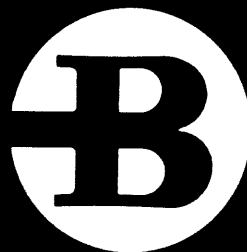# Burroughs

B 2500
and
B 3500
SYSTEMS

COBOL CROSS-REFERENCE UTILITY SYSTEM
REFERENCE MANUAL

Burroughs

B 2500/B 3500 SYSTEMS

COBOL

CROSS-REFERENCE
UTILITY SYSTEM
REFERENCE MANUAL

BUSINESS MACHINES GROUP
SALES TECHNICAL SERVICES
SYSTEMS DOCUMENTATION

Burroughs Corporation **B**

Detroit, Michigan 48232

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LIST OF ILLUSTRATIONS

INTRODUCTION

This manual describes the Burroughs B 2500/B 3500 COBOL Cross-Reference Utility System which utilizes the Burroughs technique of cross-referencing COBOL source programs written for the B 2500/ B 3500 Systems.

COBOL programs are normally very lengthy due to the inherent nature of the language itself. They normally contain data elements by the hundreds, plus containing many procedure-names, thus causing time consuming manual perusal effort when a programmer is required to make a simple change in a program. A single programmatic change in the source language may affect many areas of a program with the possibility that an affected area will be far removed from that which was immediately changed and in turn can be easily missed by the most experienced programmer. The Cross-Reference Utility System allows a programmer to find all areas that a change will affect, at a glance.

Cross-referencing speeds reflected in tests of typical COBOL programs are exceptionally fast and provide all B 2500/B 3500 users with a documentation tool of great value, at a very small operational cost.

The three programs involved with the system are available to B 2500/ B 3500 users commencing on the ASR #1 systems release as CBXRIN, CBXSRT, and CBXLST.

The Burroughs Corporation takes pride in providing this system as a continuing effort to offer the user aids in reducing COBOL program maintenance expenditures through readily usable documentation facilities.

SECTION 1
SYSTEM DESCRIPTION

The B 2500/B 3500 COBOL Cross-Referencing Utility System consists of three programs (see figure 1-1):

a. CBXRIN. The first program, CBXRIN, uses a COBOL source program as input and produces a disk file as output. The disk file output is used as input to the second (sort) program. CBXRIN also creates a listing of the input source program, if desired.

b. CBXSRT. The second program, CBXSRT, is a disk sort program designed to arrange all output records from the first program into a usable sequence as input to the third program.

c. CBXLST. The third program, CBXLST, formats the sorted data from the second program and produces a COBOL cross-reference listing of the original source language program.

The B 2500/B 3500 COBOL Cross-Reference Utility System will operate on all B 2500/B 3500 Advanced Systems. The peripheral configuration required is:

a. One card reader.

b. One magnetic tape unit (if input source program is on a SOLT tape).

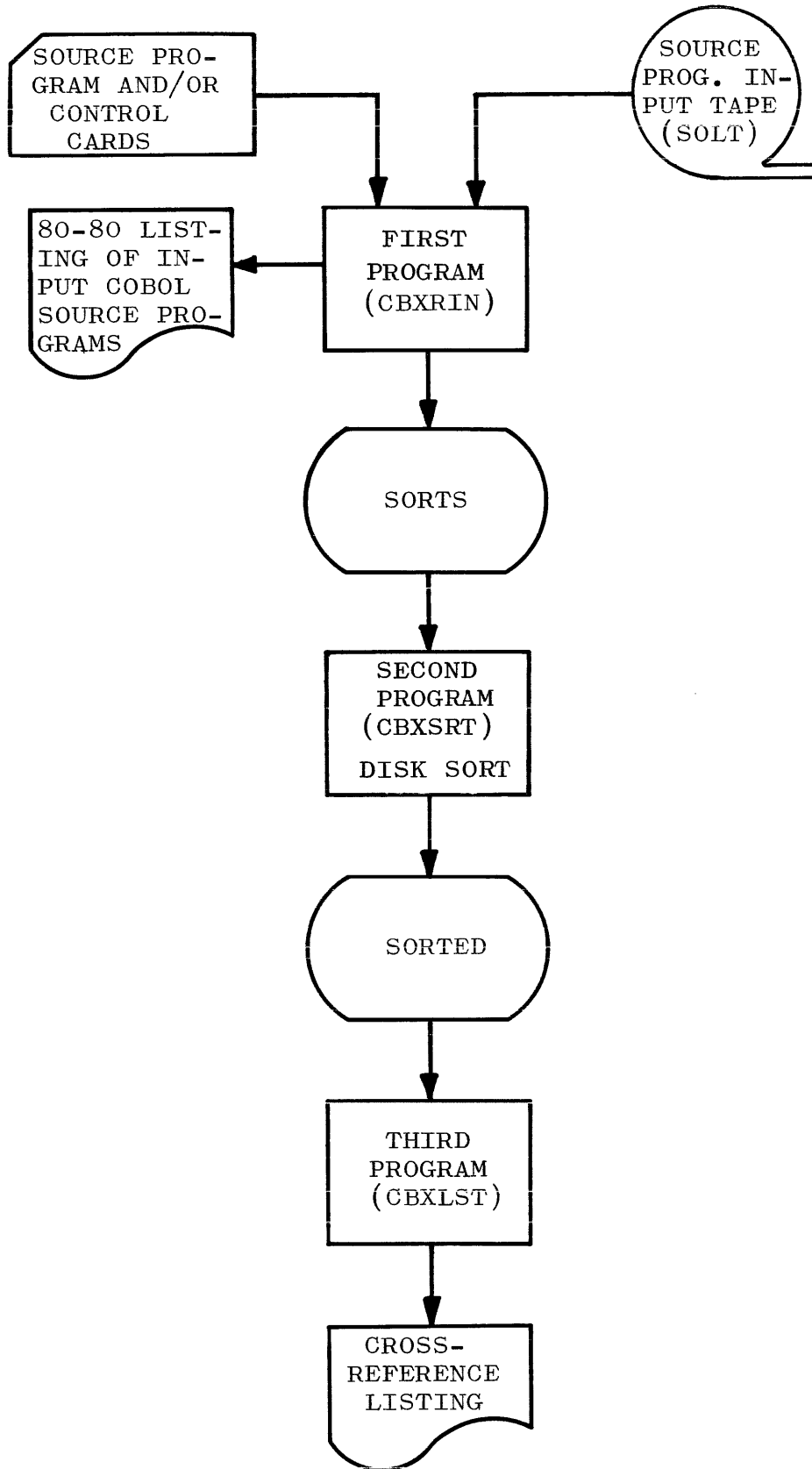c. One printer (8 lines per inch).

d. One disk module.

Figure 1-1. B 2500/B 3500 COBOL Cross-Reference
Utility System Flow

SECTION 2
COBOL CROSS-REFERENCE INPUT CONTROL

The first program (CBXRIN) uses a syntactically correct COBOL source program as input. The source program to be cross-referenced can be read from either punched cards or magnetic tape (SOLT).

The control cards necessary for execution of the first program are:

```
    ? EXECUTE CBXRIN
  { ? DATA  SOURCE  }
  { ? DATAB SOURCE  }   Source language input options.
    [CARD]
    [CDLIST]
    [TAPE]                Input/output options.
    [TPLIST]
    [LISTCD]
    [LISTTP]
```

All control card data starts in card column one.

The EXECUTE control card notifies the MCP to call the first program (CBXRIN) from the disk library.

The second control card is the MCP Label Card.

    a. ? DATA SOURCE indicates EBCDIC Source Language Input.

    b. ? DATAB SOURCE indicates BCL Source Language Input.

Input/Output options which can be specified are as follows. If one of the listed options is not used, the CARD option will be assumed.

    a. CARD. The CARD option indicates that the input source program is in punched card form and that cross-referencing is desired.

    b. CDLST. The CDLST option indicates that the input source program is in punched card form and that a listing of the input program (see figure 2-1) is desired along with a cross-reference of the program.

c. TAPE. The TAPE option indicates that the input source program is on magnetic tape with a label of "SOLT" and that cross-referencing is desired.

d. TPLIST. The TPLIST option indicates that the input source program is on magnetic tape with a label of SOLT and that a listing of the input program is desired along with a cross-reference of the program.

e. LISTCD. The LISTCD option indicates that the input source program is in card form and that an 80/80 listing is desired of the program without accomplishing a cross-reference.

f. LISTTP. The LISTTP option indicates that the input source program is on magnetic SOLT tape and that an 80/80 listing is desired of the program without accomplishing a cross-reference.

The second program of the system, CBXSRT, is scheduled automatically and executed at completion of the first program requiring options a, b, c, or d above, by a ZIP function within the first program.

The output disk file from the first program is labeled SORTS.

```
000100 IDENTIFICATION DIVISION.
000200 PROGRAM-ID. COBOL CROSS REFERENCE.
000300 AUTHOR. BURROUGHS CORP.
000400 ENVIRONMENT DIVISION.
000500 CONFIGURATION SECTION.
000600 INPUT-OUTPUT SECTION.
000700 FILE-CONTROL.
000800     SELECT DISK-I-O ASSIGN TO DISK.
000900 I-O-CONTROL.
001000     RERUN EVERY 9999 RECORDS OF DISK-I-O
001100     SAME RECORD AREA FOR DISK-I-O DISK-O-I.
001200 DATA DIVISION.
001300 FILE SECTION.
001400 FD DISK-I-O VALUE OF ID IS "B-3500".
001500 01 DISK1.
001600     03 CONTROL-CD PC X(6).
001600     03 CODE-1 PC X(6).
001700     03 CODE-1 PC X(6).
001800     03 CODE-2 PC X(80).
       WORKING-STORAGE SECTION.
001900 01 HELLO COPY "HELLO".
002000 PROCEDURE DIVISION.
002100 BEGIN SECTION.
002200 START.
002300     OPEN INPUT/OUTPUT DISK-I-O.
002400     READ DISK-I-O.
002500     WRITE DISK1.
002600     MOVE CONTROL-CD TO CODE-2 CODE-1.
002700     MOVE CODE-1 TO CODE-2 CONTROL-CD.
002710 COPIED SECTION 50.
002800     COPY "YOUALL".
002900     MOVE SW1 TO SW2 SW3 SW5.
003000     MOVE SW4 TO CODE-1 SW1 SW2 SW3.
003100     MOVE SW6 TO SW4 CODE-2.
003200     MOVE TODAYS-DATE TO CONTROL-CD.
003300     MOVE TIME TO CODE-2
003400     MOVE DATE TO CODE-2.
003500     MOVE TALLY TO CODE-2.
003700     MOVE CODE-2 TO CODE-1. WRITE DISK1.
003900     CLOSE DISK-I-O WITH LOCK.
004000     MOVE HELLO TO TODAYS-DATE TIME TALLY DATE.
```

Figure 2-1.   Sample Listing of Input
              Program to CBXRIN

SECTION 3

DISK SORT PROGRAM

The disk sort program (CBXSRT) is scheduled and executed without operator intervention by a ZIP from the first program.

CBXSRT is a sort program which uses the disk file output from the first program as input to be sorted.

The output from this sort program is written to a disk file labeled as SORTED.

The third program in the utility system (CBXLST) is scheduled automatically and executed at completion of the sort by a ZIP function within the sort program.

SECTION 4
CROSS-REFERENCE LISTING

The third program in the utility system (CBXLST) is scheduled and executed without operator intervention.

The input to this program is a disk file labeled SORTED from the second program.

The output is the cross-reference listing of the COBOL source program used as input to the first program. See figure 4-1 as an example listing.

The listing consists of the following:

    a. FILE-CONTROL information.
        1) File-name.
        2) Hardware assignments.
        3) OPEN status.
        4) FILE ID.
        5) Lines OPEN on.
        6) Lines CLOSE on.
        7) Lines read on (if applicable).
        8) Lines written on (if applicable).
        9) Number of records for RERUN.
     10) RECORDING MODE.
     11) File-name of files sharing SAME-AREA.

    b. Data-names referenced by line number.
        1) Line number data-name defined on.
        2) Line numbers data-name referenced on.
        3) Library file-name to be copied into program and line number of copy statement.

    c. Internal Program Switches.
        1) Line number of the first switch usage in the program.
        2) Switch-name.
        3) Line numbers of additional switch usage.

PROGRAM ID: COBOL CROSS REFERENCE.   AUTHOR: BURROUGHS CORP.

FILE NAME   FILE DESCRIPTIONS
==== ====   ==== ============

DISK-I-O   ASSIGNED TO DISK   AS INPUT/OUTPUT VALUE OF ID IS "B-3500".
                              OPENED ON LINE 002300
                              CLOSED ON LINE 003900
                              READ ON LINES 002400
                              WRITTEN ON LINES   002500 003700
                              RERUN EVERY   9999   RECORDS
                              RECORD AREA SHARE WITH DISK-O-I
                              RECORDING MODE STANDARD

DEFINED	DATA-NAME	REFERENCED
001600	CODE-1	THIS DATA-NAME DEFINED MORE THAN ONCE
001700	CODE-1	002600 002700 003000 003700
001800	CODE-2	002600 002700 003100 003300 003400 003500 003700
002710	COPIED SECTION 50	NO OTHER REFERENCE
001400	DISK-I-O	000800 001000 002300 002400 003900
001500	DISK1	002500 003700
001900	HELLO	004000
HELLO	COPIED FROM LIBRARY ON LINE	001900
YOUALL	COPIED FROM LIBRARY ON LINE	002800

                              INTERNAL PROGRAM SWITCHES

002900	SW1	003000
002900	SW2	003000
002900	SW3	003000
003000	SW4	003100
002900	SW5	
003100	SW6	

                              SPECIAL REGISTERS

003400	DATE	004000
003500	TALLY	004000
003300	TIME	004000
003200	TODAYS-DATE	004000

Figure 4-1.   Sample Cross-Reference Listing

d. Special Registers.

   1) Line number that each special register is used on.

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REMARKS FORM

TITLE: _____   FORM: _____
       _____   DATE: _____
       _____

CHECK TYPE OF SUGGESTION:

☐ ADDITION   ☐ DELETION   ☐ REVISION   ☐ ERROR

GENERAL COMMENTS AND/OR SUGGESTIONS FOR IMPROVEMENT OF PUBLICATION:

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         TITLE   _____
         COMPANY   _____
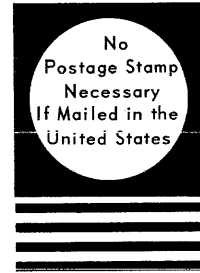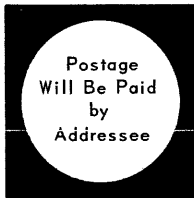   ADDRESS   _____
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