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DEPARTMENT OF DEFENSE
HANDBOOK

DOD-PRODUCED CD-ROM PRODUCTS

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FOREWORD

1. This handbook is approved for use by all Departments and Agencies of the Department of Defense (DOD).

2. This handbook is for guidance only. This handbook cannot be cited as a requirement. If it is, the contractor does not have to comply.

3. The production and use of Compact Disc-Read Only Memory (CD-ROM) have significantly different considerations than of paper products. This handbook serves to provide guidance to Department of Defense agencies on the use of Compact Disc (CD) technology as the recommended method for pnysical distribution of information within DOD. This document is the basis for addressing current/future CD-ROM issues/concerns.

4. In the past few years the International Standards Organization CD-ROM Standards, ISO 9660 and ISO 10149, have become widely accepted for sharing large amounts of information across all computing platforms. With the acceptance of the two ISO standards, the use of CD-ROM to store and disseminate information is not only becoming a reality, but is being implemented throughout DOD as a means of reducing paper/magnetic media/microform distribution and attendant costs. ISO 9660 standardizes the logical (data storage) format and ISO 10149 the physical format of CD-ROM, but user interfaces, application platform support, and the utility of the information provided is driven by many different producers of CD-ROMs. Ultimately, end users must deal with CD-ROM products containing different access/retrieval capabilities. Standards and guidelines lighten the burden on the end user, standardize production procedures, and streamline migration from paper/microform/magnetic media products to CD-ROM media products.

5. All DOD components/activities should evaluate the use of ISO 9660 compliant CD-ROM for the distribution of information.

6. All DOD components/activities producing CD-ROM products for use within DOD should adhere to the standards and general guidelines provided in this handbook.

7. Handbook objectives:

a. Encourage a common migration path to CD-ROM.

b. Compile adopted standards for the use of CD-ROM.

c. Provide general guidance to CD-ROM producers/users.

d. Establish a DOD forum for discussions of CD-ROM issues/standards, their use by DOD publishers, their impact on DOD end users, and their impact/use in the CD-ROM industry as a whole.

e. Provide a central DOD library/catalog of CD-ROM titles and their contents where applicable to DOD components/activities.

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8. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: DISA/JIEO Center for Standards, 10701 Parkridge Boulevard, ATTN: Mr. James Barnette, Reston, VA 22091-4398, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document, or by letter.

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1. SCOPE

1.1 Scope. This document was prepared by the Defense Information Systems Agency (DISA), in cooperation with the services and other activities within the Department of Defense (DOD). The goal of this document is to provide information and guidelines to support the creation and interoperability of Compact Disc-Read Only Memory (CD-ROM) development and use within DOD. This document specifies core compact disc fundamentals for the DOD community. Specialized functions within DOD may require expanded internal guidance to meet their own mission needs. It is strongly recommended all DOD components comply with the fundamentals established within this document. All other Governmental entities are invited to use this document.

This document is for guidance only. This document cannot be cited as a requirement. If it is, the contractor does not have to comply.

This document will evolve as guidelines and new standards mature. Recommendations for changes/improvements to this document should be submitted using DD Form 1426 provided.

2. APPLICABLE DOCUMENTS

2.1 Government documents. The following government documents form a part of this handbook to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the latest issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto.

a. *FIPS PUB 1-2 - Code for Information Interchange, Its Representations, Subsets, and Extensions, (American Standard Code for Information Interchange [ASCII]*). DOD activities may request copies from: Commanding Officer, Naval Publications and Forms Center, ATTN: NPODS, 5801 Tabor Avenue, Philadelphia, PA 19120-5099, Tel: (215) 697-2179.

b. *MIL-M-28001B (for CALS) - Markup Requirement and Generic Style Specification for Electronic Printed Output and Exchange of Text (Standard Generalized Markup Language [SGML])*. DOD activities may request copies from: Commanding Officer, Naval Publications and Forms Center, ATTN: NPODS, 5801 Tabor Avenue, Philadelphia, PA 19120-5099, Tel: (215) 697-2179.

c. *MIL-PRF-28002B (for CALS) - Requirements for Raster Graphics Representation in Binary Format (Group 4 Raster Scanned Images)*. DOD activities may request copies from: Commanding Officer, Naval Publications and Forms Center, ATTN: NPODS, 5801 Tabor Avenue, Philadelphia, PA 19120-5099, Tel: (215) 697-2179.

d. *MIL-PRF-28000A (for CALS) - Digital Representation for Communication of Product Data: IGES (Initial Graphics Exchange Specification) Application Subsets and IGES Application Protocols*. DOD activities may request copies from: Commanding Officer, Naval Publications and Forms Center, ATTN: NPODS, 5801 Tabor Avenue, Philadelphia, PA 19120-5099, Tel: (215) 697-2179.

e. *MIL-PRF-28003A (for CALS) - Digital Representation for Communication of Illustration Data: CGM (Computer Graphics Metafile) Applications Profile*. DOD activities may request copies from: Commanding Officer, Naval Publications and Forms Center, ATTN: NPODS, 5801 Tabor Avenue, Philadelphia, PA 19120-5099, Tel: (215) 697-2179.

f. Automated Document Conversion Master Plan, April 1995, Office of the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence/Information Management), Version 1.0.

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g. Defense Information Systems Agency, Joint Interoperability and Engineering Organization (DISA/JIEO) Report 8300, "Department of Defense Minimum Desktop Configuration," November 1994.

h. Department of Defense, Information Technology Standards Guidance, Version 1.1.

i. Department of Defense Technical Architecture Framework for Information Management, Volume 7, Adopted Information Technology Standards (DOD TAFIM AITS), Version 2.0, 2 August 1994.

j. DOD Personal Computer Policy Implementation Plan, FY1995-FY2000, 7 April 1995.

k. U.S. Department of Commerce, SIGCAT/SIGCLASS Specification for Encrypted CD-ROM, SecureCD, April 21, 1993.

(Unless otherwise indicated, copies of the above documents are available from DISA/JIEO Center for Standards, ATTN: Mr. James Barnette, 10701 Parkridge Blvd., Reston, VA 22091-4398.)

2.2 Non-Government publications. The following non-government documents form a part of this handbook to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the latest issue of the DODISS, and supplement thereto.

a. DISC Manufacturing Incorporated's documents dated 6 February 1992: Integrating Mixed-Mode CD-ROM; An Overview to Multimedia CD-ROM Production; and Compact Disc Terminology.

b. Pahwa, Ash, The CD-Recordable Bible: An Essential Guide For Any Business, Eight Bit Books, 462 Danbury Road, Wilton, CT 06897-2126, 1994. Copies may be obtained from Eight Bit Books.

c. ANSI/NISO/ISO 9660: 1990 - *Volume and File Structure of CD-ROM for Information Interchange.* Copies may be obtained from ANSI (American National Standards Institute), 1430 Broadway, New York, NY 10018; Phone (212) 642-4900.

d. ISO/IEC 10149: 1989 - *Information technology - Data interchange on read-only 120 mm optical data disks (CD-ROM).* Copies may be obtained from ANSI (American National Standards Institute), 1430 Broadway, New York, NY 10018; Phone (212) 642-4900.

(Unless otherwise indicated, copies of the above documents are available from DISA/JIEO Center for Standards, ATTN: Mr. James Barnette, 10701 Parkridge Blvd, Reston, VA 22091-4398.)

2.3 Order of precedence. In the event of a conflict between the text of this handbook and the references cited herein, the text of this document takes precedence. Nothing in this handbook, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. DEFINITIONS

3.1 Acronyms and Abbreviations. Acronyms and abbreviations related to this handbook are defined below.

ADC	-	Automated Document Conversion
AITS	-	Adopted Information Technology Standards

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ANSI	-	American National Standards Institute
ASCII	-	American Standard Code for Information Interchange
CAD	-	Computer-Aided Design
CAM	-	Computer Aided Manufacturing
CALS	-	Continuous Acquisition and Life Cycle Support
CCITT	-	Comite Consultatif International de Telegraphique et Telephonique (International Telegraph and Telephone Consultative Committee). See ITU.
CD	-	Compact Disc
CD-I	-	Compact Disc - Interactive
CD-R	-	Compact Disc - Recordable
CD-ROM	-	Compact Disc - Read Only Memory
CGM	-	Computer Graphics Metafile
CIA	-	Central Intelligence Agency
CIPS	-	Combined Intelligence Publishing Service
DBMS	-	Data Base Management System
DEC	-	Digital Equipment Corporation
DEXA	-	DODIIS Executive Agent
DIA	-	Defense Intelligence Agency
DISA	-	Defense Information Systems Agency (DOD)
DOD	-	Department of Defense
DOS	-	Disk Operating System
DPI	-	Dots Per Inch
EGA	-	Enhanced Graphics Adapter
FIPS	-	Federal Information Processing Standard (NIST)
GSA	-	General Service Administration

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IGES	-	Initial Graphics Exchange Specification
ISO	-	International Organization for Standardization
ITSG	-	Information Technology Standards Guidance
ITSI BBS	-	Information Technology Standards Integrated Bulletin Board System
ITU	-	International Telecommunications Union (Formerly CCITT)
JCALS	-	Joint Computer-Aided Acquisition and Logistic Support
JIEO	-	Joint Interoperability Engineering Organization
JPEG	-	Joint Photographic Experts Group
KB	-	Kilobyte (1,000 bytes)
KHz	-	Kilohertz (1,000 hertz)
MB	-	Megabyte (1,000,000 bytes)
MHz	-	Megahertz (1,000,000 hertz)
MIL-	-	Military
MPC	-	Multimedia Personal Computer
MPEG	-	Motion Pictures Expert Group
MSCDEX	-	Microsoft CD-ROM extensions
MSEC	-	Millisecond
NIST	-	National Institute of Standards and Technology
NSA	-	National Security Agency
OADR	-	Origination Agency Determination Required
PCMCIA	-	Personal Computer Memory Card International Association
PCX	-	A graphics file format
PDF	-	Portable Document Format
PIXEL	-	Picture Element
QA	-	Quality Assurance

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QC	-	Quality Control
RTF	-	Rich Text Format (a standard database file format)
SCI	-	Sensitive Compartmented Information
SGML	-	Standard Generalized Markup Language
SIGCAT	-	Special Interest Group on CD-ROM Applications & Technology
SIGCLASS	-	Special Interest Group on Classified Applications (a subgroup of SIGCAT)
SSP	-	Secure Storage Processor
TAFIM	-	Technical Architecture Framework for Information Management
TIFF	-	Tagged Image File Format
UIC	-	Unit Identification Code

3.2 Definitions. The definitions used in this handbook are defined as follows:

a. ANSI (American National Standards Institute) - ANSI is a member of the International Organization for Standardization (ISO). ANSI is responsible for developing and approving industry-wide consensus-based standards for the United States. Address: 1430 Broadway, New York, NY 10018; Phone (212) 642-4900.

b. Authoring/Retrieval Software - Although in some situations these.can represent totally different software applications, for the most part authoring and retrieval software can be viewed as a pair. They represent the mechanism for writing information to CD-ROMs and for accessing or retrieving information from CD-ROMs. Since CD-ROMs can hold a significant amount of information, more advanced data management schemes have been developed and marketed as Authoring/Retrieval software. Authoring software is often referred to as ISO 9660 premastering software, but this is generally only one piece of the functionality. The actual process of indexing the information for efficient retrieval is the other piece of authoring software functionality.

c. Compact Disc-Audio (CD-A) or Compact Disc-Digital Audio (CD-DA) - A Compact Disc for holding audio. The physical standards for CD-A were defined by Sony and Philips in 1980 and published in a red binder called the Red Book standards for audio. CD-quality audio is played at 44,100 samples per second, 16 bits and stereo. To play CD-quality audio on a computer, the minimum transfer rate must be 176 KBps.

d. Compact Disc-Interactive (CD-I) - A Compact Disc format holding data, still and full motion video, audio, and animated graphics. CD-I discs require unique CD-I players and are incompatible with a CD-ROM drive. The specifications for CD-I are defined in the Green Book.

e. Compact Disc-Read Only Memory/Extended Architecture (CD-ROM/XA) - XA defines a new form of the Yellow Book CD-ROM format, Mode-2 data tracks, which utilizes some filler space in the sector header to allow specification of data types by sector. The XA format allows producers to interleave audio, video, text, and other computer data within the same physical track on a CD-ROM. Until recently, special hardware was required to read CD-ROM/XAs but there are now some software solutions available. Yellow Book XA

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specifications may be obtained from ANSI - see ANSI definition.

f. Compact Disc-Recordable (CD-R) - A CD format allowing local recording to the disc. The specifications for CD-R are defined in the Orange Book. Part 1 of the Orange Book standard pertains to Compact Disc-Magneto Optical (CD-MO), which divides a disc into two parts - the inner tracks are used as compact discs and the outer tracks may be written to, erased and rewritten. Part 2 of the Orange Book standard pertains to Compact Disc-Write Once (CD-WO). The CD-WO specifications covers single- and multi-session writing to a compact disc. CD-WO discs may be written to, but not erased.

g. Compact Disc-Read Only Memory (CD-ROM) - An optical storage, read-only, compact disc format used to hold various types of information, such as computer data, audio, video, or animation. CD-ROMs can hold in excess of 600 MB representing over 200,000 pages of ASCII text, 20,000 medium resolution graphic images (at an estimated per image size of 33 Kilobytes), or 63 minutes of 44.1 KHz 16-bit stereo sound without compression. Different information types may also be combined on the same disc. The specifications for CD-ROM are defined in the Yellow Book and may be obtained from ANSI (see ANSI definition).

h. Compiled By - Preparation of multiple source information by an Activity or other entity responsible for data assembly.

i. Contributed By - Activity responsible for the original information.

j. Data Preparer - A person or other entity which controls the processing of the data to be recorded on a volume group.

k. DOD-produced - Compact discs produced by or under the authority of any DOD Activity.

l. Green Book - The Compact Disc-Interactive (CD-I) specifications. This book specifies the sector and track layout and synchronization of video, audio, and data for a CD-I application. This document may be obtained from American CD-I Association, 11111 Santa Monica Blvd., Los Angeles, CA 90025; phone (310) 444-6619.

m. Handling caveats - Warnings or cautions on how the information should be handled or used.

n. ISO 9660 - The international standard which defines the file structure for putting computer files on compact discs. This standard may be obtained from ANSI - see ANSI definition.

o. ITSI BBS - Information Technology Standards Integrated Bulletin Board System. An official Government bulletin board for use in the development and distribution of DOD information technology standards and related information. The Department of Defense CD-ROM Requirements and Guidelines document and updates can be obtained from the ITSI BBS. For information call the ITSI Help Desk at (703) 735-8338, DSN: 653-8338.

p. Orange Book - This book provides specifications describing the physical attributes associated with CD-Recordables (CD-R). It is divided into two parts: one for CD-MO (Magneto-Optical, rewritable) and one for CD-WO (Write Once).

q. Pixel - Short for Picture Element, the smallest addressable element of a computer graphic display, area into which a document is divided for scanning purposes.

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r. Producing Organization - The name of the Government organization with overall responsibility for the product.

s. Red Book - This book specifies the sector and track structure and layout for an audio compact disc (CD-Audio). The CD industry started when Philips and Sony introduced the Compact Disc Digital Audio (CD-DA or CD-A) standard. Most music CDs conform to this standard.

t. SCSI - Small Computer Systems Interface is an interface specification for connecting multiple peripheral equipment to computers. It is utilized on most UNIX & Macintosh platforms and is readily available and becoming more popular on PC based platforms. Most CD-ROM readers and CD-Recordable devices utilize SCSI interfaces.

u. SCSI-2 - This is a newer standard defining actual SCSI connection, termination, and data transmission in more detail then the original SCSI specification. Several multi-platform computer peripherals including CD-ROM drives, CD-Recordable drives, and image scanners use SCSI-2 interfaces.

v. TAFIM - Technical Architecture Framework for Information Management. A DOD publication which provides guidance for the evolution of the DOD technical infrastructure. It consists of eight volumes, providing services, standards, design concepts, components, and configurations that can be used to guide the development of technical architectures that meet specific mission requirements.

w. User - (ISO 9660) A person or other entity (for example, an application program) that causes the invocation of the services provided by an implementation.

x. Volume - (ISO 9660) A dismountable CD-ROM.

y. White Book - Industry leaders, including Philips, Sony, JVC, and Matsushita have proposed Video CD specifications known as the White Book. It is based on Motion Pictures Experts Group (MPEG) encoding and decoding.

z. Yellow Book - Compact Disc-Read Only Memory (CD-ROM) specifications. The Yellow Book, the second phase of the CD industry, introduced by Philips and Sony, describes the physical attributes for CD-ROMs and CD-ROM/XAs (Extended Architecture). The Red Book specifications were expanded to include two new types of tracks: Mode-1 for text and computer data, and Mode-2 for compressed audio and video/picture data.

4. COMPACT DISC FUNDAMENTALS

4.1 General. This section provides fundamental information that should be used by all DOD compact disc users and producers.

4.2 Physical Properties. ISO 10149: 1989 Information Technology - Data Interchange on Read-only 120 mm Optical Discs is the standard for DOD-produced CD-ROM discs. This standard defines physical track shape, track pitch, and data structure as well as disc size (120 millimeters or 4.72 inches).

4.3 Disc Labeling. The following paragraphs provide disc labeling instructions for both classified and unclassified DOD-produced CD-ROM discs destined for distribution as a final product. Unless specified as "optional" all items should be present on any DOD-produced CD-ROM disc. All information on the label should also be unclassified. See Figure 1 for a sample classified label and Figure 2 for a sample unclassified label. See 5.2.2 for the proper marking of CD disc containers, paper enclosures, and liners.

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a. Data Classification:

(1) Security classification: For discs containing classified information. The classification marking to use is the highest of any information contained on the disc. Position the classification marking at the top of the disc label, in 18 point bold type with a Sans Serif typeface. All other markings on the label should have a smaller point size than the classification marking.

(2) Other Protective Markings: For discs containing protected information, such as For Official Use Only (FOUO). Use at least 12 point bold type with a Sans Serif typeface.

b. Handling Caveats: For discs containing any information with handling caveats.

(1) For discs containing Sensitive Compartmented Information (SCI) or Top Secret Code words (TSC), include SCI numbers or TSC numbers. (Example: SI-xxxxx/yr or TSC-xxxxx/yr). Place the handling caveat marking directly below the data classification marking.

(2) For discs containing information covered by Public law 93-579 "The Privacy Act of 1974," the handling caveat phrase "Privacy Act Data, Sec. 552a, Title 5, U.S.C." is placed directly below the data classification marking.

(3) Prominently display access or use constraints, such as "copyright," "proprietary," or "limited distribution" on the label.

c. Classification Color Rings: For discs containing classified information. Place a 1/4 inch wide color ring along the outside perimeter of the disc label. The following list provides the ring color for the corresponding classifications.

(1) Yellow	(Sensitive Compartmented Information)
(2) Orange	(Top Secret)
(3) Red	(Secret)
(4) Blue	(Confidential)

d. Producing Organization's Name: All discs.

e. Classification Authority: For classified discs.

f. Declassification Date: If applicable.

g. Producer Seal/Logo: Optional.

h. ISO 9660/Compact Disc Data Storage Logos: Optional; however, placing the ISO 9660 logo on a disc indicates to the user that the disc is ISO 9660 compliant. It also quickly identifies the disc as a CD-Audio, CD-ROM, CD-I, etc., without having to insert it into a drive.

i. Title of Production or Disc Set, including any disc set numbering schemes, such as 1 of 3: All discs. NOTE: Include markings on classified discs to show that the title is unclassified information (U).

j. Date Produced: All discs.

k. Platforms Supported: If applicable (examples: DOS, Windows, UNIX, Macintosh, DEC).

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l. Supplemental Data Formats Used: When using any extended or supplemental data formats (examples: XA, MPC, MPC2).

m. Edition: Optional.

n. Volume Identification: All discs. This should be identical to the eleven characters of the Volume Identifier (first eleven characters of the ISO 9660 Volume Identifier (32 characters available)) written in the header of the disc. To accommodate the requirements for unique volume identification for discs in CD-ROM jukeboxes, towers, and network systems, use the producing organization's Unit Identification Code (UIC) as the first six characters; the producing organization should then manage/ensure disc uniqueness using the next five characters of the Volume Identifier.

o. Identification Number for Disc (serial/copy #): For accounting of top secret or code word discs, optional for other discs.

(1) For top secret or code word disc accountability, each producer should assign a unique serial number to each title or production release. Additionally, each disc should contain a copy number unique to the serial number.

(2) For accountability of other discs: As needed. Identification Numbers can be used to provide accountability for every disc produced.

4.3.1 CD-Recordables. Items in 4.3 also apply to CD-Recordable discs. If used, adhesive labels should be frangible (tears if you try to remove it). CD-Recordable adhesive labels need to be thin enough to not interfere with the CD-ROM drive and be able to withstand humidity and heat in typical user environments. CD-Recordable label printers need to have permanent, smear-proof inks. Refer to 6.3 for general information concerning CD-Recordable labeling options.

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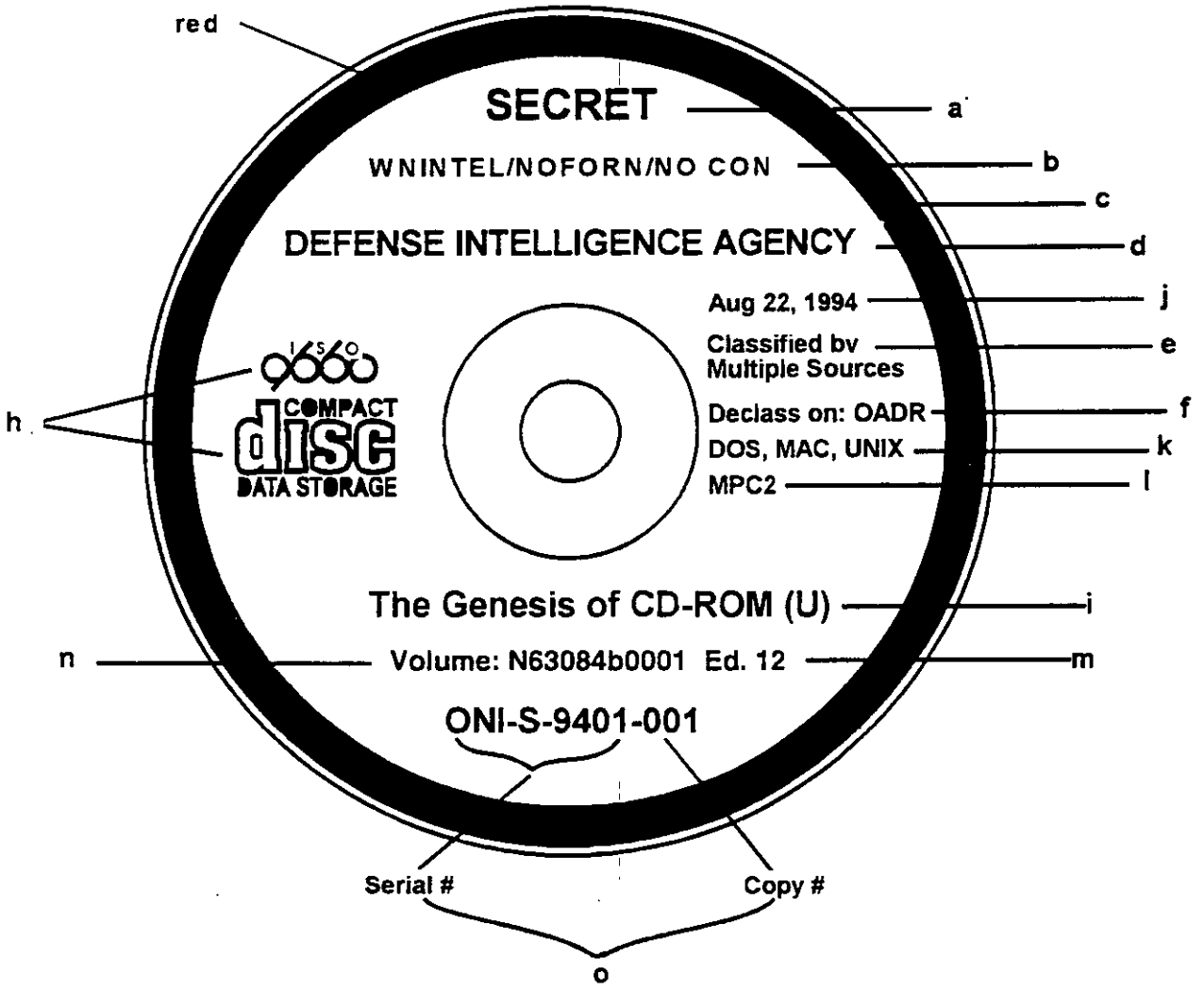


FIGURE 1. **Sample CLASSIFIED Label**

NOTES: Letters correspond to paragraphs in 4.3. This is an example only. Note the locations for the classified ring, disc classification, and handling caveats. Components/agencies may tailor the rest of the label layout.

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FIGURE 2. **Sample UNCLASSIFIED Label**

NOTES: Letters correspond to paragraphs in 4.3. This is an example only. Note the locations for the classified ring, disc classification, and handling caveats. Components/agencies may tailor the rest of the label layout.

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4.4 Disc Contents.

4.4.1 Volume and File Structure. *ISO 9660: 1988 Information Processing - Volume and File Structure of CD-ROM for Information Interchange*, is the volume and file structure for DOD-produced CD-ROMs.

4.4.2 Internal CONTENT.TXT File. For every DOD-produced CD-ROM disc, include a flat ASCII file titled "CONTENT.TXT" in the top level (root) directory with the following format and information:

a. Eighty or less characters per line, with a hard return (ASCII Carriage Return - Line Feed combination CRLF) at the end of each line. Use descriptors (such as "DISC TITLE:") to introduce each new information block in all capital letters, beginning in column one of their line. Use upper and lower case for associated data.

b. Following is the proper structure for the CONTENT.TXT file. For consistency, use all the descriptors, although the associated information is optional.

TITLE:
State verbatim the name by which the disc is known, including any disc set numbering schemes, such as 1 of 3. Do not include any superfluous descriptions or qualifiers.

EDITION:
The version of the title.

VOLUME IDENTIFIER:
All discs. This should be identical to the eleven characters of the Volume Identifier (first eleven characters of the ISO 9660 Volume Identifier (32 characters available)) written in the header of the disc. To accommodate the requirements for unique volume identification for discs in CD-ROM jukeboxes, towers, and network systems, use the producing organization's Unit Identification Code (UIC) as the first six characters; the producing organization should then manage/ensure disc uniqueness using the next five characters of the Volume Identifier.

ORIGINATOR:
The name of an organization(s) or individual(s) that developed the data (see definition of contributed by). If the names of editors or compilers are provided, follow each name by "(ed.)" or "(comp.)," respectively.

CD PUBLICATION DATE:
The date when the disc was published or otherwise made available for release.

SECURITY CLASSIFICATION:
Name of the security restrictions on the disc. Use the highest classification of any information on the disc.

CLASSIFICATION AUTHORITY/SECURITY CLASSIFICATION SYSTEM:
Name of the classification system. State/reference the actual classification authority or "Multiple Sources" if appropriate. Use "N/A" for unclassified discs.

SECURITY HANDLING DESCRIPTION:
Additional information about the restrictions on handling the disc.

DECLASSIFICATION DATE:
Provide the date the disc becomes declassified. This is either the last declassification date of any material on the disc, or Originating Agency Determination Required (OADR) if appropriate. Use "N/A" for unclassified discs.

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TIME PERIOD OF CONTENT:
Time period(s) for which the data on the disc is valid.

Select one of the following methods:

SINGLE DATE/TIME: method of encoding a single date and time.

CALENDAR DATE: the year (and optionally month or month and day).

TIME OF DAY: the hour (and optionally minute or minute and second).

MULTIPLE DATES/TIMES: means of encoding multiple individual dates and times.

DATA DESCRIPTION:

CALENDAR DATE: as above.

TIME OF DAY: as above.

RANGE OF DATES/TIMES: means of encoding a range of dates and times.

BEGINNING DATE: The first year (and optionally month or month and day) for which the data is valid.

BEGINNING TIME: The first hour (and optionally minute, or minute and second) of the day for which the data is valid.

ENDING DATE: The last year (and optionally month or month and day) for which the data is valid.

ENDING TIME: The last hour (and optionally minute, or minute and second) of the day for which the data is valid.

OPERATING ENVIRONMENT/NATIVE DATA SET ENVIRONMENT:
State the minimum DOS version, Microsoft Windows version, UNIX version, Macintosh version that is required to operate this disc. In addition, state any other hardware/software requirements.

ACCESS CONSTRAINTS:
Restrictions and legal prerequisites for accessing the data. These include any access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the data.

USE CONSTRAINTS:
Restrictions and legal prerequisites for using the data after access is granted. These include any use constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the data.

ABSTRACT:
A brief narrative summary describing the CD product/data and its purpose.

ORDERING INSTRUCTIONS:
State specifically how to request copies of the CD.

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FEES:
The fees/terms for receiving the disc.

POINT OF CONTACT:
Contact information for an individual and organization that is knowledgeable about the data on the disc.

CONTACT PERSON:
CONTACT ORGANIZATION:
CONTACT ADDRESS:
CONTACT VOICE TELEPHONE:
CONTACT FACSIMILE TELEPHONE:
CONTACT E-MAIL/INTERNET ADDRESS:

MAINTENANCE AND UPDATE FREQUENCY:
State plans for product enhancements, schedule of updates, termination of product support or any other related information.

ORIGINATOR COMMENTS:
Provide any comments desired by the originator of the CD or products on the CD.

DOCUMENT IDENTIFICATION:
List the number, title, date, and originator of each document or product found on the disc. (This and the following document abstract section can be repeating pairs).

DOCUMENT ABSTRACT:
Provide a brief narrative describing each document or product on the disc. (This field and the document identification field can be repeating pairs for every document/product found on the disc).

END OF CONTENT.TXT FILE:

c. Forward an unclassified version of each CONTENT.TXT file (in the format specified above) to DISA electronically or on a 3.5", 1.44 MB, IBM PC compatible floppy disk. DISA will not accept classified CONTENT.TXT files. The appropriate EMAIL/INTERNET address is: barnettj@ncr.disa.mil. The appropriate mailing address is: DISA/JIEO Center for Standards, 10701 Parkridge Boulevard, ATTN: Mr. James Barnette, Reston, VA 22091-4398. These CONTENT.TXT files will be used to develop and maintain a database of all DOD CD products. Information on how to access the database will be provided in future publications of this handbook.

4.5 Compact Disc Security.

4.5.1 Classified Disc Labeling, Color, and Serialization Marking. Refer to 4.3 for labeling instructions and FIGURE 1 for a sample of the proper format for a classified label.

4.5.2 Output Classification Screen/Printer. Classification marking information should be provided/attached to relevant information to allow the retrieval engine to display the highest classification of any information on the display at that time. In addition, mark all paragraphs/subsections contained within a classified document/database on CD-ROM with the appropriate classification in accordance with security regulations.

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5. COMPACT DISC GUIDELINES

5.1 Software Guidelines.

5.1.1 Licensing Issues. A major concern in the production and dissemination of CD-ROM discs is software licensing restrictions and costs for the selected authoring/retrieval package. A search and retrieval engine can be used to support those CD-ROMs containing extensive text. This is required to facilitate rapid searches through volumes of information.

Authoring software is normally packaged/priced separately from retrieval software, but is specifically designated for a single retrieval engine. Each operating platform supported by the disc may require separate viewers, authoring software, or both.

Most authoring/retrieval engines can be purchased in a variety of ways. The following list defines many of the more popular licensing schemes. If the vendor does not currently offer the particular scheme best suited for your needs/budget, they often will develop new pricing/licensing to obtain your business.

a. Site License: A one-time cost includes all future titles, replicated copies and users. A separate fee or royalty is not required for each user receiving a CD-ROM disc. Example: A site license for authoring and retrieval software may cost $50,000, with no additional charges. This method is usually the most cost-effective if a single package can address all of your CD-ROM publishing needs.

b. Per Title License: A one-time cost and a fixed royalty for each new title produced. A producer pays a fixed fee, and an additional fee each time a new title is produced. Example: Purchasing price is $20,000, each new title costs $10,000.

c. Per Product License: A one time cost per CD-ROM product regardless of the number of discs replicated or the number of releases. This type of license is usually associated with a unique customer base/type (distribution list) but can grow/shrink as required.

d. Free Runtime Licensing: A one time cost is paid for the authoring software and there are no costs associated with distributing the retrieval engine.

e. Per User or Replicate Licensing: A one-time cost is paid for the authoring software and a fee for each user or each disc replicated/distributed must be paid. Example: A producer pays $20,000 for authoring software, then $10 for each user or each disc disseminated. This is the favored approach of vendors but can often be the most costly for producers.

Any combination of the above schemes can also be negotiated. Before any purchase, investigate the number of titles, copies, updates, and users affected by the license(s).

5.1.2 Authoring/Retrieval Software Selection. One of the most important decisions to be made when developing a CD-ROM product is the authoring package/retrieval engine used. There are a large number of government and commercially developed packages available. Any product having a significant amount of text should have a full text retrieval package.

There are several packages available that enable producers to easily convert existing paper products to CD-ROM, but they also require more time and effort on the part of the end user to obtain/access required information. Although the catalyst for producing CD-ROM products is often cost effective for the producer, end user acceptance/utilization must be given the highest priority when selecting a package. If the end user does not accept, or cannot effectively utilize the CD-ROM product, then either the paper product must continue to be produced or the end user no longer has access to the information.

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CD-ROM developers/producers should get their prospective end users involved early in the development cycle. If users feel they have contributed to the development of the product and in the selection of the retrieval engine, they will be more likely to accept the product and continue to work with the producers to perfect the product.

Approaches/methods for developing standards governing the selection and use of retrieval engines include:

a. Selecting a single engine or a small set of engines for use;

b. Compiling a list of minimum capabilities required of any authoring/retrieval system used;

c. Adopting a data exchange standard. This approach uses a client-server architecture with a standard messaging format so any compliant user interface can query and obtain data from any other compliant server database (example: a command could use its own retrieval engine on any CD-ROM disc complying with the standard);

d. Standardizing on the actual stored data format with like data being represented consistently (examples: WordPerfect format, SGML, PDF, RTF);

e. Standardizing by de facto by limiting the number of organizations allowed to produce CD-ROM titles;

f. Letting CD-ROM use grow on its own.

5.2 Production Guidelines (Recommendations).

5.2.1 Disc Packaging and Mailing. There are several options available for packaging a CD-ROM disc for distribution. A choice must be made on both the actual disc container and packaging/mailing container.

Some of the most popular disc containers include: jewel cases, tyvex sleeves, paper sleeves, disc caddies, and multi-disc trays. Paper/tyvex sleeves are the lowest cost containers and are often provided free with the purchase of replicated discs. Jewel cases generally cost 20 to 30 cents each and are fragile, but provide a good mechanism for marking the packaged disc with needed information (such as title, classification, date). Disc caddies and multi-disc trays can cost up to a few dollars each.

Some of the most popular packaging/mailing containers include: cardboard disc mailers, padded disc mailers, padded envelopes, bubble wrap within an envelope, and envelopes by themselves. Cardboard disc mailers and padded disc mailers usually come with a self adhesive securing strip saving some packaging time and effort but they only provide slightly better protection then regular envelopes and can cost 45 to 60 cents each. Bubble wrap and padded envelopes provide good protection for discs (especially when jewel cases are used), but they can cost over a dollar apiece.

5.2.2 CD Containers, Paper Enclosures, and Liners. CD containers, such as jewel cases or cardboard cases, can provide information on the front and back cover as well as the two side ribs.

For classified discs, place a 1/4 inch border of the appropriate color on both the front and back covers as well as a 1/4 inch color square on the top and bottom on each of the ribs. Stamp/mark the backside of any sleeve containing a classified disc with the classification of that disc.

Note that marking the CD containers, paper enclosures, or liners does not take the place of 4.3 labeling instructions. If any of the classification markings on the disc itself is covered by the container, enclosure, or liner, then all of the items in 4.3 (except those listed as optional) need to be repeated on the container/enclosure/liner.

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5.2.3 Decision to Produce CD-ROM. The production of a CD-ROM can be a lengthy process. Proper planning is a must for proper production and the right decisions made during the planning stage can make or break the success of the project. The following points must be considered before initiating a CD-ROM project:

a. Decide whether the project is a money making venture or an internal vehicle for boosting efficiency and reducing costs. Have a realistic idea of direct and associated costs and desired results.

b. Evaluate what, how, and to whom information is to be disseminated. Benefits to the customer/user must be considered in addition to benefits to the producer. Figure out the perishability of the information to be put on the CD-ROM. Ease of retrieval of CD-ROM versus other media, weight/volume trade-offs, urgency of dissemination, and timeliness all need to be integral variables in determining the best approach. Be flexible.

c. Determine if data used must be integrated, cleaned up, or reformatted. Consider the time, effort, and cost for any needed digital conversion. Formulate all costs and time involved in this effort.

d. Determine hardware requirements. Evaluate any hardware constraints bearing on the success of the project. Consideration can be given to producing and using the CD-ROM across hardware/operating platforms (examples: DOS, Windows, UNIX, Macintosh, DEC). Consider this for the production environment as well as the user environment.

e. Evaluate user acceptance of this type of information. This is the most important step for ensuring a valuable product is developed. Get users involved early in the development cycle.

f. Determine what production and user software may be required. Is the software available? If not, is there an efficient approach to get what is needed? Look carefully at user fees and licenses.

g. Evaluate the need for data encryption, serialization, or copyrights. Follow established procedures. Consult with your legal office before including copyrighted or non-freeware/shareware material copyrighted by non-government organizations on your CDs.

h. Evaluate and readjust the project production and distribution time frame as often as needed. Make sure all steps in the production, replication, and distribution process are considered.

i. Determine the impact of final packaging. The variety and availability of materials, such as use of color, number of discs per package, or method of distribution, all affect costs and efficiency.

j. Evaluate the need for, and method of, providing training. Determine options and time needed.

k. Plan for the impact on maintaining and updating data. Determine the process needed to update. Evaluate redistribution approaches.

l. Evaluate any similar products. Determine any advantages and disadvantages.

m. Develop an investment strategy based upon a cost and benefit analysis, comparing CD-ROM dissemination of information with the use of paper medium for distribution.

5.2.3.1 Commercial CD-ROM Replication Versus Local Production Break-Even Analysis Tool. When many copies of a CD-ROM are to be produced, one decision to be made is whether to produce CD-ROMs locally (in-house) using one-off machines or to contract the job to a CD-ROM replication company. If time is critical, local one-off production may be the only satisfactory alternative (although one-day turnaround can be obtained from a production vendor). If there is time to have a company replicate the CD-ROM, however, the prime consideration becomes cost. The following tool is provided to identify the crossover point (number of CD-

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ROMs) at which it becomes less expensive to use a CD-ROM replication company. If a CD-ROM production run is below the crossover point, it costs less to produce them locally; if higher than the crossover point, it costs less to have them produced by a CD-ROM replication company. For the purpose of this equaltion/example, it is assumed that the producer currently has the capability in-house to produce.

The price charged by a CD-ROM replication company is divided into two categories: fixed price and variable price. The fixed price is the same regardless of how many CDs are produced. The variable price is equal to the number of CD-ROMs produced times the total "per CD-ROM" price. The CD-ROM replication company may identify just the total fixed price and the total "per CD-ROM" price or it may itemize the prices. If itemized, you will need to identify fixed prices and the "per CD-ROM" prices. The fixed price is the total of the fixed price components for a production run. The "per CD-ROM" price is the composite of the "per CD-ROM" price components.

Many replication companies have block rates; for example, one rate for up to 2,000 CD-ROM discs and another rate for 2,000-5,000 which permits greater volume discounts. This analysis will need to be accomplished for each block.

The following equations are used to determine the CD-ROM break-even number. If the planned production run is larger than the break-even number, the production can be contracted to a CD-ROM replication company. If it is less, the CD-ROMs can be produced locally as one-offs.

Break-even # = FcC/(ADo - Pdc)
Break-even # = ((1 + S) x FcC)/(ADo - ((1 + S) x Pdc))) (when a surcharge is applied)

FcC - Fixed charges, Commercial: This is the total of one-time fixed costs charged by the CD-ROM replication company. Fixed costs include the substantial "start up" costs associated with developing a CD-ROM template (glass master and metal press). It may also include a single charge for etching sequential numbers (serialization) on every disc.

Pdc - Per Disc Charge, Commercial: This is the CD-ROM replication company charge for each CD-ROM produced. It may be provided as a total or may be calculated by adding the following together:

- Charge per disc
- Charge for serialization per disc (may be fixed)
- Charge for printing each included booklet
- Charge per package/container (may be included in disc charge)
- Charge to produce/install liner (may be included in disc charge)
- Charge for mailing each CD-ROM back to the publisher

S - Surcharge: This is the total of surcharges (a percentage of the total commercial charges) levied by contract middlemen; for instance, the Government Printing Office or the Defense Printing Service. Some contracting vehicles will not require a surcharge.

ADo - Average Disc Cost, one-offs: This is the only cost relevant to producing CD-ROMs locally. It is the cost incurred by you, the producer, for each one-off produced. It is the sum of the following:

- Cost per CD-ROM one-off blank (the primary cost consideration)
- Cost per package/container
- Cost per label materials
- Cost per liner materials
- Cost per booklet materials
- Average manpower cost per disc to write to the one-off, make the labels, liner, and booklet and assemble each package.

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Example:

Fixed Charges, Commercial = $2,500.00
Per Disc Charges, Commercial = $3.00
Surcharge = 10%
Average Disc Cost, One-off = $16.00

Break-even # = ((1 + .1) x $2,500)/($16 - ((1 + .10) x $3) = 216.6

Therefore, if you need 217 or more copies, you should contract out to a replication company. If you need less then 217 copies, you should produce the discs in-house.

5.2.4 Quality Assurance Guidelines for CD-ROM Producers. To ensure CD-ROMs produced by DOD adhere to minimum quality assurance/quality control (QA/QC) guidelines, check the following items before final production:

a. Review the CONTENT.TXT file to ensure its information conforms with the physical label, documentation, and the actual content of the disc. The CONTENT.TXT file can be created early in the CD-ROM product development cycle. It can then be printed and used to ensure all of the documents/databases are actually on the appropriate discs.

b. Review all external document/database references (hyper-links) to ensure they are present and properly named. Missing images or improperly named images/directories are the most frequent errors found on CD-ROM products. If possible, develop a standard naming convention for images. For example, place all images for a particular document in a unique directory or folder. Then a scheme like CCFFFSSS.TIF could be used to represent each image where CC = chapter number, FFF = figure number, and SSS = sheet number. This allows a top level QA check to ensure there is an actual file corresponding to each required image. Ultimately, going through the List Of Illustrations inside the retrieval engine and pulling up each image is the only way to absolutely ensure each image is appropriately named and not corrupted.

c. Review the documents/databases placed on a release and derive a consistent tagging scheme to be applied throughout. Document this tagging scheme and provide rules for various situations. Then have one phase of your QA/QC process be a tag/format proof of the documents. Have the various personnel responsible for tagging distribute the proofing evenly among themselves. This will allow them to resolve tagging conflicts and ensure their tagging is consistent with their peers.

d. Finally, someone who is not involved with the release should provide the final QA/QC check by actually using the production one-off. Have the individual work with only the documentation and CONTENT.TXT file provided to ensure the information can be installed, run and effectively accessed. If they get stuck or confused about anything make corrections - it will pay off in less required end user support in the future.

5.2.5 Data Encryption. If the producer of a classified CD-ROM product requires the disc to be handled, shipped, and stored as if it were unclassified, then NSA Approved encryption is required. A NSA Approved encrypted disc can be handled and stored without regard to its data classification. Use of a NSA Approved media encryption/decryption system will permit users to accrue benefits by preventing unauthorized access to any level of classified data written to the CD-ROM discs.

Contact NSA (V-group) for additional information on NSA Approved encryption/decryption methods. Refer to 6.2 for more information on encryption.

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5.2.6 Data Exchange/File Format. CD-ROM has the capacity to store a large amount of information and it is important to use established standards. Be careful not to get locked into a proprietary solution. Standards are listed in the DOD TAFIM AITS (see 2. APPLICABLE DOCUMENTS).

The following are established exchange standards used by the DOD for CALS (Continuous Acquisition and Life Cycle Support) and Automated Document Conversion (ADC):

a. *Code for Information Interchange, Its Representations, Subsets, and Extensions, (American Standard Code for Information Interchange [ASCII]* (FIPS PUB 1-2)) is the standard for the exchange of textual data including any structured arrangement of character-oriented records, files, or indices.

b. *Markup Requirement and Generic Style Specification for Electronic Printed Output and Exchange of Text (Standard Generalized Markup Language [SGML])*, which adopts ISO 8879:1986 (MIL-M-28001B for CALS), is the standard for the exchange of textually-oriented data.

c. *Requirements for Raster Graphics Representation in Binary Format (Group 4 Raster Scanned Images)* (MIL-PRF-28002B for CALS) is the scanning standard for exchange of data in raster file format.

d. *Digital Representation for Communication of Product Data: IGES (Initial Graphics Exchange Specification) Application Subsets and IGES Application Protocols* (MIL-PRF-28000A for CALS) is the standard for the exchange of 3-D data in vector file format, particularly for documents prepared in CAD/CAM.

e. *Digital Representation for Communication of Illustration Data: CGM (Computer Graphics Metafile) Applications Profile* (MIL-PRF-28003A for CALS) is the standard for exchange of 2-D data in vector file format for documents not prepared in CAD/CAM.

IGES, CGM, TIFF, and PCX are file formats for graphics files that systems with imaging interfaces can generally read and print. TIFF files are popular, but compression schemes vary and the result can be a specific type of TIFF file.

Some of the major wordprocessing, desktop publishing, and document retrieval software companies have announced support for SGML, but it has not yet become a fully implemented industry text and document markup standard. RTF is another markup language gaining popularity, especially in the Microsoft Windows programming/document processing environment. Adobe's Portable Document Format (PDF) is beginning to gather support in the commercial sector, but is currently oriented towards document format/layout vice structure/content.

Regardless of the format you choose, it is important to be consistent. Consistency will significantly reduce manual effort required to implement future system enhancements/data conversions.

5.2.6.1 Compression/Decompression. Scanned (bitmapped) images, motion video, animation, and sound generally must be compressed to reduce the amount of required disc storage space. Several compression/decompression algorithms and schemes are available enabling producers to maximize the amount of information provided on their discs. Compressed files are also smaller to transfer, which enhances computer performance.

By using standard compression/decompression schemes instead of proprietary, information can be more easily transferred/converted to other applications/formats.

The following are established standards used by the DOD for CALS (Continuous Acquisition and Life Cycle Support) and Automated Document Conversion (ADC):

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a. ITU (formerly CCITT) Recommendation T.6:1988, Facsimile Coding Schemes and Coding Control Functions for Group 4 Facsimile Apparatus (Group 4) - used to encode/decode (compress/decompress) binary raster graphics (black and white bit-mapped images) as defined in FIPS PUB 150 - Telecommunications: Facsimile Coding Schemes and Coding Control Functions for Group 4 Facsimile Apparatus.

b. JPEG (Joint Photographic Experts Group) (ISO 10918-1) - used for encoding/decoding (compression/decompression) of still-frame, continuous-tone, gray scale images that are eight or more bits per pixel, and color images that are sixteen or more bits per pixel. JPEG consists of a family of image compression processes. Some data is lost during the processing. (A JPEG "toolkit" allows the user to choose how much loss an application can tolerate.) JPEG also provides an extension for true "lossless" compression.

Compressed information must be decompressed by the end-user workstation/system before it is usable. Scanned images should be viewed on high resolution monitors which can display at 150 to 240 dots per inch (dpi). Standard VGA monitors display at less than 100 dpi and images often need to be "zoomed out" to be legible. Scanning images at less than 300 dpi may display on a monitor nicely, take less storage space, and take less time to transfer and print, but a significant amount of the original image detail is lost. Standard laser printers can print scanned images at a resolution of 300 dpi or greater.

5.3 End-User Guidelines

5.3.1 Minimum End-User System to be Supported. Minimum system requirements are to be used by DOD CD-ROM producers as a baseline equipment suite to design their products. In other words, producers can assume DOD personnel will at least have access to one of the minimum system platforms described below. If producers know their users/customers have a higher level system, then they can design to the higher level. End-users looking to procure new systems or upgrade existing systems can refer to 6.1.

5.3.1.1 Minimum Computer Specifications.

DOS Environment: 80286 processor, 2 MB RAM, 20 MB hard disk (must have 10 MB free space), EGA graphics adapter, EGA color monitor, MS DOS 5.0, Microsoft CD-ROM extensions (MSCDEX) version 2.2.

UNIX Environment: Tac-3 with runtime HP-UX, or SPARCstation 2 workstation with 40 MHz SPARC floating-point processor; 14-inch monochrome monitor; 64 KB write-through cache; 32 MB RAM; 424 MB SCSI hard drive; SUN 4.1.2.

Macintosh Environment: 68030 processor with 2 MB of RAM and 20 MB hard drive running Macintosh System 6 or 7.

5.3.1.2 Minimum CD-ROM Drive Specifications. All Environments: 1X CD-ROM drive, ISO 9660 compatible, with appropriate driver software and interface card/cabling for the computer system being used. A High Sierra compatible drive is not necessarily ISO 9660 compatible although ISO 9660 can read High Sierra format. Also, some MS-DOS PCs will only support Level 1 of ISO 9660, which limits the number and type of characters that can be used for file names and directory names. Typical average access times for these drives range from 350 milliseconds (msec) to one second and throughput/data transfer rate is approximately 150 KBps (Kilobytes per second).

5.3.2 Handling, Storage, and Cleaning of CDs. To ensure continued usefulness of a CD, do not write on, touch, or scratch the recording surface. The CD should be handled by the edges or the center hole only and should not be bent or exposed to excessive sun or heat. Store CDs in the provided container when not in use. Clean dust from the recorded side with a clean soft dry cloth. Liquid cleaners are available to clean other than dust from the recording surface.

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5.3.3 Classified CD-ROM Destruction. This pertains to classified CDs without 5.2.5 encryption.

Currently there is no standard for the destruction of classified CD-ROMs. Work is being done to approve a method to grind the CD-ROM surface, thus destroying the information recorded on the disc. Acceptable methods for disposing of classified CD-ROMs include incineration under controlled conditions, and shipping old CD-ROMs to a central facility for destruction. Special care needs to be taken when incinerating CD-ROMs to ensure that the space is very well ventilated since fumes in high concentration can be toxic. If shipping old CD-ROMs to a central destruction site is desired, send by the following methods:

FOR Secret and below send by registered mail to:

Director, National Security Agency
9800 Savage Road
ATTN: L322 - Building 9838
Ft George G. Meade, MD 20755-6000

FOR Top Secret and Code word: By Defense Courier Service, addressed to:

449563-BA21
Film Destruction Facility
9800 Savage Road
ATTN: L322 - Building 9838
Ft George G. Meade, MD 20755-6000

6. GENERAL INFORMATION

6.1 Recommended End-User System. The following system specifications should be considered minimum requirements for end users when procuring new systems or upgrading existing systems. They can be used by CD-ROM producers as the baseline minimum system requirements starting in calendar year 1998.

6.1.1 Computer Specifications. For recommended computer specifications, refer to JIEO Report 8300, November 1994, "Department of Defense Minimum Desktop Configuration."

6.1.2 CD-ROM Specifications. All Environments: 2X (or faster) CD-ROM drive, ISO 9660 compatible, with appropriate driver software and an interface card/cabling for the computer system being used. Average access time will be no greater than 350 msec and throughput/data transfer rate 300 KBps or greater. The CD-ROM drive and the interface card can be XA compatible.

6.1.3 Sound Specifications. All Environments (for multimedia applications): 16-bit (32-bit preferred) sound card capable of audio playback at 44.1 KHz stereo with optional wave table support, and audio speakers or earphones. For IBM compatible computers running DOS or Windows, use MPC2 capability.

6.2 Data Encryption. A lower cost companion product to the SSP3110 (Secure Storage Processor) NSA Approved Type I encryption/decryption system is currently under development. It is called the Secure Retrieval Processor (SRP), and is basically a computer card for decrypting SSP-encrypted media. It is presently only being developed as a PC/AT bus-compatible board.

A PCMCIA technology encrypt/decrypt system is also being developed for Type II encryption/decryption, with a probable Type I compatibility in the future.

In addition, DOD has submitted a proposal to ISO to add an encryption appendix to the ISO 9660 standard. The purpose of the appendix is to provide an automated process to identify an encrypted CD and its

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cryptography. The proposal applies to fully encrypted ISO 9660 CDs and CDs with individually encrypted files and/or partitions using different keys. It does not specify what encryption algorithm to use. Expected acceptance of this proposal will occur in the 1996 time frame.

6.3 CD-Recordable Labeling Options. The following options are available for labeling CD-Rs:

a. In-house Color Printing. For production of CD-ROMs using CD-Recordable equipment, purchase blank labels (currently two to a sheet), graphics software, and a color printer to print the labels in-house as needed.

b. Off-set Color Printing. For production of CD-ROMs using CD-Recordable equipment, purchase blank labels and have color ring/generic information printed by an off-set printing facility. Then, as required for specific titles, print additional information with a standard office printer.

c. Disc Printer. Purchase a CD-Recordable disc printer, blank discs compatible with that disc printer, the appropriate graphics software, and print directly on the discs.

d. Silk Screen Labels. Design a label which complies with the labeling instructions in 4.3, purchase custom CD-Recordable discs from a mastering facility, and request the facility silk screen your label design on the CD-Recordable discs. This solution is considered the best if more than 100 discs are required and if time permits.

7. NOTES

7.1 Intended Use. The purpose of this handbook is to provide a common format for DOD CD-ROM producers. The ultimate goal is to ensure the interoperability of CD-ROM products throughout DOD.

7.2 Subject Term (Key Word) Listing.

Authoring
CALS
CD-ROM
Classified
Compression
CONTENT.TXT
Data Exchange
Destruction
Encryption
File format
File structure
Green Book
ISO
Label
Licensing
Orange Book
Packaging and Mailing
Red Book
Replication
Retrieval
Security
SGML

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CONCLUDING MATERIAL

Custodians:
- DISA - DC
- Army - AC
- Navy - NM
- Air Force - 02
- DLA - DH
- DMA - MP

Review activities:
- OSD - DO, IQ, IR
- DISA - DC-2, DC-5, DC-7
- Army - AM, PT, TM-1, TM-3, SC-1, SC-2
- Navy - EC, CH, MC, CG, NC, ND, TD, OM
- Air Force - 16, 17, 19, 29, 33, 84, 90, 93, 99
- DLA - ES
- DIA - DI
- MISC. - US, CI, KMR, OST

Preparing activity:
DISA - DC
(Project IPSC 0342)

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