0	7.5	16	22	44	88.9
20480	2	1.4	2.6	3.8	5.0	7.5	16	22	44	177.8
20480	3	1.4	2.6	3.8	5.0	7.5	16	22	44	266.7
20480	4	1.4	2.6	3.8	5.0	7.6	16	22	45	349.2
49152	1	1.1	1.9	2.8	3.7	5.8	11	16	32	94.2
49152	2	1.1	1.9	2.8	3.7	5.7	11	16	32	188.4
49152	3	1.1	1.9	2.8	3.7	5.7	11	16	32	281.2
49152	4	1.1	1.9	2.8	3.7	5.7	11	16	32	374.9
81910	1	1.1	1.8	2.6	3.4	4.9	11	14	29	97.2
81910	2	1.1	1.8	2.6	3.4	4.9	11	14	29	194.3
81910	3	1.1	1.8	2.6	3.4	5.0	11	14	29	291.5
81910	4	1.1	1.8	2.6	3.4	5.0	11	14	29	388.7
102400	1	1.1	1.9	2.6	3.3	4.9	10	14	29	98.3
102400	2	1.1	1.9	2.6	3.3	4.9	10	14	29	196.6
102400	3	1.1	1.9	2.6	3.3	4.9	10	14	29	294.9
102400	4	1.1	1.9	2.6	3.3	4.9	10	14	29	393.3
151552	1	1.1	1.9	2.6	3.4	5.0	9.6	13	28	97.2
151552	2	1.1	1.9	2.6	3.4	5.0	9.6	13	28	194.3
151552	3	1.1	1.9	2.6	3.4	5.0	9.6	13	28	291.5
151552	4	1.1	1.9	2.6	3.4	5.0	9.6	13	28	388.7

WORK UNIT TYPE	8430
INPUT UNIT TYPE	U16
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U16
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	20- 39

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	0.9	1.2	1.8	3.6	4.8	9.6	MAX CAPAC. (MB.)
20480	1	1.5	2.7	3.9	5.1	7.6	16	22	45	88.9
20480	2	1.5	2.7	3.9	5.1	7.6	16	22	45	177.8
20480	3	1.5	2.7	3.9	5.1	7.7	16	22	45	266.7
20480	4	1.5	2.7	3.9	5.1	7.7	16	22	45	349.2
49152	1	1.1	2.0	2.9	3.8	5.9	12	16	33	94.2
49152	2	1.1	2.0	2.9	3.8	5.9	12	16	32	188.4
49152	3	1.1	2.0	2.9	3.8	5.9	12	16	33	281.2
49152	4	1.1	2.0	2.9	3.8	5.9	12	16	32	374.9
81910	1	1.1	1.8	2.6	3.4	4.9	11	14	29	97.2
81910	2	1.1	1.8	2.6	3.4	4.9	11	14	29	194.3
81910	3	1.1	1.8	2.6	3.4	5.0	11	14	29	291.5
81910	4	1.1	1.8	2.6	3.4	5.0	11	14	29	388.7
102400	1	1.1	1.9	2.6	3.4	4.9	10	14	29	98.3
102400	2	1.1	1.9	2.6	3.4	4.9	10	14	29	196.6
102400	3	1.1	1.9	2.6	3.4	4.9	10	14	29	294.9
102400	4	1.1	1.9	2.6	3.4	4.9	10	14	29	393.3
151552	1	1.1	1.9	2.6	3.4	5.0	9.7	13	28	97.2
151552	2	1.1	1.9	2.6	3.4	5.0	9.7	13	28	194.3
151552	3	1.1	1.9	2.6	3.4	5.0	9.7	13	28	291.5
151552	4	1.1	1.9	2.6	3.4	5.0	9.7	13	28	388.7

WORK UNIT TYPE	8430
INPUT UNIT TYPE	U14
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U14
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	20- 39

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	0.9	1.2	1.8	3.6	4.8	9.6	MAX CAPAC. (MB.)
20480	1	1.5	2.8	4.1	5.4	8.0	17	23	47	88.9
20480	2	1.5	2.8	4.1	5.4	8.0	17	23	47	177.8
20480	3	1.5	2.8	4.1	5.4	8.0	17	23	47	266.7
20480	4	1.5	2.8	4.1	5.4	9.1	17	23	47	349.2
49152	1	1.2	2.1	3.0	4.0	6.3	13	17	34	94.2
49152	2	1.2	2.1	3.0	4.0	6.3	13	17	35	188.4
49152	3	1.2	2.1	3.0	4.0	6.3	13	17	35	281.2
49152	4	1.2	2.1	3.0	4.0	6.3	13	17	34	374.9
81910	1	1.1	1.8	2.6	3.4	5.0	11	15	30	97.2
81910	2	1.1	1.8	2.6	3.5	5.0	11	15	30	194.3
81910	3	1.1	1.8	2.6	3.5	5.1	11	15	30	291.5
81910	4	1.1	1.8	2.6	3.4	5.1	11	15	30	388.7
102400	1	1.1	1.9	2.7	3.4	5.0	10	14	29	98.3
102400	2	1.1	1.9	2.7	3.4	5.0	10	14	29	196.6
102400	3	1.1	1.9	2.7	3.4	5.0	10	14	29	294.9
102400	4	1.1	1.9	2.7	3.4	5.0	10	14	29	393.3
151552	1	1.1	1.9	2.7	3.4	5.0	9.8	13	29	97.2
151552	2	1.1	1.9	2.7	3.4	5.0	9.8	13	29	194.3
151552	3	1.1	1.9	2.7	3.4	5.0	9.8	13	29	291.5
151552	4	1.1	1.9	2.7	3.4	5.0	9.8	13	29	388.7

WORK UNIT TYPE	8430
INPUT UNIT TYPE	U12
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U12
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	20- 39

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	0.9	1.2	1.8	3.6	4.8	9.6	MAX CAPAC. (MB.)
20480	1	1.6	2.9	4.3	5.6	8.4	18	24	49	88.9
20480	2	1.6	2.9	4.3	5.6	8.4	18	24	49	177.6
20480	3	1.6	2.9	4.3	5.6	8.4	18	24	49	266.7
20480	4	1.6	3.0	4.3	5.6	8.5	18	24	49	349.2
49152	1	1.3	2.2	3.2	4.3	6.7	13	18	37	94.2
49152	2	1.3	2.2	3.2	4.3	6.7	13	18	37	188.4
49152	3	1.3	2.2	3.2	4.3	6.7	13	18	37	281.2
49152	4	1.3	2.2	3.2	4.3	6.7	13	18	37	374.9
81910	1	1.1	1.9	2.7	3.5	5.0	11	15	30	97.2
81910	2	1.1	1.9	2.7	3.5	5.1	11	15	30	194.3
81910	3	1.1	1.9	2.7	3.5	5.1	11	15	30	291.5
81910	4	1.1	1.9	2.7	3.5	5.1	11	15	30	388.7
102400	1	1.1	1.9	2.7	3.4	5.1	10	14	30	98.3
102400	2	1.1	1.9	2.7	3.4	5.1	10	14	30	196.6
102400	3	1.1	1.9	2.7	3.4	5.1	10	14	30	294.9
102400	4	1.1	1.9	2.7	3.4	5.1	10	14	30	393.3
151552	1	1.2	1.9	2.7	3.4	5.1	9.9	13	29	97.2
151552	2	1.2	1.9	2.7	3.4	5.1	9.9	13	29	194.3
151552	3	1.2	1.9	2.7	3.4	5.1	9.9	13	29	291.5
151552	4	1.2	1.9	2.7	3.4	5.1	9.9	13	29	388.7

WORK UNIT TYPE	8430
INPUT UNIT TYPE	8430
INPUT BLOCK SIZE	3840
OUTPUT UNIT TYPE	8430
OUTPUT BLOCK SIZE	3840
APPLICABLE RECORD LENGTHS	20- 39

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	0.9	1.2	1.8	3.6	4.8	9.6	MAX CAPAC. (MB.)
20480	1	1.5	2.7	3.9	5.1	7.6	16	22	45	88.9
20480	2	1.4	2.7	3.9	5.1	7.6	16	22	45	177.8
20480	3	1.5	2.7	3.9	5.1	7.6	16	22	45	266.7
20480	4	1.5	2.7	3.9	5.1	7.6	16	22	45	349.2
49152	1	1.1	1.9	2.8	3.8	5.8	11	15	32	93.7
49152	2	1.1	1.9	2.8	3.8	5.8	12	15	31	187.4
49152	3	1.1	2.0	2.8	3.8	5.8	12	15	32	281.2
49152	4	1.1	2.0	2.8	3.8	5.8	12	16	32	374.9
81910	1	1.1	1.9	2.7	3.5	5.1	11	15	30	97.2
81910	2	1.1	1.9	2.7	3.5	5.1	11	15	30	194.3
81910	3	1.1	1.9	2.7	3.5	5.1	11	15	30	291.5
81910	4	1.1	1.9	2.7	3.5	5.1	11	15	30	388.7
102400	1	1.1	1.9	2.7	3.5	5.2	10	14	30	98.3
102400	2	1.1	1.9	2.7	3.5	5.2	10	14	30	196.6
102400	3	1.1	1.9	2.7	3.5	5.2	10	14	30	294.9
102400	4	1.1	1.9	2.7	3.5	5.2	10	14	30	393.3
151552	1	1.2	2.0	2.7	3.5	5.2	10	13	29	97.2
151552	2	1.2	2.0	2.7	3.5	5.2	10	13	29	194.3
151552	3	1.2	2.0	2.7	3.5	5.2	10	13	29	291.5
151552	4	1.2	2.0	2.7	3.5	5.2	10	13	29	388.7

WORK UNIT TYPE	8430
INPUT UNIT TYPE	8418
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8418
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	21- 42

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	1.0	1.3	1.9	3.8	5.1	10.2	MAX CAPAC. (MB.)
20480	1	1.6	2.8	4.1	5.6	8.6	18	24	50	88.2
20480	2	1.6	2.8	4.1	5.5	8.5	17	23	47	176.4
20480	3	1.6	2.8	4.1	5.5	8.5	17	23	48	264.6
20480	4	1.6	2.8	4.1	5.5	8.6	17	23	48	352.8
49152	1	1.2	2.0	2.9	3.9	6.0	12	16	33	92.6
49152	2	1.2	2.0	2.9	3.9	6.0	12	16	33	185.2
49152	3	1.2	2.0	2.9	3.9	6.1	12	16	33	277.9
49152	4	1.2	2.0	2.9	3.9	6.0	12	16	33	370.5
81910	1	1.1	1.9	2.7	3.5	5.2	11	15	31	97.0
81910	2	1.1	1.9	2.7	3.5	5.2	11	15	30	194.1
81910	3	1.1	1.9	2.7	3.5	5.2	11	15	30	291.1
81910	4	1.1	1.9	2.7	3.5	5.2	11	15	30	388.1
102400	1	1.1	1.9	2.7	3.5	5.1	11	15	30	98.0
102400	2	1.1	1.9	2.7	3.5	5.1	11	15	30	196.0
102400	3	1.1	1.9	2.7	3.5	5.1	11	15	30	294.0
102400	4	1.1	1.9	2.7	3.5	5.1	11	15	30	392.0
151552	1	1.1	2.0	2.7	3.5	5.2	10	13	29	97.0
151552	2	1.1	2.0	2.7	3.5	5.2	10	13	29	194.1
151552	3	1.1	2.0	2.7	3.5	5.2	10	13	29	291.1
151552	4	1.1	2.0	2.7	3.5	5.2	10	13	29	388.1

WORK UNIT TYPE	8430
INPUT UNIT TYPE	020
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	020
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	40- 79

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.2	1.8	2.4	3.6	7.2	9.6	19.2	MAX CAPAC. (MB.)
20480	1	1.8	3.5	5.2	7.2	11	23	31	71	86.8
20480	2	1.8	3.3	5.1	6.9	11	22	30	65	174.6
20480	3	1.8	3.3	5.0	6.9	11	22	29	64	260.5
20480	4	1.8	3.3	5.0	7.0	11	22	29	64	349.2
49152	1	1.2	2.2	3.3	4.4	6.6	13	18	39	96.5
49152	2	1.2	2.2	3.3	4.4	6.6	13	18	38	180.1
49152	3	1.2	2.2	3.3	4.4	6.6	13	18	38	270.1
49152	4	1.2	2.2	3.3	4.3	6.6	13	18	38	360.2
81910	1	1.1	1.9	2.7	3.6	5.7	12	16	32	96.5
81910	2	1.1	1.9	2.7	3.6	5.8	12	16	32	193.0
81910	3	1.1	1.9	2.7	3.6	5.8	12	16	32	289.4
81910	4	1.1	1.9	2.8	3.6	5.8	12	16	32	385.9
102400	1	1.1	1.9	2.7	3.6	5.3	11	15	32	96.5
102400	2	1.1	1.9	2.7	3.6	5.3	11	15	32	193.0
102400	3	1.1	1.9	2.7	3.6	5.3	11	15	32	289.4
102400	4	1.1	1.9	2.7	3.6	5.3	11	15	31	385.9
151552	1	1.1	1.9	2.7	3.5	5.1	11	15	31	98.3
151552	2	1.1	1.9	2.7	3.5	5.1	11	15	31	196.6
151552	3	1.1	1.9	2.7	3.5	5.1	11	15	31	294.9
151552	4	1.1	1.9	2.7	3.5	5.1	11	15	31	393.3

WORK UNIT TYPE	8430
INPUT UNIT TYPE	U16
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U16
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	40- 79

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.2	1.8	2.4	3.6	7.2	9.6	19.2	MAX CAPAC. (MB.)
20480	1	1.9	3.6	5.4	7.4	11	23	32	73	88.2
20480	2	1.9	3.4	5.2	7.2	11	23	31	67	174.6
20480	3	1.8	3.4	5.1	7.1	11	23	30	66	260.5
20480	4	1.9	3.4	5.2	7.2	11	22	30	66	349.2
49152	1	1.3	2.3	3.5	4.6	6.9	14	19	41	96.5
49152	2	1.3	2.3	3.5	4.6	6.9	14	19	40	180.1
49152	3	1.3	2.3	3.5	4.6	6.9	14	19	40	270.1
49152	4	1.3	2.3	3.5	4.6	6.9	14	19	40	360.2
81910	1	1.1	1.9	2.8	3.6	5.8	12	16	33	96.5
81910	2	1.1	1.9	2.7	3.6	5.8	12	16	32	193.0
81910	3	1.1	1.9	2.7	3.6	5.8	12	16	32	289.4
81910	4	1.1	1.9	2.8	3.6	5.8	12	16	32	385.9
102400	1	1.1	1.9	2.7	3.6	5.3	12	15	32	96.5
102400	2	1.1	1.9	2.7	3.6	5.3	12	15	32	193.0
102400	3	1.1	1.9	2.7	3.6	5.3	12	15	32	289.4
102400	4	1.1	1.9	2.7	3.6	5.3	12	15	32	385.9
151552	1	1.1	1.9	2.7	3.6	5.1	11	15	31	98.3
151552	2	1.1	1.9	2.7	3.6	5.1	11	15	31	196.6
151552	3	1.2	1.9	2.8	3.6	5.1	11	15	31	294.9
151552	4	1.2	1.9	2.8	3.6	5.1	11	15	31	393.3

WORK UNIT TYPE	8430
INPUT UNIT TYPE	014
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	014
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	40- 79

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.2	1.8	2.4	3.6	7.2	9.6	19.2	MAX CAPAC. (MB.)
20480	1	2.0	3.9	5.7	7.9	12	25	34	76	86.8
20480	2	2.0	3.7	5.6	7.7	12	24	33	71	174.6
20480	3	2.0	3.7	5.5	7.6	12	24	32	70	260.5
20480	4	2.0	3.7	5.6	7.7	12	24	32	71	349.2
49152	1	1.4	2.6	3.9	5.2	7.7	16	21	45	96.5
49152	2	1.4	2.6	3.9	5.1	7.7	16	21	44	180.1
49152	3	1.4	2.6	3.9	5.1	7.7	16	21	44	270.1
49152	4	1.4	2.6	3.9	5.1	7.7	15	21	44	360.2
81910	1	1.1	2.0	2.8	3.7	5.9	12	16	33	96.5
81910	2	1.1	2.0	2.8	3.7	5.9	12	16	33	193.0
81910	3	1.1	2.0	2.8	3.7	5.9	12	16	33	289.4
81910	4	1.1	2.0	2.9	3.7	5.9	12	16	33	385.9
102400	1	1.2	2.0	2.8	3.7	5.5	12	16	32	96.5
102400	2	1.2	2.0	2.8	3.7	5.5	12	16	32	193.0
102400	3	1.2	2.0	2.8	3.7	5.5	12	16	32	289.4
102400	4	1.2	2.0	2.8	3.7	5.5	12	16	32	385.9
151552	1	1.2	1.9	2.7	3.6	5.3	11	15	32	98.3
151552	2	1.2	1.9	2.7	3.6	5.3	11	15	32	196.6
151552	3	1.2	2.0	2.8	3.6	5.3	11	15	32	294.9
151552	4	1.2	1.9	2.8	3.6	5.3	11	15	32	393.3

WORK UNIT TYPE	8430
INPUT UNIT TYPE	012
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	012
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	40- 79

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.2	1.8	2.4	3.6	7.2	9.6	19.2	MAX CAPAC. (MB.)
20480	1	2.1	4.1	6.1	8.4	13	26	36	80	86.8
20480	2	2.1	4.0	6.0	8.2	13	26	35	75	174.6
20480	3	2.1	3.9	5.9	8.1	13	26	34	74	260.5
20480	4	2.1	3.9	6.0	8.2	13	25	34	74	347.3
49152	1	1.5	2.8	4.3	5.7	8.5	17	23	49	90.0
49152	2	1.5	2.8	4.3	5.7	8.5	17	23	48	180.1
49152	3	1.5	2.8	4.3	5.7	8.5	17	23	48	270.1
49152	4	1.5	2.8	4.3	5.7	8.5	17	23	48	360.2
81910	1	1.2	2.0	2.9	3.8	6.0	12	17	34	96.5
81910	2	1.2	2.0	2.9	3.8	6.1	12	16	34	193.0
81910	3	1.2	2.0	2.9	3.8	6.1	12	16	34	289.4
81910	4	1.2	2.0	3.0	3.8	6.1	12	16	34	385.9
102400	1	1.2	2.0	2.9	3.8	5.6	12	16	33	96.5
102400	2	1.2	2.0	2.9	3.8	5.6	12	16	33	193.0
102400	3	1.2	2.0	2.9	3.8	5.6	12	16	33	289.4
102400	4	1.2	2.0	2.9	3.8	5.6	12	16	33	385.9
151552	1	1.2	2.0	2.8	3.7	5.4	11	16	32	98.3
151552	2	1.2	2.0	2.8	3.7	5.4	11	16	32	196.6
151552	3	1.2	2.0	2.9	3.7	5.4	11	16	32	294.9
151552	4	1.2	2.0	2.9	3.7	5.4	11	16	32	393.3

WORK UNIT TYPE	8430
INPUT UNIT TYPE	8430
INPUT BLOCK SIZE	3840
OUTPUT UNIT TYPE	8430
OUTPUT BLOCK SIZE	3840
APPLICABLE RECORD LENGTHS	40- 79

ESTIMATED SORT EXECUTION TIME IN MINUTES

SCRT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.2	1.8	2.4	3.6	7.2	9.6	19.2	MAX CAPAC. (MB.)
20480	1	1.8	3.4	5.3	7.3	11	23	32	70	87.3
20480	2	1.8	3.4	5.1	7.0	11	23	31	65	174.6
20480	3	1.8	3.4	5.1	7.0	11	22	30	65	260.5
20480	4	1.8	3.4	5.0	7.0	11	22	30	64	349.2
49152	1	1.2	2.2	3.2	4.3	6.4	13	18	39	95.6
49152	2	1.2	2.2	3.2	4.3	6.4	13	17	38	180.1
49152	3	1.2	2.2	3.2	4.3	6.3	13	18	37	270.1
49152	4	1.2	2.2	3.2	4.4	6.5	13	18	37	360.2
81910	1	1.2	2.0	2.9	3.8	6.0	12	16	33	96.5
81910	2	1.2	2.0	2.9	3.8	5.9	12	16	33	193.0
81910	3	1.2	2.0	2.9	3.8	5.9	12	16	33	289.4
81910	4	1.2	2.0	2.9	3.8	5.9	12	16	33	385.9
102400	1	1.2	2.0	2.8	3.7	5.4	12	16	33	96.5
102400	2	1.2	2.0	2.8	3.7	5.4	12	16	33	193.0
102400	3	1.2	2.0	2.8	3.7	5.4	12	16	33	289.4
102400	4	1.2	2.0	2.8	3.7	5.4	12	16	33	385.9
151552	1	1.2	2.0	2.8	3.7	5.4	11	15	32	98.3
151552	2	1.2	2.0	2.8	3.7	5.4	11	15	32	196.6
151552	3	1.2	2.0	2.8	3.7	5.3	11	15	32	294.9
151552	4	1.2	2.0	2.8	3.7	5.3	11	15	32	393.3

WORK UNIT TYPE	8430
INPUT UNIT TYPE	8418
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8418
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	43- 84

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.3	1.9	2.6	3.8	7.7	10.2	20.5	MAX CAPAC. (MB.)
20480	1	2.0	4.0	6.2	8.4	13	26	36	80	88.2
20480	2	1.9	3.8	5.8	7.9	12	25	34	75	176.4
20480	3	1.9	3.8	5.8	7.7	12	24	34	74	264.6
20480	4	2.0	3.8	5.9	8.0	12	24	34	74	352.8
49152	1	1.3	2.4	3.5	4.7	7.0	14	19	41	92.6
49152	2	1.3	2.4	3.4	4.6	7.0	14	19	40	185.2
49152	3	1.3	2.4	3.4	4.6	7.0	14	19	40	277.9
49152	4	1.3	2.4	3.4	4.6	7.0	14	19	40	370.5
81910	1	1.2	2.0	2.9	3.9	6.1	12	16	34	97.0
81910	2	1.2	2.0	2.9	3.9	6.1	12	16	34	194.1
81910	3	1.2	2.0	2.9	3.9	6.1	12	16	34	288.1
81910	4	1.2	2.0	2.9	3.9	6.0	12	16	34	384.2
102400	1	1.2	2.0	2.8	3.7	5.6	12	16	33	97.0
102400	2	1.2	2.0	2.8	3.7	5.6	12	16	33	194.1
102400	3	1.2	2.0	2.8	3.7	5.6	12	16	33	291.1
102400	4	1.2	2.0	2.8	3.7	5.6	12	16	33	388.1
151552	1	1.2	2.0	2.9	3.7	5.3	11	16	32	98.0
151552	2	1.2	2.0	2.9	3.7	5.3	11	16	32	196.0
151552	3	1.2	2.0	2.9	3.7	5.3	11	16	32	294.0
151552	4	1.2	2.0	2.9	3.7	5.3	11	16	32	392.0

WORK UNIT TYPE	8430
INPUT UNIT TYPE	U20
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U20
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	80- 159

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.2	2.4	3.6	4.8	7.2	14.4	19.2	38.4	MAX CAPAC. (MB.)
20480	1	2.7	5.5	8.8	12	19	42	58	128	91.9
20480	2	2.8	5.5	8.4	12	18	40	56	122	180.1
20480	3	2.7	5.4	8.4	12	18	39	55	119	248.1
20480	4	2.7	5.6	8.6	12	18	39	55	118	360.2
49152	1	1.5	2.9	4.4	5.9	9.2	19	26	58	95.6
49152	2	1.5	2.8	4.3	5.7	8.9	18	25	54	191.1
49152	3	1.5	2.8	4.3	5.6	8.8	18	24	53	286.7
49152	4	1.5	2.8	4.2	5.6	8.8	18	24	52	382.2
81910	1	1.2	2.2	3.4	4.4	6.9	14	19	41	97.4
81910	2	1.2	2.2	3.4	4.4	6.8	14	19	39	191.1
81910	3	1.2	2.2	3.4	4.4	6.8	13	19	39	286.7
81910	4	1.2	2.2	3.4	4.4	6.8	13	19	39	382.2
102400	1	1.2	2.1	3.1	4.3	6.5	13	17	38	96.5
102400	2	1.2	2.1	3.1	4.3	6.5	13	17	36	193.0
102400	3	1.2	2.1	3.1	4.3	6.5	13	17	36	289.4
102400	4	1.2	2.1	3.1	4.3	6.4	13	17	36	385.9
151552	1	1.2	2.1	2.9	3.9	6.0	13	17	35	97.4
151552	2	1.2	2.1	2.9	3.9	6.0	13	17	35	194.8
151552	3	1.2	2.1	2.9	3.9	6.0	13	17	35	292.2
151552	4	1.2	2.1	2.9	3.9	6.0	13	17	35	389.6

WORK UNIT TYPE	8430
INPUT UNIT TYPE	U16
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U16
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	80- 159

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.2	2.4	3.6	4.8	7.2	14.4	19.2	38.4	MAX CAPAC. (MB.)
20480	1	2.8	5.8	9.2	13	19	43	60	131	91.9
20480	2	2.9	5.7	8.8	12	19	41	58	126	165.4
20480	3	2.8	5.7	8.8	12	19	40	56	123	248.1
20480	4	2.8	5.9	9.0	12	19	40	56	122	360.2
49152	1	1.6	3.1	4.7	6.2	9.9	20	28	61	95.6
49152	2	1.7	3.0	4.6	6.1	9.5	19	26	57	191.1
49152	3	1.7	3.0	4.5	6.0	9.5	19	26	56	286.7
49152	4	1.7	3.0	4.5	6.0	9.5	19	26	56	382.2
81910	1	1.2	2.2	3.4	4.5	7.0	14	19	41	97.4
81910	2	1.2	2.2	3.4	4.5	6.9	14	19	40	191.1
81910	3	1.2	2.2	3.4	4.5	6.9	14	19	39	286.7
81910	4	1.2	2.2	3.4	4.5	6.9	14	19	40	382.2
102400	1	1.2	2.1	3.2	4.4	6.6	13	18	38	96.5
102400	2	1.2	2.1	3.1	4.4	6.6	13	18	37	193.0
102400	3	1.2	2.1	3.1	4.4	6.6	13	18	36	289.4
102400	4	1.2	2.1	3.1	4.4	6.5	13	18	36	385.9
151552	1	1.2	2.1	3.0	3.9	6.1	13	17	35	97.4
151552	2	1.2	2.1	3.0	3.9	6.0	13	17	35	194.8
151552	3	1.2	2.1	3.0	3.9	6.0	13	17	35	292.2
151552	4	1.2	2.1	3.0	3.9	6.1	13	17	35	389.6

WORK UNIT TYPE	8430
INPUT UNIT TYPE	U14
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U14
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	80- 159

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.2	2.4	3.6	4.8	7.2	14.4	19.2	38.4	MAX CAPAC. (MB.)
20480	1	3.1	6.3	9.9	14	21	46	64	139	91.9
20480	2	3.1	6.3	9.6	13	21	45	62	135	183.6
20480	3	3.1	6.2	9.6	13	21	43	61	132	248.1
20480	4	3.1	6.4	9.8	14	21	43	61	130	360.2
49152	1	1.8	3.7	5.5	7.3	12	24	32	69	95.6
49152	2	1.9	3.6	5.5	7.2	11	23	31	66	191.1
49152	3	1.9	3.6	5.4	7.1	11	23	31	64	286.7
49152	4	1.9	3.6	5.4	7.1	11	23	31	64	382.2
81910	1	1.3	2.4	3.6	4.8	7.3	15	20	43	95.6
81910	2	1.3	2.4	3.6	4.8	7.2	14	20	41	191.1
81910	3	1.3	2.4	3.6	4.8	7.2	14	20	41	286.7
81910	4	1.3	2.4	3.6	4.8	7.2	14	20	41	382.2
102400	1	1.3	2.2	3.3	4.6	6.8	14	18	39	96.5
102400	2	1.3	2.2	3.3	4.6	6.8	14	18	38	193.0
102400	3	1.3	2.2	3.3	4.6	6.8	14	18	38	289.4
102400	4	1.3	2.2	3.3	4.6	6.8	14	18	38	385.9
151552	1	1.3	2.2	3.1	4.1	6.4	13	18	37	97.4
151552	2	1.2	2.2	3.1	4.1	6.3	13	18	37	194.8
151552	3	1.3	2.2	3.1	4.1	6.3	13	18	36	292.2
151552	4	1.2	2.2	3.1	4.1	6.4	13	18	36	389.6

WORK UNIT TYPE	8430
INPUT UNIT TYPE	U12
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U12
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	80- 159

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.2	2.4	3.6	4.8	7.2	14.4	19.2	38.4	MAX CAPAC. (MB.)
20480	1	3.4	6.9	11	15	23	50	68	148	91.9
20480	2	3.5	6.8	10	14	22	48	66	143	183.8
20480	3	3.4	6.7	10	14	22	47	65	141	248.1
20480	4	3.4	7.0	11	15	22	47	65	139	360.2
49152	1	2.1	4.1	6.2	8.2	13	26	36	76	95.6
49152	2	2.1	4.1	6.1	8.1	13	25	35	73	191.1
49152	3	2.1	4.1	6.1	8.0	13	25	34	72	286.7
49152	4	2.1	4.1	6.0	8.0	12	25	34	71	382.2
81910	1	1.4	2.7	4.0	5.3	8.1	17	23	48	97.4
81910	2	1.4	2.7	4.0	5.2	8.1	16	22	47	194.8
81910	3	1.4	2.7	4.0	5.2	8.1	16	22	47	292.2
81910	4	1.4	2.7	4.0	5.2	8.0	16	22	47	389.6
102400	1	1.4	2.5	3.9	5.1	7.7	15	21	46	96.5
102400	2	1.4	2.5	3.8	5.1	7.6	15	21	44	193.0
102400	3	1.4	2.5	3.8	5.1	7.6	15	21	44	289.4
102400	4	1.4	2.5	3.8	5.1	7.6	15	20	43	385.9
151552	1	1.4	2.4	3.5	4.7	7.2	15	20	42	97.4
151552	2	1.4	2.4	3.5	4.7	7.2	15	20	41	194.8
151552	3	1.4	2.4	3.5	4.6	7.2	15	20	41	292.2
151552	4	1.4	2.4	3.4	4.6	7.2	15	20	41	389.6

WORK UNIT TYPE	8430
INPUT UNIT TYPE	8430
INPUT BLOCK SIZE	3840
OUTPUT UNIT TYPE	8430
OUTPUT BLOCK SIZE	3840
APPLICABLE RECORD LENGTHS	80- 159

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.2	2.4	3.6	4.8	7.2	14.4	19.2	38.4	MAX CAPAC. (MB.)
20480	1	2.7	5.6	8.7	12	19	41	59	127	91.9
20480	2	2.8	5.5	8.3	12	18	40	55	122	180.1
20480	3	2.7	5.5	8.3	12	18	39	55	118	270.1
20480	4	2.7	5.6	8.7	12	18	38	54	118	360.2
49152	1	1.5	2.8	4.0	5.6	8.5	18	25	53	95.6
49152	2	1.5	2.7	3.9	5.5	8.2	17	24	50	191.1
49152	3	1.4	2.7	3.9	5.4	8.2	17	23	49	286.7
49152	4	1.5	2.8	4.1	5.5	8.2	17	23	50	385.9
81910	1	1.3	2.3	3.5	4.6	7.1	14	19	42	97.4
81910	2	1.3	2.3	3.6	4.7	7.0	14	19	41	194.6
81910	3	1.3	2.3	3.6	4.7	7.0	14	19	40	286.7
81910	4	1.3	2.3	3.6	4.6	7.0	14	19	40	382.2
102400	1	1.3	2.2	3.2	4.5	6.8	14	18	39	96.5
102400	2	1.3	2.2	3.2	4.4	6.8	14	18	38	193.0
102400	3	1.3	2.2	3.2	4.4	6.8	14	18	38	289.4
102400	4	1.3	2.2	3.2	4.4	6.8	14	18	37	385.9
151552	1	1.2	2.2	3.1	4.1	6.2	13	18	36	97.4
151552	2	1.2	2.2	3.1	4.1	6.2	13	18	36	194.8
151552	3	1.2	2.2	3.1	4.1	6.2	13	18	36	292.2
151552	4	1.2	2.2	3.1	4.1	6.2	13	18	36	389.6

WORK UNIT TYPE	8430
INPUT UNIT TYPE	8418
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8418
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	85- 170

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.3	2.6	3.8	5.1	7.7	15.4	20.5	41.0	MAX CAPAC. (MB.)
20480	1	3.2	6.5	9.9	14	21	48	65	138	93.1
20480	2	3.0	6.0	9.2	12	20	43	59	131	172.5
20480	3	3.1	6.1	9.3	12	20	43	58	128	264.6
20480	4	3.1	6.0	9.3	12	20	43	57	125	345.0
49152	1	1.5	3.2	4.7	6.2	9.6	20	28	60	94.1
49152	2	1.5	3.1	4.6	6.2	9.3	19	27	57	188.2
49152	3	1.5	3.1	4.6	6.2	9.3	19	26	56	282.3
49152	4	1.5	3.1	4.6	6.2	9.1	19	26	56	376.4
81910	1	1.3	2.4	3.6	4.7	7.3	15	21	43	98.0
81910	2	1.3	2.4	3.6	4.7	7.2	14	20	41	196.0
81910	3	1.3	2.4	3.6	4.7	7.2	14	20	41	294.0
81910	4	1.3	2.4	3.6	4.7	7.2	14	20	42	376.4
102400	1	1.3	2.2	3.3	4.6	6.9	14	19	40	97.0
102400	2	1.3	2.2	3.3	4.6	6.9	14	19	38	194.1
102400	3	1.3	2.2	3.3	4.6	6.9	14	19	38	291.1
102400	4	1.3	2.2	3.3	4.6	6.9	14	19	38	388.1
151552	1	1.2	2.2	3.1	4.1	6.5	13	18	37	98.0
151552	2	1.2	2.2	3.1	4.1	6.4	13	18	37	196.0
151552	3	1.2	2.2	3.1	4.1	6.4	13	18	36	294.0
151552	4	1.2	2.2	3.1	4.1	6.4	13	18	36	392.0

WORK UNIT TYPE	8430
INPUT UNIT TYPE	U20
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U20
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	160- 319

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.4	3.6	4.8	9.6	14.4	28.8	57.6	76.8	MAX CAPAC. (MB.)
20480	1	4.9	7.7	11	22	37	80	175	249	91.9
20480	2	5.0	7.7	11	22	35	77	167	235	183.6
20480	3	4.9	7.8	11	22	35	76	167	233	275.7
20480	4	5.0	7.8	11	22	35	79	165	234	360.2
49152	1	2.3	3.4	4.4	9.8	15	35	75	105	93.7
49152	2	2.3	3.3	4.3	9.3	14	32	69	96	187.4
49152	3	2.2	3.2	4.2	9.2	14	31	66	93	281.2
49152	4	2.2	3.2	4.2	8.8	14	31	66	91	374.9
81910	1	1.6	2.3	3.0	6.4	10	21	46	65	95.6
81910	2	1.6	2.3	3.0	6.2	9.3	20	42	59	191.1
81910	3	1.6	2.3	3.0	6.2	9.3	20	41	58	286.7
81910	4	1.6	2.2	2.9	6.1	9.3	20	41	57	382.2
102400	1	1.4	2.0	2.9	5.7	8.6	19	44	61	95.6
102400	2	1.4	2.0	2.9	5.5	8.3	18	41	56	191.1
102400	3	1.4	2.0	2.9	5.5	8.3	18	40	54	286.7
102400	4	1.4	2.0	2.8	5.5	8.3	18	39	54	382.2
151552	1	1.4	1.9	2.5	5.1	7.8	17	35	49	95.6
151552	2	1.4	1.8	2.4	5.0	7.6	16	33	45	191.1
151552	3	1.4	1.9	2.4	5.0	7.6	16	33	44	286.7
151552	4	1.4	1.9	2.4	5.0	7.6	16	33	44	382.2

WORK UNIT TYPE	8430
INPUT UNIT TYPE	U16
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U16
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	160- 319

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.4	3.6	4.8	9.6	14.4	28.8	57.6	76.8	MAX CAPAC. (MB.)
20480	1	5.2	8.0	11	23	38	83	181	257	91.9
20480	2	5.2	8.0	11	23	37	80	172	243	183.8
20480	3	5.2	8.2	11	23	37	79	172	240	275.7
20480	4	5.2	8.2	11	23	37	81	170	241	360.2
49152	1	2.5	3.7	4.9	11	17	37	81	112	93.7
49152	2	2.5	3.6	4.7	10	16	35	74	103	187.4
49152	3	2.5	3.5	4.6	10	15	34	71	100	281.2
49152	4	2.5	3.6	4.6	9.7	15	33	71	97	374.9
81910	1	1.7	2.5	3.2	6.8	11	23	48	69	95.6
81910	2	1.6	2.4	3.1	6.6	10	22	45	63	191.1
81910	3	1.6	2.4	3.1	6.5	9.9	21	44	62	286.7
81910	4	1.6	2.4	3.1	6.4	9.9	21	43	61	382.2
102400	1	1.4	2.2	3.0	6.2	9.3	21	47	65	95.6
102400	2	1.4	2.1	3.0	5.9	8.9	20	43	60	191.1
102400	3	1.4	2.1	3.0	5.9	8.8	20	43	59	286.7
102400	4	1.4	2.1	3.0	5.9	8.8	19	42	58	382.2
151552	1	1.4	1.9	2.5	5.4	8.3	17	36	52	95.6
151552	2	1.4	1.9	2.5	5.3	8.1	17	34	46	191.1
151552	3	1.4	1.9	2.5	5.3	8.0	17	34	45	286.7
151552	4	1.4	1.9	2.5	5.3	8.0	17	34	45	382.2

WORK UNIT TYPE	8430
INPUT UNIT TYPE	U14
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U14
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	160- 319

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.4	3.6	4.8	9.6	14.4	28.8	57.6	76.8	MAX CAPAC. (MB.)
20480	1	5.6	8.7	12	25	41	88	193	273	91.9
20480	2	5.7	8.8	12	25	39	86	184	258	183.8
20480	3	5.8	8.9	12	25	40	85	185	256	275.7
20480	4	5.9	9.0	12	25	40	88	184	259	360.2
49152	1	3.0	4.5	5.9	13	19	43	94	129	93.7
49152	2	3.0	4.4	5.8	12	18	41	87	119	187.4
49152	3	2.9	4.3	5.6	12	18	40	83	116	281.2
49152	4	2.9	4.3	5.7	12	18	39	83	113	374.9
81910	1	2.1	3.0	3.9	8.3	13	27	57	80	95.6
81910	2	2.1	3.0	3.9	8.1	12	26	54	75	191.1
81910	3	2.1	3.0	3.9	8.0	12	26	53	74	286.7
81910	4	2.1	2.9	3.9	8.0	12	26	53	74	382.2
102400	1	1.9	2.8	3.8	7.5	11	25	55	76	95.6
102400	2	1.9	2.8	3.7	7.3	11	24	53	72	191.1
102400	3	1.9	2.8	3.7	7.3	11	24	52	70	286.7
102400	4	1.9	2.8	3.8	7.4	11	24	52	70	382.2
151552	1	1.6	2.5	3.3	6.8	10	22	47	63	95.6
151552	2	1.8	2.5	3.3	6.6	10	21	45	60	198.5
151552	3	1.8	2.5	3.3	6.6	10	21	44	59	286.7
151552	4	1.8	2.5	3.3	6.6	9.9	21	44	59	382.2

WORK UNIT TYPE	8430
INPUT UNIT TYPE	U12
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U12
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	160- 319

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.4	3.6	4.8	9.6	14.4	28.8	57.6	76.8	MAX CAPAC. (MB.)
20480	1	6.1	9.4	13	27	44	94	205	289	91.9
20480	2	6.2	9.6	13	27	43	92	197	276	183.8
20480	3	6.3	9.7	13	27	43	91	197	273	275.7
20480	4	6.3	9.7	13	27	43	93	194	273	360.2
49152	1	3.5	5.2	6.8	15	22	49	104	144	93.7
49152	2	3.4	5.1	6.7	14	21	46	97	134	187.4
49152	3	3.4	5.0	6.6	14	21	45	95	130	281.2
49152	4	3.4	5.0	6.6	14	21	45	94	128	374.9
81910	1	2.6	3.7	4.9	10	16	33	69	96	95.6
81910	2	2.6	3.7	4.9	10	15	32	66	91	191.1
81910	3	2.6	3.7	4.9	10	15	32	65	90	286.7
81910	4	2.5	3.7	4.8	9.9	15	31	64	89	382.2
102400	1	2.4	3.6	4.8	9.5	14	31	67	91	95.6
102400	2	2.4	3.5	4.7	9.3	14	30	64	87	191.1
102400	3	2.4	3.5	4.7	9.3	14	30	63	86	286.7
102400	4	2.4	3.5	4.7	9.3	14	30	63	85	382.2
151552	1	2.2	3.2	4.2	8.6	13	28	58	78	99.2
151552	2	2.2	3.2	4.2	8.5	13	27	56	75	198.5
151552	3	2.2	3.2	4.2	8.4	13	27	55	74	297.7
151552	4	2.2	3.2	4.2	8.5	13	27	55	74	382.2

WORK UNIT TYPE	8430
INPUT UNIT TYPE	8430
INPUT BLOCK SIZE	3840
OUTPUT UNIT TYPE	8430
OUTPUT BLOCK SIZE	3840
APPLICABLE RECORD LENGTHS	160- 319

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.4	3.6	4.8	9.6	14.4	28.8	57.6	76.8	MAX CAPAC. (MB.)
20480	1	4.9	7.7	11	22	36	81	173	247	91.9
20480	2	4.9	7.7	10	22	35	77	165	234	183.8
20480	3	5.0	7.7	10	21	35	76	164	231	275.7
20480	4	5.0	7.8	11	22	35	79	165	233	360.2
49152	1	2.1	3.1	4.3	9.0	14	32	71	98	93.7
49152	2	2.0	2.9	4.0	8.2	13	29	64	88	187.4
49152	3	2.1	3.0	4.0	8.1	13	29	63	85	281.2
49152	4	2.1	3.0	4.0	8.5	13	29	64	86	374.9
81910	1	1.6	2.4	3.2	6.4	10	22	46	65	95.6
81910	2	1.6	2.4	3.1	6.2	9.6	21	43	58	191.1
81910	3	1.6	2.4	3.1	6.2	9.6	21	43	58	286.7
81910	4	1.6	2.4	3.1	6.1	9.6	20	42	57	382.2
102400	1	1.5	2.1	3.0	6.0	9.0	20	45	64	95.6
102400	2	1.5	2.1	3.0	5.9	8.8	19	42	57	191.1
102400	3	1.5	2.1	3.0	5.9	8.8	19	41	56	286.7
102400	4	1.5	2.1	3.0	5.9	8.8	19	41	56	382.2
151552	1	1.4	2.0	2.6	5.4	8.0	18	37	50	95.6
151552	2	1.4	2.0	2.6	5.3	7.9	17	35	47	191.1
151552	3	1.4	2.0	2.6	5.3	7.9	17	35	47	286.7
151552	4	1.4	2.0	2.6	5.3	7.9	17	35	47	382.2

WORK UNIT TYPE	8430
INPUT UNIT TYPE	8418
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8418
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	171- 340

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.6	3.8	5.1	10.2	15.4	30.7	61.4	81.9	MAX CAPAC. (MB.)
20480	1	5.8	9.2	12	26	43	94	218	**	82.3
20480	2	5.6	8.5	12	26	40	86	197	279	164.7
20480	3	5.7	8.5	12	26	41	86	194	271	247.0
20480	4	5.9	9.0	12	27	42	92	194	278	329.3
49152	1	2.3	3.3	4.3	9.9	15	34	71	103	94.1
49152	2	2.3	3.2	4.5	9.6	14	32	70	95	188.2
49152	3	2.2	3.2	4.4	9.5	15	30	68	93	282.3
49152	4	2.2	3.2	4.4	9.3	15	30	67	90	376.4
81910	1	1.6	2.4	3.1	6.6	9.9	22	49	71	98.0
81910	2	1.6	2.3	3.0	6.6	9.9	21	46	65	196.0
81910	3	1.6	2.3	3.0	6.5	9.9	21	46	65	294.0
81910	4	1.6	2.3	3.0	6.4	9.9	20	45	63	392.0
102400	1	1.5	2.1	3.0	6.1	9.1	20	45	60	98.0
102400	2	1.5	2.1	3.0	6.0	8.9	19	42	59	196.0
102400	3	1.5	2.2	3.1	6.0	9.1	19	41	58	294.0
102400	4	1.5	2.2	3.1	6.0	9.1	20	40	58	392.0
151552	1	1.4	2.0	2.6	5.2	8.0	17	37	48	98.0
151552	2	1.4	2.0	2.6	5.1	7.8	17	35	47	196.0
151552	3	1.4	2.0	2.6	5.1	7.8	17	35	47	294.0
151552	4	1.4	2.0	2.6	5.1	7.8	17	35	47	392.0

WORK UNIT TYPE	8430
INPUT UNIT TYPE	U20
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U20
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	320- 639

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 4.8	9.6	14.4	19.2	28.8	57.6	76.8	153.6	MAX CAPAC. (MB.)
20480	1	9.7	20	33	46	74	161	230	**	91.9
20480	2	9.6	20	32	45	71	153	217	481	183.8
20480	3	9.7	21	33	45	70	156	218	466	275.7
20480	4	10	22	33	45	73	163	224	493	352.8
49152	1	4.1	9.0	14	19	29	69	99	**	95.6
49152	2	3.9	8.2	13	17	27	63	87	187	176.4
49152	3	3.8	8.2	13	17	27	61	86	182	264.6
49152	4	3.9	8.1	12	17	27	60	83	176	352.8
81910	1	2.5	5.4	8.7	12	19	40	57	**	95.6
81910	2	2.5	5.2	8.2	11	18	37	52	123	191.1
81910	3	2.4	5.1	8.0	11	17	36	50	118	286.7
81910	4	2.4	5.0	7.8	11	17	35	50	115	382.2
102400	1	2.4	4.8	7.2	9.8	17	38	53	**	95.6
102400	2	2.3	4.6	6.9	9.4	16	35	49	104	191.1
102400	3	2.3	4.5	6.7	9.2	15	34	47	99	286.7
102400	4	2.3	4.5	6.7	9.1	15	34	46	97	382.2
151552	1	1.9	4.0	6.1	8.5	14	29	40	**	99.2
151552	2	1.9	3.8	5.8	8.2	13	28	37	84	198.5
151552	3	1.9	3.8	5.8	8.1	13	27	36	82	297.7
151552	4	1.9	3.8	5.8	8.0	13	27	36	81	396.9

WORK UNIT TYPE	8430
INPUT UNIT TYPE	U16
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U16
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	320- 639

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 4.8	9.6	14.4	19.2	28.8	57.6	76.8	153.6	MAX CAPAC. (MB.)
20480	1	10	21	35	49	77	167	238	**	91.9
20480	2	10	21	33	46	73	158	223	493	183.8
20480	3	10	22	34	47	73	162	225	481	275.7
20480	4	10	22	34	46	75	167	229	504	352.6
49152	1	4.5	9.9	15	21	32	74	106	**	95.6
49152	2	4.4	9.2	14	19	30	69	95	203	176.4
49152	3	4.3	9.1	14	19	30	67	93	197	264.6
49152	4	4.3	9.1	14	19	30	65	91	192	352.6
81910	1	2.9	6.1	9.8	13	21	45	64	**	95.6
81910	2	2.8	5.9	9.2	13	20	41	58	135	191.1
81910	3	2.8	5.9	9.2	13	20	41	57	132	286.7
81910	4	2.8	5.8	9.0	12	19	40	56	129	382.2
102400	1	2.8	5.5	8.3	11	19	43	60	**	99.2
102400	2	2.7	5.2	7.8	11	18	40	55	116	191.1
102400	3	2.7	5.3	7.8	11	18	39	53	113	286.7
102400	4	2.7	5.2	7.8	11	17	39	53	111	382.2
151552	1	2.3	4.7	7.2	10	16	34	46	**	99.2
151552	2	2.2	4.5	6.8	9.5	15	32	43	94	198.5
151552	3	2.2	4.5	6.8	9.5	15	31	42	93	297.7
151552	4	2.2	4.5	6.8	9.3	15	31	42	92	396.9

WORK UNIT TYPE	8430
INPUT UNIT TYPE	U14
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U14
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	320- 639

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 4.8	9.6	14.4	19.2	28.8	57.6	76.8	153.6	MAX CAPAC. (MB.)
20480	1	11	23	38	52	82	178	253	**	91.9
20480	2	11	23	36	51	79	170	240	527	183.8
20480	3	11	24	38	51	80	175	243	518	275.7
20480	4	12	25	38	51	82	181	248	541	352.8
49152	1	5.5	12	18	25	39	86	121	**	95.6
49152	2	5.4	11	17	23	36	81	112	238	176.4
49152	3	5.3	11	17	23	36	79	110	231	264.6
49152	4	5.3	11	17	22	35	78	107	225	352.8
81910	1	3.8	8.0	13	17	27	56	79	**	95.6
81910	2	3.8	7.8	12	17	26	53	74	167	191.1
81910	3	3.8	7.8	12	16	25	52	72	162	286.7
81910	4	3.8	7.7	12	16	25	52	72	160	382.2
102400	1	3.7	7.4	11	15	25	54	74	**	99.2
102400	2	3.6	7.2	11	15	24	51	70	147	191.1
102400	3	3.6	7.1	11	14	23	50	69	143	286.7
102400	4	3.7	7.2	11	15	23	50	68	142	382.2
151552	1	3.2	6.5	9.8	13	21	44	60	**	99.2
151552	2	3.2	6.4	9.6	13	21	43	58	124	198.5
151552	3	3.2	6.3	9.5	13	20	42	57	122	297.7
151552	4	3.2	6.3	9.6	13	20	42	57	122	396.9

WORK UNIT TYPE	8430
INPUT UNIT TYPE	U12
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U12
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	320- 639

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 4.8	9.6	14.4	19.2	28.8	57.6	76.8	153.6	MAX CAPAC. (MB.)
20480	1	12	25	40	56	88	190	268	**	91.9
20480	2	12	25	39	54	85	182	255	558	183.8
20480	3	12	26	41	55	86	188	260	551	275.7
20480	4	12	27	41	55	88	192	263	571	352.8
49152	1	6.5	14	21	28	45	98	136	**	95.6
49152	2	6.3	13	20	27	42	92	127	267	176.4
49152	3	6.2	13	20	26	41	90	124	260	264.6
49152	4	6.2	13	19	26	41	89	122	254	352.8
81910	1	4.8	9.9	16	21	33	68	94	**	95.6
81910	2	4.8	9.8	15	21	31	64	89	198	191.1
81910	3	4.8	9.8	15	20	31	64	88	194	286.7
81910	4	4.7	9.6	15	20	31	63	87	191	382.2
102400	1	4.7	9.3	14	19	30	66	90	**	99.2
102400	2	4.6	9.1	14	19	29	63	86	179	191.1
102400	3	4.6	9.1	14	18	29	62	84	174	286.7
102400	4	4.6	9.1	14	18	29	62	83	172	382.2
151552	1	4.2	8.4	13	17	27	56	75	**	99.2
151552	2	4.1	8.3	13	17	26	54	73	155	198.5
151552	3	4.1	8.2	12	17	26	54	72	152	297.7
151552	4	4.1	8.3	12	17	26	54	72	152	396.9

WORK UNIT TYPE	8430
INPUT UNIT TYPE	8430
INPUT BLOCK SIZE	3840
OUTPUT UNIT TYPE	8430
OUTPUT BLOCK SIZE	3840
APPLICABLE RECORD LENGTHS	320- 639

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 4.8	9.6	14.4	19.2	28.8	57.6	76.8	153.6	MAX CAPAC. (MB.)
20480	1	9.8	21	34	47	74	162	230	**	91.9
20480	2	9.6	20	32	45	71	153	216	477	183.8
20480	3	9.6	20	32	44	69	151	211	466	275.7
20480	4	10	22	34	45	73	165	226	494	352.8
49152	1	3.9	8.4	13	17	29	68	94	**	88.2
49152	2	3.5	7.7	12	16	26	59	81	175	176.4
49152	3	3.6	7.7	12	16	26	57	80	174	264.6
49152	4	3.5	7.3	12	15	25	56	77	162	352.8
81910	1	2.7	5.8	9.3	13	20	42	61	**	95.6
81910	2	2.6	5.4	8.7	12	18	39	55	130	191.1
81910	3	2.6	5.4	8.5	12	18	38	54	125	286.7
81910	4	2.6	5.2	8.3	11	18	37	53	120	382.2
102400	1	2.6	5.3	7.8	11	18	41	56	**	99.2
102400	2	2.5	4.9	7.4	10	17	37	52	111	191.1
102400	3	2.5	4.9	7.2	9.8	16	36	50	106	286.7
102400	4	2.5	4.9	7.2	9.8	16	35	50	104	382.2
151552	1	2.1	4.3	6.5	9.1	15	32	43	**	99.2
151552	2	2.0	4.2	6.3	8.7	14	30	40	88	198.5
151552	3	2.0	4.2	6.3	8.7	14	29	40	85	297.7
151552	4	2.0	4.3	6.3	8.8	14	29	40	85	396.9

WORK UNIT TYPE	8430
INPUT UNIT TYPE	8418
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8418
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	341- 682

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 5.1	10.2	15.4	20.5	30.7	61.4	81.9	163.8	MAX CAPAC. (MB.)
20480	1	11	25	38	54	87	194	**	**	78.4
20480	2	11	23	35	51	82	179	242	**	156.8
20480	3	11	23	35	50	82	177	240	552	235.2
20480	4	12	26	40	56	87	189	268	600	329.3
49152	1	3.9	8.6	13	19	30	65	93	**	94.1
49152	2	4.0	8.3	12	17	28	61	83	194	188.2
49152	3	3.9	8.0	12	18	27	59	80	185	282.3
49152	4	3.9	8.1	12	18	27	58	79	182	376.4
81910	1	2.5	5.5	8.5	11	18	40	59	**	94.1
81910	2	2.4	5.1	7.9	11	17	36	52	125	188.2
81910	3	2.4	5.1	7.7	11	17	35	51	121	282.3
81910	4	2.4	5.1	7.6	10	17	34	50	115	376.4
102400	1	2.4	4.7	7.0	9.8	17	39	54	**	94.1
102400	2	2.3	4.5	6.6	9.3	16	35	48	104	188.2
102400	3	2.3	4.4	6.6	9.2	15	34	46	99	282.3
102400	4	2.3	4.4	6.6	9.2	15	33	46	95	376.4
151552	1	1.9	4.0	6.2	8.7	14	29	40	**	98.0
151552	2	1.9	3.9	6.1	8.4	13	26	36	85	196.0
151552	3	1.8	3.9	6.1	8.3	13	26	35	83	294.0
151552	4	1.8	3.9	6.1	8.3	13	26	35	83	392.0

WORK UNIT TYPE	8414
INPUT UNIT TYPE	8414
INPUT BLOCK SIZE	3360
OUTPUT UNIT TYPE	8414
OUTPUT BLOCK SIZE	3360
APPLICABLE RECORD LENGTHS	20- 39

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	0.9	1.2	1.8	3.6	4.8	9.6	MAX CAPAC. (MB.)
20480	1	1.5	3.0	4.5	6.1	9.2	20	29	63	25.7
20480	2	1.5	2.8	4.1	5.7	8.6	19	27	58	51.3
20480	3	1.5	2.8	4.2	5.6	8.5	19	26	57	77.0
20480	4	1.5	2.8	4.2	5.6	8.9	18	26	55	102.7
49152	1	1.1	2.0	2.9	4.0	6.0	12	17	35	27.2
49152	2	1.1	2.0	2.9	3.9	6.0	12	16	34	54.4
49152	3	1.1	2.0	2.9	3.9	5.9	12	16	34	81.7
49152	4	1.1	2.0	2.9	3.9	5.9	12	16	34	108.9
81910	1	1.2	1.9	2.8	3.6	5.4	11	16	32	27.7
81910	2	1.2	1.9	2.8	3.6	5.4	11	16	32	55.4
81910	3	1.2	1.9	2.8	3.6	5.4	11	16	32	83.1
81910	4	1.2	1.9	2.8	3.6	5.4	11	15	32	110.8
102400	1	1.2	2.0	2.8	3.6	5.3	11	15	31	28.9
102400	2	1.2	2.0	2.8	3.6	5.3	11	15	31	57.8
102400	3	1.2	2.0	2.8	3.6	5.3	11	15	31	86.7
102400	4	1.2	2.0	2.8	3.6	5.3	11	15	31	115.6
151552	1	1.2	2.0	2.8	3.6	5.3	10	14	31	28.9
151552	2	1.2	2.0	2.8	3.6	5.3	10	14	31	57.8
151552	3	1.2	2.0	2.8	3.6	5.3	10	14	31	83.1
151552	4	1.2	2.0	2.8	3.6	5.3	10	14	30	110.8

WORK UNIT TYPE	8414
INPUT UNIT TYPE	U14
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U14
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	20- 39

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	0.9	1.2	1.8	3.6	4.8	9.6	MAX CAPAC. (MB.)
20480	1	1.6	3.1	4.8	6.3	9.6	22	30	65	25.7
20480	2	1.5	2.9	4.4	5.9	9.4	20	28	58	51.3
20480	3	1.5	2.9	4.4	5.8	9.1	19	26	57	77.0
20480	4	1.6	2.9	4.4	6.0	9.1	19	27	59	105.1
49152	1	1.2	2.2	3.1	4.2	6.6	13	18	38	27.2
49152	2	1.2	2.2	3.1	4.2	6.5	13	18	36	54.4
49152	3	1.2	2.1	3.1	4.2	6.5	13	18	36	81.7
49152	4	1.2	2.1	3.1	4.1	6.5	13	18	36	108.9
81910	1	1.1	1.8	2.7	3.5	5.2	11	15	31	27.7
81910	2	1.1	1.9	2.7	3.5	5.2	11	15	31	55.4
81910	3	1.1	1.9	2.7	3.4	5.2	11	15	31	83.1
81910	4	1.1	1.9	2.7	3.4	5.1	11	15	31	110.8
102400	1	1.1	1.9	2.7	3.4	5.1	11	15	30	28.9
102400	2	1.1	1.9	2.6	3.4	5.1	10	15	30	57.8
102400	3	1.1	1.9	2.6	3.4	5.1	10	14	30	86.7
102400	4	1.1	1.9	2.6	3.4	5.1	10	14	30	115.6
151552	1	1.2	1.9	2.7	3.5	5.1	10	13	30	28.9
151552	2	1.2	1.9	2.7	3.5	5.0	10	13	30	57.8
151552	3	1.2	1.9	2.7	3.5	5.0	10	13	30	86.7
151552	4	1.2	1.9	2.7	3.5	5.0	10	13	29	110.8

WORK UNIT TYPE	8414
INPUT UNIT TYPE	8416
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8416
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	21- 42

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	1.0	1.3	1.9	3.8	5.1	10.2	MAX CAPAC. (MB.)
20480	1	1.6	3.2	4.9	6.5	9.8	22	30	71	26.1
20480	2	1.6	3.0	4.7	6.3	9.5	22	30	66	50.4
20480	3	1.6	2.9	4.5	6.1	9.4	21	29	63	75.7
20480	4	1.6	2.9	4.5	6.1	9.4	21	29	62	100.9
49152	1	1.2	2.1	2.9	4.1	6.3	13	18	37	27.1
49152	2	1.2	2.1	2.9	4.0	6.2	12	17	36	54.3
49152	3	1.2	2.1	2.9	4.0	6.2	12	17	36	81.4
49152	4	1.2	2.1	2.9	4.1	6.2	13	17	35	108.5
81910	1	1.1	2.0	2.8	3.6	5.4	12	16	32	27.8
81910	2	1.1	2.0	2.8	3.5	5.3	12	16	32	55.5
81910	3	1.1	2.0	2.8	3.5	5.3	12	16	32	83.3
81910	4	1.1	2.0	2.7	3.5	5.3	12	16	32	111.1
102400	1	1.2	1.9	2.7	3.6	5.3	11	15	31	28.9
102400	2	1.2	1.9	2.7	3.6	5.3	11	15	31	57.6
102400	3	1.2	1.9	2.7	3.6	5.3	11	15	31	86.7
102400	4	1.2	1.9	2.7	3.6	5.3	11	15	31	115.6
151552	1	1.2	2.0	2.8	3.6	5.2	10	14	31	28.9
151552	2	1.2	2.0	2.8	3.6	5.2	10	14	31	57.8
151552	3	1.2	2.0	2.8	3.6	5.2	10	14	31	86.7
151552	4	1.2	2.0	2.8	3.6	5.2	10	14	30	115.6

WORK UNIT TYPE	8414
INPUT UNIT TYPE	8414
INPUT BLOCK SIZE	3360
OUTPUT UNIT TYPE	8414
OUTPUT BLOCK SIZE	3360
APPLICABLE RECORD LENGTHS	40- 79

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.2	1.8	2.4	3.6	7.2	9.6	19.2	MAX CAPAC. (MB.)
20480	1	2.2	4.6	7.4	10	16	35	51	118	25.8
20480	2	2.1	4.5	6.9	9.7	15	35	48	111	50.1
20480	3	2.0	4.4	6.6	9.5	15	33	47	104	75.2
20480	4	2.1	4.4	6.6	9.2	14	33	46	101	100.3
49152	1	1.2	2.5	3.7	4.9	7.8	17	24	53	27.7
49152	2	1.2	2.4	3.6	4.7	7.3	15	21	46	55.4
49152	3	1.2	2.4	3.5	4.6	7.2	15	21	46	83.1
49152	4	1.2	2.4	3.4	4.5	7.0	15	20	44	110.8
81910	1	1.2	2.1	3.1	4.0	6.4	14	19	41	28.9
81910	2	1.2	2.1	3.0	4.0	6.3	14	18	39	57.8
81910	3	1.2	2.1	3.0	4.0	6.3	13	18	38	83.1
81910	4	1.2	2.1	3.0	4.0	6.2	13	18	38	110.8
102400	1	1.2	2.0	3.0	3.9	6.0	13	17	38	28.9
102400	2	1.2	2.0	3.0	3.9	5.9	13	17	36	57.8
102400	3	1.2	2.0	3.0	3.9	5.9	12	17	36	86.7
102400	4	1.2	2.0	3.0	3.9	5.8	13	17	36	115.6
151552	1	1.2	2.1	2.9	3.8	5.5	12	17	35	28.9
151552	2	1.2	2.1	2.9	3.8	5.5	12	16	34	57.8
151552	3	1.2	2.1	2.9	3.8	5.5	12	16	34	86.7
151552	4	1.2	2.1	2.9	3.8	5.5	12	16	34	115.6

WORK UNIT TYPE	8414
INPUT UNIT TYPE	U14
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U14
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	40- 79

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.2	1.8	2.4	3.6	7.2	9.6	19.2	MAX CAPAC. (MB.)
20480	1	2.4	5.0	7.7	11	17	40	55	129	25.6
20480	2	2.3	4.6	7.4	11	17	36	49	117	50.1
20480	3	2.3	4.5	7.2	10	16	35	48	112	75.2
20480	4	2.2	4.3	7.0	9.8	16	33	45	109	100.3
49152	1	1.5	2.7	4.4	5.8	8.7	20	27	61	27.7
49152	2	1.5	2.7	4.2	5.6	8.3	19	25	54	55.4
49152	3	1.5	2.7	4.2	5.5	8.2	18	25	53	83.1
49152	4	1.5	2.7	4.1	5.4	8.0	18	24	51	110.8
81910	1	1.1	2.0	3.0	3.9	6.2	13	19	39	28.9
81910	2	1.1	2.0	3.0	3.9	6.1	13	18	38	57.8
81910	3	1.1	2.0	3.0	3.8	6.1	13	18	37	83.1
81910	4	1.1	2.0	3.0	3.8	6.1	13	18	37	110.8
102400	1	1.2	2.0	2.9	3.6	5.9	12	17	37	28.9
102400	2	1.2	2.0	2.9	3.7	5.8	12	16	36	57.8
102400	3	1.2	2.0	2.9	3.7	5.7	12	16	35	86.7
102400	4	1.2	2.0	2.9	3.7	5.7	12	16	35	115.6
151552	1	1.2	2.0	2.8	3.6	5.4	12	16	34	28.9
151552	2	1.2	2.0	2.8	3.6	5.4	12	16	33	57.8
151552	3	1.2	2.0	2.8	3.6	5.4	12	16	33	86.7
151552	4	1.2	2.0	2.8	3.6	5.4	11	16	32	115.6

WORK UNIT TYPE	8414
INPUT UNIT TYPE	8416
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8416
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	43- 84

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.3	1.9	2.6	3.8	7.7	10.2	20.5	MAX CAPAC. (MB.)
20480	1	2.5	5.4	8.3	11	19	42	60	143	25.5
20480	2	2.3	5.0	8.1	11	17	37	54	127	53.0
20480	3	2.2	4.8	7.6	10	16	36	52	116	76.4
20480	4	2.4	4.8	7.6	10	17	39	53	121	106.0
49152	1	1.3	2.6	4.0	5.3	8.2	18	24	54	27.5
49152	2	1.3	2.5	3.8	5.0	7.8	17	22	50	55.0
49152	3	1.3	2.5	3.8	5.0	7.6	17	22	49	82.5
49152	4	1.3	2.4	3.7	4.8	7.3	16	22	47	110.0
81910	1	1.2	2.1	3.1	4.3	6.7	15	20	42	28.8
81910	2	1.2	2.1	3.1	4.2	6.6	14	19	39	55.0
81910	3	1.2	2.1	3.1	4.1	6.5	14	19	38	82.5
81910	4	1.2	2.1	3.1	4.1	6.4	14	19	38	110.0
102400	1	1.2	2.1	3.0	3.9	6.2	13	17	39	28.8
102400	2	1.2	2.1	3.0	3.8	6.2	13	17	38	57.6
102400	3	1.2	2.1	3.0	3.8	6.1	12	17	37	86.4
102400	4	1.2	2.1	3.0	3.8	6.1	12	16	37	115.1
151552	1	1.2	2.0	2.9	3.7	5.6	12	17	36	28.8
151552	2	1.2	2.0	2.9	3.7	5.6	12	16	34	57.6
151552	3	1.2	2.0	2.9	3.7	5.6	12	16	34	86.4
151552	4	1.2	2.0	2.9	3.7	5.6	12	16	34	115.1

WORK UNIT TYPE	8414
INPUT UNIT TYPE	8414
INPUT BLOCK SIZE	3360
OUTPUT UNIT TYPE	8414
OUTPUT BLOCK SIZE	3360
APPLICABLE RECORD LENGTHS	80- 159

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.2	2.4	3.6	4.8	7.2	14.4	19.2	38.4	MAX CAPAC. (MB.)
20480	1	4.1	8.7	14	20	32	73	104	**	24.6
20480	2	3.8	8.2	13	18	29	66	93	222	49.7
20480	3	3.7	7.9	13	17	29	63	88	207	74.5
20480	4	3.5	7.9	12	17	26	60	86	194	99.3
49152	1	2.0	3.7	6.2	8.7	13	31	44	**	28.7
49152	2	1.8	3.5	5.5	7.9	12	27	37	90	55.4
49152	3	1.7	3.4	5.5	7.5	12	27	36	84	83.1
49152	4	1.7	3.2	5.3	7.4	11	26	35	78	110.8
81910	1	1.5	2.9	4.4	5.8	9.6	23	31	**	28.7
81910	2	1.4	2.8	4.2	5.5	9.4	20	27	64	57.3
81910	3	1.4	2.7	4.1	5.4	9.1	20	27	58	86.0
81910	4	1.4	2.7	4.1	5.6	9.0	20	27	57	114.6
102400	1	1.3	2.6	4.2	5.6	8.6	19	28	**	28.7
102400	2	1.3	2.6	3.9	5.3	8.3	17	25	60	57.3
102400	3	1.3	2.4	3.9	5.3	8.0	17	24	55	86.0
102400	4	1.3	2.4	3.5	5.2	7.9	17	24	53	114.6
151552	1	1.3	2.3	3.4	4.8	7.7	18	26	**	28.7
151552	2	1.3	2.3	3.2	4.6	7.5	16	22	50	57.3
151552	3	1.3	2.3	3.2	4.5	7.3	16	22	45	86.0
151552	4	1.3	2.3	3.2	4.5	7.2	16	22	44	114.6

WORK UNIT TYPE	8414
INPUT UNIT TYPE	U14
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U14
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	80- 159

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.2	2.4	3.6	4.8	7.2	14.4	19.2	38.4	MAX CAPAC. (MB.)
20480	1	4.5	9.7	15	21	34	78	114	**	27.2
20480	2	4.3	9.1	15	20	32	71	100	227	54.4
20480	3	4.2	9.0	14	20	31	69	97	213	81.7
20480	4	4.0	8.9	14	19	30	69	96	206	108.9
49152	1	2.3	4.5	6.9	9.6	16	36	50	**	28.7
49152	2	2.2	4.3	6.4	9.2	15	32	44	98	55.4
49152	3	2.2	4.2	6.3	9.1	14	31	43	94	83.1
49152	4	2.1	4.1	6.0	8.7	14	30	41	87	110.8
81910	1	1.5	3.1	4.6	6.2	10	23	31	**	28.7
81910	2	1.5	3.0	4.4	6.0	9.7	21	29	64	57.3
81910	3	1.4	2.9	4.3	5.8	9.4	20	28	61	86.0
81910	4	1.4	2.9	4.3	5.8	9.3	20	27	59	114.6
102400	1	1.3	2.6	4.1	5.5	8.4	19	28	**	28.7
102400	2	1.3	2.6	3.9	5.3	8.1	17	24	59	57.3
102400	3	1.3	2.5	3.9	5.2	7.9	17	24	57	86.0
102400	4	1.3	2.4	3.9	5.2	7.8	16	23	53	114.6
151552	1	1.3	2.3	3.3	4.6	7.7	18	25	**	28.7
151552	2	1.3	2.2	3.2	4.6	7.4	16	22	50	57.3
151552	3	1.3	2.2	3.2	4.5	7.2	16	21	45	86.0
151552	4	1.3	2.2	3.2	4.5	7.2	16	21	44	114.6

WORK UNIT TYPE	8414
INPUT UNIT TYPE	8416
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8416
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	85- 170

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.3	2.6	3.8	5.1	7.7	15.4	20.5	41.0	MAX CAPAC. (MB.)
20480	1	4.9	10	17	23	38	89	126	**	26.5
20480	2	4.5	9.7	16	21	34	79	109	266	53.0
20480	3	4.3	9.4	14	20	33	75	105	237	76.4
20480	4	4.5	9.6	14	20	34	74	104	232	106.0
49152	1	1.9	3.8	6.0	8.5	14	32	45	**	27.5
49152	2	1.9	3.5	5.4	7.9	13	28	39	90	55.0
49152	3	1.8	3.5	5.4	7.7	12	27	37	85	82.5
49152	4	1.8	3.3	5.1	7.3	12	26	35	79	110.0
81910	1	1.3	2.9	4.2	6.2	9.9	21	29	**	28.5
81910	2	1.3	2.8	4.1	6.0	9.4	20	27	63	57.1
81910	3	1.3	2.7	4.0	5.8	9.2	20	26	60	85.6
81910	4	1.3	2.7	4.2	5.8	9.1	19	26	59	114.1
102400	1	1.3	2.4	4.0	5.5	8.3	18	27	**	28.5
102400	2	1.3	2.3	3.8	5.3	8.0	17	25	56	57.1
102400	3	1.3	2.3	3.7	5.3	7.9	17	25	54	85.6
102400	4	1.3	2.2	3.6	5.2	7.8	17	24	53	114.1
151552	1	1.3	2.2	3.3	4.6	7.7	17	23	**	28.5
151552	2	1.3	2.2	3.2	4.4	7.4	16	22	45	57.1
151552	3	1.3	2.2	3.2	4.3	7.3	16	21	44	85.6
151552	4	1.3	2.2	3.2	4.3	7.3	15	21	43	114.1

WORK UNIT TYPE	8414
INPUT UNIT TYPE	8414
INPUT BLOCK SIZE	3360
OUTPUT UNIT TYPE	8414
OUTPUT BLOCK SIZE	3360
APPLICABLE RECORD LENGTHS	160- 319

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.4	4.8	7.2	9.6	14.4	28.8	38.4	76.8	MAX CAPAC. (MB.)
20480	1	8.2	19	30	43	70	**	**	**	25.6
20480	2	7.7	18	29	39	62	149	212	**	51.6
20480	3	7.7	18	28	38	61	143	200	**	77.4
20480	4	7.4	17	27	37	61	136	190	448	103.2
49152	1	3.5	7.3	12	17	27	**	**	**	28.7
49152	2	3.1	6.9	11	16	25	55	80	**	57.3
49152	3	3.1	7.1	11	16	25	53	79	199	86.0
49152	4	2.9	6.5	11	15	24	50	73	184	107.0
81910	1	2.6	5.2	8.4	12	20	**	**	**	28.7
81910	2	2.4	4.9	8.1	12	18	39	56	**	57.3
81910	3	2.4	4.8	7.9	11	18	37	53	125	86.0
81910	4	2.4	4.8	7.6	11	18	37	51	119	114.6
102400	1	2.3	5.0	7.6	10	17	**	**	**	28.7
102400	2	2.1	4.7	7.4	9.8	15	37	52	**	57.3
102400	3	2.1	4.7	7.1	9.4	15	35	50	111	86.0
102400	4	2.1	4.5	6.9	9.2	15	34	48	107	114.6
151552	1	2.0	4.1	6.8	9.4	16	**	**	**	28.7
151552	2	2.0	3.9	6.5	9.0	14	31	43	**	57.3
151552	3	1.9	3.9	6.3	8.7	14	29	40	92	86.0
151552	4	1.9	3.8	6.2	8.6	14	28	39	88	114.6

WORK UNIT TYPE	8414
INPUT UNIT TYPE	U14
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U14
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	160- 319

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.4	4.8	7.2	9.6	14.4	28.8	38.4	76.8	MAX CAPAC. (MB.)
20480	1	8.8	20	32	44	74	**	**	**	25.8
20480	2	8.5	19	30	41	68	159	219	**	51.6
20480	3	8.3	19	29	40	66	147	203	**	77.4
20480	4	8.1	18	28	38	63	140	194	466	103.2
49152	1	4.2	8.6	14	19	31	**	**	**	28.7
49152	2	3.9	8.1	13	18	29	63	90	**	57.3
49152	3	3.8	7.9	13	18	29	61	86	212	80.2
49152	4	3.6	7.5	13	17	27	57	81	203	107.0
81910	1	2.7	5.7	8.9	13	21	**	**	**	28.7
81910	2	2.7	5.4	8.6	12	19	41	59	**	57.3
81910	3	2.6	5.2	8.3	12	18	39	56	131	86.0
81910	4	2.6	5.2	8.3	12	18	38	54	126	114.6
102400	1	2.5	5.2	7.9	11	17	**	**	**	28.7
102400	2	2.4	5.0	7.7	10	16	38	55	**	57.3
102400	3	2.4	4.9	7.5	10	16	37	52	117	86.0
102400	4	2.4	4.8	7.3	9.8	15	36	50	112	114.6
151552	1	2.1	4.3	7.1	10	16	**	**	**	28.7
151552	2	2.1	4.1	6.8	9.5	15	32	45	**	57.3
151552	3	2.0	4.1	6.6	9.4	15	31	43	97	86.0
151552	4	2.0	4.1	6.6	9.1	14	30	41	93	114.6

WORK UNIT TYPE	8414
INPUT UNIT TYPE	8416
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8416
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	171- 340

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 2.6	5.1	7.7	10.2	15.4	30.7	41.0	81.9	MAX CAPAC. (MB.)
20480	1	8.8	20	33	47	74	**	**	**	24.5
20480	2	8.0	19	31	41	65	162	240	**	48.9
20480	3	8.0	19	29	41	63	151	220	**	73.4
20480	4	8.9	19	29	43	72	158	219	540	97.8
49152	1	3.2	7.1	12	18	27	**	**	**	28.5
49152	2	2.9	6.4	11	15	24	54	80	**	53.0
49152	3	2.8	6.4	10	15	23	51	75	**	85.6
49152	4	2.6	6.0	9.7	14	22	46	69	180	106.0
81910	1	2.2	4.9	7.8	11	18	**	**	**	28.5
81910	2	2.1	4.5	7.3	10	16	36	53	**	57.1
81910	3	2.0	4.4	7.0	9.8	15	33	50	121	85.6
81910	4	2.0	4.4	6.9	9.6	15	33	49	114	114.1
102400	1	2.0	4.1	6.2	8.5	15	**	**	**	28.5
102400	2	1.8	3.8	5.9	7.8	13	33	46	**	57.1
102400	3	1.7	3.8	5.7	7.8	13	31	44	100	85.6
102400	4	1.7	3.7	5.6	7.4	13	30	42	95	114.1
151552	1	1.5	3.3	5.6	7.9	13	**	**	**	28.5
151552	2	1.5	3.1	5.3	7.3	11	25	36	**	57.1
151552	3	1.4	3.1	5.1	7.2	11	24	33	84	85.6
151552	4	1.4	3.0	5.0	6.9	11	23	32	78	114.1

WORK UNIT TYPE	8414
INPUT UNIT TYPE	8414
INPUT BLOCK SIZE	3360
OUTPUT UNIT TYPE	8414
OUTPUT BLOCK SIZE	3360
APPLICABLE RECORD LENGTHS	320- 639

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 4.8	9.6	14.4	19.2	28.8	57.6	76.8	115.2	MAX CAPAC. (MB.)
20480	1	18	45	73	102	**	**	**	**	22.9
20480	2	17	40	64	88	146	**	**	**	45.8
20480	3	16	39	60	85	136	352	**	**	68.6
20480	4	16	37	58	79	129	321	451	**	91.7
49152	1	6.8	16	25	35	**	**	**	**	28.7
49152	2	6.4	15	23	32	51	**	**	**	57.3
49152	3	6.4	16	25	34	52	124	189	**	86.0
49152	4	6.2	15	24	32	49	120	178	**	114.6
81910	1	5.1	11	19	27	**	**	**	**	28.7
81910	2	4.9	11	18	24	39	**	**	**	57.3
81910	3	4.8	11	17	24	37	82	118	**	86.0
81910	4	4.7	10	17	23	36	78	112	**	114.6
102400	1	4.9	10	16	22	**	**	**	**	28.7
102400	2	4.7	9.6	15	20	35	**	**	**	57.3
102400	3	4.6	9.3	14	20	34	79	110	**	86.0
102400	4	4.4	9.1	14	19	33	76	106	**	114.6
151552	1	3.8	9.3	15	21	**	**	**	**	28.7
151552	2	3.7	8.8	14	19	30	**	**	**	57.3
151552	3	3.7	8.6	14	19	28	63	88	**	86.0
151552	4	3.7	8.5	14	18	28	61	84	**	114.6

WORK UNIT TYPE	8414
INPUT UNIT TYPE	U14
INPUT BLOCK SIZE	4800
OUTPUT UNIT TYPE	U14
OUTPUT BLOCK SIZE	4800
APPLICABLE RECORD LENGTHS	320- 639

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	-----SIZE OF DATA SET IN MEGABYTES (MB.)------ 4.8	9.6	14.4	19.2	28.8	57.6	76.8	115.2	MAX CAPAC. (MB.)
20480	1	20	47	75	106	**	**	**	**	22.9
20480	2	19	43	67	92	159	**	**	**	45.8
20480	3	18	41	62	86	144	**	**	**	68.8
20480	4	17	39	61	83	138	327	479	**	91.7
49152	1	7.8	18	28	39	**	**	**	**	28.7
49152	2	7.4	17	26	36	57	**	**	**	57.3
49152	3	7.3	17	28	38	59	133	197	**	80.2
49152	4	7.3	17	26	36	55	129	189	**	107.0
81910	1	5.5	12	20	28	**	**	**	**	28.7
81910	2	5.2	12	19	26	41	**	**	**	57.3
81910	3	5.2	11	18	25	38	86	125	**	86.0
81910	4	5.1	11	18	25	38	83	119	**	114.6
102400	1	5.2	11	17	24	**	**	**	**	28.7
102400	2	5.0	10	16	22	38	**	**	**	57.3
102400	3	4.9	10	16	21	37	83	115	**	86.0
102400	4	4.8	9.7	15	21	35	80	111	**	114.6
151552	1	4.2	9.9	16	23	**	**	**	**	28.7
151552	2	4.1	9.4	15	20	32	**	**	**	57.3
151552	3	4.1	9.2	14	20	30	66	94	**	86.0
151552	4	4.0	9.1	14	19	30	64	90	**	114.6

WORK UNIT TYPE	8414
INPUT UNIT TYPE	8416
INPUT BLOCK SIZE	5120
OUTPUT UNIT TYPE	8416
OUTPUT BLOCK SIZE	5120
APPLICABLE RECORD LENGTHS	341- 682

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 5.1	10.2	15.4	20.5	30.7	61.4	81.9	122.9	MAX CAPAC. (MB.)
20480	1	20	44	71	107	**	**	**	**	24.5
20480	2	18	40	62	91	157	**	**	**	48.9
20480	3	17	38	59	86	144	348	**	**	73.4
20480	4	18	43	71	97	152	358	541	**	97.8
49152	1	6.6	16	25	35	**	**	**	**	28.5
49152	2	6.4	14	23	32	54	**	**	**	57.1
49152	3	6.0	14	22	31	51	116	**	**	85.6
49152	4	6.0	14	23	32	50	125	181	**	114.1
81910	1	4.2	10	16	23	**	**	**	**	28.5
81910	2	3.9	9.1	14	20	33	**	**	**	57.1
81910	3	3.8	8.9	14	19	31	75	113	**	85.6
81910	4	3.8	8.6	14	19	30	73	106	**	114.1
102400	1	3.6	7.5	13	20	**	**	**	**	28.5
102400	2	3.4	6.9	12	18	30	**	**	**	57.1
102400	3	3.3	6.8	11	17	28	65	92	**	85.6
102400	4	3.2	6.5	11	17	27	62	87	**	114.1
151552	1	2.8	7.0	12	16	**	**	**	**	28.5
151552	2	2.7	6.3	10	14	22	**	**	**	57.1
151552	3	2.6	6.2	9.7	13	21	47	76	**	85.6
151552	4	2.6	6.0	9.6	13	20	44	70	**	114.1

WORK UNIT TYPE	8411
INPUT UNIT TYPE	U10
INPUT BLOCK SIZE	1440
OUTPUT UNIT TYPE	U10
OUTPUT BLOCK SIZE	1440
APPLICABLE RECORD LENGTHS	20- 39

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	0.9	1.2	1.8	3.6	4.8	9.6	MAX CAPAC. (MB.)
20480	1	2.1	4.0	6.3	8.6	14	30	41	**	6.8
20480	2	2.0	3.8	6.0	8.1	13	28	38	85	13.6
20480	3	2.0	3.8	5.9	8.0	12	27	37	83	20.4
20480	4	2.0	3.7	5.8	7.7	12	26	36	80	27.2
49152	1	1.3	2.2	3.2	4.3	7.2	15	21	**	7.2
49152	2	1.2	2.1	3.1	4.2	6.9	14	20	44	14.3
49152	3	1.2	2.1	3.0	4.1	6.7	14	20	42	20.4
49152	4	1.2	2.1	3.0	4.1	6.6	14	20	42	27.2
81910	1	1.2	2.1	3.0	3.9	5.7	13	18	**	7.2
81910	2	1.2	2.1	3.0	3.8	5.6	13	17	36	14.3
81910	3	1.2	2.1	2.9	3.8	5.6	12	17	36	21.5
81910	4	1.2	2.1	2.9	3.8	5.5	12	17	35	28.7
102400	1	1.3	2.1	3.0	3.9	5.8	12	17	**	7.2
102400	2	1.2	2.1	3.0	3.9	5.7	11	16	36	14.3
102400	3	1.2	2.1	3.0	3.8	5.6	11	16	35	21.5
102400	4	1.2	2.1	3.0	3.8	5.6	11	16	35	28.7
151552	1	1.3	2.2	3.1	4.0	5.8	11	15	**	7.2
151552	2	1.3	2.1	3.0	3.9	5.8	11	15	34	14.3
151552	3	1.3	2.1	3.0	3.9	5.7	11	15	33	21.5
151552	4	1.3	2.1	3.0	3.9	5.7	11	15	33	28.7

WORK UNIT TYPE	8411
INPUT UNIT TYPE	VI-C
INPUT BLOCK SIZE	1440
OUTPUT UNIT TYPE	VI-C
OUTPUT BLOCK SIZE	1440
APPLICABLE RECORD LENGTHS	20- 39

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	0.9	1.2	1.8	3.6	4.8	9.6	MAX CAPAC. (MB.)
20480	1	1.9	3.6	5.6	7.8	12	26	36	**	6.8
20480	2	1.9	3.5	5.3	7.3	11	24	33	75	13.6
20480	3	1.8	3.5	5.4	7.1	11	24	32	73	20.4
20480	4	1.8	3.4	5.2	6.8	10	23	31	71	26.5
49152	1	1.2	2.1	2.9	4.0	6.5	13	19	**	7.2
49152	2	1.2	2.1	2.9	3.9	6.4	13	18	39	13.6
49152	3	1.2	2.1	2.9	3.9	6.3	13	18	39	21.5
49152	4	1.2	2.1	2.9	3.9	6.2	13	18	38	28.7
81910	1	1.2	2.1	2.9	3.7	5.4	12	17	**	7.2
81910	2	1.2	2.1	2.9	3.7	5.4	12	17	34	14.3
81910	3	1.2	2.1	2.9	3.7	5.4	12	16	34	21.5
81910	4	1.2	2.1	2.9	3.7	5.4	12	16	34	28.7
102400	1	1.2	2.1	3.0	3.8	5.5	11	16	**	7.2
102400	2	1.2	2.1	2.9	3.8	5.5	11	15	34	14.3
102400	3	1.2	2.1	2.9	3.8	5.5	11	15	34	21.5
102400	4	1.2	2.1	2.9	3.8	5.5	11	15	33	28.7
151552	1	1.3	2.1	3.0	3.9	5.6	11	14	**	7.2
151552	2	1.3	2.1	3.0	3.9	5.6	11	14	32	14.3
151552	3	1.3	2.1	3.0	3.9	5.6	11	14	32	21.5
151552	4	1.3	2.1	3.0	3.9	5.6	11	14	32	28.7

WORK UNIT TYPE	8411
INPUT UNIT TYPE	8416
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	8416
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	21- 42

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.3	0.6	1.0	1.3	1.9	3.8	5.1	10.2	MAX CAPAC. (MB.)
20480	1	1.7	3.0	4.9	7.0	11	25	34	**	6.5
20480	2	1.6	3.0	4.4	6.3	10	22	30	69	13.0
20480	3	1.6	3.0	4.5	5.9	10	21	29	71	20.3
20480	4	1.6	3.0	4.4	5.9	9.7	20	28	69	27.0
49152	1	1.2	2.2	3.1	4.2	6.7	13	19	**	7.1
49152	2	1.2	2.1	3.0	3.9	6.6	14	19	41	13.5
49152	3	1.2	2.1	3.0	4.1	6.6	14	19	41	21.4
49152	4	1.2	2.1	3.0	4.1	6.5	13	19	40	28.5
81910	1	1.3	2.1	3.0	3.9	5.6	13	18	**	7.1
81910	2	1.2	2.1	3.0	3.9	5.6	13	17	36	14.3
81910	3	1.2	2.1	3.0	3.8	5.7	13	17	35	21.4
81910	4	1.2	2.1	3.0	3.8	5.7	12	17	35	28.5
102400	1	1.3	2.1	3.0	3.9	5.7	11	16	**	7.1
102400	2	1.3	2.1	3.0	3.9	5.7	11	16	36	14.3
102400	3	1.3	2.1	3.0	3.9	5.7	11	16	35	21.4
102400	4	1.3	2.1	3.0	3.9	5.7	12	16	35	28.5
151552	1	1.3	2.2	3.1	4.0	5.8	11	15	**	7.1
151552	2	1.3	2.2	3.1	4.0	5.8	11	15	34	14.3
151552	3	1.3	2.2	3.1	4.0	5.8	11	15	33	21.4
151552	4	1.3	2.2	3.1	4.0	5.8	11	15	33	28.5

WORK UNIT TYPE	8411
INPUT UNIT TYPE	U10
INPUT BLOCK SIZE	1440
OUTPUT UNIT TYPE	U10
OUTPUT BLOCK SIZE	1440
APPLICABLE RECORD LENGTHS	40- 79

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.2	1.8	2.4	3.6	7.2	9.6	19.2	MAX CAPAC. (MB.)
20480	1	3.5	7.3	12	16	24	**	**	**	6.7
20480	2	3.4	6.7	11	15	23	53	73	**	12.9
20480	3	3.3	6.7	11	14	23	50	69	**	20.1
20480	4	3.1	6.6	10	14	22	49	70	148	26.7
49152	1	2.0	3.9	6.0	8.0	13	**	**	**	7.2
49152	2	1.9	3.7	5.8	7.8	12	27	37	**	14.3
49152	3	1.9	3.7	5.7	7.7	12	26	36	77	21.5
49152	4	1.9	3.7	5.6	7.5	12	26	35	75	28.7
81910	1	1.8	3.3	4.8	6.8	11	**	**	**	7.2
81910	2	1.8	3.2	4.7	6.6	11	23	31	**	14.3
81910	3	1.8	3.2	4.7	6.6	10	23	31	64	21.5
81910	4	1.8	3.2	4.6	6.4	10	22	30	62	28.7
102400	1	1.8	3.3	4.8	6.3	9.6	**	**	**	7.2
102400	2	1.8	3.2	4.7	6.2	9.4	22	30	**	14.3
102400	3	1.8	3.2	4.7	6.2	9.4	22	30	64	21.5
102400	4	1.8	3.2	4.6	6.1	9.2	21	29	62	28.7
151552	1	1.8	3.3	4.8	6.3	9.4	**	**	**	7.2
151552	2	1.8	3.2	4.7	6.2	9.2	19	27	**	14.3
151552	3	1.8	3.2	4.7	6.2	9.2	19	27	62	21.5
151552	4	1.8	3.2	4.6	6.1	9.0	19	27	60	28.7

WORK UNIT TYPE	8411
INPUT UNIT TYPE	VI-C
INPUT BLOCK SIZE	1440
OUTPUT UNIT TYPE	VI-C
OUTPUT BLOCK SIZE	1440
APPLICABLE RECORD LENGTHS	40- 79

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.2	1.8	2.4	3.6	7.2	9.6	19.2	MAX CAPAC. (MB.)
20480	1	2.9	6.0	9.9	14	22	**	**	**	6.7
20480	2	2.8	5.8	9.4	13	20	44	60	**	12.9
20480	3	2.7	5.6	9.1	13	19	42	56	**	20.1
20480	4	2.7	5.8	8.6	13	19	41	60	132	26.7
49152	1	1.4	2.6	4.6	6.0	9.5	**	**	**	7.2
49152	2	1.4	2.5	4.3	5.9	9.0	21	29	**	14.3
49152	3	1.4	2.5	4.2	5.8	8.9	20	28	59	21.5
49152	4	1.4	2.5	4.2	5.7	8.8	20	28	58	28.7
81910	1	1.4	2.4	3.5	4.9	8.1	**	**	**	7.2
81910	2	1.4	2.4	3.4	4.8	7.9	17	23	**	14.3
81910	3	1.4	2.4	3.4	4.7	7.8	17	23	47	21.5
81910	4	1.4	2.4	3.4	4.7	7.7	17	22	46	28.7
102400	1	1.4	2.4	3.5	4.5	6.8	**	**	**	7.2
102400	2	1.4	2.4	3.5	4.5	6.8	16	22	**	14.3
102400	3	1.4	2.4	3.5	4.5	6.7	16	22	47	21.5
102400	4	1.4	2.4	3.5	4.5	6.7	16	22	46	28.7
151552	1	1.4	2.5	3.5	4.6	6.7	**	**	**	7.2
151552	2	1.4	2.5	3.5	4.6	6.7	14	20	**	14.3
151552	3	1.4	2.5	3.5	4.5	6.6	14	20	46	21.5
151552	4	1.4	2.5	3.5	4.5	6.6	14	20	45	28.7

WORK UNIT TYPE	8411
INPUT UNIT TYPE	8416
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	8416
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	43- 84

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 0.6	1.3	1.9	2.6	3.8	7.7	10.2	20.5	MAX CAPAC. (MB.)
20480	1	2.5	5.7	9.2	13	21	**	**	**	6.6
20480	2	2.2	5.2	8.5	12	19	40	59	**	13.0
20480	3	2.3	5.1	8.3	11	18	42	61	**	19.9
20480	4	2.2	4.9	7.9	11	17	40	58	131	26.5
49152	1	1.4	2.6	4.2	5.6	8.7	**	**	**	7.1
49152	2	1.4	2.6	4.1	5.5	8.4	20	28	**	14.3
49152	3	1.4	2.5	4.0	5.3	8.3	19	27	59	21.4
49152	4	1.3	2.4	4.0	5.3	8.2	19	26	57	28.5
81910	1	1.3	2.2	3.1	4.5	7.7	**	**	**	7.1
81910	2	1.3	2.2	3.1	4.4	7.3	16	23	**	14.3
81910	3	1.3	2.2	3.1	4.4	7.3	16	21	46	21.4
81910	4	1.3	2.2	3.1	4.4	7.2	16	21	44	28.5
102400	1	1.3	2.2	3.1	4.0	6.4	**	**	**	7.1
102400	2	1.3	2.2	3.1	4.0	6.2	15	22	**	14.3
102400	3	1.3	2.2	3.1	4.0	6.1	15	21	46	21.4
102400	4	1.3	2.2	3.1	4.0	6.1	15	21	45	28.5
151552	1	1.3	2.2	3.2	4.1	6.1	**	**	**	7.1
151552	2	1.3	2.2	3.2	4.1	6.0	12	19	**	14.3
151552	3	1.3	2.2	3.2	4.1	6.0	12	19	45	21.4
151552	4	1.3	2.2	3.2	4.1	6.0	12	18	44	28.5

WORK UNIT TYPE	8411
INPUT UNIT TYPE	U10
INPUT BLOCK SIZE	1440
OUTPUT UNIT TYPE	U10
OUTPUT BLOCK SIZE	1440
APPLICABLE RECORD LENGTHS	80- 159

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.2	1.8	2.4	3.6	4.8	7.2	14.4	19.2	MAX CAPAC. (MB.)
20480	1	6.8	10	14	22	32	**	**	**	6.7
20480	2	6.3	9.9	13	21	29	48	**	**	13.4
20480	3	6.1	9.5	13	20	29	46	100	**	20.1
20480	4	6.1	9.4	13	19	28	45	98	134	26.7
49152	1	3.9	5.9	7.9	12	16	**	**	**	7.2
49152	2	3.7	5.7	7.6	12	16	26	**	**	14.3
49152	3	3.7	5.6	7.5	11	16	25	55	76	21.5
49152	4	3.7	5.5	7.4	11	15	25	54	74	28.7
81910	1	3.3	4.8	6.6	11	15	**	**	**	7.2
81910	2	3.2	4.7	6.4	10	14	23	**	**	14.3
81910	3	3.2	4.6	6.4	10	14	22	46	63	21.5
81910	4	3.2	4.6	6.3	10	14	22	45	61	28.7
102400	1	3.3	4.8	6.3	9.3	13	**	**	**	7.2
102400	2	3.2	4.7	6.2	9.2	13	22	**	**	14.3
102400	3	3.2	4.6	6.1	9.1	13	21	46	63	21.5
102400	4	3.2	4.6	6.0	9.0	13	21	45	61	28.7
151552	1	3.3	4.8	6.2	9.3	12	**	**	**	7.2
151552	2	3.2	4.7	6.1	9.1	12	19	**	**	14.3
151552	3	3.2	4.6	6.1	9.1	12	18	44	61	21.5
151552	4	3.1	4.6	6.0	8.9	12	18	43	59	28.7

WORK UNIT TYPE	8411
INPUT UNIT TYPE	VI-C
INPUT BLOCK SIZE	1440
OUTPUT UNIT TYPE	VI-C
OUTPUT BLOCK SIZE	1440
APPLICABLE RECORD LENGTHS	80- 159

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.2	1.8	2.4	3.6	4.8	7.2	14.4	19.2	MAX CAPAC. (MB.)
20480	1	5.4	8.9	13	20	28	**	**	**	6.7
20480	2	5.2	8.5	12	18	25	41	**	**	13.4
20480	3	5.0	8.2	11	17	24	38	90	**	20.1
20480	4	5.1	8.2	11	17	24	37	89	123	26.7
49152	1	2.5	4.3	5.8	8.8	13	**	**	**	7.2
49152	2	2.4	4.0	5.6	8.4	12	20	**	**	14.3
49152	3	2.4	4.0	5.6	8.3	12	20	42	57	21.5
49152	4	2.4	3.9	5.5	8.2	12	19	41	56	28.7
81910	1	2.3	3.3	4.6	7.7	11	**	**	**	7.2
81910	2	2.3	3.2	4.5	7.3	10	16	**	**	14.3
81910	3	2.3	3.2	4.4	7.2	10	16	33	45	21.5
81910	4	2.3	3.2	4.4	7.0	10	16	33	44	28.7
102400	1	2.3	3.3	4.2	6.2	9.2	**	**	**	7.2
102400	2	2.3	3.2	4.2	6.1	9.0	15	**	**	14.3
102400	3	2.3	3.2	4.2	6.1	8.9	15	33	44	21.5
102400	4	2.3	3.2	4.1	6.1	9.0	15	32	44	28.7
151552	1	2.3	3.2	4.2	6.2	8.1	**	**	**	7.2
151552	2	2.3	3.2	4.2	6.1	8.0	12	**	**	14.3
151552	3	2.3	3.2	4.2	6.1	8.0	12	30	43	21.5
151552	4	2.2	3.2	4.1	6.0	8.0	12	30	42	28.7

WORK UNIT TYPE	8411
INPUT UNIT TYPE	8416
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	8416
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	85- 170

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.3	1.9	2.6	3.8	5.1	7.7	15.4	20.5	MAX CAPAC. (MB.)
20480	1	5.3	8.1	11	19	28	**	**	**	7.1
20480	2	4.9	7.7	11	17	25	41	**	**	13.2
20480	3	4.7	7.1	10	16	24	39	87	**	19.9
20480	4	4.6	7.1	9.9	16	23	37	83	122	26.5
49152	1	2.2	3.4	4.6	7.2	10	**	**	**	7.1
49152	2	2.0	3.3	4.4	6.9	10	17	**	**	14.3
49152	3	2.0	3.2	4.3	6.7	9.8	16	37	51	21.4
49152	4	1.9	3.2	4.2	6.6	9.6	16	36	49	28.5
81910	1	1.7	2.3	3.4	6.2	8.9	**	**	**	7.1
81910	2	1.6	2.3	3.3	5.6	8.0	13	**	**	14.3
81910	3	1.6	2.2	3.3	5.6	7.8	12	27	38	21.4
81910	4	1.6	2.2	3.3	5.4	7.7	12	27	36	28.5
102400	1	1.7	2.3	3.0	4.8	7.5	**	**	**	7.1
102400	2	1.6	2.3	2.9	4.4	6.7	12	**	**	14.3
102400	3	1.6	2.2	2.9	4.4	6.6	11	27	38	21.4
102400	4	1.6	2.2	2.9	4.3	6.5	11	26	36	28.5
151552	1	1.7	2.3	3.0	4.6	6.1	**	**	**	7.1
151552	2	1.6	2.3	2.9	4.2	5.6	8.9	**	**	14.3
151552	3	1.6	2.3	2.9	4.2	5.5	8.8	25	37	21.4
151552	4	1.6	2.3	2.9	4.2	5.5	8.8	24	35	28.5

WORK UNIT TYPE	8411
INPUT UNIT TYPE	0180
INPUT BLOCK SIZE	1440
OUTPUT UNIT TYPE	0180
OUTPUT BLOCK SIZE	1440
APPLICABLE RECORD LENGTHS	160- 319

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.2	2.4	3.6	4.8	7.2	9.6	14.4	19.2	MAX CAPAC. (MB.)
20480	1	6.4	13	21	30	**	**	**	**	6.7
20480	2	6.0	13	19	28	46	63	**	**	13.4
20480	3	5.9	12	19	27	44	61	96	**	20.1
20480	4	5.7	12	18	26	43	59	93	127	26.7
49152	1	3.8	7.8	12	16	**	**	**	**	7.2
49152	2	3.7	7.6	11	15	25	36	**	**	14.3
49152	3	3.7	7.5	11	15	25	35	55	75	21.5
49152	4	3.6	7.3	11	15	24	34	54	73	28.7
81910	1	3.2	6.5	11	15	**	**	**	**	7.2
81910	2	3.2	6.3	10	14	23	31	**	**	14.3
81910	3	3.2	6.3	10	14	22	30	46	63	21.5
81910	4	3.1	6.2	10	14	22	29	45	61	28.7
102400	1	3.2	6.2	9.2	13	**	**	**	**	7.2
102400	2	3.2	6.1	9.1	13	21	29	**	**	14.3
102400	3	3.2	6.1	9.0	13	21	29	46	62	21.5
102400	4	3.1	6.0	8.9	13	21	29	45	61	28.7
151552	1	3.2	6.2	9.2	12	**	**	**	**	7.2
151552	2	3.2	6.1	9.0	12	18	26	**	**	14.3
151552	3	3.2	6.0	9.0	12	18	26	43	60	21.5
151552	4	3.1	5.9	8.8	12	18	26	42	59	28.7

WORK UNIT TYPE	8411
INPUT UNIT TYPE	VI-C
INPUT BLOCK SIZE	1440
OUTPUT UNIT TYPE	VI-C
OUTPUT BLOCK SIZE	1440
APPLICABLE RECORD LENGTHS	160- 319

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.2	2.4	3.6	4.8	7.2	9.6	14.4	19.2	MAX CAPAC. (MB.)
20480	1	5.1	12	19	27	**	**	**	**	6.7
20480	2	4.8	11	18	24	39	56	**	**	13.4
20480	3	4.8	11	17	23	37	54	87	**	20.1
20480	4	4.8	11	17	23	36	53	85	115	26.7
49152	1	2.5	5.8	8.7	12	**	**	**	**	7.2
49152	2	2.4	5.6	8.4	12	20	27	**	**	14.3
49152	3	2.3	5.5	8.2	12	19	26	41	57	21.5
49152	4	2.3	5.4	8.1	11	19	26	41	55	28.7
81910	1	2.3	4.5	7.5	11	**	**	**	**	7.2
81910	2	2.3	4.4	7.1	10	16	22	**	**	14.3
81910	3	2.3	4.4	6.9	10	16	21	33	44	21.5
81910	4	2.2	4.3	6.9	9.9	15	21	32	43	28.7
102400	1	2.3	4.2	6.2	9.1	**	**	**	**	7.2
102400	2	2.3	4.2	6.1	9.0	15	21	**	**	14.3
102400	3	2.3	4.2	6.1	8.8	15	21	32	44	21.5
102400	4	2.2	4.1	6.1	8.7	14	20	32	43	28.7
151552	1	2.3	4.2	6.1	8.1	**	**	**	**	7.2
151552	2	2.3	4.2	6.1	8.0	12	18	**	**	14.3
151552	3	2.2	4.1	6.1	8.0	12	18	30	42	21.5
151552	4	2.2	4.1	6.0	7.9	12	18	30	42	28.7

WORK UNIT TYPE	8411
INPUT UNIT TYPE	8416
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	8416
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	171- 340

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.3	2.6	3.8	5.1	7.7	10.2	15.4	20.5	MAX CAPAC. (MB.)
20480	1	5.2	11	18	26	**	**	**	**	7.1
20480	2	4.5	11	16	24	39	55	**	**	12.2
20480	3	4.1	9.4	16	23	35	50	86	**	18.3
20480	4	4.1	9.3	14	22	35	48	81	115	24.5
49152	1	2.2	4.5	7.0	9.8	**	**	**	**	7.1
49152	2	2.1	4.2	6.6	9.8	16	24	**	**	14.3
49152	3	1.9	4.1	6.4	9.4	15	22	35	49	21.4
49152	4	2.0	4.0	6.3	9.2	15	21	34	47	28.5
81910	1	1.6	3.1	5.8	8.4	**	**	**	**	7.1
81910	2	1.5	3.0	5 3	7.5	12	18	**	**	14.3
81910	3	1.5	3.1	5 3	7.4	12	16	26	36	21.4
81910	4	1.5	3.0	5.1	7.2	11	16	25	34	28.5
102400	1	1.6	2.8	4.5	7.0	**	**	**	**	7.1
102400	2	1.5	2.7	4.1	6.3	11	17	**	**	14.3
102400	3	1.5	2.7	4.1	6.2	11	15	26	36	21.4
102400	4	1.5	2.7	4.0	6.1	11	15	25	34	28.5
151552	1	1.5	2.7	4.2	5.6	**	**	**	**	7.1
151552	2	1.5	2.7	3.9	5.1	8.2	14	**	**	14.3
151552	3	1.5	2.7	3.9	5.1	8.1	13	24	34	21.4
151552	4	1.5	2.7	3.8	5.0	8.0	12	23	33	28.5

WORK UNIT TYPE	8411
INPUT UNIT TYPE	0180
INPUT BLOCK SIZE	1440
OUTPUT UNIT TYPE	0180
OUTPUT BLOCK SIZE	1440
APPLICABLE RECORD LENGTHS	320- 639

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.2	2.4	3.6	4.8	7.2	9.6	14.4	28.8	MAX CAPAC. (MB.)
20480	1	6.5	14	22	30	**	**	**	**	5.7
20480	2	6.3	13	21	28	47	65	**	**	13.4
20480	3	6.2	13	20	27	46	63	99	**	20.1
20480	4	6.0	13	20	27	44	62	97	**	26.7
49152	1	3.9	8.0	12	16	**	**	**	**	6.7
49152	2	3.7	7.6	12	15	24	35	**	**	13.4
49152	3	3.7	7.5	11	15	24	33	54	**	20.1
49152	4	3.6	7.3	11	15	23	33	53	**	26.7
81910	1	3.3	6.4	10	15	**	**	**	**	6.7
81910	2	3.2	6.1	10	14	23	31	**	**	13.4
81910	3	3.2	6.1	9.9	14	22	30	47	**	20.1
81910	4	3.2	6.0	9.8	14	22	30	46	**	26.7
102400	1	3.3	6.4	9.5	13	**	**	**	**	6.7
102400	2	3.2	6.1	9.1	13	21	29	**	**	13.4
102400	3	3.2	6.1	9.1	13	21	29	46	**	20.1
102400	4	3.1	6.0	8.9	12	20	28	45	**	26.7
151552	1	3.3	6.3	9.4	13	**	**	**	**	6.7
151552	2	3.2	6.1	9.1	12	18	26	**	**	13.4
151552	3	3.2	6.1	9.0	12	18	26	43	**	20.1
151552	4	3.1	6.0	8.9	12	18	26	43	**	26.7

WORK UNIT TYPE	8411
INPUT UNIT TYPE	VI-C
INPUT BLOCK SIZE	1440
OUTPUT UNIT TYPE	VI-C
OUTPUT BLOCK SIZE	1440
APPLICABLE RECORD LENGTHS	320- 639

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.2	2.4	3.6	4.8	7.2	9.6	14.4	28.8	MAX CAPAC. (MB.)
20480	1	5.4	11	18	27	**	**	**	**	5.7
20480	2	4.9	11	18	25	41	57	**	**	11.5
20480	3	4.9	11	16	24	39	53	91	**	17.2
20480	4	4.8	10	17	24	37	51	85	**	22.9
49152	1	2.5	5.8	8.8	12	**	**	**	**	6.7
49152	2	2.4	5.6	8.5	12	19	27	**	**	13.4
49152	3	2.3	5.5	8.3	11	18	26	42	**	20.1
49152	4	2.3	5.4	8.1	11	18	25	41	**	26.7
81910	1	2.3	4.4	7.4	11	**	**	**	**	6.7
81910	2	2.3	4.3	7.2	10	16	22	**	**	13.4
81910	3	2.3	4.3	7.1	10	16	22	33	**	20.1
81910	4	2.3	4.2	7.0	9.9	16	21	33	**	26.7
102400	1	2.3	4.2	6.2	9.0	**	**	**	**	6.7
102400	2	2.3	4.2	6.1	8.8	15	21	**	**	13.4
102400	3	2.3	4.2	6.1	8.7	15	21	33	**	20.1
102400	4	2.3	4.2	6.1	8.7	15	20	32	**	26.7
151552	1	2.3	4.2	6.2	8.1	**	**	**	**	6.7
151552	2	2.3	4.2	6.1	8.0	12	18	**	**	13.4
151552	3	2.3	4.2	6.1	8.0	12	18	30	**	20.1
151552	4	2.2	4.1	6.0	8.0	12	18	30	**	26.7

WORK UNIT TYPE	8411
INPUT UNIT TYPE	8416
INPUT BLOCK SIZE	1024
OUTPUT UNIT TYPE	8416
OUTPUT BLOCK SIZE	1024
APPLICABLE RECORD LENGTHS	341- 682

ESTIMATED SORT EXECUTION TIME IN MINUTES

SORT MAIN STORAGE	NO. WORK UNITS	SIZE OF DATA SET IN MEGABYTES (MB.) 1.3	2.6	3.8	5.1	7.7	10.2	15.4	30.7	MAX CAPAC. (MB.)
20480	1	5.2	11	18	25	**	**	**	**	6.1
20480	2	4.5	9.9	16	23	39	54	**	**	12.2
20480	3	4.1	9.3	15	23	35	50	82	**	18.3
20480	4	4.1	9.2	14	21	34	48	80	**	24.5
49152	1	2.2	4.4	6.9	9.8	**	**	**	**	7.1
49152	2	2.1	4.2	6.6	9.5	16	23	**	**	14.3
49152	3	1.9	4.1	6.4	9.3	15	22	35	**	21.4
49152	4	1.9	4.0	6.3	9.1	15	21	34	**	28.5
81910	1	1.6	3.1	5.8	8.3	**	**	**	**	7.1
81910	2	1.5	3.0	5.3	7.5	12	18	**	**	14.3
81910	3	1.5	3.1	5.3	7.3	12	16	26	**	21.4
81910	4	1.5	3.0	5.1	7.2	11	16	25	**	28.5
102400	1	1.6	2.8	4.5	7.0	**	**	**	**	7.1
102400	2	1.5	2.7	4.1	6.3	11	17	**	**	14.3
102400	3	1.5	2.7	4.1	6.2	11	15	26	**	21.4
102400	4	1.5	2.7	4.0	6.1	10	15	25	**	28.5
151552	1	1.5	2.7	4.2	5.6	**	**	**	**	7.1
151552	2	1.5	2.7	3.9	5.1	8.2	14	**	**	14.3
151552	3	1.5	2.7	3.9	5.0	8.1	13	23	**	21.4
151552	4	1.5	2.6	3.8	5.0	8.0	12	23	**	28.5

Glossary

A

action code

Tells independent sort/merge what action to take during your own-code routine for input file processing (E15) or output file processing (E35). The action code is placed in the *action word*.

action word

A 1-word (4-byte) entry in the exit parameter list, a table built by independent sort/merge to specify location of records and information affecting record processing. The action word contains the *action code* and is used by exits E15 and E35.

address-out sort

A method of sorting in which the output file produced contains only the addresses of the records sorted. For independent sort/merge and subroutine sort/merge, the output file consists of the 10-byte direct address for each record sorted. For SORT3, the output consists of the 10-byte relative record address for each record sorted.

alternate collation sequence

A collating sequence other than the standard one used by the sort programs for arranging data in particular data formats. Alternate collation sequences must be user defined. Independent sort/merge requires transition tables and the E84 exit code. Subroutine sort/merge requires transition tables and the USEQ keyword parameter. SORT3 requires an S in column 26 of the header specification and ALTSEQ statements in the control stream.

B

bin

A fixed-length subunit of a variable-length record. Variable-length records to be sorted are divided into bins to conserve main storage space and provide optimum processing speed. The first *bin* of a record contains all of the *key fields* and the 4-byte record length field.

block

The portion of a file transferred into or out of main storage by a single access. Contains one or more *records*.

buffer

An I/O area in main storage which compensates for the differences in speed between low-speed I/O devices and high-speed main storage processing. In a subroutine sort/merge program, assigning two *buffer* areas substantially increases sort speed.

byte numbering method

Independent sort/merge and subroutine sort/merge use different *byte numbering methods* for indicating the starting position of key fields. The byte numbering method used by independent sort/merge is compatible with other systems. Key field starting positions are indicated by byte numbers, starting at 1 for the first byte. Subroutine sort/merge uses byte position numbers, starting at 0 for the first byte. Byte position number is always 1 less than byte number.

byte.bit format

A binary key field can start at a specific bit within a byte. The starting position and key field length of a binary key field are indicated in *byte.bit format*. As an example, if a key field starts at bit 2 of byte 9 in a record, 9.2 should be specified as the starting position in an independent sort/merge, 8.2 in a subroutine sort/merge. (See *byte numbering method*.) For key field length, if the key field extends from bit 2 of byte 10 through bit 5 of byte 12, the length would be specified as 2.4.

C

checksum word

Provides a check for data integrity during read and write transfer operations (I/O processing) between an independent or subroutine sort/merge operation and the sort work files. Normally, a *checksum word* is generated for each output data *block* written to the tape or disc working storage areas. The checksum word is calculated by logically summing, into a one-word field, the *records* in the data block before they are written out to the sort work file. After the data blocks are read back into main storage from the sort work file, a checksum word is recalculated. Data integrity is then verified by comparing the new checksum word with the old checksum word. If the comparison is unequal, the sort terminates. Calculation of a checksum word can be suppressed by specifying the NOCKSM keyword parameter.

collation sequence

The consecutive order in which data is arranged in a particular data format.

control field

In SORT3, a field that is a location anywhere within a record and contains the information used to select, omit, compare, and arrange records.

D

default sort

An independent sort/merge operation in which all information is automatically supplied in the absence of sort control statements. All input, output, and word files assigned in the job control stream must be disc files. In a *default sort*, independent sort/merge takes the *record* size, *block* size, and record type specifications from the value-table-of-contents (VTOC) for the input files. If input files are partitioned, the first partition is assumed, and a single partition output file is created. The data records are assumed to be character formatted and to have one sort key field the same length as the record of 256 bytes, whichever is less.

disc sort

Sort/merge procedure in which auxiliary sotrage is on disc. One to eight disc work files may be allocated for independent sort/merge and subroutine sort/merge. They must be assigned the names DM01,..., DM08 or $SCR1,...,$SCR8 on LFD job control statements. WORK jproc calls automatically assign the filenames $SCR1,...,$SCR8. One to three disc work files may be allocated for SORT3 and they must be assigned the names DM01,...,DM03 or $SCR1,...,$SCR3 or LFD job control statements.

DTF (define the file)

Any of a series of tables generated by a data management macro instruction which defines a file and the data management technique which will be used in processing the file. Sort/merge can process files defined by the DTFMT (tape), DTFSD, DTFDA, or DTFNI (disc) macro instructions.

E

exit

Point at which control is passed from independent sort/merge to a user own-code routine.

exit code

Defines the *exit* associated with a specific own-code routine in an independent sort/merge.

external reference (EXTRN)

Defines the entry point for an object module which is to be linked to the user program in a link edit run. In a subroutine sort/merge program, *MR$ORT* is named as an *EXTRN* in order to build the *sort common module (SG$ORT)* into the user load module.

F

filenameB

In the *nonindexed file processor system*, a 6-byte addressable field in the DTFNI table, full-word aligned, in which data management returns the partition-relative disc address of the current block or record when the NOTE imperative macro is issued. Addressable by concatenating the letter B to the 7-character file name.

I

indexed random access method (IRAM)

An access technique within OS/3 data management which allows processing of disc files by relative record number or by key (indexed), in a random or sequential order.

indexed sequential access method (ISAM)

An access technique within OS/3 data management which allows processing of disc files in either a random or a sequential order, through the use of an index.

interlace

A method of recording more than one physical record on a disc for each rotation. The number of records that can be recorded and accessed for each rotation depends on the interlace factor. The interlace (or lace) factor used when a file is created must be specified each time that file is accessed. A detailed explanation of *interlace* is provided in the data management programmer reference, UP-8159 (current version).

internal sort

Accomplished in main storage without the use of tape or disc work files. An *internal sort* is performed when work files are not assigned in the job control stream.

J

jproc call

Generates a series of job control statements. The job control statements can be tailored to suit specific needs through the use of optional parameters and an optional label field. The format of a *jproc call* is:

```
//[label] jproc call [parameter-1,...,parameter-n]
```

See also *WORK jproc*.

K

key/key field

The word *key* has two separate meanings in the context of this manual.

In an independent or subroutine sort/merge program, a *key* or *key field* is located anywhere within a *record* and contains the information used as the basis for comparing the arranging records in the desired order. A record may contain a number of key fields. The length and other information about these sort key fields are specified in the FIELD or FIELDS keyword parameter.

In the data management *nonindexed file processor system*, a *key* may optionally precede each physical *block*. The key is a character string, unrelated to the disc location of the block, which uniquely distinguishes that block from all others in the area of search. Key length can be from 3 bytes to 255 bytes, but all keys in any one file must have the same length. When blocks with keys are being processed in an independent sort/merge program, the KEYLEN parameter should be specified on the OPTION control statement. In a subroutine sort/merge program, it should be coded in the input file DTF.

M

merge-only process

Combines 2 to 16 previously sorted files into 1 output file in the same sequence as the input files. The initial sort and preliminary merge operational phases are bypassed.

MR$ORT

An *external reference (EXTRN)* which calls in the *sort common module* in a subroutine sort/merge program.

multipartitioned file

A disc file may be divided into a maximum of seven partitions. Only one partition from each input file can be sorted; however, additional partitions from the same file can be sorted by redefining them as separate files in the job control stream.

N

nonindexed file processor system

A system within OS/3 data management allowing files to be processed sequentially, randomly, or by a combination of both techniques.

O

operational phases

The sort/merge process consists of the following *operational phases*:

Phase 0: sort initialization and assignment

Phase 1: data input and initial sort

Phase 2: preliminary merge

Phase 3: final merge and output

In a *merge-only* operation, the initial sort and preliminary merge phases are omitted.

own-code routine

A user-provided routine for performing a specialized function other than the normal OS/3-supplied sort/merge operations. Provides additional control over input or output processing, record sequencing, data reduction, or collation sequencing.

P

PUBS list

Control blocks (physical unit blocks) in main storage containing the peripheral device information used by the physical I/O control system (PIOCS).

R

record

A collection of contiguous characters, designated as such to data management by the user, for handling as a unit. The *record* size must not exceed *block* size.

reserved tape unit

Serves as both the device for a work file during the input and intermediate phases of sort/merge and the device for the output file during the output phase.

restart

To resume processing a job from some intermediate point (called a checkpoint or recovery point) following an interruption. A tape sort can be restarted through use of the RESUME parameter; a disc sort cannot be restarted.

S

sequential access method (SAM)

An access technique within OS/3 data management allowing sequential processing of records from any input device.

shared tape unit

Functions as an input device during the input phase of sort/merge operation and as the device for a work file during the intermediate and output phases.

single-cycle sort

The entire sort/merge procedure is performed in one cycle; i.e., the operational phases are performed in sequence, without any of the phases being repeated. The volume of data to be sorted is limited to the physical capacity of the disc or tape work area assigned. In a tape sort, each reel of tape assigned to the sort must be able to contain all of the records being sorted.

sort common module (SG$ORT)

An interface module residing in the system object library file (YOBJ). To establish a communication interface between the user program and the subroutine sort/merge, the sort common module is linked to the user program in a link edit run by naming MR$ORT as an *external reference (EXTRN)*. The linkage editor makes the *sort common module* part of the user program when it builds the load module. When the user program is loaded into main storage, the sort common module remains there for the duration of subroutine sort/merge processing and provides a link between the user program and the subroutine sort/merge.

sort/merge process

Records are read one at a time into main storage where initial sorting is performed by key field or control field comparison, producing strings of sequenced data. The record strings are written to disc or tape work files (if assigned), where they are continuously merged into longer strings. At the final merge, the data string is brought into main storage and written to the output file.

sort parameter table

A table constructed by the independent sort/merge and subroutine sort/merge process from specifications submitted on independent sort/merge control statements, subroutine sort/merge macro instructions, PARAM job control statements, and/or from default specifications. Entries in the table define the conditions under which the particular sort/merge or merge-only operation is to be performed.

summary sort

An SORT3 sorting method that summarizes or adds together designated data fields during the sort.

T

tag-along sort

An SORT3 sorting method that allows the data field to "tag along" with the control fields in the output records. Output from a tag-along sort can consist of control and data fields, control fields only, or data fields only.

tag sort

A method of sorting in which direct access addresses and key fields, or direct access addresses alone, are stripped from each record and formed into a new record. A *tag sort* can be performed only when input is from nonindexed or IRAM disc files.

tape sort

Sort/merge procedure in which auxiliary storage is on tape. Three to six tape units may be assigned. The names SM01,...,SM06 must be designated on LFD job control statements.

W

winner record

The record which meets the sequencing criterion as a result of comparing one record from each input file. In a subroutine *merge-only* procedure, the *winner record* is returned to the user program; another record is then released to the merge from the input file associated with the winner record for the next comparison.

WORK jproc

Allocates temporary work files on disc. Ignoring optional parameters, the format of the WORK jproc call is:

```
// [label] WORKn
```

The WORK jproc call

```
// WORK1
```

generates these job control statements:

```
// DVC RES
// EXT ST,,1,BLK,(256,4000)
// LBL $SCR1
// LFD $SCR1
```

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