

**NOTICE OF CHANGE**

**METRIC**

MIL-STD-2411  
NOTICE 1  
17 January 1995

**MILITARY STANDARD  
RASTER PRODUCT FORMAT**

TO ALL HOLDERS OF MIL-STD-2411:

1. THE FOLLOWING PAGES OF MIL-STD-2411 HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

| NEW PAGE | DATE            | SUPERSEDE PAGE | DATE                     |
|----------|-----------------|----------------|--------------------------|
| 15       | 6 October 1994  | 15             | REPRINTED WITHOUT CHANGE |
| 16       | 17 January 1995 | 16             | 6 October 1994           |
| 31       | 17 January 1995 | 31             | 6 October 1994           |
| 32       | 6 October 1994  | 32             | REPRINTED WITHOUT CHANGE |
| 41       | 17 January 1995 | 41             | 6 October 1994           |
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| 61       | 17 January 1995 | 61             | 6 October 1994           |
| 62       | 6 October 1994  | 62             | REPRINTED WITHOUT CHANGE |

2. RETAIN THIS NOTICE AND INSERT BEFORE TABLE OF CONTENTS.

3. Holders of MIL-STD-2411 will verify that page changes and additions indicated above have been entered. This notice page will be retained as a check sheet. This issuance, together with appended pages, is a separate publication. Each notice is to be retained by stocking points until the military standard is completely revised or canceled.

Custodian:  
DMA-MP

Preparing Activity  
DMA-MP

Review activities:  
Air Force - 09  
Army -  
Navy - NO, MC

(Project MCGT-0160)

AMSC N/A

AREA MCGT

DISTRIBUTION STATEMENT A.  
distribution unlimited.

Approved for public release;

4.5.1.2 Erasable optical disk. The data shall be recorded using a continuous composite servo tracking method on 130 mm (5.25-in.) erasable optical disks (EODs), as defined in ISO/IEC DIS 10089.

The User Zone on each EOD shall be formatted as defined in ISO/IEC DIS 10089, Sections 16 and 17, with 512 bytes per sector.

4.5.1.3 8mm Magnetic tape cartridge. The data shall be recorded on 8mm wide magnetic tape cartridges manufactured in accordance with ISO/IEC DIS 11319.

4.5.1.4 4mm Digital audio tape. The data shall be recorded on 4mm wide magnetic tape cartridges manufactured in accordance with ISO/IEC DIS 10777.

4.5.1.5 Compact Disk/Recordable (CD-R). The data shall be recorded on 120mm optical data disks as defined in TBD.

#### 4.5.2 Volume and file structures.

a. The volume and file structure for data recorded on CD-ROM and CD-R shall be as defined in ISO 9660.

Note: The nature of the ISO 9660 CD-ROM standard is such that platforms will present the files and directory names differently. As an example, although the files are written to the CD-ROM in upper case (as defined in the standard), some file systems will present the data in lower case letters. In addition, the following differences in the presentation of the file and directory names may also appear on various platforms:

- Filenames with extensions may be appended with a semicolon-1 (;1).
- Filenames without extensions may be appended by a single period (.) or with a period-semicolon-1(.;1).

The table of contents file for RPF products includes the pathnames to the frame files. The pathnames and frame files in the table of contents file are written in upper case, and the directory delimiters are given as forward slashes (/). Developers of software for CADRG will be required to understand the format of the pathnames in the table of contents file, as defined in this section, in order to properly use the table of contents file.

b. The preferred volume and file structure for data recorded on read-write and write-once/read-many random access media (i.e. disks) shall be the Non-Sequential Recording Format, as defined in ISO 13346.

c. User data on sequential media (i.e. tapes) shall be formatted in accordance with the extended tar format, as defined in IEEE 1003.1, paragraph 10.1.1.

4.5.3 Directory structures. The overall format and structure of directories shall be in accordance with Section 5 of IEEE Standard 1003.1.

A given random access volume shall contain the following directory structure:

```
[rpf root directory] (unordered)
  {1} (unordered)
  [table of contents file]
  [lookup table directory] (0, 1)
    {2} (unordered)
    [external color/grayscale file] (1, ... many)
  {1} (unordered)
  [frame directory] (0, ... many)
    {2} (unordered)
    [frame file] (1, .. many)
    [subordinate directory] (0, ... many) (unordered)
```

4.5.4 File and directory naming convention. The unqualified name of each RPF file shall be in the industry standard "8.3" format: up to 8 alphanumeric characters, followed by a period, followed by an extension of up to three alphanumeric characters. The unqualified name of each RPF directory shall be up to 8 alphanumeric characters.

4.5.4.1 Directories. Directories on RPF interchange volumes are intended to help locate the data on a given interchange volume. At the discretion of the implementor, receivers of the data may relocate the directory tree found on the interchange media anywhere within their own file system hierarchies for processing.

a. The [rpf root directory] on a given volume shall be named "RPF". Every RPF volume shall have an [rpf root directory], plus at least one subordinate [frame directory] or [lookup table directory].

b. All [external color/grayscale file]s shall be stored on the interchange media in the "RPF/LOOKUP" directory.

c. [frame file]s shall be stored in a separate directory hierarchy under the RPF directory. The producer shall determine a strategy for choosing the hierarchical structure, the name of each directory at each level in the hierarchy in a given volume, and a method for assigning [frame file]s to specific directories. Each [subordinate frame directory] shall have the same structure as the [frame directory]. Each [frame directory] shall contain at least

resolution). A given record will also specify the dimensions of a rectangular "virtual matrix" of fixed-size frames of the given scale or resolution that fills the given boundary rectangle. The [frame file index section] will provide the identities of the subset of these frames that are actually recorded on the given interchange volume. If the [frame file index section] is omitted, then the [boundary rectangle section] shall be omitted. An example of a boundary rectangle is shown in FIGURE 1.

(4) The [frame file index section] will contain scales and data types for all [frame file]s in the given volume. Each entry will identify the boundary rectangle (named in the [boundary rectangle section]) where the frame is located, and it will specify the row and column in a "virtual matrix" of frames within the boundary rectangle where the specific frame is located. The information will enable the user to compute the coverage of the given frame, as specified in the corresponding [frame file].

The [pathname table] will show the pathname from the RPF directory of each [frame file] listed in the [frame file index table]. For example, for any [frame file] stored in directory RPF/CONC/CONCZ02, the pathname will be "./CONC/CONCZ02/". Since the [pathname table] entries will vary in length, the [frame file index record] for a given [frame file] provides the offset and length of the <pathname> field in the [pathname table] that pertains to the given [frame file]. The [frame file]s stored in the same directory will have the same <pathname>. The [frame file index record]s for these [frame file]s will be able to use a single [pathname record].

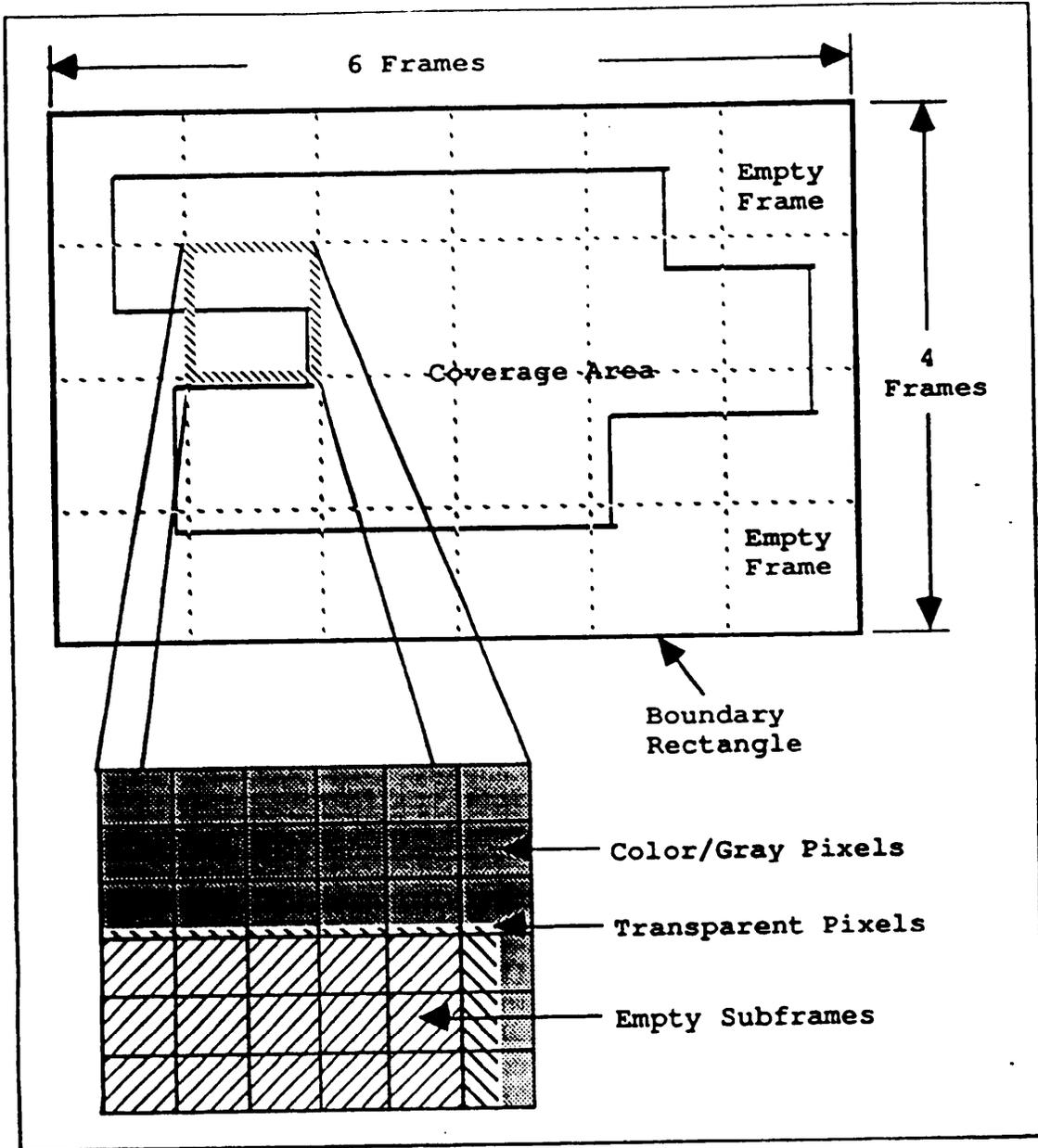


FIGURE 1. Example of a boundary rectangle.

(47) <number of pathname records> ::= a 2-byte unsigned integer  $\geq 1$  indicating the number of [pathname record]s in the [pathname table].

(48) <pathname> ::= a variable-length ASCII character string defining the pathname for a given [frame file] (e.g. "/CONC/CONCZ02/" for a [frame file] stored in the directory /RPF/CONC/CONCZ02).

(49) <pathname length> ::= a 2-byte unsigned integer  $\geq 1$  indicating the length in bytes of the <pathname> field in this [pathname record].

(50) <pathname record offset> ::= a 4-byte unsigned integer defining the address (i.e. byte number) of the first byte of the [pathname record] containing the <pathname> associated with this [frame file index record], relative to the beginning of the [frame file index subsection] (counting the first byte of the [frame file index subsection] as 0).

(51) <producer> ::= a 5-byte ASCII character string encoded as specified in MIL-STD-2411-1, section 5.2.1, identifying in human-readable form a designator for the organization (e.g. "DMAAC", "SOCAF", "AFESC") that produced the [frame file]s associated with this [boundary rectangle record].

(52) <product data type> ::= a 5-byte ASCII character string encoded as specified in MIL-STD-2411-1, section 5.1.6, defining the data type (e.g. "ADRG ", "DTED ") of the [frame file]s associated with this [boundary rectangle record] in human-readable form.

(53) <scale or resolution> ::= a 12-byte ASCII character string identifying in human-readable form the nominal scale (e.g. "1:1M", "1:12.5K") or nominal resolution (e.g. "100m" or "50m" that produced the [frame file]s associated with this [boundary rectangle record]).

(54) <security classification> ::= a 1-byte ASCII character coded to indicate the security level (e.g. unclassified, confidential, secret) of this file, as specified in MIL-STD-2411-1, section 5.1.8.

(55) <security country/international code> ::= a 2-byte ASCII character string coded to indicate the originating country or international affiliation of the <security classification> of this file, as defined in MIL-STD-2411-1, section 5.1.7.

(56) <security release marking> ::= a 2-byte ASCII character string coded to indicate any special handling or releasability restrictions assigned to the contents of this file, as defined in MIL-STD-2411-1, section 5.1.9.

(57) <southeast/lower right latitude> ::= an 8-byte real value corresponding to the latitude of the southeast or lower right corner of the boundary rectangle defined in this [boundary rectangle record], measured in decimal degrees.

(58) <southeast/lower right longitude> ::= an 8-byte real value corresponding to the longitude of the southeast or lower right corner of the boundary rectangle defined in this [boundary rectangle record], measured in decimal degrees.

(59) <southwest/lower left latitude> ::= an 8-byte real value corresponding to the latitude of the southwest or lower left corner of the boundary rectangle defined in this [boundary rectangle record], measured in decimal degrees.

(60) <southwest/lower left longitude> ::= an 8-byte real value corresponding to the longitude of the southwest or lower left corner of the boundary rectangle defined in this [boundary rectangle record], measured in decimal degrees.

(61) <zone> ::= a 1-byte ASCII character string encoded as specified in MIL-STD-2411-1, section 5.1.3, identifying in human-readable form the latitudinal zone described in the [frame file]s associated with this [boundary rectangle record].

### 5.2.2 Frame file.

a. The overall structure of the [frame file] shall be as follows:

```
[frame file]
  (1)
    [header section]
    [location section]
    [coverage section] (0, 1)
    [compression section] (0, 1)
    [color/grayscale section] (0, 1)
    [image section]
    [attribute section] (0, 1)
    [related images section] (0, 1)
    [replace/update section] (0, 1)
```

(1) The [header section] will contain information that enables the programmer to uniquely identify the [frame file] and process it further. (Note: the <location section location> field is intended to facilitate backward compatibility. See 5.1.8 above.)

(2) The [location section] will show the programmer the beginning byte locations (addresses) of the remaining sections in the file, relative to the beginning of the file.

[related image description record] (intended for backward compatibility; see 5.1.8 above).

(91) <related image description table offset> ::= a 4-byte unsigned integer indicating the displacement, measured in bytes, between the beginning of the [related images subsection] and the first byte of the [related image description table] (counting the first byte of the [related images subsection] as 0). (Intended for backward compatibility; see 5.1.8 above).

(92) <related image file name> ::= a 12-byte ASCII character string in the format defined in 4.5.4.4 above, identifying a [frame file] recorded on this volume that is related to this [frame file] in a manner defined by the <relationship code> in this [related image description record].

(93) <related image pathname> ::= a variable-length ASCII character string defining the pathname for the directory containing a given [frame file], recorded on this volume for an image that is related to the image recorded in this [frame file], in accordance with the relationship defined in the corresponding <relationship code> in the [related image description record] for the related file. For example, if the image in [frame file] /RPF/CONC/CONCZ03/EFGH5678.ON3 is related to the image in this [frame file], then <related image pathname> ::= "./CONC/CONCZ03/" in the [related image pathname record], and the corresponding <related image file name> ::= "EFGH5678.ON3" in the appropriate [related image description record].

(94) <related image pathname length> ::= a 2-byte unsigned integer indicating the length in bytes of the <related image pathname> field for the [frame file] identified in this [related image description record].

(95) <related image pathname offset> ::= a 4-byte unsigned integer defining the displacement, measured in bytes, between the beginning of the [related images subsection] and the first byte of the record in the [related image pathname table] containing the pathname of the image file named in this [related image description record] (counting the first byte of the [related images subsection] as 0).

(97) <replace/update record length> ::= a 2-byte unsigned integer  $\geq 25$  indicating the length in bytes of each [replace/update record] (intended for backward compatibility; see 5.1.8 above).

(98) <replace/update status> ::= a 1-byte unsigned integer indicating the status of this [replace/update record], encoded as follows:

::= 1 to indicate that the [frame file] identified in <new file name> field in this [replace/update record] updates one or more subframes in the [frame file] identified in the <old file name> field in this [replace/update record].

::= 2 to indicate that the [frame file] identified in <new file name> (which is intended to update a parent edition supersedes the [frame file] identified in the <old file name> field in this [replace/update record] (which also was intended to update the same parent edition).

::= 3 to indicate that the [frame file] identified in <new file name> field in this [replace/update record] replaces the entire [frame file] identified in the <old file name> field in this [replace/update record].

(99) <replace/update table offset> ::= a 4-byte integer defining the displacement, measured in bytes, between the beginning of the [replace/update subsection] and the first byte of the [replace/update table], (counting the first byte of the [replace/update subsection] as 0).

(100) <security classification> ::= a 1-byte ASCII character coded to indicate the security level (e.g. unclassified, confidential, secret) of this file, as specified in MIL-STD-2411-1, section 5.1.8.

(101) <security country/international code> ::= a 2-byte ASCII character string coded to indicate the originating country or international affiliation of the <security classification> of this file, as defined in MIL-STD-2411-1, section 5.1.7.

(102) <security release marking> ::= a 2-byte ASCII character string coded to indicate any special handling or releasability restrictions assigned to the contents of this file, as defined in MIL-STD-2411-1, section 5.1.9.