CONTROL DATA®
CYBER 170 SERIES COBOL 4.0

DESCRIPTION

The CONTROL DATA CYBER 170 Series COBOL 4.0 is a business-oriented programming language and compiler for use on CDC® CYBER 170 Series Computers. The COBOL language uses ordinary English words in an orderly manner to define data and procedures. Although the language is relatively unrestricted in its simulation of speech, it is governed by rules that enable the COBOL compiler to translate a COBOL language source program into a coded object program intelligible to the computer. The language is easy to work with and enables the programmer to write his programs easily, rapidly, and accurately.

The COBOL compiler operates under control of the CONTROL DATA Network Operating System (NOS). The compiler is an extremely full implementation of all common dialects of the COBOL language. In addition to being a superset of the 1968 ANSI Standard, it contains many significant elements from the 1973 revision to the standard. This broad implementation not only permits ease of program conversion from non-Control Data computers, it also gives the programmer access to facilities not normally available directly to the COBOL programmer except via control cards or assembler language.

FEATURES

CDC CYBER 170 COBOL has the following features.

- Full ANSI compatibility
- Mass storage input and output
- SORT verb to sort files in conjunction with the Sort/Merge system
- RERUN option allows jobs to be restarted at any specified point in a program
- RENAME option (level 66) provides alternate naming of elementary items
- Common-Storage permits data to be shared by separately compiled programs
- COPY statement provides access to a source library
- Report Writer facilitates flexible formats for printed reports
- Segmentation and overlay of the object program
- 18-digit arithmetic operands
- Formulas in conditional statements
- Exponentiation with COMPUTE
- Numeric procedure names and qualification allowed in the Procedure Division

The program can drive up to 52 data files in any combination of six organizations. These file organizations include the following:

SEQUENTIAL INPUT/OUTPUT
DIRECT ACCESS
INDEXED SEQUENTIAL
RELATIVE
STANDARD
ACTUAL KEY

A direct interface to the Multiple Index Processor is being developed to permit the specification of any number of secondary or alternate keys to records contained in Indexed Sequential, Direct Access, or Actual Key files, thus allowing the programmer to approach the data in a multi-dimensional manner without having to explicitly maintain inter-record relationships. The compiler also is being developed to permit direct interface to the CDC CYBER 170 Data Control System to allow access to data base areas whose data description (sub-schema) had been supplied via the Data Description Language compiler, independent of the COBOL program itself. This combination of traditional file-oriented concepts and modern data base techniques into one compiler provides for an easy incremental transition from one to the other.

Full facilities are provided in the standard manner for sorting files, segmenting (over-laying) programs, and copying source statements from a library. Control parameters for compilation include provision for a cross-reference listing, diagnosis of non-standard (non-ANSI) usage and construction, and variation of the default collating sequence in addition to a number of other controls for use in particular environments.

The compiler itself, while extremely fast (approximately 3000 source statements per second) generates efficient object codes optimized to the architecture of the particular model of CDC CYBER 170 computer involved. Where appropriate, extensive use is made of character-oriented machine instructions. Both compile time and object time diagnostics are in clear text, with cross reference to original source line numbers where appropriate. The compiler has been engineered to be extremely "forgiving" of source errors and where appropriate will flag errors and continue compiling. Only when the user desires, or in case of catastrophic errors, will the object program be prevented from entering execution.

The COBOL program can converse with low-speed devices, such as remote keyboard equipment, using the statement ACCEPT for input and DISPLAY for output.

The COBOL language is made up of the following elements: (1) COBOL reserved words, (2) user defined words, (3) literals, (4) level numbers, (5) symbols, and (6) pictures. The user defines words, literals, and pictures according to rules that govern the choice and arrangement of characters from the COBOL characters set. The COBOL reserved words, symbols, and level numbers are presented in fixed sets from which the user can select. There are over 250 English words and abbreviations that have been set aside as COBOL reserved words.

Languages other than COBOL can be used within the structure of a COBOL source program. The subcompile capability of the COBOL language allows the user to leave COBOL and call in a separately compiled program in FORTRAN or COMPASS. COBOL, FORTRAN, FORTRAN Extended, or COMPASS programs may be written, compiled, and tested as independent programs. When they are combined into a system, one is specified as the main program and the others as subprograms.