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GENERAL MANAGER
SANTA BARBARA PLANT

Burroughs Corporation

COMPUTER SYSTEMS GROUP
SANTA BARBARA PLANT

SORT/COLLATE

PRODUCT SPECIFICATION

REV LTR	REVISION ISSUE DATE	APPROVED BY	REVISIONS
D	8/30/76	Hale	Name changed from B1700 TRANSLATE TABLE GENERATOR to SORT/COLLATE. Updated to MARK 6.1 level software. Added references to B500 option on the following pages: 1-1 2-1 2-2 2-3 3-1 4-1

#2212 5371

Burroughs Corporation

BUSINESS MACHINES GROUP
SMALL SYSTEMS PLANT

B1700 TRANSLATE TABLE GENERATOR

PRODUCT SPECIFICATION

REVISIONS

REV LTR	REVISION ISSUE DATE	PAGES REVISED ADDED DELETED OR CHANGE OF CLASSIFICATION	PREPARED BY	APPROVED BY
A	6/12/75	Original Issue	K.M.K.	
B	2/26/76	Revised to support MARK V.1-level software. MAKE/TRANSLATE program changed to SORT/COLLATE 1-1 Uses of table files expanded. 2-1 FUNCTIONAL DESCRIPTION now Section 2. Description of table files expanded. 2-2 Definition of TRANSLATE CHARACTERISTIC STATEMENT expanded. Definitions added for; ASCII 8 BIT OPTION ASCII 7 BIT OPTION BCL OPTION 3-1 SEMANTICS now Section 3. Naming conventions explained. 4-1 Added Section 4, TRANSLATE HEADER FORMAT containing description of records in a file and description of fields of information in a header. 5-1 CONTROL CARDS section now Section 5 and renamed SAMPLE EXECUTE DECK.	K.M.K.	
C	3/23/76	Added references to BCL 8 bit on the following pages: 1-1 2-1 2-2 2-3 3-1 4-1	K.M.K.	

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GENERAL DESCRIPTION

The SORT/COLLATE program accepts the TRANSLATE language described herein and generates the required COLLATE or TRANSLATE TABLE in the form of a disk file to be used by the sort intrinsics in the performance of a collate sort or by application programs that perform a translation and require a table to define the desired translations.

A collate sort permits the programmer to alter the sequence in which the sort intrinsics order records during the sorting process. Normally all characters encountered in the sort keys are arranged in the B1700 hardware collating sequence (i.e., 2002 through 2FF2). Only those elements of the sort key described as unsigned alphanumeric are affected by the translation capability.

The collate or translate table file generated by SORT/COLLATE may be created to:

A. Specify a new collating sequence for the particular program invoking the sort.

B. Retain the normal collating sequence of 2002 through 2FF2 except for certain characters whose rank in the sequence it is desired to interchange.

C. Make a number of characters have the same rank for the ordering of the records.

D. Specify translation tables to EBCDIC from ASCII 8 bit, ASCII 7 bit, BCL, BCL 8 bit or B500.

The collate table file is frequently required for foreign alphabets or conversion from other processing systems. When performing a sort with translation, the sort intrinsic brings the collate table file into main memory; and, as the sort key is extracted from each record, those elements of the sort key which are declared as unsigned eight-bit (BYTE) format are processed through a translation operation before being passed to the sort intrinsic comparison logic.

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FUNCTIONAL DESCRIPTION

The SORT/COLLATE program creates either a collate or translate table. The collate table file consists of two 256-BYTE records, on disk, for subsequent use by the sort intrinsics or other application programs. The translate table file is a three record file consisting of a translate header (See TRANSLATE HEADER FORMAT Section), translation forward and translation backward table for translation from EBCDIC to ASCII 8 bit, ASCII 7 bit, BCL, BCL -8 bit, B500 and back to EBCDIC. Files of the first type are referred to as collate files (two records) and files of the second type as translate files (three records).

The program reads parameter cards describing the sequence desired or the non-standard aspects only of the sequence desired. Cards are checked for syntax and ambiguity, and if no errors are found a table is produced.

The input to SORT/COLLATE is in the form of statements, each of which serves a discrete function as described below. The statements are in free field format. The statements may be permuted in any order; however, column 72 and beyond are not used by SORT/COLLATE, and may contain any sequence or documentary information deemed appropriate. The SORT/COLLATE language input is given by the following expressions:

<SORT/COLLATE LANGUAGE INPUT> ::=	<IDNT STATEMENT> <TRANSLATE CHARACTERISTIC STATEMENT>
<IDNT STATEMENT> ::=	$ IDNT<BLANK><FILE NAME>
<BLANK> ::=	NOTE: <BLANK> IS THE OCCURRENCE OF ONE NON VISIBLE CHARACTER " ".
<FILE NAME> ::=	<MULTI-FILE-ID> | <MULTI-FILE-ID>/<FILE-ID> | <PACK-ID>/<MULTI-FILE-ID>/ | <PACK-ID>/<MULTI-FILE-ID>

```
                                    /<FILE-ID>
                                  | <EMPTY>

<MULTI-FILE-ID> ::=                 <LABEL>

<FILE-ID> ::=                       <LABEL>

<PACK-ID> ::=                       <LABEL>

<LABEL> ::=                         <ALPHANUMERIC CHARACTER STRING>
                                  | "<ALL CHARACTERS EXCEPT QUOTE>"

<TRANSLATE CHARACTERISTIC
STATEMENT> ::=                      <ALPHA-NUMERIC OPTION>
                                  | <SEQUENCE OPTION>
                                  | <ASCII 8 BIT OPTION>
                                  | <ASCII 7 BIT OPTION>
                                  | <BCL OPTION>
                                  | <BCL 8 BIT OPTION>
                                  | <8500 OPTION>

<ALPHA-NUMERIC OPTION> ::=          <ALPHA OPTION><NUMERIC OPTION>
                                  | <ALPHA-NUMERIC OPTION>
                                    <ALPHA OPTION>
                                  | <ALPHA-NUMERIC OPTION>
                                    <NUMERIC OPTION>

<ALPHA OPTION> ::=                  $ ALFA<BLANK><ALPHA LIST>

<ALPHA LIST> ::=                    <EBCDIC CHARACTER>
                                    <EBCDIC CHARACTER>
                                  | <ALPHA LIST><BLANK>
                                    <EBCDIC CHARACTER>
                                    <EBCDIC CHARACTER>

<NUMERIC OPTION> ::=                $ NUMR<BLANK><NUMERIC LIST>

<NUMERIC LIST> ::=                  <HEX CONSTANT><HEX CONSTANT>
                                  | <NUMERIC LIST><BLANK>
                                    <HEX CONSTANT><HEX CONSTANT>

<HEX CONSTANT> ::=                  <HEXIDECIMAL VALUE FROM
                                    "00" TO "FF">

<SEQUENCE OPTION> ::=               $ SEQN<BLANK><SEQUENCE LIST>
                                  | <SEQUENCE OPTION> $ SEQN<BLANK>
```

	<SEQUENCE LIST>
<SEQUENCE LIST> ::=	<HEX CONSTANT><SEQUENCE STRING> | <SEQUENCE LIST><BLANK> <HEX CONSTANT> | <SEQUENCE LIST><BLANK> <SEQUENCE STRING>
<SEQUENCE STRING> ::=	<HEX CONSTANT><HYPHEN> <HEX CONSTANT>
<HYPHEN> ::=	-
<ASCII 8 BIT OPTION>::=	$ ASC8
<ASCII 7 BIT OPTION>::=	$ ASC7
<BCL OPTION>::=	$ BCL
<BCL 8 BIT OPTION>::=	$ BCL8
<B500 OPTION>::=	$ B500

SEMANTICS

The <IDNT STATEMENT> provides the facility to name the collate or translate file being created. <FILE NAME> may consist of <PACK-ID>, <MULTI-FILE-ID> and <FILE-ID> combined in accordance with standard B1700 file naming convention. Use of the <IDNT STATEMENT> is optional. If this statement is omitted, a default multi-file-id of "TRANSLATE" will be assigned to the file produced if $ASC8, $ASC7, $BCL, $BCL8, or $B500 is specified and a default name "COLLATE" if the others are used. In both cases, the file will be placed on the system disk.

The <TRANSLATE CHARACTERISTIC STATEMENT> is used to describe the new collating sequence desired. Information may be supplied in six forms. The <ALPHA-NUMERIC OPTION> is a means through which individual collating sequence characteristics may be altered. This is done with the <ALPHA OPTION> and/or <NUMERIC OPTION>. The <SEQUENCE OPTION> provides a method through which an entire collating sequence may be defined. The other options provide the translation tables from EBCDIC to ASCII 8 bit, ASCII 7 bit, BCL, BCL 8 bit, B500 and back to EBCDIC

The <ALPHA OPTION> is used to depart from an otherwise standard collating sequence. Where the position of certain characters in the sequence is to be occupied by other characters, these may be specified as follows:

```
$ALFA AB CD EF (( ))] .,
```

In the above example, A would collate as B, C as D, E as F, parenthesis as brackets and period as comma. The <ALPHA OPTION> is a convenient way of specifying those characters which are graphics.

The <NUMERIC OPTION> may be used by itself or in conjunction with the <ALPHA OPTION>. The <NUMERIC OPTION> is most suitable for non-graphic special characters although it may be used for any characters. Its format is similar to that of the <ALPHA OPTION>.

```
$NUMR  0E3E 0040  4000  C04E
```

In the above example, each hex pair would collate as follows: 0E as 3E, 00 as 40, 40 as 00, and C0 as 4E.

When using the <ALPHA-NUMERIC OPTION>, any characters not specifically mentioned retain their standard position in the collating sequence. Note that with this option, any number of characters can be made to collate alike. However, when doing so a TAGSEARCH or TAGSORT must be used in conjunction with the translate facility to guarantee that all characters that collate alike will be returned in their original form. If a character appears on the left side of a replacement pair more than once, SORT/COLLATE will assume that its last appearance reflects the collating position desired in the new collating sequence.

An alternate method of specifying a new collating sequence is with the <SEQUENCE OPTION>. If this option is used, the <ALPHA-NUMERIC OPTION> is invalid. The collating sequence information provided through the <SEQUENCE OPTION> must contain sufficient entries to completely describe all 256 possible character combinations. The first sequence parameter will indicate that character which is to collate as 00, the next character will indicate that character which is to collate as 01 and so on. To reduce keypunching, the contiguous representation 00 01 02 03 04 05 06 07 08 09 may be coded 00-09. Likewise, the inverse contiguous representation 09 08 07 06 05 04 03 02 01 00 may be coded 09-00. The presence of the hyphen indicates that a range of characters is being described; single entries such as 4E C0 7F 5D are delimited by a space.

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TRANSLATE HEADER FORMAT

Each record for the 3-record file generated by $ASC8, $ASC7, $BCL, $BCL8, and $B500 will be 2048 bits, 1792 bits and 1536 bits respectively. The first record is a header and describes the next two records which are the translation forward and backward tables. Eight fields of information are contained in the beginning of the header:

1. A 24 bit level identifier which will change for each release. It will consist of the year and day number of the year of the first release of that level; e.g., 75258 is 1975, the 258th day of the year.

2. An 8 bit translation forward entry size, giving the size of each entry of the second record.

3. An 8 bit translation backward entry size, giving the size of each entry of the third record.

4. A 24 bit translation forward table size (second record).

5. A 24 bit translation backward table size (third record).

6. A character table type containing "TRAN".

7. A 24 bit field containing the filler character (in hex right justified) associated with the second record; 2402-EBCDIC.

8. A 24 bit field containing the filler character (in hex right justified) associated with the third record; 2102-BCL, 2402-BCL 8 bit, 2202-ASCII 7 bit, 2A02-ASCII 8 bit, and 20C2-B500.

The collate files may be used by the sort intrinsics only.

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SAMPLE EXECUTE DECK

CARD	COLUMN 1	COLUMNS 2-80
#1	?	EXECUTE SORT/COLLATE
#2	?	DATA CARDS
-	STATEMENT CARDS	
LAST	?	END

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