DATA ITEM DESCRIPTION

Title: COMPUTER PROGRAMMING MANUAL (CPM)

Number: DI-IPSC-81447A
AMSC Number: N7369
DTIC Applicable:
Office of Primary Responsibility: N/SPAWAR
Applicable Forms:
Use, Relationships:

Approval Date: 19991215
Limitation:
GIDEP Applicable:

The Computer Programming Manual (CPM) provides information needed by a programmer to understand how to program a given computer. This manual focuses on the computer itself, not on particular software that will run on the computer.

The CPM is intended for newly developed computers, special-purpose computers, or other computers for which commercial or other programming manuals are not readily available.

This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

This DID is used when the developer is tasked to identify and record information needed to program the computer(s) on which software was developed or on which it will run.

This DID supersedes DI-IPSC-81447.

Requirements:

1. Reference documents. None.

2. General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

3. Format. Following are the format requirements.

The manual shall be in contractor format unless otherwise specified on the Contract Data Requirements List (CDRL)(DD 1423). The CDRL should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be

delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

4. Content. The manual shall contain the following:

a. Title page or identifier. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; and distribution statement. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

b. Table of contents and index. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix, and an index providing an alphabetic listing of key terms and concepts covered in the document and the pages or paragraphs in which the terms or concepts are covered. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

c. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

d. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

e. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

f. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

g. Substitution of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

The numbers shown designate the paragraph numbers to be used in the document.

1. Scope. This section shall be divided into the following paragraphs.

1.1 Identification. This paragraph shall contain the manufacturer's name, model number, and any other identifying information.

1.2 Computer system overview. This paragraph shall briefly state the purpose of the computer system to which this document applies.

1.3 Document overview. This paragraph shall summarize the purpose and contents of this document and shall describe any security or privacy considerations associated with its use.

2. Referenced documents. This section shall list the number, title, revision, and date of all documents referenced in this document. This section shall also identify the source for all documents not available through normal Government stocking activities.

3. Programming environment. This section shall be divided into paragraphs as appropriate to provide the following information.

a. The components and configuration of the computer system

b. Operating characteristics, capabilities, and limitations, including, as applicable:

1) Machine cycle time
2) Word length
3) Memory capacity and characteristics
4) Instruction set characteristics
5) Interrupt capabilities
6) Modes of operation (e.g., batch, interactive, privileged, non-privileged)
7) Operational registers
8) Error indicators
9) Input/output characteristics
10) Special features

c. Description of the equipment (e.g., tapes, disks, other peripheral equipment) necessary to perform compilations and assemblies on the computer system. Identify (as applicable) by name and version the editor, linker, link-editor, compiler, assembler, cross-compilers, cross-assemblers, and other utilities used, and reference appropriate manuals describing their use. Highlight any special flags or instructions necessary for loading, executing, or recording the results.

4. Programming information. This section shall be divided into paragraphs as appropriate to provide the following information:

a. Description of the programming features of the computer's instruction set architecture, including, as applicable

1) Data representation (e.g., byte, word, integer, floating-point, double precision)

2) Instruction formats and addressing modes
3) Special registers and words (e.g., stack pointer, program counter)
4) Control instructions (e.g., branch, jump, subroutine and procedure call instructions, privileged instructions, and the modes they operate in)
5) Subroutines and procedures (e.g., non-reentrant, reentrant, macrocode routines, argument lists, parameter passing conventions)
6) Interrupt processing
7) Timers and clocks
8) Memory protection features (e.g., read-only memory)
9) Additional features, such as instruction or data cache architecture

b. Description of each instruction, including, as applicable:

1) Use
2) Syntax
3) Condition codes set
4) Execution time
5) Machine-code format
6) Mnemonic conventions
7) Other characteristics

c. Description of input and output control programming, including, as applicable:

1) Initial loading and verification of computer memory
2) Serial and parallel data channels
3) Discrete inputs and outputs
4) Interface components

5) Device numbers, operational codes, and memory locations for peripheral equipment

d. Additional, restricted, or special programming techniques associated with the computer system (e.g., a concise description of the microprogram control section)

e. Examples that demonstrate the programming features described above, including examples of the proper use of all categories of instructions on the computer system

f. Error detection and diagnostic features associated with the computer system, including condition codes, overflow and addressing exception interrupts, and input and output error status indicators

5. Notes. This section shall contain any general information that aids in understanding this document (e.g., background information, glossary, rationale). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of any terms and definitions needed to understand this document.

A. Appendices. Appendices may be used to provide information published separately for convenience in document maintenance (e.g., charts classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

END OF DI-IPSC-81447A.