NOTICE OF CHANGE

NOT MEASUREMENT SENSITIVE

MIL-STD-2500B
NOTICE 1
2 October 1998

DEPARTMENT OF DEFENSE
INTERFACE STANDARD

NATIONAL IMAGERY TRANSMISSION FORMAT VERSION 2.1
FOR THE NATIONAL IMAGERY TRANSMISSION FORMAT STANDARD

TO ALL HOLDERS OF MIL-STD-2500B:

1. THE FOLLOWING PAGES OF MIL-STD-2500B HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

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

3. Holders of MIL-STD-2500B 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 standard is completely revised or canceled.

Custodians
Army - CR
Navy - OM
Air Force - 90

Preparing activity:
Misc - MP

(Project INST0051

NOT MEASUREMENT SENSITIVE

MIL-STD-2500B
22 August 1997

SUPERSEDING
ON 1 OCTOBER 1998
MIL-STD-2500A
12 October 1994

DEPARTMENT OF DEFENSE
INTERFACE STANDARD

NATIONAL IMAGERY TRANSMISSION FORMAT VERSION 2.1

FOR THE
NATIONAL IMAGERY TRANSMISSION FORMAT STANDARD

AMSC N/A **AREA INST**

REPRINTED WITHOUT CHANGE

FOREWORD

1. This standard is approved for use by all departments and agencies of the Department of Defense (DOD).

2. The National Imagery Transmission Format Standard (NITFS) is the suite of standards for formatting digital imagery and imagery-related products and exchanging them among members of the Intelligence Community (IC) as defined by the Executive Order 12333, and other United States Government departments and agencies.

3. The NITFS Technical Board (NTB) developed this standard based upon currently available technical information.

4. The DOD and other IC members are committed to the interoperability of systems used for formatting, transmitting, receiving, and processing imagery and imagery-related information. This standard describes the National Imagery Transmission Format (NITF) file format and establishes its application within the NITFS.

5. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed the National Imagery and Mapping Agency (NIMA), MS P-24, 12310 Sunrise Valley Drive, Reston, VA 20191-3449 by using the 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 standard establishes the requirements for the file format component of the NITFS. The file format described in this document is called the NITF. The NITFS is a collection of related standards and specifications developed to provide a foundation for interoperability in the dissemination of imagery and imagery associated data among different computer systems. An overview of the component documents of the NITFS can be found in NIMA-NNPP-97.

1.2 Purpose. This document, NITF 2.1, provides a detailed description of the standard file format structure. It specifies the valid data content and format for all fields defined within a NITF file. For this document, NITF refers to NITF Version 2.1. Several NITF implementation issues are addressed in the appendices. Issues pertinent to the use of NITF as the file format for tactical imagery transmission are described in the NITFS transmission protocol component, MIL-STD-2045-44500. An example of NITF as the basis for file formation in tactical communications is provided in Section 6. Certifiable implementation of the NITF for support of interoperability is subject to constraints not specified in this standard. Pertinent compliance requirements are defined in CJCSI 62-12.01A.

1.3 Applicability. This standard is applicable to DOD and other IC members. It is mandatory for all Secondary Imagery Dissemination Systems (SIDS) in accordance with the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence (ASD(C^3I)) memorandum, Subject: National Imagery Transmission Format Standard (NITFS), 12 August 1991, and is applicable also to all types of primary imagery systems such as Unmanned Aerial Vehicle (UAV), archives, and libraries. MIL-STD-2500B will be implemented in accordance with NIMA-0102-B and NIMA 0105-98. New equipment and systems, those undergoing major modification, or those capable of rehabilitation, will conform to this standard.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, and 5 of this standard. At the time of publication, the editions indicated were valid. All documents are subject to revision and users of this standard should investigate recent editions and change notices of the documents listed below. This section does not include documents cited in other sections of this standard or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3, 4, and 5 of this standard, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issue of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

FEDERAL INFORMATION PROCESSING STANDARDS

FIPS PUB 10-4	-	Countries, Dependencies, Areas of Special Sovereignty, and Their Principal Administrative Divisions, April 1995

(Copies of Federal Information Processing Standards (FIPS) are available to DOD activities from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094. Others must request copies of FIPS from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161-2171.)

STANDARDIZATION AGREEMENT

STANAG 7074	-	Digital Geographic Information Exchange Standard (DIGEST) - AGeoP-3A, edition 1, 19 October 1994

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(Copies of Standardization Agreements (STANAGs) can be obtained from the Central United States (US) Registry, 3072 Army Pentagon, Room 1B889, Washington, DC 20310-3072)

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-188-198A	-	Joint Photographic Experts Group (JPEG) Image Compression for the National Imagery Transmission Format Standard, 15 December 1993 through NOTICE 2
MIL-STD-188-199	-	Vector Quantization Decompression for the National Imagery Transmission Format Standard, 27 June 1994 through NOTICE 1
MIL-STD-2045-44500	-	Tactical Communications Protocol 2 (TACO2) for the National Imagery Transmission Format Standard, 18 June 1993 through NOTICE 2
MIL-STD-2301A	-	Computer Graphics Metafile (CGM) for the National Imagery Transmission Format Standard
MIL-STD-6040	-	United States Message Text Formatting (USMTF) Program, January 1997

(Unless otherwise indicated, copies of the above standards are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

EXECUTIVE ORDER

EO 12958	-	Classified National Security Information, 17 April 1995

DEPARTMENT OF DEFENSE REGULATION

DOD 5200.1-R	-	Department of Defense Information Security Program Regulation, 1996

CHAIRMAN JOINT CHIEF OF STAFF INSTRUCTION

CJCSI 62-12.01A	-	Compatibility, Interoperability, and Integration of Command, Control, Communications, Computers, and Intelligence Systems, 30 June 1995

NATIONAL IMAGERY AND MAPPING AGENCY PUBLICATIONS

NIMA TR8350.2	-	Department of Defense World Geodetic System 1984, Third Edition, 4 July 1997
NIMA N0102B	-	USIGS System Architecture Volume II USIGS Interoperability Profile (UIP)
NIMA N0105-98	-	National Imagery Transmission Format Standard (NITFS) Standards Compliance and Interoperability Test and Evaluation Program Plan
NIMA NNPP-97	-	The National Imagery Transmission Format Standard Program Plan

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NIMA N0106-98	-	National Imagery Transmission Format Standard Bandwidth Compression Standards and Guidelines Document

(Copies of NIMA documents can be obtained from the web at http://www.nima.mil.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues or documents not listed in the DODISS are the issues or the documents cited in the solicitation.

INTERNATIONAL TELECOMMUNICATION UNION

ITU-R BT.601-5	-	Studio encoding parameters of digital television for standard 4:3 and wide-screen 16:9 aspect ratios, 10/95
ITU-T T.4	-	Standardization of group 3 facsimile apparatus for document transmission, AMD2 08/95

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO 646	-	Information technology - ISO 7-bit coded character set for information interchange, 1991
ISO 1000	-	SI units and recommendations for the use of their multiples and of certain other units, 1992
ISO 4873	-	Information technology - ISO 8-bit code for information interchange - Structure and rules for implementation, 1991
ISO/IEC 7498-1	-	Information technology - Open systems interconnection; Basic reference model - Part 1: The basic model, 1994
ISO/IEC 8632-1	-	Information technology - Computer graphics - Metafile for the storage and transfer of picture description information: Functional specification, 1992
ISO/IEC 8632-1 AMD1	-	Rules for profiles, 1994
ISO/IEC 8632-1 AMD2	-	Application structuring extensions, 1995
ISO 10646-1	-	Information technology - Universal multiple - octet coded character set (UCS) - Part 1: Architecture and basic multilingual plane, 1993
ISO/IEC 10918-1	-	Information technology - Digital compression and coding of continuous-tone still images - Part 1: Requirements and guidelines; 1994
ISO/IEC IS 12087-5	-	Information technology - Computer graphics and image processing - Image processing and interchange (IPI) - Functional specification - Part 5: Basic image interchange format (BIIF)

(Applications for copies should be addressed to the American National Standards Institute, 13th Floor, 11 West 42nd Street, New York, NY 10036.)

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INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS STANDARD

IEEE 754 - IEEE Standard for binary floating point arithmetic

(Copies of IEEE documents can be ordered from Customer Service, 445 Hose Lane, PO box 1331, Piscataway, NJ 08855-1331.)

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

3. DEFINITIONS

3.1 Acronyms used in this standard. The acronyms used in this standard are defined as follows:

a.	ALVL	-	Attachment LeVeL
b.	AMD	-	AMmenDment
c.	AMSC	-	Acquisition Management Systems Control
d.	ASCII		American Standard Code for Information Interchange
e.	ASD(C^3I)	-	Assistant Secretary of Defense for Command, Control, Communications, and Intelligence
f.	B	-	band interleaved by Block (IMODE value)
g.	BARO	-	Barometric pressure (ICAT value)
h.	BCKGDA	-	BaCKGround Data
i.	BCS	-	Basic Character Set
j.	BCS-A	-	Basic Character Set Alphanumeric
k.	BCS-N	-	Basic Character Set Numeric
l.	BE	-	Basic Encyclopedia
m.	BGHIGHT	-	BackGround HeIGHT
n.	BGWIDTH	-	BackGround WIDTH
o.	BIIF	-	Basic Image Interchange Format (ISO/IEC IS 12087-5)
p.	BIIF	-	Basic Image Interchange Format
q.	BMP	-	Basic Multilingual Plane
r.	BMRnBNDm	-	n^{th} Block Mask Record of BaND m
s.	BP	-	Black/white frame Photography (ICAT value)

SUPERSEDES PAGE 4 OF MIL-STD-2500B

t. C - (1) Column
(2) Conditional

u. C1 - Bi-level (IC value)

v. C3 - JPEG (IC value)

w. C4 - Vector Quantization (IC value)

x. C5 - Lossless JPEG (IC value)

y. CAT - Computerized Axial Tomography scan (ICAT value)

z. CCS - Common Coordinate System

aa. CE - Controlled Extension

ab. CEDATA - Controlled Extension user-defined DATA

ac. CETAG - Controlled unique Extension Type identifier

ad. CGM - Computer Graphics Metafile

ae. CJCSI - Chariman Joint Chief of Staff Instruction

af. CLEVEL - Complexity LEVEL

ag. CP - Color frame Photography (ICAT value)

ah. CRT - Cathode Ray Tube

ai. CURRENT - water Current (ICAT value)

aj. DC - District of Columbia

ak. DD - Defense Department

al. DEPTH - water Depth (ICAT value)

am. DES - Data Extension Segment

an. DESDATA - DES user-defined DATA

ao. DESITEM - DES data segment overflowed

ap. DESOFLW - DES OverFLoW header type

aq. DESSHF - DES user-defined SubHeader Field

ar. DESSHL - DES user-defined SubHeader Length

as. DIGEST - Digital Geographic Information Exchange Standard (STANAG 7074)

at. DLVL - Display LeVeL

au. DOD - Department Of Defense

av. DODISS - Department Of Defense Index of Specifications and Standards

aw. DTEM - Digital Terrain Elevation Model (ICAT value)

ax. EEI - Essential Elements of Information

ay. ENCRYPT - File ENCYPTion

az. EO - (1) Executive Order
(2) Electro-Optical (ICAT value)

ba. FBKGC - File BacKGround Color

bb. FDT - File Date and Time

bc. FHDR - File profile name

bd. FIPS - Federal Information Processing Standard

be. FIPS PUB - FIPS Publication

bf. FL - (1) Forward Looking infrared (ICAT value)
(2) File Length

bg. FORMETS NATO Message Text Formatting System

bh. FOUO - For Official Use Only

bi. FP - Fingerprints (ICAT value)

bj. FSCATP - File Classification Authority TyPe

bk. FSCAUT - File Classification AUThority

bl. FSCLAS - File Security CLASsification

bm. FSCLSY - File Security Classification Sytem

bn. FSCLTX File CLassification TeXt

bo. FSCODE - File Security CODEwords

bp. FSCRSN - File Classification ReaSoN

bq. FSCTLH - File ConTroL and Handling

br. FSCTLN - File Security ConTroL Number

bs. FSDCDT - File DeClassification DaTe

bt. FSDCTP - File DeClassification TyPe

bu. FSDCXM - File DeClassification eXeMption bv. FSDG - File DownGrade

bw. FSDGDT - File DownGrade DaTe

bx. FSREL - File REL instructions

by. FSSRDT - File Security SouRce DaTe

bz. FTITLE - File TITLE

ca. FVER - File VERsion

cb. GS - Graphic Segment

cc. HL - file Header Length

cd. HR - High Resolution radar (ICAT value)

ce. HS - HyperSpectral (ICAT value)

cf. HTML Hypertext Mark-up Language

cg. I - Inphase

ch. I1 - Downsampled JPEG (IC value)

ci. IC - (1) Intelligence Community
(2) Image Compression

cj. ICAT - Image Category

ck. ICORDS - Image Coordinate Representation

cl. IDLVL - Image Display LeVeL

cm. IEC - International Electrotechnical Commission

cn. IEEE - Institute of Electronic and Electrical Engineers

co. IGEOLO - Image Coordinate Location

cp. ILOC - Image Location

cq. IMODE - Image Mode

cr. INST - INformation Standards and Technology

cs. IPI - Image Processing and Interchange

ct. IR - InfRared (ICAT value)

cu. IREP - Image REPresentation

cv. IREPBANDn - IREP nth BAND represenation

cw. IS - Image Segment

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cx. ISMC - Imagery Standards Management Committee

cy. ISO - International Organization for Standardization

cz. ISUBCATn - image nth band SUBCATegory

da. ITU - International Telecommunication Untion

db. ITU-R - ITU Recommendation

dc. ITU-T - ITU Telecommunications

dd. IXSHD - Image eXtended SubHeader Data

de. JITC - Joint Interoperability Test Command

df. JPEG - Joint Photographic Experts Group

dg. LDn - Length of nth Data extension segment

dh. LEG - Legend (ICAT value)

di. LIn - Length of the n^{th} Image segment

dj. LISHn - Length of the n^{th} Image SubHeader

dk. LOC - Location

dl. LOCG - LOCation Grid (ICAT value)

dm. LSB - Least Significant Bit

dn. LSn - Length of the n^{th} graphic segment

do. LSSHn - Length of the n^{th} graphic SubHeader

dp. LUT - Look-Up Table

dq. M - Magnitude

dr. M1 - Compressed Bi-level (IC value)

ds. M3 - Compressed JPEG (IC value)

dt. M4 - Compressed Vector Quantization (IC value)

du. M5 - Compressed Lossless JPEG (IC value)

dv. MAP - raster MAP (ICAT value)

dw. MATR - MATRix data (ICAT value)

dx. MGRS - Military Grid Reference System

dy. MIL-STD - MILitary STandarD

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dz. MONO - MONOchrome (IREP value)

ea. MRI - Magnetic Resonance Imagery (ICAT value)

eb. MS - MultiSpectral (ICAT value)

ec. MSB - Most Significant Bit

ed. MTF - Message Text Formatting (TXTFMT value)

ee. MULTI - MULTIband Imagery (IREP value)

ef. N - North (ICORDS value)

eg. NATO - North Atlantic Treaty Organization

eh. NBPC - Number of Blocks Per Column

ei. NBPR - Number of Blocks Per Row

ej. NC - No Compression

ek. NELUTn - Number of LUT Entries for the n^{th} image band

el. NICOM - Number of Image COMments

em. NIMA - National Imagery and Mapping Agency

en. NITF - National Imagery Transmission Format

eo. NITFS - National Imagery Transmission Format Standard

ep. NM - Uncompressed image indicating an image that contains a Block Mask or a Pad Pixel Mask (IC value)

eq. NODISPLY - No DISPLaY (IREP value)

er. NPPBH - Number of Pixels Per Block Horizontal

es. NPPBV - Number of Pixels Per Block Vertical

et. NSIF - NATO Secondary Imagery Format

eu. NSIL - NATO Standard Image Library

ev. NTB - NITFS Technical Board

ew. NUMDES - NUMber of Data Extension Segments

ex. NUMI NUMber of Image segments

ey. NUMRES - NUMber of Reserved Extension Segments

ez. NUMS - NUMber of graphic segments

fa. NUMT - NUMber of Text segments

NEW PAGE

fb. NUMX - Reserved for Future Use

fc. NVECTOR - VECTOR with Cartesian coordinates (IREP value)

fd. NY - New York

fe. ONAME - Originator's NAME

ff. OP - Optical (ICAT value)

fg. OPHONE - Originator's PHONE number

fh. P - (1) Phase
(2) band interleaved by Pixel (IMODE value)

fi. PA - PennsylvaniA

fj. PAT - color PATch (ICAT value)

fk. PJUST - Pixel JUSTifcation

fl. PO - Post Office

fm. POLAR - Vector with POLAR coordinates (IREP value)

fn. PROPIN - Proprietary Information

fo. Q - Quadrature

fp. R - (1) Row
(2) band interleaved by Row (IMODE value)
(3) Required

fq. RD - RaDar (ICAT value)

fr. RE - Registered Extension

fs. REDATA - RES user-defined DATA

ft. RES - Reserved Extension Segment

fu. RESSHF - RES user-defined Subheader Fields

fv. RESSHL - RES user-defined SubHeader Length

fw. RETAG - Registered unique Extension Type identifier

fx. RGB - Red, Green, Blue (IREP value)

fy. RGB/LUT - mapped color (IREP value)

fz. RS - Reserved Segment

ga. Rset - Reduced resolution data set

NEW PAGE

gb.	RTF		Rich Text Format
gc.	S	-	(1) band Sequential (IMODE value) (2) South (ICORDS value)
gd.	SAR	-	Synthetic Aperture Radar (ICAT value)
ge.	SARIQ	-	SAR radio hologram (ICAT value)
gf.	SBND1	-	Graphic BouND 1
gg.	SBND2	-	Graphic BouND 2
gh.	SDE	-	Support Data Extension
gi.	SDIF		SGML Document Interchange Format
gj.	SDLVL	-	Graphic Display LeVeL
gk.	SFH	-	Streaming File Header
gl.	SFH_DELIM1	-	SFH Delimiter 1
gm.	SFH_DELIM2	-	SFH Delimiter 2
gn.	SFH_L1	-	SFH Length 1
go.	SFH_L2	-	SFH Length 2
gp.	SGML		Standard Generalized Mark-up Language
gq.	SI	-	International System of units (the modern metric system)
gr.	SID	-	(1) Secondary Imagery Dissemination System (2) Graphic Identifier
gs.	SIDS	-	Secondary Imagery Dissemination System
gt.	SL	-	Side-Looking radar (ICAT value)
gu.	SLOC	-	Graphic LOCation
gv.	STA	-	Standard (TXTFMT value)
gw.	STANAG	-	STANdardization AGreement
gx.	STREAMING_FILE_HEADER	-	Streaming File Header (DESID value)
gy.	STYPE	-	System TYPE
ha.	SXSHD	-	Graphic eXtended SubHeader Data
hb.	TACO2	-	TActical COmmunications Protocol 2
hc.	TFS	-	Transportable File Structure

NEW PAGE

hd. TI - Thermal Infrared (ICAT value)

he. TMRnBNDm - n^{th} Pad Pixel for BAND m

hf. TPXCD - Pad Output Pixel Code

hg. TPXCDLNTH - Pad Output Pixel Code Length

hh. TRE - Tagged Record Extension

hi. TRE_OVERFLOW - TRE overflow (DESID value)

hj. TS - Text Segment

hk. TXSHD - Text eXtended SubHeader Data

hl. TXTFMT - TeXT ForMaT

hm. UAV - Unmanned Aerial Vehicle

hn. UCS - Universal multiple octet coded Character Set

ho. UDHD - User-Defined Header Data

hp. UDHDL - User-Defined Header Data Length

hq. UDID - User-Defined Image Data

hr. UIP - USIGS Interoperability Profile

hs. URL - Universal Resource Locator

ht. US - United States

hu. USIGS - US Imagery and Geographic information System

hv. USMTF - US Message Text Formatting

hw. UT1 - UTF-1, UCS Transformation Format 1 (TXTFMT value)

hx. UTC - Coordinated Universal Time

hy. UTM - Universal Transverse Mercator

hz. VA - VirginiA

ia. VD - ViDeo (ICAT value)

ib. VDC - Virtual Display Coordinates

ic. VIS - VISible Imagery (ICAT value)

id. VPH - Video Phase History (IREP value)

ie. VQ - Vector Quantization

if. WGS - World Geodetic System

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ig.	WGS 84	-	World Geodetic System 1984
ih.	WIND	-	air Wind charts (ICAT value)
ii.	XHD	-	eXtended Header Data
ij.	XHDL	-	eXtended Header Data Length
ik.	XRAY	-	X-ray (ICAT value)
il.	YCbCr601	-	Y, brightness; Cb, chrominance (blue); Cr, chrominance (red) (ITU-R BT.601-5) (IREP value)
im.	ZULU	-	Zero meridian

3.2 Terms and definitions. The following terms and definitions are used for the purpose of this standard. All used concepts (file, field, segment, etc.) exclusively refer to the NITF standard. For concepts for which this is not correct a corresponding firm intention has been chosen (for example: system field, BIIF file, etc.).

3.2.1 Associated Data. That related data required for completeness of the standard.

3.2.2 Attachment Level (ALVL). A way to associate images and graphics to the same level during movement, rotation, or display.

3.2.3 Band. A well defined range of wavelengths, frequencies or energies of optical, electric, or acoustic radiation. At the pixel level, a band is represented as one of the vector values of the pixel.

3.2.4 Bandwidth. 1. The difference between the limiting frequencies within which performance of a device, in respect to some characteristic, falls within specified limits. 2. The difference between the limiting frequencies of a continuous frequency band.

3.2.5 Base Image. A base image is the principle image of interest or focus for which other data may be inset or overlaid. The NITF file can have none, one, or multiple base images. For multiple base images in a single NITF file, the relative location of each base image is defined in the image location (ILOC) field in each image subheader. This location will be the offset within the Common Coordinate System (CCS).

3.2.6 Basic Character Set (BCS). A subset of the Basic Multilingual Plane (BMP). The Basic Character Set consists of the characters defined in the first row (row 0x00) of the BMP A-zone. For this reason the first octet normally used to define character positions in the BMP will be omitted when expressing BCS character codes. Valid BCS character codes, therefore, will range from 0x00 to 0xFF.

3.2.7 Basic Character Set-Alphanumeric (BCS-A). A subset of the Basic Character Set. The range of allowable characters consists of space to tilde, (codes 0x20 to 0x7E) and line feed, form feed, carriage return, (0x0A, 0x0C, and 0x0D).

3.2.8 Basic Character Set-Numeric (BCS-N). A subset of the Basic Character Set-Alphanumeric. The range of allowable characters consists of minus to the number "9", BCS codes 0x2D to 0x39, and plus, code 0x2B.

3.2.9 Basic Multilingual Plane (BMP). The BMP is the first plane of the first group of the Universal Multiple-Octet Coded Character Set as defined by ISO/IEC 10646-1. The BMP is a matrix consisting of 256 rows each containing 256 cells. Individual cells are indexed using a pair of octets expressed in hexadecimal format. The first octet indicates the row containing the cell and the second octet indicates the position of the cell in the specified row. Rows within the BMP are grouped into four zones: A-zone (rows 0x00 to 0x4D), I-zone (rows 0x4E to 0x9F), O-zone (rows 0xA0 to 0xDF), and R-zone (rows 0xE0 to 0xFF). The A-zone is used for alphabetic and syllabic scripts together with various symbols. The I-zone is used for unified East Asianideographs. The O-zone is reserved for future standardization. The R-zone is restricted for graphic characters that are used in ways not explicitly constrained by ISO/IEC 10646-1.

3.2.10 BCS Space. BCS code 0x20.

3.2.11 Block. A block is a rectangular array of pixels. (Synonymous with tile.)

3.2.12 Block Image. A blocked image is comprised of the union of one or more non-overlapping blocks. (Synonymous with tiled image.)

3.2.13 Blocked Image Mask. A structure which identifies the blocks in a blocked (tiled) image which contain no valid data, and which are not included in the file. The structure allows the receiver to recognize the offset for each recorded/transmitted block. For example, a 2x2 blocked image file which contained no valid data in the second block (block 1) would be recorded in the order: block 0, block 2, block 3. The blocked image mask would identify block 1 as a non-existing block, and would allow the receiving application to construct the image in the correct order.

3.2.14 Brightness. An attribute of visual perception, in accordance with which a source appears to emit more or less light. A pixel with a higher value is brighter than a pixel with a lower value.

3.2.15 Byte. A sequence of 8 adjacent binary digits.

3.2.16 Character. 1. A letter, digit, or other graphic that is used as part of the organization, control, or representation of data. 2. One of the units of an alphabet.

3.2.17 Common Coordinate System (CCS). The virtual two dimensional Cartesian-like coordinate space which will be common for determining the placement and orientation of displayable data.

3.2.18 Complexity Level (CLEVEL). A code used in the file header which signals the degree of complexity an interpret implementation needs to support to adequately interpret the files. Items that differentiate complexity include: number of image segments, number of symbol segments, number of text segments, size of the common coordinate system, size of image data etc.

3.2.19 Conditional (C). A state applied to a NITF header or subheader data field whose existence and content is dependent on the existence and/or content of another field.

3.2.20 Controlled Extension (CE). Those tagged record extensions which are submitted for approval by the NTB and are then maintained under formal configuration management control. Both the extension type identifier (six character CETAG field) and the user-defined data (CEDATA field) structure is under configuration management control.

3.2.21 Coordinated Universal Time (UTC). The time scale maintained by the International Earth Rotation Service (having previously been maintained by the Bureau International de l'Heure that forms the basis of a coordinated dissemination of standard frequencies and time signals.

3.2.22. Data. Information in digital format.

3.2.23 Data Communication. The transfer of information between functional units by means of data transmission according to a protocol.

3.3.24 Data Extension Segment (DES). A type of extension segment with sub-header and data fields structured similarly to the standard data types in the NITF (e.g. image, label, symbol, text). The extension type identifier (25 character DESTAG field), the version (two character DESVER field), and the full underlying structure is under configuration management control as registered with the NTB.

3.2.25 Date Time Group (DTG). A composite representation of date and time.

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3.2.26 Digraph. A two letter reference code.

3.2.27 Field. Elementary set of meaningful data.

3.2.28 Graphic. Graphic data is used in the NITF to store two-dimensional information represented as a Computer Graphics Metafile (CGM). Each graphic segment consists of a symbol subheader and data. A graphic may be black and white, grey scale, or color. Examples of graphics are circles, ellipses, rectangles, arrows, lines, triangles, logos, unit designators, object designators (ships, aircraft), text, special characters, or combination thereof. A graphic is stored as a distinct unit in the NITF file allowing it to be manipulated and displayed nondestructively relative to the images, and other graphics in the file. This standard does not preclude the use of n-dimensional graphics when future standards are developed.

3.2.29 Grey scale. An optical pattern consisting of discrete steps or shades of grey between black and white.

3.2.30 Image. A two-dimensional rectangular array of pixels indexed by row and column.

3.2.31 Image Codes. For a vector quantized image file, values in the image data section that are used to retrieve the v x h kernels from the image code book.

3.2.32 Imagery. Collectively, the representations of objects reproduced electronically or by optical means on film, electronic display devices, or other media.

3.2.33 Imagery Associated Data. Data which is needed to properly interpret and render pixels; data which is used to annotate imagery such as text, graphics, etc.; data which describes the imagery such as textual reports; and data which support the exploitation of imagery.

3.2.34 Interface. 1. A concept involving the definition of the interconnection between two equipment items or systems. The definition includes the type, quantity, and function of the interconnecting circuits and the type, form, and content of signals to be interchanged via those circuits. Mechanical details of plugs, sockets, and pin numbers, etc., can be included within the context of the definition. 2. A shared boundary, e.g., the boundary between two subsystems or two devices. 3. A boundary or point common to two or more similar or dissimilar command and control systems, subsystems, or other entities against which or at which necessary information flow takes place. 4. A boundary or point common to two or more systems or other entities across which useful information flow takes place. (It is implied that useful information flow requires the definition of the interconnection of the systems which enables them to interoperate.) 5. The process of interrelating two or more dissimilar circuits or systems 6. The point of interconnection between user terminal equipment and commercial communication-service facilities.

3.2.35 Interoperability. The ability of systems, units, or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together.

3.2.36 Kernel. For a vector quantized image file, a rectangular group of pixels used in the organization of quantizing image data.

3.2.37 Look-Up Table (LUT). A collection of values used for translating image samples from one value to another. The current sample value is used as an index into the look-up table(s); therefore, the number of entries in each look-up table for a binary image would contain two entries, and each look-up table for an 8-bit image would contain 256 entries. Multiple look-up tables allow for the translation of a 1-vector pixel value to an n-vector pixel value.

3.2.38 Magnification. The multiplication factor which causes an apparent change in linear distance between two points in an image. Thus a magnification of 2 is a change which doubles the apparent distance between two points (multiplying area by 4), while a magnification of 0.5 is a change which halves the apparent distance.

3.2.39 Military Grid Referencing System (MGRS). A means of expressing Universal Transverse Mercator (UTM) or Universal Polar Stereographic (UPS). coordinates as a character string, with the 100-kilometer components replaced by special letters (which depend on the UTM or UPS zone and ellipsoid).

3.2.40 Network. 1. An interconnection of three or more communicating entities and (usually) one or more nodes. 2. A combination of passive or active electronic components that serves a given purpose.

3.2.41 Non-blank. Non-blank indicates that the field cannot be filled by the character space (0x20) but may contain the character space when included with other characters. (embedded blanks)

3.2.42 Null. The field is filled entirely with spaces (0x20).

3.2.43 Pack Capable System. A system which is capable of generating a NITF file.

3.2.44 Pad Pixel. A pixel with sample values that have no significant meaning to the image. Pad pixels are used with block images when either the number of pixel rows in an image is not an integer multiple of the desired number of vertical image blocks, or when the number of pixel columns in an image is not an integer multiple of the desired number of horizontal image blocks. In all cases, the sample values for pad pixels will not appear within the bounds of significant sample values for pixels which comprise the original image.

3.2.45 Pad Pixel Mask. A data structure which identifies recorded/transmitted image blocks which contain pad pixels. The pad pixel mask allows applications to identify image blocks which require special interpretation due to pad pixel content.

3.2.46 Parity. In binary-coded systems, the oddness or evenness of the number of ones in a finite binary stream. It is often used as a simple error-detection check and will detect (but not correct) the occurrences of any single bit error in the field.

3.2.47 Pixel. A pixel is represented by an n-vector of sample values, where n corresponds to the number of bands comprising the image.

3.2.48 Primary Imagery. Unexploited, original imagery data that has been derived directly from a sensor. Elementary processing may have been applied at the sensor, and the data stream may include auxiliary data.

3.2.49 Processed Imagery. Imagery that has been formatted into image pixel format, enhanced to remove detected anomalies, and converted to a format appropriate for subsequent disposition.

3.2.50 Protocol. 1. [In general], A set of semantic and syntactic rules that determines the behavior of functional units in achieving communication. For example, a data link protocol is the specification of methods whereby data communication over a data link is performed in terms of the particular transmission mode, control procedures, and recovery procedures. 2. In layered communication system architecture, a formal set of procedures that are adopted to facilitate functional interoperation within the layered hierarchy. Note: Protocols may govern portions of a network, types of service, or administrative procedures.

3.2.51 Pseudocolor. A user-defined mapping of N bits into arbitrary colors.

3.2.52 Reconstruction. For a vector quantized image file, the process of transforming an image from a quantized form into a displayable and exploitable form.

3.2.53 Registered Extension (RE). Those tagged record extensions for which the extension type identifier (six character RETAG field) and the user-defined data (REDATA field) structure is registered with the NTB. The user-defined data (REDATA field) structure is not controlled by the NTB.

3.2.54 Reserved Extension Segment (RES). A type of extension segment with sub-header and data fields structured similarly to the standard data types in the NITF (e.g. image, label, symbol, text). The extension type identifier (25 character RESTAG field), the version (two character RESVER field), and the full underlying structure is under configuration management control as registered with the NTB. The RES construct provides the same mechanism as the DES construct for adding a variety of new data types for inclusion in NITF files. However, the RES is reserved for data types that need to be placed at or near the end of the file. For example, a digital signature that covered the whole file could be defined for placement in a RES to verify the bit level integrity of the NITF file.

3.2.55 Required. A NITF header or subheader field that must be present and filled with valid data.

3.2.56 Resolution. 1. The minimum difference between two discrete values that can be distinguished by a measuring device. 2. The degree of precision to which a quantity can be measured or determined. 3. A measurement of the smallest detail that can be distinguished by a sensor system under specific conditions. Note: High resolution does not necessarily imply high accuracy.

3.2.57 Sample. The atomic element of an image pixel having a discrete value. One sample from the same location in each band comprising an image will combine to form a pixel.

3.2.58 Secondary Imagery. Secondary Imagery is digital imagery and/or digital imagery products derived from primary imagery or from the further processing of secondary imagery.

3.2.59 Secondary Imagery Dissemination (SID). The process of dispersing or distributing digital secondary imagery.

3.2.60 Secondary Imagery Dissemination System (SIDS). The equipment and procedures used in secondary imagery dissemination.

3.2.61. Segment. A header and data fields.

3.2.62. Tagged Record Extension (TRE). A set of fields to support user defined data.

3.2.63 Text. Information conveyed as characters.

3.2.64 Tile. Synonymous with Block

3.2.65 Universal Multiple Octet Coded Character Set (UCS). The Universal Multiple Octet Coded Character Set is used for expressing text that must be human readable, potentially in any language of the world. It is defined in ISO/IEC 10646-1.

3.2.66 Universal Polar Stereographic (UPS). A pair of grids, one used north of 84^o north and one used south of 80^o south. Each grid is based on the polar stereographic projection. The actual grid depends on the choice of the geodetic datum.

3.2.67 Universal Transverse Mercator (UTM). A system of grids for global use between latitudes 84 degrees North and 80 degrees South. The range of longitudes 180 degrees West to 180 degrees East is divided into 60 zones, each of which is a grid based on the Transverse Mercator projection. (Within each zone, there is a difference in coordinate systems either side of the Equator. On the northern side, northings start from zero at the Equator; on the southern side, northings are positive rising to 10 million at the Equator.) The actual grid depends on the choice of geodetic datum as well as the zone.

3.2.68 Unpack Capable System. A system which is capable of receiving/processing a NITF file.

3.2.69 Vector Quantization (VQ). A compression technique in which many groups of pixels in an image are replaced by a smaller number of image codes. A clustering technique is used to develop a code book of "best fit" pixel groups to be represented by the codes. Compression is achieved because the image codes can be recorded using fewer bits than the original groups of pixels they represent.

3.2.70 vsize. For a vector quantized image file, the size of the kernel in pixels.

3.2.71 v x h kernel. For a vector quantized image file, a rectangular group of pixels (kernels) with v-rows and h-columns.

4. GENERAL REQUIREMENTS

4.1 Background. The DOD and the IC use many types of systems for the reception, transmission, storage, and processing of images, graphics, text, and other associated data. Without special efforts, the file format used in systems of one service or agency are likely to be incompatible with the format of another system. Since each system may use a unique, internal data representation, a common format for exchange of information across systems is needed for interoperability of systems within and among DOD and IC organizations. As the need for imagery-related systems grows, their diversity is anticipated to increase. The need to exchange data is also anticipated to increase, even though systems of each organization must retain their own individual characteristics and capabilities. This document defines the NITF, the standard file format for imagery and imagery-related products to be used by the DOD and IC. The NITF provides a common basis for storage and interchange of images and associated data among existing and future systems. The NITF can be used to support interoperability by providing a data format for shared access applications, while also serving as a standard file format for dissemination of images, graphics, text, and associated data.

4.2. NITF operations concept. The NITF shall be used as an interoperability format for transmission and storage of electronic imagery within and among DOD and IC organizations. The NITF has direct application to the dissemination of imagery to requesters of imagery derived intelligence. Multimedia intelligence reports will be composed and packaged into a single file which answers the Essential Elements of Information (EEI) of a particular requester. Intelligence reports may be composed of textual reports along with images, annotated images, graphics, and maps. Intelligence reports are generated after an interpreter exploits primary images or further exploits secondary images pulled out of an archive. The NITF is suitable for archiving imagery required to support the collection process in the reconnaissance cycle. Figure 1 illustrates the elements used in the exploitation process of the reconnaissance cycle.

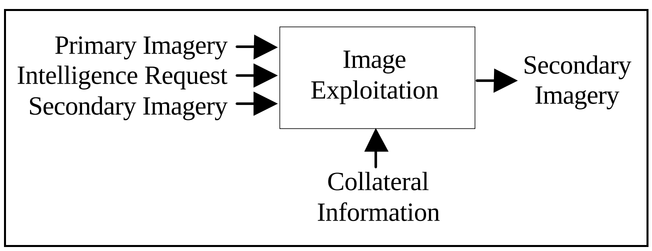


FIGURE 1. NITF operational concept.

In the NITF concept, imagery data interchange between systems is organized in files and is enabled by a potential cross-translation process. When systems use other than NITF as an internal imagery format, each system will have to translate between the system's internal representation for files, and the NITF file format. A system from which imagery data is to be transferred is envisioned to have a translation module that accepts information, structured according to the system's internal representation for images, graphics, text, and other associated data, and assembles this information into one file in the standard NITF file format. Then the file will be exchanged with one or more recipients. The receiving systems will reformat the file, converting it into one or more files structured as required by the internal representation of the receiving station. The functional architecture of this cross-translation process is shown on figure 2. In the diagram, the terms "Native$_1$ File Format" and "Native$_2$ File Format" refer to files represented in a way potentially unique to the sending or receiving system. Using the NITF, each system must be compliant with only one external file format that will be used for interchange with all other participating systems. The standard format allows a system to send data to several other systems since each receiving system converts the file into its own native file format. Each receiving system can translate selectively and permanently store only those portions of data in the received file that are of interest. This allows a system to transmit all of its data in one file, even though some of the receiving systems may be unable to process certain elements of the data usefully. NITF can also serve as the internal native file format so any translation would be eliminated.

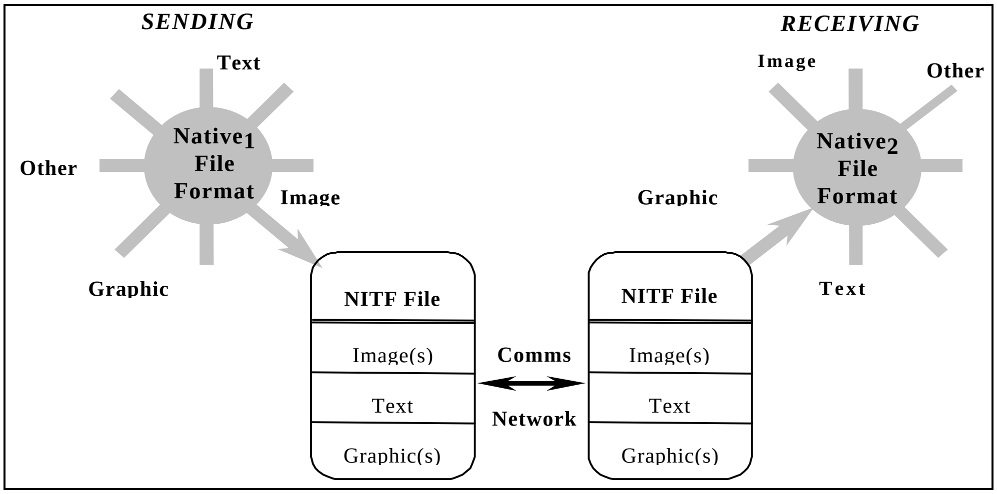


FIGURE 2. NITF functional architecture.

4.3 NITF design objectives. The design objectives of the NITF are as follows:

a. To provide a means whereby diverse systems can share imagery and associated data.

b. To allow a system to send comprehensive information within one file to users with diverse needs or capabilities, allowing each user to select only those portions of data that correspond to their needs and capabilities.

c. To minimize the cost and schedule required to achieve such capability.

4.4 NITF general requirements. The NITF is specified to satisfy several general requirements in response to the role it plays in the NITF functional architecture. These requirements are:

a. To be comprehensive in the kinds of data permitted in the file within the image-related objectives of the format, including geo-located imagery or image related products.

b. To be implementable across a wide range of computer systems without reduction of available features.

c. To provide extensibility to accommodate data types and functional requirements not foreseen.

d. To provide useful capability with limited formatting overhead.

4.5 NITF characteristics. To serve a varied group of users exchanging multiple types of imagery and associated data who are using differing hardware and software systems, the NITF strives to possess the following characteristics:

a. Completeness - allows exchange of all needed imagery and associated data.

b. Simplicity - requires minimal preprocessing and post processing of transmitted data.

c. Minimal overhead - minimized formatting overhead, particularly for those users transmitting only a small amount of data and for bandwidth-limited users.

d. Universality - provides universal features and functions without requiring commonality of hardware or software.

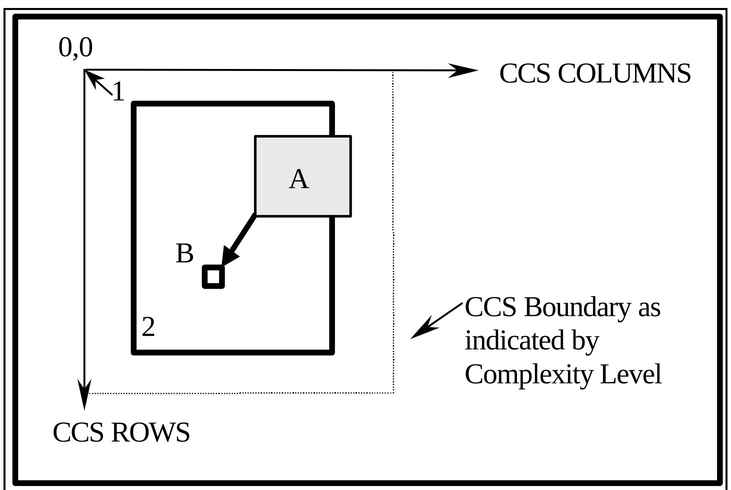
4.6 NITF file structure. The NITF file consists of the NITF file header and one or more segment(s). A segment consists of a subheader and data fields as shown in figure 3.

<table>
<tr><td colspan="7">NITF File</td></tr>
<tr><td rowspan="2">NITF
File Header</td><td colspan="2">Segment</td><td colspan="2">. . .</td><td colspan="2">Segment</td></tr>
<tr><td>Sub-
Header</td><td>Data
Field</td><td>. . .</td><td>. . .</td><td>Sub-
Header</td><td>Data
Field</td></tr>
</table>

FIGURE 3. NITF file structure.

4.7 Common coordinate system (CCS). The Common Coordinate System (CCS) is the virtual two dimensional Cartesian-like coordinate space which shall be common for determining the placement and orientation of displayable data within a specific NITF file and among correlated NITF files which comprise an integrated product.

4.7.1 CCS structure. The virtual CCS structure can be conceived of as a two dimensional drawing space with a coordinate system similar in structure to the lower right quadrant of the Cartesian coordinate system. The CCS has two perpendicular coordinate axes, the horizontal column axis and the vertical row axis as depicted in figure 4. The positive directions of the axes are based on the predominate scan (column) and line (row) directions used by the digital imagery community. The intersection of the axes is designated as the origin point with the coordinates (0, 0). Given the orientation of the axes in figure 4, the positive direction for the column axis is from (0, 0) and to the right; the positive direction for the row axis is from (0, 0) downward. The quadrant represented by the positive column and positive row axes is the only coordinate space in which NITF displayable data may be located.



1. Common Coordinate System Origin (0,0 - 2047,2047)
2. Image
A. Inset Image
B. Inset Graphic (Box & Arrow)

FIGURE 4. Common Coordinate System (CCS) example.

4.7.2 Row and column coordinates. Displayable data shall be placed in the CCS according to the row and column coordinates placed in subheader location fields (for example, Image Location (ILOC), Graphic Location (SLOC)). The location coordinates of a specific "data item" (as shown in figure 4.) represent row and column

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offsets from either the CCS origin point (when 'unattached'), or the location point in the CCS of the "data item" to which the item is attached. Other means used to locate displayable data shall be directly correlated to row and column coordinates. (For example, displayable tagged extension data might have geo-location data correlated with row and column indices.) When location coordinates are relative to the CCS origin, they shall always have a positive value. When location coordinates are relative to the location coordinates of an "item" to which they are attached, both positive and negative offset values are possible. In all cases, the location coordinates selected for any "data item" shall ensure that none of the displayable item extends outside of the quadrant defined by the axes of the CCS.

4.7.3 Complexity Level (CLEVEL) constraints. The upper and left boundaries of the CCS are explicitly constrained in the specification. When CLEVEL constraints are specified, one of the key attributes for specification shall be to identify the lower and right boundary drawing space constraints for a given CLEVEL. CLEVEL constraints are defined in appendix E and NIMA-N0105-98.

5. DETAILED REQUIREMENTS

5.1 Format description.

5.1.1 Header, segments, and fields. The format contains a file header and segments. A segment contains a subheader~~,~~ and data fields. The NITF file header and subheader fields are byte aligned. A file header carries information about the identification, classification, structure, content, size of the file as a whole, and the number and size of the major segments within the file. For each type of data segment, as shown in figure 5, supported by the format, there is an associated subheader and data fields. A subheader contains information that describes characteristics of data fields that contain the actual data.

5.1.2 Extension segments, conditional fields. Flexibility to add support for the data and data characteristics not explicitly defined in this standard is provided within the format. This is accomplished by providing for conditional fields in the file header and in each subheader indicating the presence of Tagged Record Extensions (TREs) and providing for a group of Data Extension Segments (DES). The TREs in the headers/subheaders may contain additional characteristics about the corresponding data segment, while the extension segments are intended primarily to provide a vehicle for adding support for new kinds of data. The identifier (tag name) for the TREs, and extension segment identifiers, will be coordinated centrally to avoid conflicting use. A current listing of the TREs that have been registered with NIMA is provided in the Tag Registry maintained by the Joint Interoperability Test Command (JITC). All NITF implementations should handle the receipt of unknown extensions by at least recognizing that they are unknown extension types and ignoring them. This can be accomplished using the byte count, extension identifier, and data length field. Using these length offsets, the unknown extension can be ignored and the user can be informed that extension data has been skipped.

5.1.3 Supported data types. A single NITF file may comprise different types of segments. A segment containing information of a standard data type is called a standard data segment. The organization of the different types of segments is described below and in figure 5.

5.1.3.1 Image Segments (IS). An Image Segment (IS) supports the standard image type of data.

5.1.3.2 Graphic Segments (GS). A Graphic Segment (GS) supports the standard graphic type of data.

5.1.3.3 Reserved Segments (RS). The Reserved Segments (RS) are place holders to support a future standard type of data, that has yet to be defined.

5.1.3.4 Text Segments (TS). A Text Segment (TS) supports the standard text type of data.

5.1.3.5 Data Extension Segments (DES). A DES allows for the addition of different data types with each type encapsulated in its own DES.

5.1.3.6 Reserved Extension Segments (RES). A Reserved Extension Segment (RES) is a non-standard data segment which is user-defined. A NITF file can support different user-defined types of segments called RES.

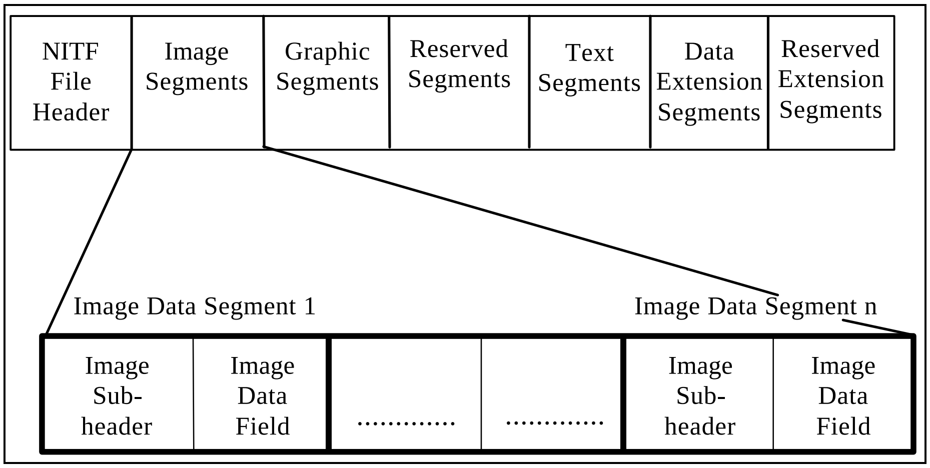

FIGURE 5. NITF file structure.

5.1.4 Application guidance. The NITF file supports inclusion of standard data segments of information in a single file: image, graphic, and text. It is possible to include zero, one, or multiples of each standard data segment in a single file (for example: several images, but no graphics). Standard data segments shall be placed in the file in the following order: all ISs, followed by all GSs, followed by all TSs.

5.1.5 Standard data segment subheaders. Each individual~~,~~ standard data segment included in a NITF file, such as an IS or a GS, shall be preceded by a subheader corresponding to that data segment. This subheader shall contain details of that particular data segment. If no segments of a given type are included in the file, a subheader for that information type shall not be included in the file. All segments and associated subheaders of a single type shall precede the first segment for the next data type. The ordering of multiple segments of one type is arbitrary. A diagram of the overall NITF file structure is shown in figure 5.

5.1.6 Header/subheader field specification. The specification of the fields in the various headers/subheaders found within a NITF file is provided in a series of tables in appendix A. Each table includes a mnemonic identifier for each FIELD within a header/subheader, the field's NAME, a description of the valid contents of the field, and constraints on the field's use, the field SIZE, the VALUE RANGE it may contain, and an indication of its TYPE (paragraph 5.1.8). The NITF file header fields are specified in table A-1. The standard data type segment subheader fields are specified in tables A-3, A-5, and A-6. The TRE subheaders (paragraph 5.8.1) are defined in table A-7. Finally, the DES subheader fields (paragraph 5.8.2) and RES subheader fields (paragraph 5.8.4) are defined in tables A-8, A-8(A), A-8(B)~~,~~ and A-9. Except for where specifically stated, the data that appears in all header/subheader fields specified in the tables, including numbers, shall be represented using the printable Basic Character Set (BCS) (defined in appendix B, table B-1) with eight bits (one byte) per character. Representing numbers in character form avoids many of the problems associated with differences in word length and internal representation among different machines. Representing the header and subheader fields in BCS also makes them more easily read by humans. All field size specifications given for the header and subheader fields specify a number of bytes. Fields that may contain any printable BCS characters (including punctuation marks) are indicated as “BCS-Alphanumeric (BCS-A)” in the VALUE RANGE specification.

5.1.7 Field structure and default values. The NITF uses character counts to delimit header fields, as opposed to special end-of-field characters or codes or direct addressing. These counts are provided in the tables detailing the NITF header and subheader field specifications. NITF uses the BCS code represented in ISO/IEC 646. The BCS codes shall be seven bits, a_1 to a_7 with an eighth bit added. The eighth bit a_8, shall be set to zero (0). The a_8 bit shall be the Most Significant Bit (MSB) and a_1 shall be the Least Significant Bit (LSB). It is intended to provide for simple communications among NITF stations. The NITF BCS format is comprised of the following BCS characters (all numbers are decimal): Line Feed (10), Form Feed (12), Carriage Return (13), and space (32) to Tilde (126). All data in fields designated “BCS-A” shall be left justified and padded to the right boundary with BCS spaces. UT1 is UTF-1, UCS Transformation Format 1, 1-Octet Coded UCS Characters, Basic Latin and Latin Supplement 1, as described in ISO 4873. All data in numeric fields (BCS-Numeric (BCS-N) and BCS-N integer) shall be right justified and padded to the left boundary with leading zeros. The standard default value shall be spaces for alphanumeric fields and zero for numeric fields. For a few fields, a specific default may be indicated in the field description. In this case, the field description shall take precedence. All header and subheader fields contained in a NITF file shall contain either meaningful data (that is, data in accordance with the restrictions specified for the contents of the field in this document) or the specified default value.

5.1.8 Field types. The NITF file header and various subheaders have two types of fields: required and conditional. A required field shall be present and shall contain valid data or the specified default value. A conditional field may or may not be present depending on the value of one or more preceding (required) fields. If a conditional field is present, it shall contain valid data. When a field is conditional, its description identifies what conditions and which preceding field or fields are used to determine whether or not to include it in the file. For example, in the NITF header, if the Number of Image Segments (NUMI) field contains the value of 2, the Length of the 1st Image Subheader (LISH1), Length of the 1st Image Segment (LI1), Length of the 2nd Image Subheader (LISH2), and Length of the 2nd Image Segment (LI2) fields will be present and must be filled with valid data. However, if the NUMI field contains a BCS zero (0x30), the subheader length and image length fields are omitted.

5.1.9 Logical recording formats.

5.1.9.1 Bit and byte order.

a. The method of recording numeric data on interchange media shall adhere to the “big endian” convention. In big endian format, the most significant byte in each numeric field shall be recorded and read first, and successive byte recorded and read in order of decreasing significance. That is, if an n-byte field F is stored in memory beginning at address A, then the most significant byte of F shall be stored at A, the next at A+1, and so on. The least significant byte shall be stored at address A+n-1.

b. BCS character strings shall be recorded in the order in which the data is generated.

c. The most significant bit in each byte of every field, regardless of data type, shall be recorded and read first, and successive bits shall be recorded and read in order of decreasing significance.

d. Pixel arrays shall be recorded in the order specified in the Image Mode (IMODE) field and as discussed in paragraph 5.4.3.3. Pixel arrays shall be recorded from left to right starting at the top, and non-interlaced raster scanning downward. The top left pixel shall be recorded first, and the bottom right pixel shall be recorded last.

5.1.9.2. Row column relationship. NITF imagery is displayed by mapping each image pixel to a specific row “r” and column “c” within the bottom right quadrant shown on figure 6. Rows are represented on the vertical (y-axis) and columns are represented on the horizontal (x-axis). Moving from location 0,0 down and to the right is considered moving in a positive direction. If the first pixel of an image is placed at r0,c0, it would be followed by pixels r0,c1; r0,c2 and so on until the end of the row. The first pixel of the second row of image pixels would be located at r1,c0.

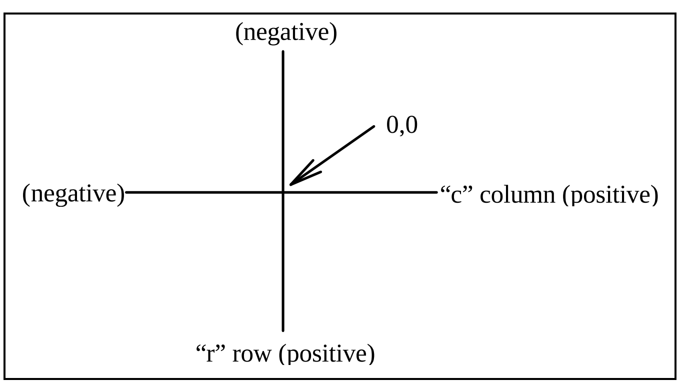

FIGURE 6. Row column relationship.

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5.2 The NITF file header. Each NITF file shall begin with, the file header, whose fields contain identification and origination information, file-level security information, and the number and size of segments of each type, such as IS(s), GS(s), and TS(s), contained in the file. Figure 7 depicts the NITF file header. It depicts the types of information contained in the header and shows the header's organization as a sequence of groups of related fields. The expansion of the "Image Group" illustrates how the header's overall length and content may expand or contract depending on the number of data segments of each type included in the file. The NITF header is detailed in table A-1.

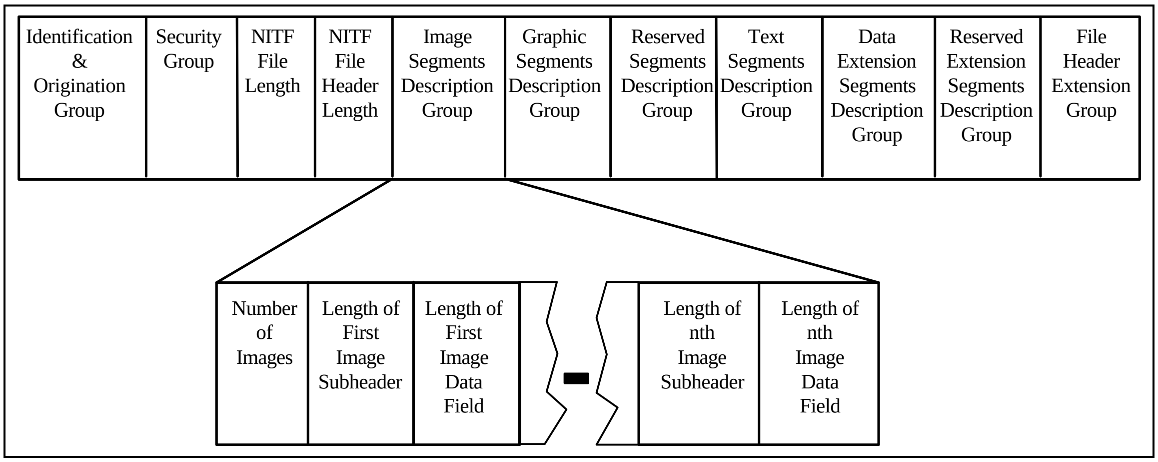


FIGURE 7. NITF file header structure.

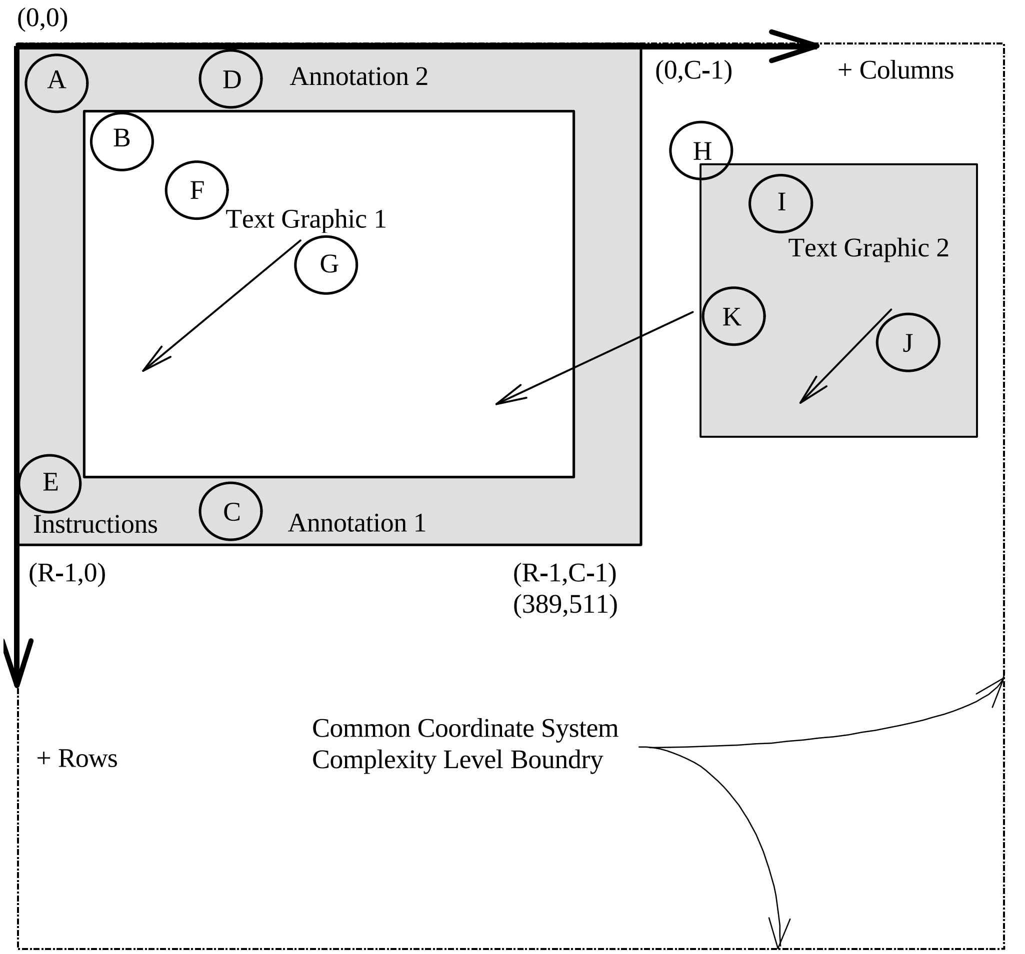
5.2.1 Incomplete NITF file header. The Streaming File Header (STREAMING_FILE_HEADER) DES is intended for use only when time critical or storage constrained operations need to begin to create or transfer a NITF file before all the NITF file header fields can be populated. To enable a receiving system to recognize an intentionally incomplete NITF file header, where data for length fields (NITF File Header Length (HL) to Length of nth Data Extension Segment (LDn) fields) are not yet available, these fields are completely populated with the numeric character 9 (0x39). A capable system receiving an NITF file, where the NITF file header is identified as intentionally incomplete, shall locate the STREAMING_FILE_HEADER DES and interpret the values in its fields as though they were located within the NITF file header. Where possible, systems capable of unpacking the STREAMING_FILE_HEADER DES should store the NITF file with a complete NITF file header by populating the fields filled with the numeric character 9 (0x39) with their corresponding values from the STREAMING_FILE_HEADER DES. This facilitates modification of the NITF file and enables successful re-transmission of the NITF file to systems that are not STREAMING_FILE_HEADER DES capable.

5.3 NITF product and overlay concept. The following subsections describe the non-destructive nature of NITF and the relationships anticipated to exist among the segments in a NITF file and how these relationships are represented in the file. An image product may conceivably consist of a correlated set of multiple NITF files; a single NITF file with multiple images, each with their own overlays and associated data; a NITF file with no image; and/or a single NITF file with a single image and its overlays and associated data. To facilitate description of the NITF overlay concept, only the latter case will be addressed in the context of this subsection. See paragraph 6.2 for applying the overlay concept to the other two cases.

5.3.1 Image overlay relationships. Each single file image product is comprised of one or more NITF standard data segments plus associated data. The association and portrayal of displayable segments is accomplished through the use of location indices, Display Levels (DLVLs), and Attachment Levels (ALVLs). The placement of displayable data segments in the CCS (paragraph 4.7) is recorded in the location field of the segment's subheader. The relative visibility, when displayed, of the various displayable segments in the file is recorded in the file by use of the display level (the "DLVL" field in the standard information type subheaders, specifically IDLVL for images and SDLVL for graphics). Groupings of related segments may be formed by use of the attachment level (the "ALVL" field in the standard information type subheaders, specifically IALVL for images and SALVL for graphics). For example, when a base IS is present, it may form the basis for using the other data contained in the product. Images other than the base image may be associated with the base image via the use of the ILOC, IDLVL, and IALVL fields of their image subheaders. All images and graphics associated with the base image define overlays to the base image in the sense that, when displayed, they will overwrite the underlying portion (if any) of the base image. Images and graphics associated (attached to) with the base image may be positioned such that they are completely on the base image, are partially on the base image, or completely off (adjacent to) the base image.

5.3.2 Overlays and Display Level (DLVL). The order in which images and graphics are "stacked" visually when displayed is determined by their display level (the DLVL field in the standard information type subheaders, specifically IDLVL for images and SDLVL for graphics), not by their relative position within the NITF file. The display level is a positive integer less than 1000. Every IS and GS in a NITF file shall have a unique display level. That is, no two segments may have the same display level. This requirement allows display appearance to be independent of data processing or file sequence order.

5.3.3 Display Level (DLVL) interpretation. The display level determines the display precedence of images and graphics within a NITF file when they are output to a display device. That is, at any pixel location shared by more than one image or graphic, the value displayed there is that determined from the segment with the highest numbered display level. Figure 8 illustrates a sample "output presentation" from a NITF file that illustrates the effects of display level assignment. The DLVL of each segment shown on figure 8 is indicated in the list of items on figure 8. In the case shown, the segment with DLVL one is not an image but rather an opaque CGM rectangle (graphic data, not image data). Because the CGM rectangle is larger than the base image (which, in this case, serves as the first overlay because its display level is two), it provides a border to the image. Following increasing DLVL value, the border is overlaid by Text Graphic 1 which is, in turn, overlaid by arrow one, etc. The ALVL values on figure 8 refer to "Attachment Levels."

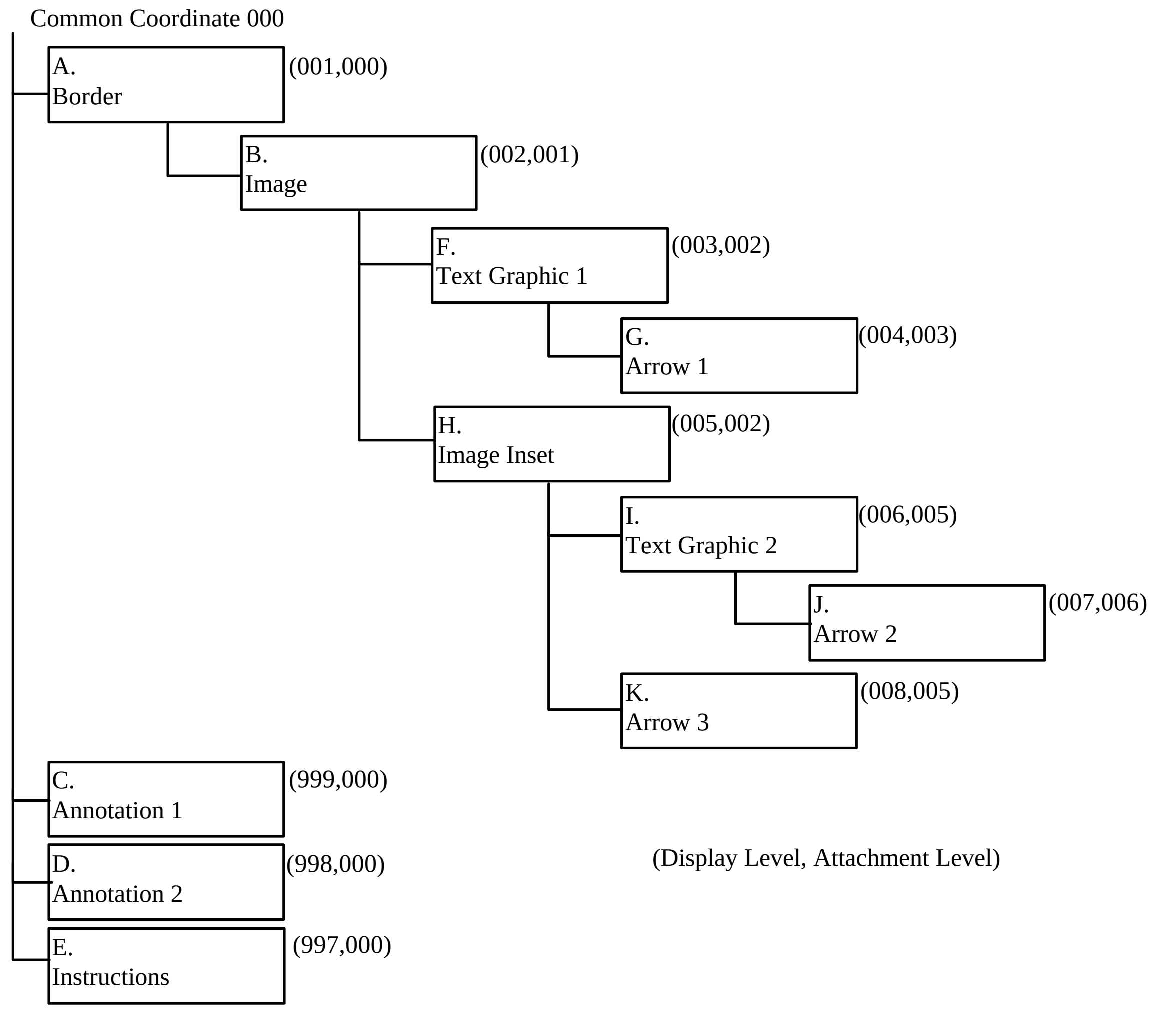


				Location Offsets	
		DLVL	ALVL	Row	Column
A.	Border (Opaque Box)	001	000	00000	00000
B.	Exploited Image	002	001	00025	00025
C.	Annotation 1	999	000	000375	00156
D.	Annotation 2	998	000	00030	00156
E.	Instructions	997	000	00375	00008
F.	Text Graphic 1	003	002	00080	00100
G.	Arrow 1	004	003	00010	00065
H.	Image Inset	005	002	00080	00400
I.	Text Graphic 2	006	005	00025	00032
J.	Arrow 2	007	006	00065	00070
K	Arrow 3	008	005	00070	-00005

FIGURE 8. NITF Display Level (DLVL) illustration.†

† This example uses a CGM rectangle as a border for the NITF composition. This method may be incompatible with some printers. These printers do not allow for transparent pixels in imagery. If a NITF composition uses CGM elements under images with NITF image padding (transparent pixels) the CGM will not be visible in any areas under the pad pixels. (For work arounds see paragraph B.4.11.)

5.3.4 Attachment Level (ALVL). ALVL provides a way to associate displayable segments (images and graphics) with one another so they may be treated together for certain operations such as moving them, rotating them, or displaying them as a group. The attachment level of a displayable segment shall be equal to the display level of the segment to which it is "attached." This value is stored in the "ALVL" field (specifically IALVL for images, SALVL for graphics) of the segment's subheader. An attachment level of zero shall be interpreted as "unattached." The segment having minimum display level shall have attachment level zero and a CCS location (0,0). Any other segment may also have ALVL zero, i.e., unattached. An overlay's display level shall always be numerically greater than its attachment level (that is, an overlay must be attached to something previously displayed or it is unattached). Figure 9 shows the attachment relationships of the overlays in figure 8. A segment with DLVL 1 (DLVL 001)(the minimum DLVL in this example), must have an ALVL of zero. When an overlay or base is edited (moved, deleted, rotated), all overlays attached to it, directly or indirectly, may be affected by the same operation. For example, in figure 9, if the image (DLVL 002, ALVL 001) were moved one centimeter to the left, the Text Graphic 1 (DLVL 003, ALVL 002) with its associated Arrow 1 (DLVL 004, ALVL 003), and the image inset (DLVL 005, ALVL 002) with its associated Arrow 3, (DLVL 008, ALVL 005), and the Text Graphic 2 (DLVL 006, ALVL 005) with its associated Arrow 2 (DLVL 007, ALVL 006) all would also be moved one centimeter to the left. If the Image Inset were deleted, so would be its associated Arrow 3 and Text Graphic 2 with Arrow 2. Although the ALVL provides the means to group or associate display items, the provision of user operations (such as moving, rotating, etc.) to act on or use ALVL information is an implementer’s choice.



A is a parent object with a single child B with 6 offspring, F, G, H, I, J, and K.
B is a parent object with 2 children F and H with 4 offspring, G, I, J, and K.
C is childless
D is childless
E is childless
F is a parent object and has a single child G.
G is childless
H is a parent object and has 2 children I and K
I is a parent object and has a single child J
J is childless
K is childless

FIGURE 9. Attachment Level (ALVL) relationships.

5.4 Image data.

5.4.1 General. For the NITF, the image data encompasses multispectral imagery and images intended to be displayed as monochrome (shades of grey), color-mapped, (pseudocolor), or true color and may include grid or matrix data intended to provide additional geographic or geo-referencing information.

5.4.1.1. Image Representation (IREP). The Image Representation (IREP) field contains a valid indicator for the general kind of image represented by the data. It is an indication of the processing required in order to display an image. Valid representation indicators are MONO for monochrome; RGB for red, green, or blue true color, RGB/LUT for mapped color; MULTI for multiband imagery, NODISPLY for an image not intended for display, NVECTOR and POLAR for vectors with Cartesian and polar coordinates respectively, and VPH for Synthetic Aperture Radar (SAR) Video Phase History. In addition, compressed imagery can have this field set to YCbCr601 when represented in the ITU-R Recommendation BT.601-5 color space using JPEG (if the value of the Image Compression (IC) field is equal to C3 or M3). An image may include multiple data bands and color Look-Up Tables (LUTs), the latter within its header fields. True color images (three band) may be specified to be interpreted using either the Red, Green, Blue (RGB) or the YCbCr601 (Y = Brightness of signal, Cb = Chrominance (blue), Cr = Chrominance (red)) color system. Grids or matrix data may include one, two, or several bands of attribute values intended to provide additional geographic or geo-referenced information. VPH requires SAR processing to produce a displayable image. Vectors with Cartesian coordinates (NVECTOR) and vectors with polar coordinates (POLAR) require appropriate vector calculations to produce a displayable image. The processing required to display each band of the image is indicated in the nth Band Representation (IREPBANDn) field. Table A-2 shows representative IREP examples and some of its associated fields.

5.4.1.2 Image Category (ICAT). The specific category of an IS reveals its intended use or the nature of its collector. Valid categories include VIS for visible imagery, SL for side-looking radar, TI for thermal infrared, FL for forward looking infrared, RD for radar, EO for electro-optical, OP for optical, HR for high resolution radar, HS for hyperspectral, CP for color frame photography, BP for black/white frame photography, SAR for synthetic aperture radar, SARIQ for SAR radio hologram, IR for infrared, MS for multispectral, FP for fingerprints, MRI for magnetic resonance imagery, XRAY for x-rays, CAT for CAT scans, VD for video, BARO for barometric pressure, CURRENT for water current, DEPTH for water depth, and WIND for air wind charts. Valid categories for geographic products or geo-reference support data are MAP for raster maps, PAT for color patch, LEG for legends, DTEM for elevation models, MATR for other types of matrix data, and LOCG for location grids. SAR data may be included as Video Phase History (VPH) (two bands, n^{th} Band Subcategory (ISUBCATn) field contains I and Q (representing Inphase and Quadrature), two component processed complex data (either ISUBCATn contains I and Q representing Inphase and Quadrature, or ISUBCATn contains M and P representing Magnitude and Phase), individual component processed complex data (ISUBCATn contains M or P), or as a monochrome image (ISUBCATn contains BCS spaces (code 0x20)). The possible use of standard Support Data Extension (SDE) to provide geo-referencing data depends on both the intended use of the transmitted image and on its nature as described in table A-2(A). The specific significance of each band in the image is indicated in the ISUBCATn field.

5.4.2 Image model. For the NITF, an image is a two-dimensional rectangular array of pixels indexed by row and column. A pixel is represented by an n-vector of sample values; where n corresponds to the number of bands comprising the image. The i^{th} entry of the pixel (vector) is the pixel value for the i^{th} band sample of the image. Therefore, the i^{th} band of the image is the rectangular array of i^{th} sample values from the pixel vectors. For an image I with R rows and C columns, the coordinates of the image pixel located in the c^{th} column of the r^{th} row shall be denoted by an ordered pair (r,c), $0 \leq r<R, 0 \leq c<C$, where the first number, r, indicates the row and the second number, c, indicates the column in the image array. This notation is standard for addressing arrays and matrices. The pixel located at (r,c) is denoted by I(r,c). For example, a typical 24-bit RGB image is an array of R rows and C columns, where each set of indices (r,c), $0 \leq r<R, 0 \leq c<C$, identifies a pixel I(r,c) consisting of three single byte values (a three-vector) corresponding to the red, green, and blue samples. The image has three bands, each consisting of a R-by-C array of single byte sample values. One band comprises the red, one band comprises the green, and the third band comprises the blue pixel sample values. Specifically, the value at position r,c in the green band, for example, contains the green byte from the pixel I(r,c) three-vector at position r,c in the image.

5.4.2.1 Display of NITF images. When an image with R rows and C columns is displayed, a mapping is accomplished from the stored image pixel value array I to a rectangular array S of physical picture elements, for example a Cathode Ray Tube (CRT) display. This mapping will be called the display mapping. Usually, the resulting display has an identified top, bottom, and left and right side. In a particular application, the display mapping may be defined explicitly. However, lacking this, an image stored in a NITF file shall be interpreted so that pixel I(0,0) is at the upper left corner, and pixel I(R-1,C-1) is at the lower right corner. The r^{th} row of the image array I shall form the r^{th} row of the display, counting from the top, $0 \le r < R$. Within the r^{th} row, the pixels shall appear beginning on the left with I(r,0) and proceeding from left to right with I(r,1), I(r,2), and so on, ending with I(r, C-1). Figure 10 illustrates the display mapping just described. This mapping of pixel values to physical picture elements is typical of non-interleaved raster pattern of picture elements. The relationship of the pixels I(r,c) in the array to up, down, left and right implicit in this diagram is used freely in later descriptions to simplify exposition.

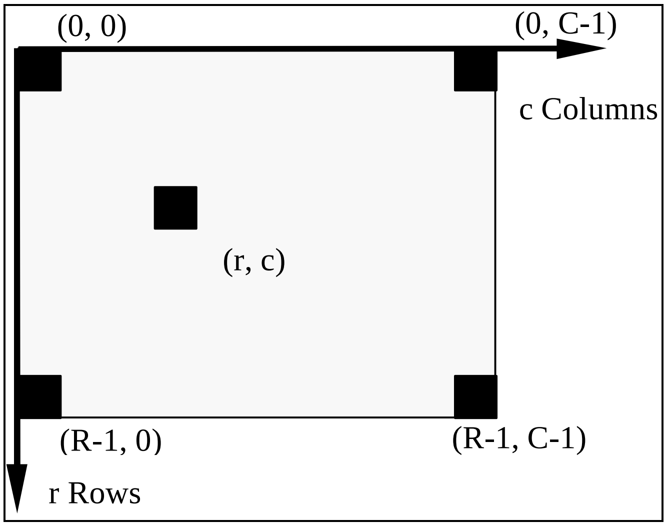


FIGURE 10. Image coordinate representation.

5.4.2.2 Blocked images. The concept of blocked images extends the image model for NITF presented above to support the representation of an image in terms of an orderly set of subimages (or subarrays) called blocks For large images (e.g., those having more horizontal and vertical pixel values than typical display devices), the performance of an imagery implementation can be potentially improved by "blocking" the image; that is, ordering the pixel values in the NITF file as a series of concatenated pixel arrays.

a. The idea behind a blocked image is analogous to a rectangular tiled floor. Regard the overall floor cover as the image and each individual tile as a block. To make this more precise, let I be an image of R rows and C columns, and let the Number of Pixels Per Block Horizontal (NPPBH), (that is, the number of columns of each block) and the Number of Pixels Per Block Vertical (NPPBV), (that is, the number of rows in each block) be positive integers that satisfy NPPBH$\le$C and NPPBV$\le$R. If R is an integer multiple of NPPBV and C is an integer multiple of NPPBH, then I may be viewed as an array B of sub arrays each having NPPBV rows and NPPBH columns. These sub arrays $B_{r,c}$ are called blocks. The block $B_{r,c}$ is in the r^{th} row of blocks and the c^{th} column of blocks. The number of columns of blocks (Number of Blocks Per Row (NBPR)) is the integer C/NPPBH, and the number of rows of blocks (Number of Blocks Per Column, (NBPC)) is the integer R/NPPBV.

b. For recording purposes, the image blocks are ordered and indexed sequentially by rows, i.e. B(1,1) ... B(1,NBPR); B(2,1) ... B(2,NBPR); B(NBPC,1) ... B(NBPC,NBPR). The relation of image blocks to image rows and columns is depicted on figure 11 using the NITF display convention described in paragraph 5.4.2.1. Although the pixel values are placed in the file as a series of arrays (blocks), the coordinate used to reference any specific pixel remains the same as if the image were not blocked. For example, if R=C=2048 and NPPBV=NPPBH=1024, there will be four blocks in the image I. The second pixel value in B(1,2) has the coordinate I (0,1025) vice the internal index (0,1) of the subarray.

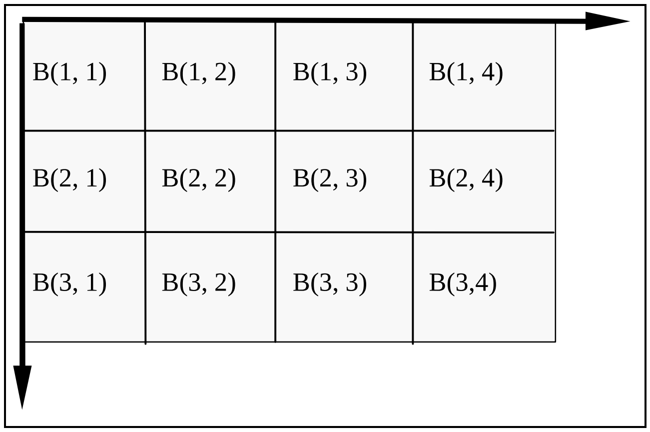


FIGURE 11. A blocked image.

c. If the number of rows in an image is not initially an integer multiple of NPPBV, or if the number of columns is not an integer multiple of NPPBH, an application that creates the blocked image construct in NITF shall "pad" the image to an appropriate number of rows and columns so the divisibility condition is met by adding rows to the bottom and/or columns to the right side of the image, as viewed. The result is that a blocked image may have a block(s) (subarray(s)) comprised of pixel values from the original image, and "pad" pixels inserted to meet block boundary conditions (figure 12). If R (the number of rows in an image) is not initially an integer multiple of NPPBV, then NBPC is the integer [R/NPPBV] + 1; if C (the number of columns in an image) is not initially an integer multiple of NPPBH, then NBPR is the integer [C/NPPBH] + 1 ([r]: = largest integer ≤ r).

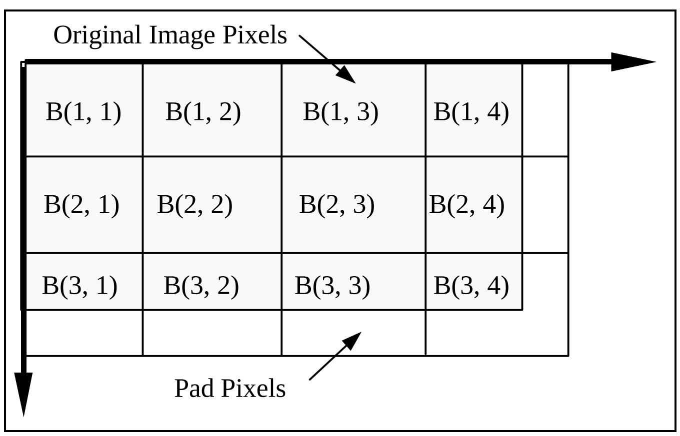


FIGURE 12. A blocked, padded image.

5.4.2.3 Blocked image masking. In some instances, a blocked image may have a considerable number of empty blocks (blocks without meaningful pixel values). This might occur when a rectangular image is not north aligned when scanned or otherwise sampled, but has been rotated to a north up orientation (figure 13) resulting in the need to insert "pad" pixels to maintain the rectangular raster pattern of the pixel array. In this case, it is sometimes useful to not record or transmit empty blocks within a NITF file. However, if empty blocks are not recorded/transmitted, the image loses its logical structure as an image with n x m blocks. In order to retain logical structure, and to allow the exclusion of empty blocks, an image data mask table (table A-3(A), Block n, Band m Offset (BMRnBNDm) field) identifies the location of non-empty blocks so that the using application can reconstruct the image correctly. In figure 13, the recording order would be B(1,1); B(1,2); B(1,3); B(2,1); B(2,2); B(2,3); B(2,4); B(3,1); B(3,2); B(3,3); B(3,4); B(4,2); B(4,3); B(4,4). Blocks B(1,4) and B(4,1) would not be recorded in the file. The blocked image mask would identify the locations of the recorded image blocks. If the image is band sequential (IMODE=S), there will be multiple blocked image masks (one for each image band), with each mask containing Number of Blocks Per Row (NBPR) x Number of Blocks Per Column (NBPC) records. Blocked image masks can be used in conjunction with a pad pixel mask (table A-3(A), Pad Pixel n, Band m (TMRnBNDm) field), as described below. A blocked image mask may also be used to provide an index for random access within the blocked image data for large images even if all blocks are recorded in the file.

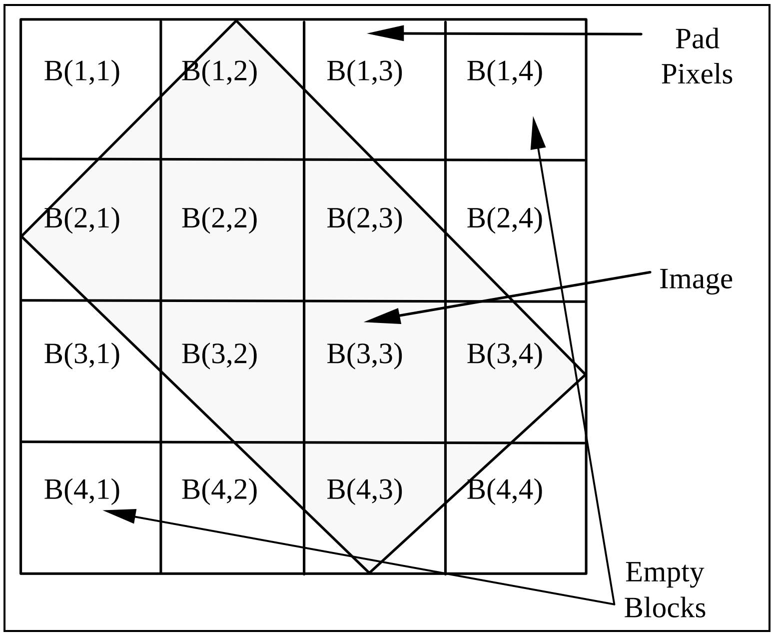


FIGURE 13. A blocked, padded image with empty blocks.

5.4.2.4 Pad pixel masking. In addition to empty image blocks, figure 13 also demonstrates that a significant number of pad pixels may be needed to "fill" an image to the nearest block boundary.

a. In the example in figure 12, the locations of B(1,1); B(1,2); B(1,3); B(2,1); B(2,3); B(2,4); B(3,1); B(3,2); B(3,4); B(4,2); B(4,3); and B(4,4) would be recorded indicating that those blocks have pad pixels. B(1,4); B(2,2); B(3,3), and B(4,1) do not have pad pixels because B(1,4) and B(4,1) are empty and B(2,2) and B(3,3) are full image blocks.

b. If the image is band sequential (IMODE=S), there will be pixel masks that will be arranged in the same order as the image bands, with each mask containing NBPR x NBPC records.

c. The output pixel code which represents pad pixels is identified within the image data mask by the Pad Output Pixel Code (TPXCD) field. The length in bits of this code is identified in the Pad Output Pixel Code Length (TPXCDLNTH) field. Although this length is given in bits, the actual TPXCD value is stored in an integral number of bytes. When the number of bits used by the code is less than the number available in the TPXCD field (for example, a 12 bit code stored in two bytes), then the code will be justified in accordance with the Pixel Justification (PJUST) field in the Image Subheader.

d. When an application identifies pad pixel values, it may replace them with a user defined value (for example, a light blue background) at the time of presentation except when the value of TPXCD is zero (0x00). When the TPXCD value is zero (0x00), the pad pixel will be treated as “Transparent” for presentation. The application may choose to ignore pad pixels in histogram generation. In any case, pad pixels are not valid data, and should not be used for interpretation or exploitation. Consequently, the value used for pad pixels shall not appear within the bounds of significant pixels of the image.

5.4.3 NITF image information. In the NITF, the information describing an image is represented in a series of adjacent fields grouped into the image subheader followed by the image data. The field containing the image data shall follow immediately the last field of the corresponding image subheader with no intervening special characters to designate the beginning of the image. Similarly, the image subheader of the first image shall follow immediately the last byte of data of the last field in the NITF file header, and the image subheader of successive images shall follow immediately the last byte of the image of the preceding image.

5.4.3.1 Image subheader. The data in the image subheader fields are BCS character data (except for LUTs). They provide information about the image source, its identification, and characteristics needed to display and interpret it properly. The image subheader field definitions are detailed in table A-3.

5.4.3.2 Image data mask. The image data mask table is a conditional data structure included in the image data stream for masked images when so indicated by the IC field value (IC values NM, M1, M3, M4 and M5). The image data mask table is not recorded for non-masked images (IC values NC, C1, C3, C4, C5, and I1). The image data field of a masked image is identical to that of non-masked images except for the following: the first byte of the image data is offset from the beginning of the image data field by the length of the image data mask table(s); and empty image blocks are not recorded/transmitted in the image data area. If the image is band sequential (IMODE=S), there will be multiple blocked image and/or pad pixel masks (one for each band). All blocked image masks will be recorded first, followed by all pad pixel masks. Since the image data mask tables are in the image data area, the data recorded/transmitted there are binary. The structure of the image data mask table is defined in detail in table A-3(A).

5.4.3.3 Image data format. Image data may be stored in a NITF file in either uncompressed or compressed form.

5.4.3.3.1 Uncompressed image data format. The order in which pixel values of a single band image are stored is fixed. When an image has more than one band, several options are available for the order in which pixel values are stored. The option used is indicated by the IMODE field in the image subheader. The following subparagraphs describe the possibilities within this format. In describing the encoding of image data, the NITF display convention is invoked freely for ease of expression. Let the image to be encoded be denoted by I, and assume I has R rows and C columns. Let I have n bands; that is, each pixel is an n-vector, the i^{th} value of which is the value for that pixel location of the i^{th} band of the image. Let N denote the number of bits-per-pixel-per-band. Thus, there are n*N bits-per-pixel. Let I be blocked with H blocks per row and V blocks per column. Note that special cases such as single band images and single blocked images are included in this general image by setting n=1, and H=V=1, respectively.

5.4.3.3.1.1 Single band image uncompressed data format. For single band images, n=1, and there is only one order for storing pixels. The field IMODE in the image subheader shall be set to B for this case. The blocks (one or more) shall be stored, one after the other starting with the upper left block and proceeding first left to right across rows of blocks, one row of blocks after the other, top to bottom. Image data within each block shall be encoded as one continuous bit stream, one pixel value after another, beginning with the N bits of the upper left corner pixel, I(0,0), followed by the N bits of I(0,1) and so on until all pixels from the first row in the block are encoded. These shall be followed immediately by the N bits of data for pixel I(1,0) continuing from left to right along each row, one row after another from the top of the block to the bottom. The last byte of each block's data is zero-filled to the next byte boundary, but all other byte boundaries within the block are ignored. See the field PVTYPE description in table A-3 for the specification of the bit representation of pixel values.

5.4.3.3.1.2 Multiple band image uncompressed data format. For multiple band images, there are four orders for storing pixels.

5.4.3.3.1.2.1 Band sequential. The first case is "band sequential", in which each band is stored contiguously, starting with the first band, one after the other, until the last band is stored. Within each band the data shall be encoded as if it were a single band image with one or more blocks (paragraph 5.4.3.3.1.1). The field IMODE in the image subheader shall be set to S for this case. This case is only valid for images with multiple blocks and multiple bands. (For single blocked images, this case collapses to the “band interleaved by block” case where IMODE is set to B.)

5.4.3.3.1.2.2 Band interleaved by pixel. The ordering mechanism for this case stores the pixels in a block sequential order in which each block is stored contiguously, starting with the upper left block and proceeding first left to right across rows of blocks, one row of blocks after the other, top to bottom. For "band interleaved by pixel" the n*N bits of the entire pixel vector are stored pixel-by-pixel in the same left to right, top to bottom pixel order as described in paragraph 5.4.3.3.1.1. The n*N bits for a single pixel are stored successively in this order: the N bits of the first band followed by the N bits of the second band and, so forth, ending with the N bits of the last band. Each block shall be zero-filled to the byte boundary. The field IMODE in the image subheader shall be set to P for this storage option. See the field PVTYPE description in table A-3 for the specification of the bit representation of pixel values for each band.

5.4.3.3.1.2.3 Band interleaved by block. The ordering mechanism for this case stores the pixels in a block sequential order where each block is stored contiguously, starting with upper left block and proceeding first left to right across rows of blocks, one row of blocks after the other, top to bottom. For "band interleaved by block" the data from each block is stored starting with the first band, one after the other until the last band is stored. Each block shall be zero-filled to the next byte boundary. The field IMODE in the image subheader shall be set to B for this storage option. See the field PVTYPE description in table A-3 for the specification of the bit representation of pixel values for each band.

5.4.3.3.1.2.4 Band interleaved by row. The ordering mechanism for this case stores the pixel values of each band in row sequential order. Within each block, all pixel values of the first row of the first band are followed by pixel value of the first row of the second band continuing until all values of the first row are stored. The remaining rows are stored in a similar fashion until the last row of values has been stored. The field IMODE shall be set to R for this option.

5.4.3.3.2 Compressed image data format. The format of the image data after compression is provided with the description of the NITFS image compression algorithms in ITU-T T.4 (1993.03), AMD2 08/95, ISO/IEC 10918-1, and NIMA-N0106-97. Also found in these references are the conditions the data must meet before a given compression method can be applied meaningfully.

5.4.3.4 Grey scale look-up tables (LUT). The grey scale to be used in displaying each pixel of a grey scale image is determined using the image's LUT, if present. A LUT for a grey scale image when present, shall comprise a one byte entry for each integer (the entry's index) in the range 0 to NELUTn-1 (Number of LUT Entries for the nth Image Band field). The bytes of the LUT shall appear in the file one after the other without separation. The entries shall occur in the index order, the first entry corresponding to index 0, the second to index 1 and so on, the last corresponding to index NELUTn-1. The display shade for a pixel in the image shall be determined by using the image pixel value as an index into the LUT. The LUT value shall correspond to the display grey shade in a way specific to the display device. NELUTn shall be equal to or greater than the maximum pixel value in the image to ensure that all image pixels are mapped to the display device.

5.4.3.5 Color look-up tables (LUT). Color images are represented using the RGB color system notation. For color images, each LUT entry shall be composed of the output color components red, green, and blue, appearing in the file in that order. There shall be a LUT entry for each pixel value in a particular band of a NITF image (the entries index of the LUT will range from 0 to NELUTn-1). The LUT entries shall appear in the file in increasing index order beginning with index 0. The display color of an image pixel shall be determined by using the pixel value as an index into each LUT (red, green, blue). The corresponding values for red, green, and blue shall determine the displayed color in a manner specific to the display device. The color component values may be any of the 256 pixel values associated with the band. The presence of color LUTs is optional for 24 bit per pixel (true color) images. Pseudo-color (e.g. 8-bit per pixel color images) shall contain a LUT to correlate each pixel value with a designated true color value.

5.5 Graphic data. Graphic data is used in the NITF to store ~~a~~ two-dimensional information represented as a CGM. Each GS consists of a graphic subheader and data fields. A graphic may be black and white, grey scale, or color. Examples of graphics are circles, ellipses, rectangles, arrows, lines, triangles, logos, unit designators, object designators (ships, aircraft), text, and special characters. A graphic is stored as a distinct unit in the NITF file allowing it to be manipulated and displayed nondestructively relative to the images, and other graphics in the file. This standard does not preclude the use of n-dimensional graphics when future standards are developed.

5.5.1 Graphic subheader. The graphic subheader is used to identify and supply the information necessary to display the graphic data as intended by the file builder. The format for a graphic subheader is detailed in table A-5.

5.5.2 Graphic data format. The graphic format is CGM as described in ISO/IEC 8632-1. The precise tailoring of the CGM standard to NITF is found in MIL-STD-2301A.

5.5.2.1 CGM graphic bounding box. CGM graphic placement is defined by the SLOC field and the CGM graphic extent is given by the SBND1 (graphic bound 1) and SBND2 (graphic bound 2) fields. SLOC defines the origin for the CGM coordinate system. The area covered by the CGM graphic is defined by a bounding box. The bounding box is the smallest rectangle that could be placed around the entire CGM graphic. The first bounding box coordinate (SBND1) is the upper left corner of the rectangle. The second bounding box coordinate (SBND2) is the lower right corner of the rectangle. SBND1 and SBND2 are values in the coordinate system defined by the attachment level. For attachment level 0, this would be the CCS. The SBND1 and SBND2 values are calculated by adding SLOC to the coordinate values for the bounding box (upper left and lower right) corners as given in the CGM graphic coordinate system.

5.6 Reserved Segment (RS). The RS are place holders to support the expansion of the NUMX field within the NITF file header for a future standard data type, that has yet to be defined.

5.7 Text data. Text data shall be used to store textual data or unformatted text. Text is intended to convey information about an associated segment in the NITF file.

5.7.1 Representation of textual information. The NITF uses two different categories of textual character representations: text only and mark-up text (e.g. word processor formatted text). Each category has a set of lexical levels which constrain the use of characters within the category. The two lexical levels are: BCS-A and Universal Multiple-Octet Coded Character Set (UCS).

5.7.1.1 BCS-A. The BCS-A restricts the allowable characters to a relatively small set that can be represented in 8-bit per character codes. This character set is selected from ISO/IEC 646, but uses only the 'Cell-octet' of the basic coding structure described in ISO/IEC 646. The BCS uses only the 'Cell-octet' of the two-octet Basic Multilingual Plane form, implementation level 1, of ISO/IEC 646. The range of allowable characters for BCS-A consists of the following: (all printable 7-bit characters plus)

Line Feed	code 0x0A
Form Feed	code 0x0C
Carriage Return	code 0x0D
Space to Tilde	codes 0x20 to 0x7E (BMP block 'BASIC LATIN')

5.7.1.2 UCS. The UCS is used for expressing text in many languages of the world as defined by ISO 10646-1. The specific character set selected from UCS shall be identified by a profile. The profile shall identify the adopted form, the adopted implementation level and the adopted subset (list of collections and/or characters) in accordance with the structures defined in ISO/IEC 10646-1. When a profile defined UCS is used in a NITF file, the coding shall contain an explicit declaration of identification of features (escape sequence) as specified in ISO/IEC 10646-1. When no declaration escape sequence is included, the default shall be that defined for BCS above.

5.7.2 Text Format (TXTFMT) field use. The Text Format (TXTFMT) field contains a three character code which indicates the type or format of text data contained in the text data segment. The allowable field values are STA, MTF, or UT1.

5.7.2.1 Standard (STA). STA designates BCS character codes. Any BCS code may be used in the text data segment when STA is indicated in the TXTFMT field. All lines within a NITF ASCII file shall be separated by carriage return/line feed pairs. A carriage return followed by a line feed shall be used to delimit lines in the text where the first character from the next line immediately follows the ASCII line feed character.

5.7.2.2 Message Text Formatting (MTF). MTF indicates that the text data segment contains BCS characters formatted according to MIL-STD-6040.

5.7.2.3 UT1. As described in ISO 4873, UT1 indicates 1-octet coded UCS characters, Basic Latin and Latin Supplement 1.

5.7.3 Text subheader. The text subheader is used to identify and supply the information necessary to read and display the text within the data field. The text subheader is detailed in table A-6.

5.8. Data extensions. Data extensions are provided to extend NITF functionality with minimal impact on the underlying standard document. There are three types of data extensions: TRE, DES, and RES. All these extensions may be incorporated into the NITF file while maintaining backward compatibility. The data extension identifier and byte count mechanisms allow applications developed prior to the addition of newly defined data, to skip over extension fields that they are not designed to interpret.

5.8.1 Tagged Record Extension (TRE). A TRE is a collection of data fields that provides space within the NITF file structure for adding, as yet unspecified, future capabilities to the standard. The TRE is used to extend NITF by adding additional attributes to designated fields in the NITF file header (table A-1) and in the image, text, and graphic subheaders (tables A-3, A-5, and A-6). Each TRE consists of three required fields that are defined in table A-7. There are two similar, but different, TRE types: Controlled Extensions (CE) and Registered Extensions (RE). The principles are described below and illustrated in figure 14.

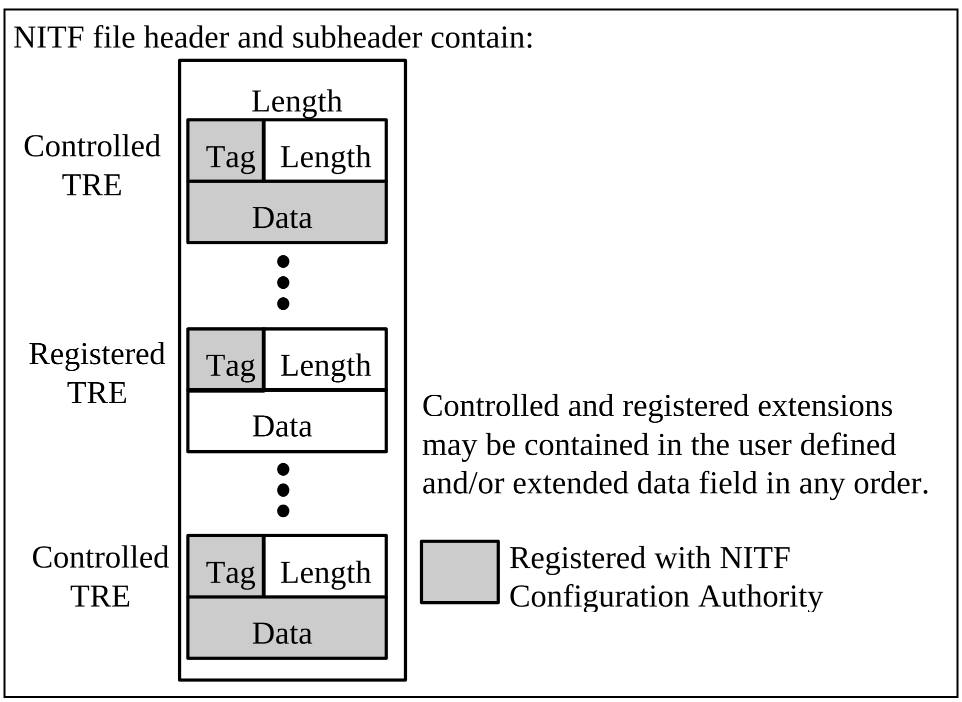


FIGURE 14. Tagged Record Extension (TRE).

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5.8.1.1 Controlled Extension (CE). A CE allows additional data constructs within a NITF file with NTB consensus. For a CE, both the Unique Extension Type Identifier (CETAG) and the specification contained in the User-Defined Data (CEDATA) field are subject to full NTB registration and configuration control. Upon receipt of a NITF file that contains a CE, a NITF compliant implementation that is not designed to interpret that CE shall ignore it and properly interpret the other NITF file components.

5.8.1.2 Registered Extension (RE). A RE allows NITF users to establish user defined data constructs within a NITF file without NTB consensus. RE use is considered private in the sense that a specific RE is meaningful only to NITF users who have agreed to its use. The structure and content of the User-Defined Data (REDATA) field does not need to be configuration managed. However to prevent duplication, each newly defined Unique Extension Type Identifier (RETAG) must be registered, along with its name and purpose, with the NTB. Upon receipt of a NITF file that contains an RE, a NITF compliant system that is not designed to interpret that RE shall ignore it and properly interpret the other NITF file components.

5.8.1.3 TRE placement. A sequence of TREs can be used in the NITF file header User Defined Data (UDHD) field, in any image subheader's User Defined Image Data (UDID) field, in Extended Header and Extended Subheader (XHD, IXSHD, SXSHD, TXSHD) fields, and in a DES that is designated to contain TRE Overflow (TRE_OVERFLOW). When the TRE carries data associated with the NITF file and sufficient room is available, it should appear in the NITF file header. If the TRE carries data associated with a segment and sufficient room is available in the segment's subheader, the data should appear in the segment's subheader. When sufficient room is not available in the NITF file header or the segment's subheader, the TRE may be placed in the TRE_OVERFLOW DES (paragraph 5.8.3.1). The entire TRE shall be included within the NITF file header, subheader, or DES that has been selected to contain it.

5.8.1.4 TRE registry. A current listing of the TRE that are registered with the NTB is provided in the Data Extension Registry maintained by the Joint Interoperability Test Command (JITC).

5.8.2 Data Extension Segment (DES). The DES structure allows the format to include different data types within a NITF file. Each data type is encapsulated in its own DES. Each DES can carry only one data type, but a NITF file can contain multiple DES. Multiple DES contained in one NITF file can be of the same or different data types. Each encapsulated extension shall appear in its own DES and shall conform to the DES structure contained in table A-9. There are two DES type identifiers defined in the MIL-STD: TRE Overflow (TRE_OVERFLOW) and Streaming File Header (STREAMING_FILE_HEADER). Examples of future data types are: augmenting imagery (with voice annotations, video clip annotations, video/voice annotations, animated graphics) and Transportable File Structures (TFS).

5.8.2.1 DES use. The following rules apply to DES usage.

a. Only those DES accepted and registered by the NTB shall be used.

b. Upon receipt of a NITF file that contains one or more DES, a NITF compliant system that is not designed to interpret that DES shall ignore it and properly interpret the other NITF file components.

c. NITF implementations that support a specific DES shall comply with the minimum conformance requirements specified in the DES description.

5.8.2.2 DES structure. The NITF file header accommodates up to 999 DES. Each DES shall consist of a DES subheader and a DES User-Defined Data (DESDATA) field (similar to the way a standard data segment has a subheader and an adjacent associated data field). The DES group in the NITF file header contains the number of DES in the NITF file, the length (size) of each DES subheader, and the length (size) of the DESDATA field. The field size specifications in the NITF file header allow each DES to be just less than one gigabyte in length. The

DES subheader shall contain the fields defined in table A-8. The DES structure includes a mechanism for defining additional DES subheader fields (DES User-Defined Subheader Length (DESSHL) field and DES User-Defined Subheader Fields (DESSHF) field), and for defining encapsulated data (DESDATA). This structure encourages the formation of a specific DES in a manner similar to the way standard data segments group fields (subheader fields) that describe the data and follow it with the data.

5.8.3. Defined DES. Additional DES, registered by the NTB, will be maintained in the JITC's Data Extension Registry.

5.8.3.1 Tagged Record Extension Overflow (TRE_OVERFLOW) DES. The TRE_OVERFLOW DES is used for encapsulating a series of TRE in a DES as overflow from the NITF file header or any segment's subheader. A separate DES is used for each NITF file header or subheader field that overflows. Which NITF file header or subheader field overflowed is indicated in the DES Overflowed Header Type (DESOFLOW) field and DES Data Segment Overflowed (DESITEM) field contents. The TRE_OVERFLOW DES for encapsulating TRE is defined in table A-8(A).

5.8.3.2 Streaming File Header (STREAMING_FILE_HEADER) DES. As described in paragraph 5.2.1, NITF provides the STREAMING_FILE_HEADER to allow NITF file creation or transfer before all NITF file header fields are populated. Table A-8(B) contains the STREAMING_FILE_HEADER field names, sizes, value ranges, and types. When an intentionally incomplete NITF file header is encountered, the NITF file shall be processed by using the NITF file header values located in the STREAMING_FILE_HEADER. When used, the STREAMING_FILE_HEADER is located at the end of the NITF file. To facilitate locating the DES, the STREAMING_FILE_HEADER contains two unique delimiter fields (SFH - Delimiter 1 (SFH-DELIM1) field and SFH - Delimiter 2 (SFH-DELIM2) field). The SFH-DELIM1 field precedes the STREAMING_FILE_HEADER and the SFH-DELIM2 field follows the STREAMING_FILE_HEADER. The SFH-DELIM1 field is preceded by the SFH Length 1 (SFH-L1) field and the SFH-DELIM2 field is followed by the SFH Length 2 (SFH-L2) field. The SFH-L1 and SFH-L2 fields are placed to ensure valid delimiters are found. The value of the SFH-DELIM1 field shall be equal to the value of the SFH-DELIM2 field, the value of the SFH-L1 field shall be equal to the value of the SFH-L2 field, and the number of characters between the SFH-DELIM1 field and the SFH-DELIM2 field must be equal to the value of the SFH-L1 and SFH-L2 fields. The STREAMING_FILE_HEADER may contain a complete NITF file header, a subset of the NITF file header, or may extend beyond the NITF file header to include fields within the subsequent subheader. If the NITF file contains more than one DES, the STREAMING_FILE_HEADER shall be the final DES.

5.8.4 Reserved Extension Segment (RES). The RES structure is designated for future use and provides a mechanism for, yet further, expansion of the standard. A RES subheader shall contain the fields defined in table A-9. RES that are registered with the NTB will be maintained in the JITC's Data Extension Registry.

5.8.4.1 RES use. The following rules apply to RES usage.

a. Only those RES accepted and registered by the NTB shall be used.

b. Upon receipt of a NITF file that contains a RES, a NITF compliant implementation that is not designed to interpret that RES shall ignore it and properly interpret the other NITF file components.

c. NITF implementations that support a specific RES shall comply with the minimum conformance requirements specified in the RES description.

5.8.4.2 RES structure. The NITF file header accommodates up to 999 RES. Each RES shall consist of a RES subheader and a RES User-Defined Data (RESDATA) field (similar to the way a standard data segment has a subheader and an adjacent associated data field). The RES group in the NITF file header contains the number of RES in the NITF file, the length (size) of each RES subheader, and length (size) of the RESDATA field. The field size specifications in the NITF file header allow each RES to be just less than ten

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megabytes in length. The RES subheader shall contain the fields defined in fable A-9. The RES structure includes a mechanism for defining additional RES subheader fields (RES User-Defined Subheader Length (RESSHL) field and RES User-Defined SubheaderFields (RESSHF) field), and for defining encapsulated data (RESDATA). This structure encourages the formation of a specific RES in a manner similar to the way standard data segments group fields (Subheader fields) that describe the data and follow it with the data.

5.9 Complexity Level (CLEVEL). Table A-10 defines the conditions of NITF file features used to determine the CLEVEL assignment for a given NITF file. The six key NITF features which differentiate CLEVELs are: CCS extent, file size (bytes), image size (rows/columns), number of multi-spectral bands, number of ISs per NITF file, and aggregate size of GSs. The other listed features provide the parameter, value, range conditions, and constraints for all the defined CLEVELs (03, 05, 06, and 07). Although a NITF file shall be marked at the lowest CLEVEL for which it qualifies, it shall be marked no lower than the highest CLEVEL feature condition included in the NITF file. For example, a 51 Mbyte file shall be marked at CLEVEL 05, even when all other features in the NITF file do not exceed the specified CLEVEL 03 conditions.

6. NOTES

(This section contains information of a general or explanatory nature which may be helpful, but is not mandatory.)

6.1 Example NITF file.

6.1.1 Use of NITF. Though the NITF was conceived initially to support the transmission of a file composed of a single base image, image insets (subimage overlays), graphic overlays, and text, its current form makes it suitable for a wide variety of file exchange needs. One of the flexible features of the NITF is that it allows several segments of each data type to be included in one file, yet any of the data types may be omitted. Thus, for example, the NITF may equally well be used for the storage of a single portion of text, a single image or a complex composition of several images, graphics, and text. The following section discusses an example NITF file of moderate complexity.

6.1.2 Example file. Table I shows the contents of the fields in the header of an example NITF file composed of two base ISs (one base image, one inset image), five graphic overlay segments, and five TSs. Figure 15 shows part of the sample file as a composite image with its overlay graphics. In an NITF file, the data for each segment is stored in a data field preceded by the segment subheader. The subheader for a data type is omitted if no data of that type are included in the file. Segment subheader field contents in the sample file are shown in tables I to IX.

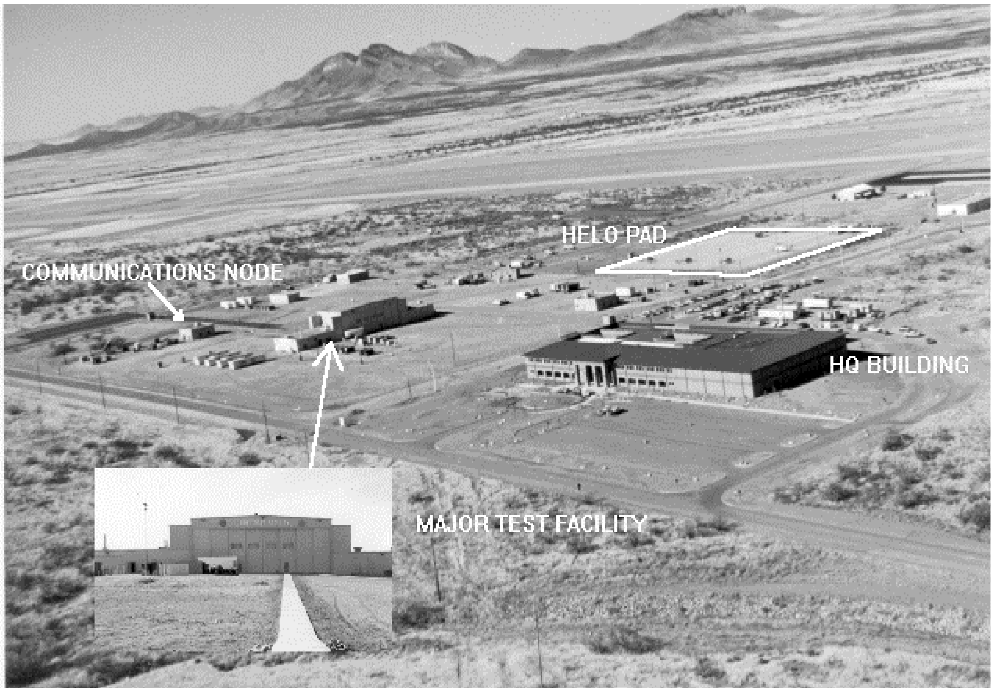

FIGURE 15. Sample file composite image.

TABLE I. Example NITF file header.

NITF HEADER FIELD	FORMAT	COMMENT
File Profile Name (FHDR)	NITF	4 characters
File Version (FVER)	02.10	5 characters
Complexity Level (CLEVEL)	05	2 characters -- images less than or equal to 8k x 8k
System Type (STYPE)	BF01	4 characters
Originating Station ID (OSTAID)	U21SOO90	8 characters with 2 spaces
File Date and Time (FDT)	19960930224632	14 characters
File Title (FTITLE)	MAJOR TEST FACILITY	19 characters followed by 61 spaces - 80 characters
File Security Classification (FSCLAS)	U	1 character
File Classification Security System (FSCLSY)		2 spaces
File Codewords (FSCODE)		11 spaces
File Control and Handling (FSCTLH)		2 spaces
File Releasing Instructions (FSREL)		20 spaces

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TABLE I. Example NITF file header - Continued.

NITF HEADER FIELD	FORMAT	COMMENT
File Declassification Type (FSDCTP)		2 spaces
File Declassification Date (FSDCDT)		8 spaces
File Declassification Exemption (FSDCXM)		4 spaces
File Downgrade (FSDG)		1 space
File Downgrade Date (FSDGDT)		8 spaces
File Classification Text (FSCLTX)		43 spaces
File Classification Authority Type (FSCATP)		1 space
File Classification Authority (FSCAUT)		40 spaces
File Classification Reason (FSCRSN)		1 space
File Security Source Date (FSSRDT)		8 spaces
File Security Control Number (FSCTLN)		15 spaces
File Copy Number (FSCOP)		5 digits
File Number of Copies (FSCPYS)		5 digits
Encryption (ENCRYP)	0	Required default no encryption
File Background Color (FBKGC)	0x000000	3 bytes signifies black background
Originator's Name (ONAME)	D. Rajan	8 characters followed by 16 spaces - 24 characters
Originator's Phone Number (OPHONE)	44 1480 84 5611	15 characters followed by 3 spaces - 18 characters
File Length (FL)	000002905629	12 digits
NITF File Header Length (HL)	000515	6 digits
Number of Image Segments (NUMI)	002	3 digits
Length of 1st Image Subheader (LISH001)	000679	6 digits
Length of 1st Image Segment (LI001)	0002730600	10 digits
Length of 2nd Image Subheader (LISH002)	000439	6 digits
Length of 2nd Image Segment (LI002)	0000089600	10 digits
Number of Graphics Segments (NUMS)	005	3 digits

TABLE I. Example NITF file header - Continued.

NITF HEADER FIELD	FORMAT	COMMENT
Length of 1st Graphic Subheader (LSSH001)	0258	4 digits
Length of 1st Graphic Segment (LS001)	000122	6 digits
Length of 2nd Graphic Subheader (LSSH002)	0258	4 digits
Length of 2nd Graphic Segment (LS002)	000122	6 digits
Length of 3rd Graphic Subheader (LSSH003)	0258	4 digits
Length of 3rd Graphic Segment (LS003)	000150	6 digits
Length of 4th Graphic Subheader (LSSH004)	0258	4 digits
Length of 4th Graphic Segment (LS004)	000112	6 digits
Length of 5th Graphic Subheader (LSSH005)	0258	4 digits
Length of 5th Graphic Segment (LS005)	000116	6 digits
Reserved for future use (NUMX)	000	3 digits
Number of Text Files (NUMT)	005	3 digits
Length of 1st Text Subheader (LTSH001)	0282	4 digits
Length of 1st Text Segment (LT001)	20000	5 digits
Length of 2nd Text Subheader (LTSH002)	0282	4 digits
Length of 2nd Text Segment (LT002)	20000	5 digits
Length of 3rd Text Subheader (LTSH003)	0282	4 digits
Length of 3rd Text Segment (LT003)	20000	5 digits
Length of 4th Text Subheader (LTSH004)	0282	4 digits
Length of 4th Text Segment (LT004)	20000	5 digits
Length of 5th Text Subheader (LTSH005)	0282	4 digits
Length of 5th Text Segment (LT005)	20000	5 digits
Number of Data Extension Segments (NUMDES)	000	3 digits

TABLE I. Example NITF file header - Continued.

NITF HEADER FIELD	FORMAT	COMMENT
Number of Reserved Extension Segments (NUMRES)	000	3 digits
User Defined Header Data Length(UDHDL)	00000	5 digits
Extended Header Data Length (XHDL)	00000	5 digits

6.1.2.1 Explanation of the file header. The File Profile Name (FHDR), NITF, and File Version (FVER), 02.10, are listed first. The next field contains the file's CLEVEL, in this case 05. A four character reserved field for the System Type (STYPE), defaulted to blanks, appears next. An identification code (OSTAID) containing ten characters for the station originating the primary information in the file is given next. The file origination date and time (FDT) follow this and are given in Coordinated Universal Time (UTC) (Zulu) time format. This is followed by the File Title (FTITLE) field containing up to 80 characters of free form text. The title of the sample file contains less than 80 characters, and therefore, the remainder of the field is padded with blanks. After this a number of security-related fields occur. The File Security Classification (FSCLAS) field is first, is mandatory, and contains one character. The remaining fields - File Security Classification System (FSCLSY), File Codewords (FSCODE), File Control and Handling (FSCTLH), File Releasing Instructions (FSREL), File Declassification Type (FSDCTP), File Declassification Date (FSDCDT), File Declassification Exemption (FSDCXM), File Downgrade (FSDG), File Downgrade Date (FSDGDT), File Classification Text (FSCLTX), File Classification Authority Type (FSCATP), File Classification Authority (FSCAUT), File Classification Reason (FSCRSN), File Security Source Date (FSSRDT), and File Security Control Number (FSCTLN) - will be filled in if the file is classified in accordance with existing security directives. Which fields are actually populated will depend on the security system used and the security parameters which apply to the specific file. Some unclassified files may also require an entry in FSCTLH (e.g. Proprietary Information (PROPIN), For Official Use Only (FOUO)). In the example above, the file is unclassified and no handling caveats apply, so all following security-related fields are blank. The next field, File Background Color (FBKGC), defines the background color behind displayable segments. It eliminates the potential to visually lose information if the originator selects a presentation color that is the same as the receiver's selected background color. File Encryption (ENCRYPT) follows and is given a "0" indicating that the file is not encrypted.. The originator's name (ONAME) and phone number (OPHONE) are given next. These fields may be left blank. Then the length in bytes of the entire file (FL) is given, including all headers, subheaders, and data. This is followed by the length in bytes of the NITF file header (HL). The Number of Image Segments (NUMI) field contains the characters 002 to indicate two images are included in the file. This is followed by six characters to specify the length of the first image subheader (LISHn), then ten characters for the length of the first image (LIn). The length of the second image subheader and the length of the second image follow. The next item in the file header is the Number of Graphics (NUMS), which contains 005 to indicate that five graphics are present in the file. The next ten characters contain the Length of Graphic Subheader (LSSHn) and Length of Graphic (LSn) (four and six characters respectively) for the first to fifth graphic, one after the other. The Number of Text Files (NUMT) field is given as 005 and is followed by four characters specifying the length of the text subheader and five characters specifying the number of characters in the TS for each of the five TSs. The Number of Data Extension Segments (NUMDES) and Number of Reserved Extension Segments (NUMRES) fields are given as "000." This completes the "road map" for separating the data subheaders from the actual data to follow. The next two fields in the header are the User Defined Header Data Length (UDHDL) and the User Defined Header Data (UDHD). User defined data could be used to include registered TREs that provide additional information about the file. In this example, however, the UDHDL is given as zero; therefore, the UDHD is omitted. The last field in the header is the Extended Header Data Length (XHDL). The XHDL is given as zero; therefore, the Extended Header Data (XHD) field is omitted, indicating that no CEs are included in the file header.

6.1.2.2 Explanation of the image subheaders.

TABLE II. Example of the first image subheader.

NITF IMAGE SUBHEADER FIELD	FORMAT	COMMENT
File Part Type (IM)	IM	2 characters
Image Identifier 1 (IID1)	0000000001	10 characters
Image Date and Time (IDATIM)	19960825203147	14 characters
Target Identifier (TGTID)		17 spaces
Image Identifier 2 (IID2)	1996238CY02123456 78ABCD25AUG1995 2031~~bbb~~F	40 characters followed by 40 spaces - 80 characters total
Image Security Classification (ISCLAS)	U	1 character
Image Classification Security System (ISCLSY)		2 spaces
Image Codewords (ISCODE)		11 spaces
Image Control and Handling (ISCTLH)		2 spaces
Image Releasing Instructions (ISREL)		20 spaces
Image Declassification Type (ISDCTP)		2 spaces
Image Declassification Date (ISDCDT)		8 spaces
Image Declassification Exemption (ISDCXM)		4 spaces
Image Downgrade (ISDG)		1 space
Image Downgrade Date (ISDGDT)		8 spaces
Image Classification Text (ISCLTX)		43 spaces
Image Classification Authority Type (ISCATP)		1 space
Image Classification Authority (ISCAUT)		40 spaces
Image Classification Reason (ISCRSN)		1 space
Image Security Source Date (ISSRDT)		8 spaces
Image Security Control Number (ISCTLN)		15 spaces
Encryption (ENCRYP)	0	Required default

TABLE II. Example of the first image subheader - Continued.

NITF IMAGE SUBHEADER FIELD	FORMAT	COMMENT
Image Source (ISORCE)	Hand-held digital camera model XYZ.	35 characters followed by 7 spaces - 42 total characters
Number of Significant Rows in image (NROWS)	00001332	8 characters
Number of Significant Columns in image (NCOLS)	00002050	8 characters
Pixel Value Type (PVTYPE)	INT	3 characters - interpret pixel values as integers
Image Representation (IREP)	MONO	4 characters followed by 4 spaces - greyscale imagery
Image Category (ICAT)	VIS	3 characters followed by 5 spaces - visible imagery
Actual Bits-Per-Pixel Per Band (ABPP)	08	2 digits
Pixel Justification (PJUST)	R	1 character
Image Coordinate Representation (ICORDS)		Space - indicates no geo-location coordinates
Number of Image Comments (NICOM)	3	1 digit
† Image Comment 1 (ICOM1)	This is a comment on Major Test Facility base and associated inset. This file w	80 total characters
† Image Comment 2 (ICOM2)	as developed at Fort Huachuca, Arizona. It shows the Joint Interoperability Tes	80 total characters
† Image Comment 3 (ICOM3)	t Command Building and associated range areas.	46 characters followed by 34 spaces - 80 total characters
Image Compression (IC)	NC	2 characters - indicates no compression
Number of Bands (NBANDS)	1	1 digit
1st Band Representation (IREPBAND1)		2 spaces
1st Band Subcategory (ISUBCAT1)		6 spaces
1st Band Image Filter Condition (IFC1)	N	1 character - required default value

TABLE II. Example of the first image subheader - Continued.

NITF IMAGE SUBHEADER FIELD	FORMAT	COMMENT
1st Band Standard Image Filter Code (IMFLT1)		3 spaces - reserved
Number of LUTs for the 1st Image Band (NLUTS1)	0	1 character
Image Sync Code (ISYNC)	0	1 digit
Image Mode (IMODE)	B	1 character - B required for 1 band
Number of Blocks per Row (NBPR)	0001	4 digits
Number of Blocks per Column (NBPC)	0001	4 digits
Number of Pixels Per Block Horizontal (NPPBH)	2050	4 digits
Number of Pixels Per Block Vertical (NPPBV)	1332	4 digits
Number of Bits Per Pixel (NBPP)	08	2 digits
Image Display Level (IDLVL)	001	3 digits - minimum DLVL requires this value
Image Attachment Level (IALVL)	000	Required 3 digit value since minimum display level.
Image Location (ILOC)	0000000000	10 characters upper left pixel located at origin of CCS
Image Magnification (IMAG)	1.0	3 character followed by a space - 4 characters total
User Defined Image Data Length (UDIDL)	00000	5 digits
Image Extended Subheader Data Length (IXSHDL)	00000	5 digits

† According to the standard - this should look like a single continuous comment of up to 3 x 80 characters.

6.1.2.2.1 Explanation of the first image subheader. There are two images in this sample file. The first image has IDVLV001. Its subheader is shown in table II. It is an unclassified, single band, single block, grey scale image with 8 bits per pixel and does not have an associated LUT. There are three associated comments. It is visible imagery, does not have geo-location data, and is stored as an uncompressed image. It is located at the origin of the CCS within which all the displayable file components are located. It is 1332 rows by 2050 columns. Figure 15 illustrates the image printed at approximately three hundred pixels per inch.

TABLE III. Example of the second image subheader.

NITF IMAGE SUBHEADER FIELD	FORMAT	COMMENT
File Part Type (IM)	IM	2 characters
Image Identifier 1 (IID1)	Missing ID	10 characters
Image Date and Time (IDATIM)	19960927011729	14 characters
Target Identifier (TGTID)		17 spaces
Image Identifier 2 (IID2)	1996271cy0212345678 ABCD27SEP19962056 ~~bbb~~F	40 characters followed by 40 spaces - 80 characters total
Image Security Classification (ISCLAS)	U	1 character
Image Classification Security System (ISCLSY)		2 spaces
Image Codewords (ISCODE)		11 spaces
Image Control and Handling (ISCTLH)		2 spaces
Image Releasing Instructions (ISREL)		20 spaces
Image Declassification Type (ISDCTP)		2 spaces
Image Declassification Date (ISDCDT)		8 spaces
Image Declassification Exemption (ISDCXM)		4 spaces
Image Downgrade (ISDG)		1 space
Image Downgrade Date (ISDGDT)		8 spaces
Image Classification Text (ISCLTX)		43 spaces
Image Classification Authority Type (ISCTP)		1 space
Image Classification Authority (ISCAUT)		40 spaces
Image Classification Reason (ISCRSN)		1 space
Image Security Source Date (ISSRDT)		8 spaces
Image Security Control Number (ISCTLN)		15 spaces

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TABLE III. Example of the second image subheader - Continued.

NITF IMAGE SUBHEADER FIELD	FORMAT	COMMENT
Encryption (ENCRYP)	0	Required default
Image Source (ISORCE)	Cut of original image.	22 characters followed by 20 spaces - 42 characters total
Number of Significant Rows in image (NROWS)	00000224	8 characters
Number of Significant Columns in image (NCOLS)	00000400	8 characters
Pixel Value Type (PVTYPE)	INT	3 characters - interpret pixel values as integers
Image Representation (IREP)	MONO	4 characters followed by 4 spaces - grey scale imagery
Image Category (ICAT)	VIS	3 characters followed by 5 spaces - visible imagery
Actual Bits-Per-Pixel Per Band (ABPP)	08	2 digits
Pixel Justification (PJUST)	R	1 character
Image Coordinate Representation (ICORDS)		Space - indicates no geo-location coordinates
Number of Image Comments (NICOM)	0	1 digit
Image Compression (IC)	NC	2 characters - indicates uncompressed
Number of Bands (NBANDS)	1	1 digit
1st Band Representation (IREPBAND1)		2 spaces
1st Band Subcategory (ISUBCAT1)		6 spaces
1st Band Image Filter Condition (IFC1)	N	1 character - required default value
1st Band Standard Image Filter Code (IMFLT1)		3 spaces - reserved
1st Band Number of LUTS (NLUTS1)	0	1 character
Image Sync Code (ISYNC)	0	1 digit
Image Mode (IMODE)	B	1 character - B required for 1 band
Number of Blocks Per Row (NBPR)	0001	4 digits
Number of Blocks Per Column (NBPC)	0001	4 digits
Number of Pixels Per Block Horizontal (NPPBH)	0400	4 digits
Number of Pixels Per Block Vertical (NPPBV)	0224	4 digits

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TABLE III. Example of the second image subheader - Continued.

NITF IMAGE SUBHEADER FIELD	FORMAT	COMMENT
Number Bits Per Pixel (NBPP)	08	2 digits
Image Display Level (IDLVL)	002	3 digits
Image Attachment Level (IALVL)	001	3 digits
Image Location (ILOC)	0057800142	10 characters, located at row 578 column 142 of base image
Image Magnification (IMAG)	1.0	3 characters followed by a space - 4 characters total
User Defined Image Data Length (UDIDL)	00000	5 digits
Image Extended Subheader Data Length (IXSHDL)	00000	5 digits

6.1.2.2.2 Explanation of the second image subheader. This image is the second image in the file. As is the first image, this image is an 8 bit visible, grey scale image. It is much smaller (400 columns x 224 rows) and is not compressed. Also, unlike the first image, it has no associated comment fields, indicated by the fact that the Number of Image Comments (NICOM) = is equal to 0. Since it is attached to the base image (IALVL = 001), the ILOC field reveals that this image is located with its upper left corner positioned at Row 578, Column 142 with respect to the upper left corner of the base image. Since it has a display level greater than that of the base image, it will obscure part of the base image when they are both displayed.

6.1.2.3 Explanation of the-graphic subheaders.

TABLE IV. Graphic subheader for the first graphic.

NITF-GRAPHIC SUBHEADER FIELD	FORMAT	COMMENT
File Part Type (SY)	SY	2
Graphic Identifier (SID)	0000000001	10
Graphic Name (SNAME)	HELO PAD RECTANGLE	18 characters followed by 2 spaces - total 20 characters
Graphic Security Classification (SSCLAS)	U	1 character
Graphic Classification Security System (SSCLSY)		2 spaces
Graphic Codewords (SSCODE)		11 spaces
Graphic Control and Handling (SSCTLH)		2 spaces
Graphic Releasing Instructions (SSREL)		20 spaces
Graphic Declassification Type (SSDCTP)		2 spaces

TABLE IV. Graphic subheader for the first graphic - Continued.

NITF-GRAPHIC SUBHEADER FIELD	FORMAT	COMMENT
Graphic Declassification Date (SSDCDT)		8 spaces
Graphic Declassification Exemption (SSDCXM)		4 spaces
Graphic Downgrade (SSDG)		1 space
Graphic Downgrade Date (SSDGDT)		8 spaces
Graphic Classification Text (SSCLTX)		43 spaces
Graphic Classification Authority Type (SSCATP)		1 space
Graphic Classification Authority (SSCAUT)		40 spaces
Graphic Classification Reason (SSCRSN)		1 space
Graphic Security Source Date (SSSRDT)		8 spaces
Graphic Security Control Number (SSCTLN)		15 spaces
Encryption (ENCRYP)	0	Required default
Graphic Type (SFMT)	C	1 character - indicates CGM
Reserved for Future Use (SSTRUCT)		reserved 13 spaces
Graphic Display Level (SDLVL)	003	3 digits
Graphic Attachment Level (SALVL)	001	3 digits
Graphic Location (SLOC)	0039201110	10 characters
First Graphic Bound Location (SBND1)	0039201110	10 characters
Graphic Color (SCOLOR)	M	indicates CGM file contains no color components
Second Graphic Bound Location (SBND2)	0051001836	10 characters
Reserved for Future Use (SRES2)		reserved 2 spaces
Graphic Extended Subheader Data Length (SXSHDL)	00000	5 digits

6.1.2.3.1 Explanation of the first graphic subheader. This graphic is a computer graphics metafile graphic (HELO PAD RECTANGLE). The graphic is attached to the base image, and its location is recorded in SLOC (row 392, column 1110) and is measured as an offset from the origin at the upper left corner of that image.

TABLE V. Graphic-subheader for the second graphic.

NITF GRAPHIC SUBHEADER FIELD	FORMAT	COMMENT
File Part Type (SY)	SY	2
Graphic Identifier (SID)	0000000002	10
Graphic Name (SNAME)	ARROW	5 characters followed by 15 spaces - total 20 characters
Graphic Security Classification (SSCLAS)	U	1 character
Graphic Classification Security System (SSCLSY)		2 spaces
Graphic Codewords (SSCODE)		11 spaces
Graphic Control and Handling (SSCTLH)		2 spaces
Graphic Releasing Instructions (SSREL)		20 spaces
Graphic Declassification Type (SSDCTP)		2 spaces
Graphic Declassification Date (SSDCDT)		8 spaces
Graphic Declassification Exemption (SSDCXM)		4 spaces
Graphic Downgrade (SSDG)		1 space
Graphic Downgrade Date (SSDGDT)		8 spaces
Graphic Classification Text (SSCLTX)		43 spaces
Graphic Classification Authority Type (SSCATP)		1 space
Graphic Classification Authority (SSCAUT)		40 spaces
Graphic Classification Reason (SSCRSN)		1 space
Graphic Security Source Date (SSSRDT)		8 spaces
Graphic Security Control Number (SSCTLN)		15 spaces
Encryption (ENCRYP)	0	Required default
Graphic Type (SFMT)	C	1 character - indicates CGM
Reserved for Future Use (SSTRUCT)	0000	Reserved 13 spaces
Graphic Display Level (SDLVL)	004	3 digits

TABLE V. Graphic-subheader for the second graphic - Continued.

NITF GRAPHIC SUBHEADER FIELD	FORMAT	COMMENT
Graphic Attachment Level (SALVL)	002	3 digits
Graphic Location (SLOC)	0000000285	10 characters relative to origin of second image
First Graphic Bound Location (SBND1)	-022500270	10 characters relative to origin of second image
Graphic Color (SCOLOR)	M	indicates CGM file contains no color components
Second Graphic Bound Location (SBND2)	0000000300	10 characters relative to origin of second image
Reserved for Future Use (SRES2)		Reserved 2 spaces
Graphic Extended Subheader Data Length (SXSHDL)	00000	5 digits

6.1.2.3.2 Explanation of the second graphic subheader. The second graphic is also a CGM graphic. It is the arrow pointing to the test facility. It is attached to the subimage. Therefore, its location as recorded in SLOC is measured as an offset from the upper left corner of the subimage.

TABLE VI. Graphic subheader for the third graphic.

NITF GRAPHIC SUBHEADER FIELD	FORMAT	COMMENT
File Part Type (SY)	SY	2
Graphic Identifier (SID)	0000000003	10
Graphic Name (SNAME)	HQ BUILDING	11 characters followed by 9 spaces - total 20 characters
Graphic Security Classification (SSCLAS)	U	1 character
Graphic Classification Security System (SSCLSY)		2 spaces
Graphic Codewords (SSCODE)		11 spaces
Graphic Control and Handling (SSCTLH)		2 spaces
Graphic Releasing Instructions (SSREL)		20 spaces
Graphic Declassification Type (SSDCTP)		2 spaces
Graphic Declassification Date (SSDCDT)		8 spaces
Graphic Declassification Exemption (SSDCXM)		4 spaces

TABLE VI. Graphic subheader for the third graphic - Continued.

NITF GRAPHIC SUBHEADER FIELD	FORMAT	COMMENT
Graphic Downgrade (SSDG)		1 space
Graphic Downgrade Date (SSDGDT)		8 spaces
Graphic Classification Text (SSCLTX)		43 spaces
Graphic Classification Authority Type (SSCATP)		1 space
Graphic Classification Authority (SSCAUT)		40 spaces
Graphic Classification Reason (SSCRSN)		1 space
Graphic Security Source Date (SSSRDT)		8 spaces
Graphic Security Control Number (SSCTLN)		15 spaces
Encryption (ENCRYP)	0	Required default
Graphic Type (SFMT)	C	1 character - indicates CGM
Reserved for Future Use (SSTRUCT)		Reserved 13 spaces
Graphic Display Level (SDLVL)	005	3 digits
Graphic Attachment Level (SALVL)	001	3 digits
Graphic Location (SLOC)	0000000000	10 characters
First Graphic Bound Location (SBND1)	0062501710	10 characters
Graphic Color (SCOLOR)	M	indicates CGM file contains no color components
Second Graphic Bound Location (SBND2)	0070502010	10 characters
Reserved for Future Use (SRES2)		Reserved 2 spaces
Graphic Extended Subheader Data Length (SXSHDL)	00000	5 digits

6.1.2.3.3 Explanation of the third graphic subheader. The third graphic is a CGM annotation (HQ Building). It is attached to the base image. Its location as recorded in SLOC is measured as an offset from the upper left corner of the base image, in this case SLOC is 0,0 and the offsetting for this graphic is actually done within the CGM construct itself.

TABLE VII. Graphic subheader for the fourth graphic.

NITF GRAPHIC SUBHEADER FIELD	FORMAT	COMMENT
File Part Type (SY)	SY	2
Graphic Identifier (SID)	0000000004	10
Graphic Name (SNAME)	MAJOR TEST FACILITY	19 characters followed by 1 spaces - total 20 characters
Graphic Security Classification (SSCLAS)	U	1 character
Graphic Classification Security System (SSCLSY)		2 spaces
Graphic Codewords (SSCODE)		11 spaces
Graphic Control and Handling (SSCTLH)		2 spaces
Graphic Releasing Instructions (SSREL)		20 spaces
Graphic Declassification Type (SSDCTP)		2 spaces
Graphic Declassification Date (SSDCDT)		8 spaces
Graphic Declassification Exemption (SSDCXM)		4 spaces
Graphic Downgrade (SSDG)		1 space
Graphic Downgrade Date (SSDGDT)		8 spaces
Graphic Classification Text (SSCLTX)		43 spaces
Graphic Classification Authority Type (SSCATP)		1 space
Graphic Classification Authority (SSCAUT)		40 spaces
Graphic Classification Reason (SSCRSN)		1 space
Graphic Security Source Date (SSSRDT)		8 spaces
Graphic Security Control Number (SSCTLN)		15 spaces
Encryption (ENCRYP)	0	Required default
Graphic Type (SFMT)	C	1 character - indicates CGM
Reserved for Future Use (SSTRUCT)		Reserved 13 spaces
Graphic Display Level (SDLVL)	006	3 digits

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TABLE VII. Graphic subheader for the fourth graphic - Continued.

NITF GRAPHIC SUBHEADER FIELD	FORMAT	COMMENT
Graphic Attachment Level (SALVL)	002	3 digits
Graphic Location (SLOC)	0008500415	10 characters relative to origin of second image
First Graphic Bound Location (SBND1)	0008500415	10 characters relative to origin of second image
Graphic Color (SCOLOR)	M	indicates CGM file contains no color components
Second Graphic Bound Location (SBND2)	0011500755	10 characters relative to origin of second image
Reserved for Future Use (SRES2)		Reserved 2 spaces
Graphic Extended Subheader Data Length (SXSHDL)	00000	5 digits

6.1.2.3.4 Explanation of the fourth graphic subheader. The fourth graphic is a CGM graphic. It is the MAJOR TEST FACILITY text. It is attached to the subimage. Therefore, its location as recorded in SLOC is measured as an offset from the upper left corner of the subimage.

TABLE VIII. Graphic subheader for the fifth graphic.

NITF GRAPHIC SUBHEADER FIELD	FORMAT	COMMENT
File Part Type (SY)	SY	2
Graphic Identifier (SID)	0000000005	10
Graphic Name (SNAME)	COMMUNICATION ARROW	19 characters followed by 1 spaces - total 20 characters
Graphic Security Classification (SSCLAS)	U	1 character
Graphic Classification Security System (SSCLSY)		2 spaces
Graphic Codewords (SSCODE)		11 spaces
Graphic Control and Handling (SSCTLH)		2 spaces
Graphic Releasing Instructions (SSREL)		20 spaces
Graphic Declassification Type (SSDCTP)		2 spaces
Graphic Declassification Date (SSDCDT)		8 spaces
Graphic Declassification Exemption (SSDCXM)		4 spaces

TABLE VIII. Graphic subheader for the fifth graphic - Continued.

NITF GRAPHIC SUBHEADER FIELD	FORMAT	COMMENT
Graphic Downgrade (SSDG)		1 space
Graphic Downgrade Date (SSDGDT)		8 spaces
Graphic Classification Text (SSCLTX)		43 spaces
Graphic Classification Authority Type (SSCATP)		1 space
Graphic Classification Authority (SSCAUT)		40 spaces
Graphic Classification Reason (SSCRSN)		1 space
Graphic Security Source Date (SSSRDT)		8 spaces
Graphic Security Control Number (SSCTLN)		15 spaces
Encryption (ENCRYP)	0	Required default
Graphic Type (SFMT)	C	1 character - indicates CGM
Reserved for Future Use (SSTRUCT)		Reserved 13 spaces
Graphic Display Level (SDLVL)	007	3 digits
Graphic Attachment Level (SALVL)	001	3 digits
Graphic Location (SLOC)	0047000040	10 characters
First Graphic Bound Location (SBND1)	0047000040	10 characters
Graphic Color (SCOLOR)	M	indicates CGM file contains no color components
Second Graphic Bound Location (SBND2)	0059000600	10 characters
Reserved for Future Use (SRES2)		Reserved 2 spaces
Graphic Extended Subheader Data Length (SXSHDL)	00000	5 digits

6.1.2.3.5 Explanation of the fifth graphic subheader. The fifth graphic is a CGM graphic. It is the COMMUNICATIONS NODE annotation with associated arrow. It is attached to the base image. Therefore, its location as recorded in SLOC is measured as an offset from the upper left corner of the base image.

6.1.2.4 Explanation of the text subheaders. There are 5 text segments included in the file. Other than the text data they contain, text files 1 - 4 differ only in matters such as title, date-time of creation, and ID. Therefore, only the first is discussed, since the subheaders of the other three are essentially the same. Text file 5 is a US Message Text Formatting (USMTF) file.

TABLE IX. Text subheader for the text document.

NITF TEXT SUBHEADER FIELD	FORMAT	COMMENT
File Part Type (TE)	TE	2 characters
Text Identifier (TEXTID)	0000001	7 characters
Text Attachment Level (TXTALVL)	001	3 characters
Text Date and Time (TXTDT)	19960930224530	14 characters
Text Title (TXTITL)	First sample text file.	22 characters followed by 58 spaces - 80 total characters
Text Security Classification (TSCLAS)	U	1 character
Text Classification Security System (TSCLSY)		2 spaces
Text Codewords (TSCODE)		11 spaces
Text Control and Handling (TSCTLH)		2 spaces
Text Releasing Instructions (TSREL)		20 spaces
Text Declassification Type (TSDCTP)		2 spaces
Text Declassification Date (TSDCDT)		8 spaces
Text Declassification Exemption (TSDCXM)		4 spaces
Text Downgrade (TSDG)		1 space
Text Downgrade Date (TSDGDT)		8 spaces
Text Classification Text (TSCLTX)		43 spaces
Text Classification Authority Type (TSCATP)		1 space
Text Classification Authority (TSCAUT)		40 spaces
Text Classification Reason (TSCRSN)		1 space
Text Security Source Date (TSSRDT)		8 spaces
Text Security Control Number (TSCTLN)		15 spaces
Encryption (ENCRYP)	0	Required default
Text Format (TXTFMT)	STA	3 characters
Text Extended Subheader Data Length (TXSHDL)	00000	5 digits

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6.1.2.4.1 Explanation of the first text subheader. The first text segment is unclassified and was created on September 30, 1996 at 22:45 hours. Its subheader is shown in table IX.

6.1.2.4.2 Sample USMTF message: The following is a sample USMTF message that is a data portion associated with a text subheader for MTF.

```
EXER/GRAU MESSER//
OVERLAY/A/420TH MI BDE/24153000ZFEB98/OP AREA 3//
GENTEXT/OVERLAY DESCRIPTION/THIS OVERLAY IDENTIFIES AN
APACHE HELICOPTER IN OPERATION AREA 3//
IMG/DTE:970223/PRJ:MI/MSN:C031/FR/56-61,68/-/TOT:1322Z/50000
/BEN:0173-99999/SFX:A123/CAT:80000//
ICONID/A/421ST MI BDE/24190000ZFEB98/001/001/AFAPMHA00000000/E//
EQUIP/APACHE/AIRCRAFT/MAIN//
ICONLOC/313448.0N1102032W/-/-/-/-/ELE:00370M/273T/0.0KPH//
```

TABLE X. Text subheader for USMTF.

NITF TEXT SUBHEADER FIELD	FORMAT	COMMENT
File Part Type (TE)	TE	2 characters
Text Identifier (TEXTID)	0000000005	10 characters
Text Date and Time (TXTDT)	19980224153000	14 characters
Text Title (TXTITL)	Fifth sample text file.	23 characters followed by 57 spaces - 80 total characters
Text Security Classification (TSCLAS)	U	1 character
Text Codewords (TSCODE)		40 spaces
Text Control and Handling (TSCTLH)		40 spaces
Text Releasing Instructions (TSREL)		40 spaces
Text Classification Authority (TSCAUT)		20 spaces
Text Security Control Number (TSCTLN)		20 spaces
Text Security Downgrade (TSDWNG)		6 spaces
Encryption (ENCRYP)	0	1 character - required default
Text Format (TXTFMT)	MTF	3 characters
Text Extended Subheader Data Length (TXSHDL)	00000	5 digits

6.2 Product considerations. The NITF provides a very flexible means to package imagery products. One of the main objectives of NITF is to provide increased interoperability among potentially disparate imagery systems. For the purposes of NITF, interoperability means the ability to exchange NITF formatted imagery products among NITF capable systems in a manner that is meaningful and useful to the end users. This places a significant burden on NITF read capable implementations to be able to interpret and use potentially any combination of NITF file format options that may be created by NITF file producers. Consequently, significant care should be taken when defining product specifications for NITF formatted imagery products. The objective of the following discussion is to describe several generalized product configurations that can be used as the basis for defining specific imagery products. These product configurations are typical of those successfully used within the imagery and mapping community to date.

6.2.1 NITF product configurations.

6.2.1.1 General. An imagery product may potentially be produced under one of the following concepts.

6.2.1.1.1 Single file, single base image. This is the most common use of the NITF format. In this product concept, the NITF file is produced with a focus on a single image, commonly called the 'base image'. All other segments and extended data within the file are focused on amplifying the information portrayed in the base image.

6.2.1.1.2 Single file, multiple images. In this product concept, the NITF file is produced containing multiple images, all of which have equal or similar significance to the value of the product. Other segments and extended data within the file are focused on amplifying the information portrayed in the image(s) to which they are associated.

6.2.1.1.3 Single file, no image. This type of product may only have GSs, or only TSs, or only extension segments, or any combination of these segments. The significance of the data within the file may pertain only to that file, or it may pertain to one or more files with which it is associated.

6.2.1.1.4 Multiple correlated files. For this product concept, the product consists of multiple NITF files that are interrelated as defined in the governing product specification.

6.2.1.2 Single file, single base image. For this type of product file, there is one image of central focus, the base image, placed on the CCS plane. Its first pixel may be located at the origin (0,0) of the CCS, or off-set from the CCS origin according to the row/column coordinate values placed in the location (ILOC) field of the image subheader. Figure 16 provides a representative portrayal for the following discussion.

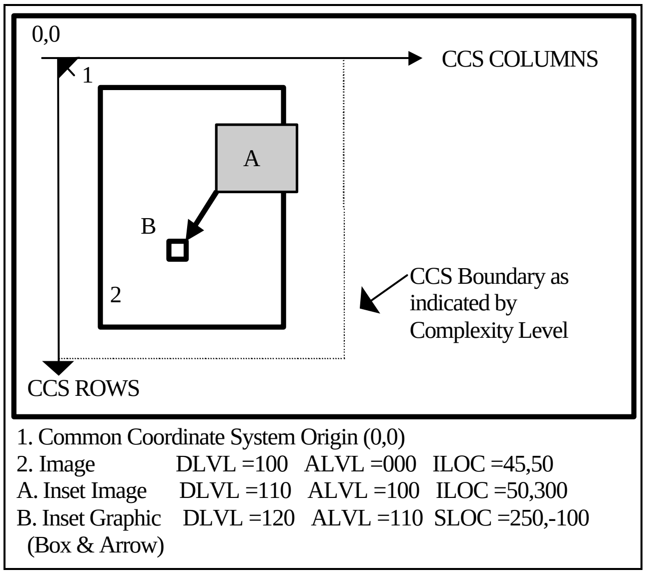


FIGURE 16. Single file, single base image.

6.2.1.2.1 Image ~~S~~egment (IS) overlays. Additional images, often called subimages or inset images, may be included as separate ISs in the file. The purpose of these images is to add information or clarity about the base image. Their placement in the CCS plane is controlled by the value of each segment's ALVL and Location (LOC) row/column value. When overlay images are attached to the base image, the LOC value represents a row/column off-set in the CCS from the location specified by the base image row/column LOC value. If the overlay image is unattached to any other segment (ALVL=000), the overlay's LOC value is a row/column off-set from the CCS origin (0,0).

6.2.1.2.2 Graphic Segment (GS) overlays. GSs are used to provide graphical (lines, polygons, ellipses, etc.) and textual annotation to the base image. The graphic representation is done using CGM. In a manner similar to IS overlays, the placement of graphics in the CCS plane is controlled by the value of each segment's ALVL and LOC values. CGM has its own internal Cartesian coordinate space called "Virtual Display Coordinates (VDC)" that has its own defined origin (0,0) point. The row/column value in the GS LOC field identifies the placement of the graphic's VDC origin point relative to the CCS origin when ALVL=000, or relative to the segment LOC to which it is attached.

6.2.1.2.3 Non-destructive overlays. NITF IS and GS overlays are handled in a non-destructive manner. The overlays may be placed anywhere within the bounds of the CCS (defined for a specific NITF file by the CLEVEL. They may be placed totally on the base image, partially on the base image, or entirely off of the base image. Any IS or GS can be placed on or under any other segment, fully or partially. The visibility of pixel values of overlapping segments is determined by the DLVL-assigned to that segment. Each displayable segment (images and graphics) is assigned a DLVL (ranging from 001 - 999) that is unique within the file. At any CCS pixel location shared by more than one image or graphic, the visible pixel value is the one from the segment having the greatest DLVL value. If the user of a NITF file opts to move an overlay, or turn off the presentation of an overlay, the next greatest underlying pixel value(s) will then become visible. This approach allows for the non-destructible nature of NITF overlays as opposed to the 'burned in' approach where overlay pixel values are used to replace pixels values of the underlying image.

6.2.1.2.4 Text Segment (TS). TSs allow inclusion in the NITF file of textual information related to the base image, perhaps a textual description of the activities portrayed in the image. For the purpose of this standard, segment refers to header or subheader and associated data. Below is a sample GRAPHREP text message:

```
EXER/GRAU MESSER//
MSGID/GRAPHREP-OVERLAY/420TH MI BDE//
OVERLAY/A/420TH MI BDE/24153000ZFEB98/OP AREA 3//
GENTEXT/OVERLAY DESCRIPTION/THIS OVERLAY IDENTIFIES AN
APACHE HELICOPTER IN OPERATION AREA 3//
IMG/DTE:970223/PRJ:MI/MSN:C031/FR/56-61,68/-/TOT:1322Z/50000
/BEN:0173-99999/SFX:A123/CAT:80000//
ICONID/A/421ST MI BDE/24190000ZFEB98/001/001/AFAPMHA00000000/E//
EQUIP/APACHE/AIRCRAFT/MAIN//
GRD/24190000ZFEB98/-/ACRCVR//
ICONLOC/313448.0N1102032W/-/-/-/-/ELE:00370M/273T/0.OKPH//
```

6.2.1.2.5 Extension data. The NITF file header and each standard data type sub-header have designated expandable fields to allow for the optional inclusion of extension data. The inclusion of extension data provides the ability to add data/information about the standard data type (metadata) that is not contained in the basic fields of the headers and subheaders. The additional data is contained within one or more NITF TREs that are placed in the appropriate field (user defined data field or extended data field) of the standard data type subheader for which the metadata applies. When TREs have application across multiple data types in the file, or otherwise apply to the entire NITF file in general, they are placed in the appropriate file header fields. Whereas general purpose NITF readers should always be able to portray IS and GS and act on standard header and subheader data, they may not always be able to act on product specific extension data. Upon receipt of a file that contains extension data, a NITF compliant system should at least ignore the extensions and properly interpret the other legal components of the NITF file. Exemplary use of TREs:

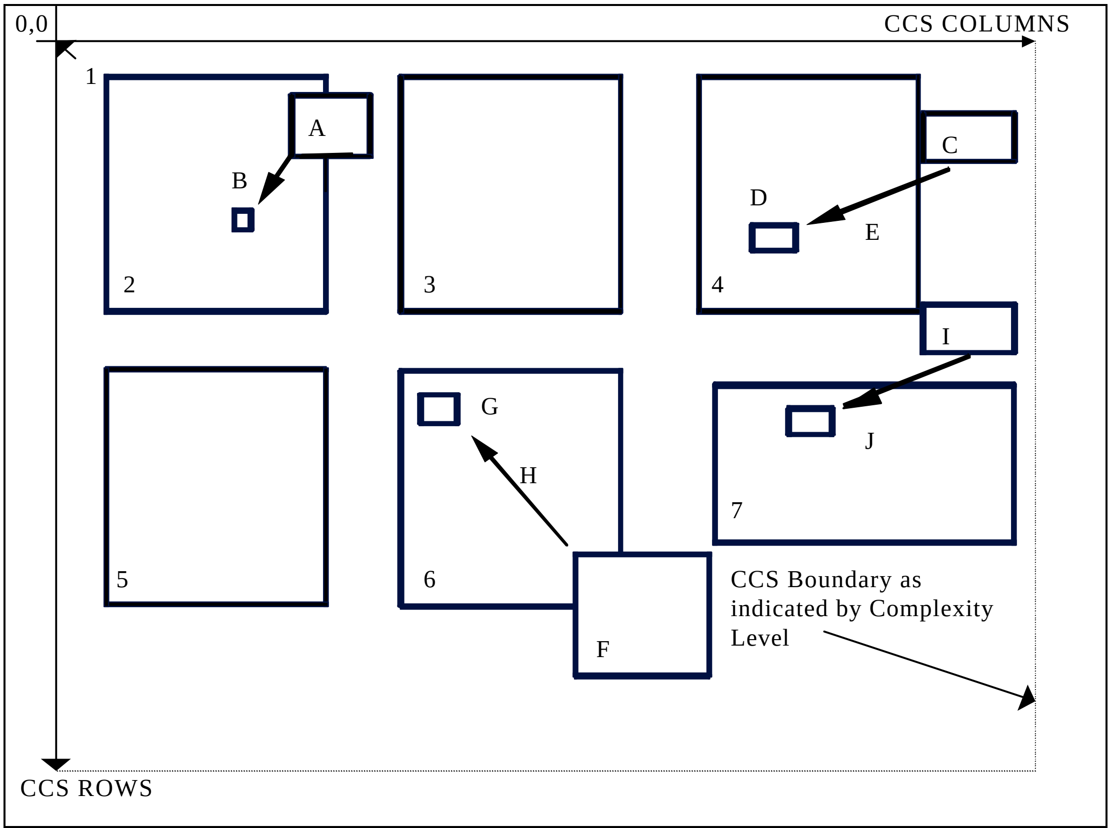
a. Data about people, buildings, places, landmarks, equipment or other objects that may appear in the image.

b. Data to allow correlation of information among multiple images and annotations within a NITF file.

c. Data about the equipment settings used to obtain the digital image, x-ray, etc.

d. Data to allow geo-positioning of items in the imagery or measurement of distances of items in the imagery.

6.2.1.3 Single file, multiple images without overlap. For this type of product file, multiple images of equal or similar focus (multiple 'base' images) are placed within the CCS plane. Each image is located at an off-set from the CCS origin such that there is no overlap among the images. The CLEVEL of the file must be chosen such that the bounds of the CCS for the file are sufficient to contain the extent of all segments within the file. Figure 17 provides a representative portrayal for this product type.



	Display Level	Attachment Level	Location
1. Common Coordinate System Origin (0,0)			
2. Image	DL = 100	AL = 000	50, 50
(A) Image Segment Overlay	DL = 110	AL = 100	50, 300
(B) Graphic Overlay (CGM Rectangle & Arrow)	DL = 120	AL = 110	100,-50
3. Image	DL = 200	AL = 000	50, 550
4. Image	DL = 300	AL = 000	50,1050
(C) Image Segment Overlay	DL = 310	AL = 300	100, 450
(D) Graphic Segment Overlay (CGM Rectangle)	DL = 320	AL = 300	300, 75
(E) Graphic Segment Overlay (CGM Arrow)	DL = 330	AL = 300	300,200
5 Image	DL = 400	AL = 000	800, 50
6 Image	DL = 500	AL = 000	800, 550
(F) Image Segment Overlay	DL = 510	AL = 500	300, 300
(G) Graphic Segment Overlay (CGM Rectangle)	DL = 520	AL = 500	35, 35
(H) Graphic Segment Overlay (CGM Arrow)	DL = 530	AL = 500	125, 125
7 Image	DL = 600	AL = 000	820,1050
(I) Image Segment Overlay	DL = 610	AL = 600	-150, 400
(J) CGM Graphic Overlay (Rectangle & Arrow)	DL = 620	AL = 600	50, 100

FIGURE 17. Single file, multiple images.

6.2.1.3.1 Overlays. Each image may be overlaid with additional ISs and GSs in the same fashion as described for the single file, single image case above. All overlays associated with a specific image should be attached to that specific image. Display levels assigned to each image and graphic in the file must be unique within the file.

6.2.1.3.2 Text Segment (TS). Each TS should be clearly marked as to whether it applies to the file as a whole, or if it is associated with specific images within the file. For the purpose of this standard, segment refers to header or subheader and associated data.

6.2.1.3.3 Extension data. TREs are placed in the file header extension fields when applicable to the file as a whole. Extensions specific to a segment are placed in that segment's subheader.

6.2.1.4 Single file, no image. An NITF single file product does not always contain an image. It could contain one or more GSs, one or more TSs, one or more extension segments, or any combination of these non-ISs. The file may be useful as a stand alone product, or it may be intended for use in conjunction with other NITF files. For example, the file could contain graphic overlays to be merged with or applied to another NITF file that was prepositioned or transmitted at an earlier time. Any general purpose NITF reader should at least be able to interpret and render the standard segments of no image NITF files on a stand alone basis.

6.2.1.5 Multiple correlated files. An imagery product may be comprised of multiple NITF files that are interrelated in a specified manner. This approach vastly increases the potential combination and permutation of options a general purpose NITF reader would need to support to maintain full interpret capability. Therefore, each NITF file in a multiple correlated file set must be structured such that a general purpose NITF reader can properly interpret and render the file as if it were a stand alone product. The correlation of multiple NITF files in a single product must be explicitly and unambiguously defined in a product specification. NITF readers can then be further categorized according to specific multiple file product specifications that are supported. Representative use of multiple correlated NITF files includes:

6.2.1.5.1 Stereo imagery. Some stereo image products are comprised of separate NITF files for the stereo components of each image scene.

6.2.1.5.2 Imagery mosaics. Some extremely large image and map products consist of multiple NITF files structured such that they can be pieced together in mosaic fashion by the interpret application as if the multiple files were a single larger image.

6.2.1.5.3 Reduced resolution data sets (Rsets). Some Rset products are comprised of multiple NITF files. One file contains a full resolution image and the other files contain the same image in a variety of lower resolutions.

6.2.1.5.4 Imagery and maps. Some geo-positioning products exist which consist of multiple separate NITF files containing interrelated maps, images, graphics, legends, product indices, and geo-reference data.

6.3 Sample NITF file structure. The following is an example of handling a file that has control TREs with overflow. The file has a single image.

TABLE XI. Sample NITF file structure.

NITF FILE HEADER	IMAGE SUBHEADER	IMAGE DATA	DATA EXTENSION SUBHEADER	DATA EXTENSION

MAIN NITF HEADER	IMAGE SUBHEADER		DES SUBHEADER	

NAME	FHDR	CLEVEL	ETC	FL	HL	NUMI	LISH001	LI001	NUMS	NUMX	NUMT	NUMDES	LDSH001	LD001	NUMRES	UDHDL	XHDL	IM	ETC	IMAG	UDIDL	IXSHDL	IXSOFL	IXSHD	IMAGE DATA	DE	DESTAG	ETC	DESOFLW	DESITEM	DESSHL	DES DATA
BYTES	9	2		1	6	3	6	10	3	3	3	3	4	9	3	5	5	2		4	5	5	3	98000		2	25		6	3	4	42000
VALUE	NSIF01.00	06		000805075764	000417	001	098442	0084934656	000	000	000	001	0249	000042000	000	00000	00000	IM		1.0	00000	98003	001			DE	TRE OVERFLOW		UDID	001	0000	

IXSHD	DES DATA
TRE 1 (32,000 BYTES)	TRE 4 (42,000 BYTES)
TRE 2 (27,000 BYTES)	
TRE 3 (39,000 BYTES)	

Note: Capacity of IXSHD is 99,999 bytes. You cannot split a TRE, therefore the first 3 TREs fit into the IXSHD and the 4th TRE is overflowed into the Data Extension Area.

6.4 Subject term (key word) listing.

Annotation, Imagery
Blocked Image Mask
Compression Algorithm
Compression, Bi-Level
Compression, Imagery
Facsimile Compression
File Format Graphics
Grey Scale Imagery
Group 3 Facsimile
Image
Image Compression
Image Dissemination
Image Transmission
Imagery, Bi-Level
Overlay

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Picture
Quantization Matrices
Raster
Secondary Imagery Dissemination Systems
SIDS
Symbols
Tag
Pad Pixel
Pad Pixel Mask

6.5 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes. Differences between MIL-STD-2500A and this standard are described in NIMA 0105-98.

APPENDIX A

NITF TABLES

A.1 SCOPE

This appendix is a mandatory part of this standard. The information contained herein is intended for compliance.

A.2 APPLICABLE DOCUMENTS

This section is not applicable to this appendix.

A.3 DEFINITIONS

The definitions in section 3 of this standard apply to this appendix.

A.4 DETAILED REQUIREMENTS

TABLE A-1. NITF file header.
(TYPE “R” = Required, “C” = Conditional, “< >“ = BCS spaces allowed for entire field)
(“†” annotations are explained at the end of the table)

FIELD	NAME	SIZE	VALUE RANGE	TYPE
FHDR	File Profile Name. This field shall contain the BCS-A character string uniquely denoting that the file is formatted using NITF. The valid value for this field is NITF.	4	BCS-A NITF	R
FVER	File Version. This field shall contain a BCS-A character string uniquely denoting the version. The valid value for this field is 02.10.	5	BCS-A 02.10	R
CLEVEL	Complexity Level. This field shall contain the complexity level required to interpret fully all components of the file. Values are integer assigned in accordance with complexity levels established in appendix E.	2	BCS-N 01-99	R
STYPE	Standard Type. Standard type or capability. A BCS-A character string BF01 which indicates that this file is formatted using ISO/IEC IS 12087-5. NITF02.10 is intended to be registered as a profile of ISO/IEC IS 12087-5.	4	BCS-A BF01	R
OSTAID	Originating Station ID. This field shall contain the identification code or name of the originating organization, system, station, or product. It shall not be filled with BCS spaces (0x20).	10	BCS-A	R
FDT	File Date and Time. This field shall contain the time (UTC) (Zulu) of the file’s origination in the format CCYYMMDDhhmmss, where CC is the century (00-99), YY is the last two digits of the year (00-99), MM is the month (01-12), DD is the day (01-31), hh is the hour (00-23), mm is the minute (00-59), and ss is the second (00-59). UTC is assumed to be the time zone designator to express the time of day.	14	BCS-N CCYYMMDDhhmmss	R

TABLE A-1. NITF file header - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
FTITLE	File Title. This field shall contain the title of the file or shall be filled with UT1 spaces (0x20).	80	UT1 (Default is UT1 spaces (0x20))	<R>
FSCLAS	File Security Classification. This field shall contain a valid value representing the classification level of the entire file. Valid values are T (=Top Secret), S (=Secret), C (=Confidential), R (=Restricted), U (=Unclassified).	1	UT1 T, S, C, R, or U	R
NOTE: If FSCLAS is T, S, C, or R, then FSCLSY must be populated with a valid code for the security classification system used.				
FSCLSY	File Security Classification System. This field shall contain valid values indicating the national or multinational security system used to classify the file. Country Codes per FIPS PUB 10-4 shall be used to indicate national security systems. If this field is all UT1 spaces (0x20), it shall imply that no security classification system applies to the file.	2	UT1 (Default is UT1 spaces (0x20))	<R>
NOTE: If any of the following fields are populated with anything other than spaces, then FSCLSY must be populated with a valid code for the security classification system used: FSCODE, FSREL, FSDCTP, FSDCDT, FSDCXM, FSDG, FSDGDT, FSCLTX, FSCATP, FSCAUT, FSCRSN, FSSRDT, and FSCTLN.				
FSCODE	File Codewords. This field shall contain a valid indicator of the security compartments associated with the file. Values include one or more of the digraphs found table A-4. Multiple entries shall be separated by a single UT1 space (0x20): The selection of a relevant set of codewords is application specific. If this field is all UT1 spaces (0x20), it shall imply that no codewords apply to the file.	11	UT1 (Default is UT1 spaces (0x20))	<R>
FSCTLH	File Control and Handling. This field shall contain valid additional security control and/or handling instructions (caveats) associated with the file. Values include digraphs found in table A-4. The digraph may indicate single or multiple caveats. The selection of a relevant caveat(s) is application specific. If this field is all UT1 spaces (0x20), it shall imply that no additional control and handling instructions apply to the file.	2	UT1 (Default is UT1 spaces (0x20))	<R>
FSREL	File Releasing Instructions. This field shall contain a valid list of country and/or multilateral entity codes to which countries and/or multilateral entities the file is authorized for release. Valid items in the list are one or more country codes as found in FIPS PUB 10-4 separated by a single UT1 space (0x20). If this field is all UT1 spaces (0x20), it shall imply that no file release instructions apply.	20	UT1 (Default is UT1 spaces (0x20))	<R>

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TABLE A-1. NITF file header - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
FSDCTP	File Declassification Type. This field shall contain a valid indicator of the type of security declassification or downgrading instructions which apply to the file. Valid values are DD (=declassify on a specific date), DE (=declassify upon occurrence of an event), GD (=downgrade to a specified level on a specific date), GE (=downgrade to a specified level upon occurrence of an event), O (=OADR), and X (= exempt from automatic declassification). If this field is all UT1 spaces (0x20), it shall imply that no file security declassification or downgrading instructions apply.	2	UT1 DD, DE, GD, GE, O, X (Default is UT1 spaces (0x20))	<R>
FSDCDT	File Declassification Date. This field shall indicate the date on which a file is to be declassified if the value in File Declassification Type is DD. If this field is all UT1 spaces (0x20), it shall imply that no file declassification date applies.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	<R>
FSDCXM	File Declassification Exemption. This field shall indicate the reason the file is exempt from automatic declassification if the value in File Declassification Type is X. Valid values are X1 to X8 and X251 to X259. X1 to X8 correspond to the declassification exemptions found in DOD 5200.1-R, paragraphs 4-202b(1) to (8) for material exempt from the 10-year rule. X251 to X259 correspond to the declassification exemptions found in DOD 5200.1-R, paragraphs 4-301a(1) to (9) for permanently valuable material exempt from the 25-year declassification system. If this field is all UT1 spaces (0x20), it shall imply that a file declassification exemption does not apply.	4	UT1 X1 to X8, X251 to X259, (Default is UT1 spaces (0x20))	<R>
FSDG	File Downgrade. This field shall indicate the classification level to which a file is to be downgraded if the values in File Declassification Type are GD or GE. Valid values are S (=Secret), C (=Confidential), R (= Restricted). If this field contains a UT1 space (0x20), it shall imply that file security downgrading does not apply.	1	UT1 S, C, R (Default is UT1 space (0x20))	<R>
FSDGDT	File Downgrade Date. This field shall indicate the date on which a file is to be downgraded if the value in File Declassification Type is GD. If this field is all UT1 spaces (0x20), it shall imply that a file security downgrading date does not apply.	8	UT1 CYYMMDD (Default is UT1 spaces (0x20))	<R>
FSCLTX	File Classification Text. This field shall be used to provide additional information about file classification to include identification of a declassification or downgrading event if the values in File Declassification Type are DE or GE. It may also be used to identify multiple classification sources and/or any other special handling rules. Values are user defined free text. If this field is all UT1 spaces (0x20), it shall imply that additional information about file classification does not apply.	43	UT1 (Default is UT1 spaces (0x20))	<R>

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TABLE A-1. NITF file header - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
FSCATP	File Classification Authority Type. This field shall indicate the type of authority used to classify the file. Valid values are O (= original classification authority), D (= derivative from a single source), and M (= derivative from multiple sources). If this field contains a UT1 space (0x20), it shall imply that file classification authority type does not apply.	1	UT1 (Default is UT1 space (0x20))	<R>
FSCAUT	File Classification Authority. This field shall identify the classification authority for the file dependent upon the value in File Classification Authority Type. Values are user defined free text which should contain the following information: original classification authority name and position or personal identifier if the value in File Classification Authority Type is O; title of the document or security classification guide used to classify the file if the value in File Classification Authority Type is D; and Derive-Multiple if the file classification was derived from multiple sources and the value of the FSCATP field is M. In the latter case, the file originator will maintain a record of the sources used in accordance with existing security directives. One of the multiple sources may also be identified in File Classification Text if desired. If this field is all UT1 spaces (0x20), it shall imply that no file classification authority applies.	40	UT1 (Default is UT1 spaces (0x20))	<R>
FSCRSN	File Classification Reason. This field shall contain values indicating the reason for classifying the file. Valid values are A to G. These correspond to the reasons for original classification per E.O. 12958, Section 1.5.(a) to (g). If this field contains a UT1 space (0x20), it shall imply that no file classification reason applies.	1	UT1 (Default is UT1 space (0x20))	<R>
FSSRDT	File Security Source Date. This field shall indicate the date of the source used to derive the classification of the file. In the case of multiple sources, the date of the most recent source shall be used. If this field is all UT1 spaces (0x20), it shall imply that a file security source date does not apply.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	<R>
FSCTLN	File Security Control Number. This field shall contain a valid security control number associated with the file. The format of the security control number shall be in accordance with the regulations governing the appropriate security channel(s). If this field is all UT1 spaces (0x20), it shall imply that no file security control number applies.	15	UT1 (Default is UT1 spaces (0x20))	<R>
FSCOP	File Copy Number. This field shall contain the copy number of the file. If this field is all BCS zeros (0x30), it shall imply that there is no tracking of numbered file copies.	5	BCS-N 00000-99999 (Default is BCS zeros (0x30))	R

TABLE A-1. NITF file header - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
FSCPYS	File Number of Copies. This field shall contain the total number of copies of the file. If this field is all BCS zeros (0x30), it shall imply that there is no tracking of numbered file copies.	5	BCS-N 00000-99999 (Default is BCS zeros (0x30))	R
ENCRYP	Encryption. This field shall contain the value BCS zero (0x30) until such time as this specification is updated to define the use of other values.	1	BCS-N 0 = Not Encrypted	R
FBKGC	File Background Color. This field shall contain the three color components of the file background in the order Red, Green, Blue. Where (0x00, 0x00, 0x00) is black and (0xFF, 0xFF, 0xFF) is white.	3	Unsigned binary integer (0x00-0xFF, 0x00-0xFF, 0x00-0xFF)	R
ONAME	Originator's Name. This field shall contain a valid name for the operator who originated the file. If the field is all UT1 spaces (0x20), it shall represent that no operator is assigned responsibility for origination.	24	UT1 (Default is UT1 spaces (0x20))	<R>
OPHONE	Originator's Phone Number. This field shall contain a valid phone number for the operator who originated the file. If the field is all UT1 spaces (0x20), it shall represent that no phone number is available for the operator assigned responsibility for origination.	18	UT1 (Default is UT1 spaces (0x20))	<R>
FL	File Length. This field shall contain the length in bytes of the entire file including all headers, subheaders, and data. Note: The largest file is limited to 999999999998 (10^{12} -2) bytes. A value of 999999999999 in this field indicates that the actual file length was not available when the header was created (paragraph 5.2.1).	12	BCS-N 000000000388-999999999998, 999999999999	R
HL	NITF File Header Length. This field shall contain a valid length in bytes of the NITF file header.	6	BCS-N 000388-99999	R
NUMI	Number of Image Segments. This field shall contain the number of separate image segments included in the file. This field shall be BCS zeros (0x30) no image segments are included in the file.	3	BCS-N (Default is BCS zeros (0x30)) 000-999	R
. . . . . Start for each IS LISHn, LIn.				
NOTE: LISHn and LIn fields repeat in pairs such that LISH001, LI01; LISH002, LI002; .....LISHn,LIn.				
LISHn	Length of n^{th} Image Subheader. This field shall contain a valid length in bytes for the n^{th} image subheader, where n is the number of the IS counting from the first IS (n=001) in order of the image segments' appearance in the file. Possible values for n are 001 to 999. This field shall occur as many times as specified in the NUMI field. This field is conditional and shall be omitted if the NUMI field contains BCS zeros (0x30). Note: The largest image subheader is limited to 999998 (10^6 -2) bytes. A value of 999999 in this field indicates that the actual subheader length was not available when the header was created (paragraph 5.2.1).	6	BCS-N 000439-999998, 999999	C

TABLE A-1. NITF file header - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
LIn	Length of n^{th} Image Segment. This field shall contain a valid length in bytes of the n^{th} IS, where n is the number of the IS counting from the first IS(n=001) in order of the IS appearance in the file. Possible values for n are 001 to 999. If the IS is compressed, the length after compression shall be used. This field shall occur as many times as specified in the NUMI field. This field is conditional and shall be omitted if the NUMI field contains BCS zeros (0x30). Note: The largest image is limited to 9999999998 (10^{10} -2) bytes. A value of 9999999999 in this field indicates that the actual image length was not available when the header was created (paragraph 5.2.1).	10	BCS-N 0000000001-9999999998, 9999999999	C
. . . . End for each IS LISHn, LIn; the number of loop repetitions is the value specified in the NUMI field.				
NUMS	Number of Graphic Segments. This field shall contain the number of separate graphic segments included in the file. This field shall be BCS zeros (0x30) if no graphic segments are included in the file.	3	BCS-N 000-999	R
. . . . . Start for each GS LSSHn, LSn.				
NOTE: LSSHn and LSn fields repeat in pairs such that LSSH001, LS00; LSSH001, LS002; .....LSSHn,LSn.				
LSSHn	Length of n^{th} Graphic Subheader. This field shall contain a valid length in bytes for the n^{th} graphic subheader, where n is the number of the graphic segment counting from the first GS (n=001) in the order of the graphic segments' appearance in the file. Possible values for n are 001 to 999. This field shall occur as many times as specified in the NUMS field. This field is conditional and shall be omitted if the NUMS contains BCS zeros (0x30). Note: The largest subheader is limited to 9998 (10^4 -2) bytes. A value of 9999 in this field indicates that the actual subheader length was not available when the header was created (paragraph 5.2.1).	4	BCS-N 0258-9998, 9999	C
LSn	Length of n^{th} Graphic Segment. This field shall contain a valid length in bytes of the n^{th} GS, where n is the number of the GS, counting from the first GS (n=001) in the order of the graphic segments' appearance in the file. Possible values for n are 001 to 999. This field shall occur as many times as specified in the NUMS field. This field is conditional and shall be omitted if NUMS field contains BCS zeros (0x30). Note: The largest graphic is limited to 999998 (106 -2) bytes. A value of 999999 in this field indicates that the actual graphic length was not available when the header was created (paragraph 5.2.1).	6	BCS-N 000001-999998, 999999	C
. . . . End for each GS LSSHn, Lsn; the number of loop repetitions is the value specified in the NUMS field.				
NUMX	Reserved for Future Use. This field is reserved for future use and shall be filled with BCS zeros (0x30).	3	BCS-N 000	R

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TABLE A-1. NITF file header - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
NUMT	Number of Text Segments. This field shall contain the number of separate text segment(s) included in the file. This field shall be BCS zeros (0x30) if no text segments are included in the file.	3	BCS-N (Default is BCS zeros (0x30)) 000-999	R
. . . . . Start for each TS LTSHn, LTn.				
NOTE: LTSHn and LTn fields repeat in pairs such that LTSH001, LT00; LTSH001, LT002; .....LTSHn,LTn.				
LTSHn~~nn~~	Length of n^{th} text subheader. This field shall contain a valid length in bytes for the n^{th} text subheader, where n is the number of the text segment, counting from the first text segment (n=001) in the order of the text segments' appearance in the file. Possible values for n are 001 to 999. This field shall occur as many times as specified in the NUMT field. This field is conditional and shall be omitted if the NUMT field contains BCS zeros (0x30). Note: The largest subheader is limited to 9998 (10^4 -2) bytes. A value of 9999 in this field indicates that the actual subheader length was not available when the header was created (paragraph 5.2.1).	4	BCS-N 0282-9998, 9999	C
LTn	Length of n^{th} Text Segment. This field shall contain a valid length in bytes of the n^{th} text segment, where n is the number of the text segment, counting from the first text segment (n=001) in the order of the text segments' appearance in the file. Possible values for n are 001 to 999. This field shall occur as many times as specified in the NUMT field. This field is conditional and shall be omitted if the NUMT field contains BCS zeros (0x30). Note: The largest text file is limited to 9998 (10^5 -2) bytes. A value of 99999 in this field indicates that the actual text file length was not available when the header was created (paragraph 5.2.1).	5	BCS-N 00001-99998, 99999	C
. . . . End for each TS LTSHn, LTn; the number of loop repetitions is the value specified in the NUMT field.				
NUMDES	Number of Data Extension Segments. This field shall contain the number of separate DESs included in the file. This field shall be BCS zeros (0x30) if no DESs are included in the file.	3	BCS-N (Default is BCS zeros (0x30)) 000-999	R
. . . . . Start for each DES LDSHn, LDn.				
NOTE: LDSHn and LDn fields repeat in pairs such that LDSH001, LD00; LDSH001, LD002; .....LDSHn,LDn.				
LDSHn	Length of n^{th} Data Extension Segment Subheader. This field shall contain a valid length in bytes for the n^{th} DES subheader, where n is the number of the DES counting from the first DES (n = 001) in order of the DES's appearance in the file. Possible values for n are 001 to 999. This field shall occur as many times as are specified in the NUMDES field. This field is conditional and shall be omitted if the NUMDES field contains BCS zeros (0x30). Note: The largest subheader is limited to 9998 (10^4 -2) bytes. A value of 9999 in this field indicates that the actual subheader length was not available when the header was created (paragraph 5.2.1).	4	BCS-N 0200-9998, 9999	C

TABLE A-1. NITF file header - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
LDn	Length of n^{th} Data Extension Segment. This field shall contain a valid length in bytes of the data in the n^{th} DES, where n is the number of the DES counting from the first DES (n=001) in order of the DESs' appearance in the file. This field shall occur as many times as are specified in the NUMDES field. This field is conditional and shall be omitted if the NUMDES ~~fields~~ field contains BCS zeros (0x30). Note: The largest DES is limited to 999999998 (10^9 -2) bytes. A value of 999999999 in this field indicates that the actual DES length was not available when the header was created (paragraph 5.2.1).	9	BCS-N 000000001-999999998, 999999999	C
. . . . End for each DES LDSHn, LDn; the number of loop repetitions is the value specified in the NUMDES field.				
NUMRES	Number of Reserved Extension Segments. This field shall contain the number of separate RESs included in the file. This field shall be BCS zeros (0x30) if no RESs are included in the file.	3	BCS-N (Default is BCS zeros (0x30)) 000-999	R
. . . . . Start for each RES LRESHn, LREn.				
NOTE: LRESHn and LREn fields repeat in pairs such that LRESH001, LRE001; LRESH001, LRE002; .....LRESHn,LREn.				
LRESHn	Length of n^{th} Reserved Extension Segment Subheader. This field shall contain a valid length in bytes for the n^{th} RES subheader, where n is the number of the RES counting from the first RES (n-= 001) in order for RESs' appearance in the file. This field shall occur as many times as are specified in the NUMRES field. This field is conditional and shall be omitted if the NUMRES field contains BCS zeros (0x30).	4	BCS-N 0200-9999	C
LREn	Length of n^{th} Reserved Extension Segment. This field shall contain a valid length in bytes for the n^{th} RES subheader, where n is the number of the RES counting from the first RES (n=001) in order of the RES appearance in the file. This field shall occur as many times as are specified in the NUMRES field. This field is conditional and shall be omitted if the NUMRES field contains BCS zeros (0x30).	7	BCS-N 0000001-9999999	C
. . . . End for each RES LRESHn, LREn; the number of loop repetitions is the value specified in the NUMRES field.				
UDHDL	User Defined Header Data Length. A value of BCS zeros (0x30) shall represent that no TREs are included in the UDHD. If a-TRE exists, the field shall contain the sum of the length of all the TREs (paragraph 5.8.1) appearing in the UDHD field plus 3 bytes (length of UDHOFL field). If a TRE is too long to fit in the UDHD field, it shall be put in the TRE overflow DES with DESID set to the value TRE_OVERFLOW (paragraph 5.8.3.1).	5	BCS-N (Default is BCS zeros (0x30)) 00000 or 00003-99999	R
UDHOFL	User Defined Header Overflow. This field shall contain BCS zeros (0x30) if the TRE in UDHD do not overflow into a DES, or shall contain the sequence number of the DES into which they do overflow. This field shall be omitted if the field UDHDL contains BCS zeros (0x30).	3	BCS-N (Default is BCS zeros (0x30)) 000-999	C

TABLE A-1. NITF file header - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
UDHD	User-Defined Header Data. If present, this field shall contain user-defined TRE data (paragraph 5.8.1). The length of this field shall be the value contained by the UDHDL field minus 3 bytes. Tagged record extensions shall appear one after the other with no intervening bytes. The first byte of this field shall be the first byte of the first tagged record extension appearing in the field. The last byte of this field shall be the last byte of the last tagged record extension to appear in the field. This field shall be omitted if the UDHDL field contains BCS zeros (0x30).	†[1]	User-defined	C
XHDL	Extended Header Data Length. A value of BCS zeros (0x30) shall represent that no TREs are included in the XHD. If a TRE exists, the field shall contain the sum of the length of all the TRE (paragraph 5.8.1) appearing in the XHD field plus 3 bytes (length of XHDLOFL field). If a TRE is too long to fit in the XHD field or the UDHD field it shall be put in the TRE overflow DES with DESID set to the value TRE_OVERFLOW (paragraph 5.8.3.1).	5	BCS-N (Default is BCS zeros (0x30)) 00000 or 00003-99999	R
XHDLOFL	Extended Header Data Overflow. This field shall contain BCS zeros (0x30) if the TREs in XHD do not overflow into a DES, or shall contain the sequence number of the DES into which they do overflow. This field shall be omitted if the XHD field contains BCS zeros (0x30).	3	BCS-N (Default is BCS zeros (0x30)) 000-999	C
XHD	Extended Header Data. If present, this field shall contain TREs (paragraph 5.8.1) approved and under configuration management of the ISMC. The length of this field shall be the length specified by the field XHDL minus 3 bytes. TREs shall appear one after the other with no intervening bytes. The first byte of this field shall be the first byte of the first TRE appearing in the field. The last byte of this field shall be the last TRE to appear in the field. This field shall be omitted if the XHDL field contains BCS zeros (0x30).	††[1]	Tagged Record Extension(s)	C

†[1] A value ~~A~~as specified in the UDHDL field minus 3 (in bytes)
††[1] A value ~~A~~as specified in the XHDL field minus 3 (in bytes)

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TABLE A-2. Display dependent parameters.

IREP	IREPBANDn	NBANDS	PVTYPE	NLUTSn
NODISPLY	BCS spaces (0x20)	1 to 9, 0†[2]	INT, R,C,B	0
MONO	M	1	INT, R,B	0, 1, 2
RGB	R,G,B	3	INT, R	0
RGB/LUT	LU	1	INT, B	3
YCbCr601	Y,Cb,Cr	3	INT	0
NVECTOR	BCS spaces (0x20)	1 to 9, 0†[2]	INT, R,C	0
POLAR	BCS spaces (0x20), M	2	INT, R,C	0
VPH	BCS spaces (0x20)	2	INT, R,C	0
MULTI	BCS spaces (0x20), M, R, G, B, LU	2 to 9, 0†[2]	INT, R,C,B	0, 1, 2, 3

†[2] If NBANDS field contains 0 then XBANDS field is required where XBANDS>9

TABLE A-2(A). Category dependent parameters.

ICAT	ISUBCATn	NBANDS	PVTYPE	NBPP	ABPP
VIS, OP	BCS spaces (0x20)	1	B	1	1
		1, 3	INT	8	2 to 8
				12	9 to 12
				16	9 to 16
				32	17 to 32
				64	33 to 64
			R	32	32
				64	64
SL, TI, FL, RD, EO, HR, BP, FP, VD, CAT, MRI, XRAY	BCS spaces (0x20)	1	INT	8	2 to 8
				12	9 to 12
				16	9 to 16
				32	17 to 32
				64	33 to 64
			R	32	32
				64	64
IR	BCS spaces (0x20), wave length	1	INT	8	2 to 8
				12	9 to 12
				16	9 to 16
				32	17 to 32
				64	33 to 64
			R	32	32
				64	64
CP, PAT	BCS spaces (0x20)	3	INT	8	2 to 8
				32	17 to 32
				64	33 to 64
MAP, LEG	BCS spaces (0x20)	1, 3	INT	8	2 to 8
				32	17 to 32
				64	33 to 64

TABLE A-2(A). Category dependent parameters - Continued.

ICAT	ISUBCATn	NBANDS	PVTYPE	NBPP	ABPP
MATR, LOCG	BCS spaces (0x20), CGX, CGY. GGX, GGY (units of elevation data from DIGEST, part 3, annex B)	1 to 9, 0†[2(A)]	INT	8	2 to 8
				12	9 to 12
				16	9 to 16
				32	17 to 32
				64	33 to 64
			R	32	32
				64	64
MATR	BCS spaces (0x20)	1 to 9, 0†[2(A)]	C	64	64
MS, HS	BCS spaces (0x20)	2 to 9, 0†[2(A)]	INT	8	2 to 8
				12	9 to 12
				16	9 to 16
				32	17 to 32
				64	33 to 64
			R	32	32
				64	64
SAR, SARIQ	BCS spaces (0x20), I, Q, M, P	1	C	64	64
		1, 2	INT	8	2 to 8
				12	9 to 12
				16	9 to 16
				32	17 to 32
				64	33 to 64
			R	32	32
				64	64
WIND, CURRENT	SPEED, DIRECT	2	INT	8	2 to 8
BARO, DEPTH	BCS spaces (0x20) (units of elevation data from DIGEST, part 3, annex B)	1	INT	8	2 to 8
				12	9 to 12
				16	9 to 16
DTEM	BCS spaces (0x20) (units of elevation data from DIGEST part 3, annex B)	1	INT	8	8
				12	9 to 12
				16	9 to 16
				32	17 to 32
				64	33 to 64
			R	32	32
				64	64

†[2(A)] If NBANDS field contains 0 then XBANDS fiedl is required where XBANDS > 9

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TABLE A-2(B). Image Catagory (ICAT) value definitions.

ICAT	DEFINITION
BARO	Barometric Pressure.
BP	Black/White Frame Photography. The film or imagery produced by a black/white camera to produce planimetric and topographic maps of the earth's surface; includes surveying cameras, hand-held camera, and most reconnaissance cameras.
CAT	Computerised Axial Tomography Scan. Cat Scans represent specialized xrays of cross-sectional images from within the body; used for medical diagnosis.
CP	Color Frame Photography. The film or imagery produced by a color camera to produce planimetric and topographic maps of the earth's surface; includes surveying cameras, hand-held camera, and most reconnaissance cameras.
CURRENT	Water Current.
DEPTH	Water Depth.
DTEM	Elevation Model. A numerical model of the elevations of points on the earth's surface.
EO	Electro-optical. Electro-Optical sensing systems sense things a film camera cannot see by using a wider range of the electromagnetic spectrum.
FL	Forward Looking Infrared. Forward Looking Infrared is an airborne, electro-optical thermal imaging device that detects far-infrared energy, converts the energy into an electronic signal, and provides a visible image for day or night viewing.
FP	Fingerprints. Fingerprints used for identification which represent the markings on the inner surface of the fingertip, particularly when made with ink.
HR	High Resolution Radar. High Resolution Radar which has been attenuated to take advantage of maximum pulse length and antenna beamwidth.
HS	Hyperspectral. Hyperspectral imagery or imagery with narrow bandwidth and hundreds of bands; compare/constrast with monochromatic, multispectral, and ultraspectral.
IR	Infrared. That imagery produced as a result of sensing electromagnetic radiation emitted or reflected from a given target surface in the infrared position of the electromagnetic spectrum (approximately 0.72 to 1,000 microns).
LEG	Legends. Legends - Textual data that provides reference amplification for images.
LOCG	Location Grid. Location Grid - geolocation of an image within a frame.
MAP	Raster Map. Raster Maps result from the numerical process that scans contiguous pixel values to produce an image representation.
MATR	Matrix Data. Geometric Data other than terrain and elevation.
MRI	Magnetic Resonance Imagery. Magnetic Resonance Imagery is imagery formed from the response of electrons, atoms, molecules, or nuclei to discrete radiation frequencies.
MS	Multispectral. Multispectral imagery or imagery from an object obtained simultaneously in a number of discrete spectral bands.
OP	Optical. Optical imagery is captured using the principle of a focal plane intersecting an optical axis in a film camera.
PAT	Color Patch. Color Patch usually accompanied with a Look-up-Table (LUT) to equate colors to an image.
RD	Radar. Radar or Radio Detection and Ranging is imagery produced by recording radar waves reflected from a given target surface.
SAR	Synthetic Aperture Radar. Synthetic Aperture Radar is radar which overcomes image resolution deficiencies by using a short physical antenna to synthesize the effect of a very large antenna giving increased beamwidth.
SARIQ	Synthetic Aperture Radar Radio Hologram. Radio hologram (initial phase information) from a Synthetic Aperture Radar (SAR) with 13,000 elements/slant range.
SL	Side Looking Radar. Side-Looking Radar represents An airborne radar, viewing at right angles to the axis of the vehicle, which produces a presentation of terrain or moving targets.

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TABLE A-2(B). Image Catagory (ICAT) value definitions - Continued.

ICAT	DEFINITION
TI	Thermal Infrared. Thermal Infrared is imagery produced by sensing and recording the thermal energy emitted or reflected from the objects which are imaged.
VD	Video. Video imagery is motion Imagery defined as imaging sensor / systems that generate sequential or continuous streaming images at specified temporal rates (normally expressed as frames per second).
VIS	Visible Imagery. Visible Imagery in the electromagnetic spectrum that is visible to the human eye, usually between .4 and .7 micrometers; this type of imagery is usually captured via digital aerial photographs.
WIND	Air Wind Charts.
XRAY	X-ray. A form of electromagnetic radiation, similar to light but of shorter wavelength.

TABLE A-3. NITF image subheader.
(TYPE “R” = Required, “C” = Conditional, “< >“ = BCS spaces allowed for entire field)
(“†” annotations are explained at the end of the table)

FIELD	NAME	SIZE	VALUE RANGE	TYPE
IM	File Part Type. This field shall contain the characters “IM” to identify the subheader as an image subheader.	2	BCS-A IM	R
IID1	Image Identifier 1. This field shall contain a valid alphanumeric identification code associated with the image. The valid codes are determined by the application.	10	BCS-A User-defined	R
IDATIM	Image Date and Time. This field shall contain the time (UTC) of the image acquisition in the format CCYYMMDDhhmmss, where CC is the century (00-99), YY is the last two digits of the year (00-99), MM is the month (01-12), DD is the day (0-31), hh is the hour (00-23), mm is the minute (00-59), ss is the second (00-59). UTC (Zulu) is assumed to be the time zone designator to express the time of day.	14	BCS-N CCYYMMDDhhmmss	R
TGTID	Target Identifier. This field shall contain the identification of the primary target in the format, BBBBBBBBBBOOOOOCC, consisting of ten characters of Basic Encyclopedia (BE) identifier, followed by five characters of facility OSUFFIX, followed by the two character country code as specified in FIPS PUB 10-4.	17	BCS-A BBBBBBBBBBOOOOOCC (Default is BCS spaces (0x20))	<R>
IID2	Image Identifier 2. This field can contain the identification of additional information about the image.	80	UT1 (Default is UT1 spaces (0x20))	<R>
ISCLAS	Image Security Classification. This field shall contain a valid value representing the classification level of the image. Valid values are T (=Top Secret), S (=Secret), C (=Confidential), R (=Restricted), U (=Unclassified).	1	UT1 T, S, C, R, or U	R
NOTE If ISCLAS is T, S, C, or R, then ISCLSY must be populated with a valid code for the security classification system used.				
ISCLSY	Image Security Classification System. This field shall contain valid values indicating the national or multinational security system used to classify the image. Country Codes per FIPS PUB 10-4 shall be used to indicate national security systems. If this field is all UT1 spaces (0x20), it shall imply that no security classification system applies to the image.	2	UT1 (Default is UT1 spaces (0x20))	<R>

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TABLE A-3. NITF image subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
NOTE If any of the following fields are populated with anything other than spaces, then ISCLSY must be populated with a valid code for the security classification system used: ISCODE, ISREL, ISDCTP, ISDCDT, ISDCXM, ISDG, ISDGDT, ISCLTX, ISCATP, ISCAUT, ISCRSN, ISSRDT, and ISCTLN.				
ISCODE	Image Codewords. This field shall contain a valid indicator of the security compartments associated with the image. Values include one or more of the digraphs found in table A-4. Multiple entries shall be separated by a single UT1 space (0x20): The selection of a relevant set of codewords is application specific. If this field is all UT1 spaces (0x20), it shall imply that no codewords apply to the image.	11	UT1 (Default is UT1 spaces (0x20))	<R>
ISCTLH	Image Control and Handling. This field shall contain valid additional security control and/or handling instructions (caveats) associated with the image. Values include digraphs found in table A-4. The digraph may indicate single or multiple caveats. The selection of a relevant caveat(s) is application specific. If this field is all UT1 spaces (0x20), it shall imply that no additional control and handling instructions apply to the image.	2	UT1 (Default is UT1 spaces (0x20))	<R>
ISREL	Image Releasing Instructions. This field shall contain a valid list of country and/or multilateral entity codes to which countries and/or multilateral entities the image is authorized for release. Valid items in the list are one or more country codes as found in FIPS PUB 10-4 and/or codes identifying multilateral entities. If this field is all UT1 spaces (0x20), it shall imply that no image release instructions apply.	20	UT1 (Default is UT1 spaces (0x20))	<R>
ISDCTP	Image Declassification Type. This field shall contain a valid indicator of the type of security declassification or downgrading instructions which apply to the image. Valid values are DD (=declassify on a specific date), DE (=declassify upon occurrence of an event), GD (=downgrade to a specified level on a specific date), GE (=downgrade to a specified level upon occurrence of an event), O (=OADR), and X (= exempt from automatic declassification). If this field is all UT1 spaces (0x20), it shall imply that no image security declassification or downgrading instructions apply.	2	UT1 DD, DE, GD, GE, O, X (Default is UT1 spaces (0x20))	<R>
ISDCDT	Image Declassification Date. This field shall indicate the date on which a image is to be declassified if the value in Image Declassification Type is DD. If this field is all UT1 spaces (0x20), it shall imply that no image declassification date applies.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	<R>

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TABLE A-3. NITF image subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
ISDCXM	Image Declassification Exemption. This field shall indicate the reason the image is exempt from automatic declassification if the value in Image Declassification Type is X. Valid values are X1 to X8 and X251 to X259. X1 to X8 correspond to the declassification exemptions found in DOD 5200.1-R, paragraphs 4-202b(1) to (8) for material exempt from the 10-year rule. X251 to X259 correspond to the declassification exemptions found in DOD 5200.1-R, paragraphs 4-301a(1) to (9) for permanently valuable material exempt from the 25-year declassification system. If this field is all UT1 spaces (0x20), it shall imply that an image declassification exemption does not apply.	4	UT1 X1 to X8, X251 to X259 (Default is UT1 spaces (0x20))	<R>
ISDG	Image Downgrade. This field shall indicate the classification level to which an image is to be downgraded if the values in Image Declassification Type are GD or GE. Valid values are S (=Secret), C (=Confidential), R (= Restricted). If this field contains a UT1 space (0x20), it shall imply that image security downgrading does not apply.	1	UT1 S, C, R (Default is UT1 space (0x20))	<R>
ISDGDT	Image Downgrade Date. This field shall indicate the date on which an image is to be downgraded if the value in Image Declassification Type is GD. If this field is all UT1 spaces (0x20), it shall imply that a image security downgrading date does not apply.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	<R>
ISCLTX	Image Classification Text. This field shall be used to provide additional information about image classification to include identification of a declassification or downgrading event if the values in Image Declassification Type are DE or GE.. It may also be used to identify multiple classification sources and/or any other special handling rules. Values are user defined free text. If this field is all UT1 spaces (0x20), it shall imply that additional information about image classification does not apply.	43	UT1 User-defined free text (Default is UT1 spaces (0x20))	<R>
ISCATP	Image Classification Authority Type. This field shall indicate the type of authority used to classify the image. Valid values are O (= original classification authority), D (= derivative from a single source), and M (= derivative from multiple sources). If this field contains a UT1 space (0x20), it shall imply that image classification authority type does not apply.	1	UT1 O, D, M (Default is UT1 space (0x20))	<R>

TABLE A-3. NITF image subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
ISCAUT	Image Classification Authority. This field shall identify the classification authority for the image dependent upon the value in Image Classification Authority Type. Values are user-defined free text which should contain the following information: original classification authority name and position or personal identifier if the value in Image Classification Authority Type is O; title of the document or security classification guide used to classify the image if the value in Image Classification Authority Type is D; and Derive-Multiple if the image classification was derived from multiple sources. In the latter case, the image originator will maintain a record of the sources used in accordance with existing security directives. One of the multiple sources may also be identified in Image Classification Text if desired. If this field is all UT1 spaces (0x20), it shall imply that no image classification authority applies.	40	UT1 User-defined free text (Default is UT1 spaces (0x20))	<R>
ISCRSN	Image Classification Reason. This field shall contain values indicating the reason for classifying the image. Valid values are A to G. These correspond to the reasons for original classification per E.O. 12958, Section 1.5.(a) through (g). If this field contains a UT1 space (0x20), it shall imply that no image classification reason applies.	1	UT1 A to G (Default is UT1 space (0x20))	<R>
ISSRDT	Image Security Source Date. This field shall indicate the date of the source used to derive the classification of the image. In the case of multiple sources, the date of the most recent source shall be used. If this field is all UT1 spaces (0x20), it shall imply that a image security source date does not apply.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	<R>
ISCTLN	Image Security Control Number. This field shall contain a valid security control number associated with the image. The format of the security control number shall be in accordance with the regulations governing the appropriate security channel(s). If this field is all UT1 spaces (0x20), it shall imply that no image security control number applies.	15	UT1 (Default is UT1 spaces (0x20))	<R>
ENCRYP	Encryption. This field shall contain the value BCS zero (0x30) until such time as this specification is updated to define the use of other values.	1	BCS-N (Default is BCS zero (0x30)) 0 = not encrypted	R
ISORCE	Image Source. This field shall contain a description of the source of the image. If the source of the data is classified, then the description shall be preceded by the classification, including codeword(s) contained in table A-4. If this field is all UT1 spaces (0x20), it shall imply that no image source data applies.	42	UT1 (Default is UT1 spaces (0x20))	<R>

TABLE A-3. NITF image subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
NROWS	Number of Significant Rows in Image. This field shall contain the total number of rows of significant pixels in the image. When the product of the values of the NPPBV field and the NBPC field is greater than the value of the NROWS field (NPPBV * NBPC > NROWS), the rows indexed with the value of the NROWS field to (NPPBV * NBPC) minus 1 shall contain fill data. NOTE: Only the rows indexed 0 to the value of the NROWS field minus 1 of the image contain significant data. The pixel fill values are determined by the application.	8	BCS-N 00000002-99999999	R
NCOLS	Number of Significant Columns in Image. This field shall contain the total number of columns of significant pixels in the image. When the product of the values of the NPPBH field and the NBPR field is greater than the NCOLS field (NPPBH * NBPR > NCOLS), the columns indexed with the value of the NCOLS field to (NPPBH * NBPR) minus 1 of the image contain significant data. The pixel fill values are determined by the application.	8	BCS-N 00000002-99999999	R
PVTYPE	Pixel Value Type. This field shall contain an indicator of the type of computer representation used for the value for each pixel for each band in the image. Valid entries are INT for integer, B for bi-level, SI for 2's complement signed integer, R for real, and C for complex. The data bits of INT and SI values shall appear in the file in order of significance, beginning with the MSB and ending with the LSB. INT and SI data types shall be limited to 16, 32, or 64-bits. R values shall be represented according to IEEE 32 or 64-bit floating point representation (IEEE 754). C values shall be represented with the Real and Imaginary parts, each represented in IEEE 32 or 64-bit floating point representation (IEEE 754) and appearing in adjacent four or eight-byte blocks, first Real, then Imaginary. B (bi-level) pixel values shall be represented as single bits with binary value 1 or 0.	3	BCS-A INT, B, SI, R, C	R
IREP	Image Representation. This field shall contain a valid indicator of the processing required in order to display an image. Valid representation indicators are MONO for monochrome; RGB for red, green, or blue true color, RGB/LUT for mapped color; MULTI for multiband imagery, NODISPLY for an image not intended for display, NVECTOR and POLAR for vectors with Cartesian and polar coordinates respectively, and VPH for SAR video phase history. In addition, compressed imagery can have this field set to YCbCr601 when compressed in the ITU-R Recommendation BT.601-5 color space using JPEG (IC field = C3). This field should be used in conjunction with the IREPBANDn field to interpret the processing required to display each band in the image.	8	BCS-A MONO, RGB, RGB/LUT, MULTI, NODISPLY, NVECTOR, POLAR, VPH, YCbCr601 (table A-2)	R

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TABLE A-3. NITF image subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
ICAT	Image Category. This field shall contain a valid indicator of the specific category of image, raster or grid data. The specific category of an IS reveals its intended use or the nature of its collector. Valid categories include VIS for visible imagery, SL for side-looking radar, TI for thermal infrared, FL for forward looking infrared, RD for radar, EO for electro-optical, OP for optical, HR for high resolution radar, HS for hyperspectral, CP for color frame photography, BP for black/white frame photography, SAR for synthetic aperture radar, SARIQ for SAR radio hologram, IR for infrared, MS for multispectral, FP for fingerprints, MRI for magnetic resonance imagery, XRAY for x-rays, CAT for CAT scans, VD for video, BARO for barometric pressure, CURRENT for water current, DEPTH for water depth, and WIND for air wind charts. Valid categories for geographic products or geo-reference support data are MAP for raster maps, PAT for color patch, LEG for legends, DTEM for elevation models, MATR for other types of matrix data, and LOCG for location grids. This field should be used in conjunction with the ISUBCATn field to interpret the significance of each band in the image.	8	BCS-A VIS, SL, TI, FL, RD, EO, OP, HR, HS,CP, BP, SAR, SARIQ, IR MAP, MS, FP, MRI, XRAY, CAT, VD, PAT, LEG, DTEM, MATR, LOCG, BARO, CURRENT, DEPTH, WIND (Default is VIS) (table A-2(A))	R
ABPP	Actual Bits-Per-Pixel Per Band. This field shall contain the number of "significant bits" for the value in each band of each pixel without compression. Even when the image is compressed, ABPP contains the number of significant bits per pixel that were present in the image before compression. This field shall be less than or equal to Number of Bits Per Pixel (field NBPP). The number of adjacent bits within each NBPP is used to represent the value. These "representation bits" shall be left justified or right justified within the bits of the NBPP ~~bits~~ field, according to the value in the PJUST field. For example, if 11-bit pixels are stored in 16 bits, this field shall contain 11 and NBPP shall contain 16. The default number of significant bits to be used is the value contained in NBPP.	2	BCS-N 01-96	R
PJUST	Pixel Justification. When ABPP is not equal to NBPP, this field indicates whether the significant bits are left justified (L) or right justified (R). Nonsignificant bits in each pixel shall contain the binary value 0. Right justification is recommended.	1	BCS-A L or R (Default is R)	R

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TABLE A-3. NITF image subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
ICORDS	Image Coordinate Representation. This field shall contain a valid code indicating the type of coordinate representation used for providing an approximate location of the image in the Image Geographic Location field (IGEOLO). The valid values for this field are : U = UTM expressed in Military Grid Reference System (MGRS) form, N = UTM (Northern hemisphere), S = UTM (Southern hemisphere), G = GEOGRAPHIC, and D = Decimal degrees. (Choice between N and S is based on hemisphere of northernmost point.) The default Geodetic reference system is WGS84 (appendix B, paragraph B.4.12 and figure B-1). If no coordinate system is identified, the space (BCS 0x20) shall be used.	1	BCS-A U, G, N, S, D or (Default is BCS spaces (0x20))	<R>
IGEOLO	Image Geographic Location. This field shall contain an approximate geographic location which is not intended for analytical purposes (e.g., targeting, mensuration, distance calculation); it is intended to support general user appreciation for the image location (e.g., cataloging). The representation of the image corner locations is specified in the ICORDS field. The locations of the four corners of the (significant) image data shall be given in image coordinate order: (0,0), (0, MaxCol), (MaxRow, MaxCol), (MaxRow, 0).MaxCol and MaxRow shall be determined from the values contained, respectively, in the NCOLS field and the NROWS field. MaxCol = is equal to the value contained in the NCOLS field minus 1 (MaxCol = NCOLS -1). Valid corner locations in geographic coordinates shall be expressed as latitude and longitude. The format ddmmssXdddmmssY represents latitude and longitude. The first half, ddmmssX, represents degrees, minutes, and seconds of latitude with X representing North or South (N for North, S for South). The second half, dddmmssY, represents degrees, minutes, and seconds of longitude with Y representing East or West (E for East, W for West), respectively. Coordinates shall only be populated in the IGEOLO field to the known precision of the corner coordinates. Non-significant digits of the field shall be replaced with BCS spaces (0x20). An example of the 60 character field with two spaces depicting the absence of arc seconds is ddmm Xdddmm Yddmm Xdddmm Yddmm Xdddmm Yddmm Xdddmm Y. Decimal degrees are expressed as ±dd.ddd±ddd.ddd (four times) where ±dd.ddd equals latitude (+ represents northern hemisphere, - represents southern hemisphere) and ±ddd.ddd equals longitude (+ represents eastern hemisphere, - represents western	60	BCS-A ±dd.ddd±ddd.ddd (four times) or ddmmssXdddmmssY (four times) or zzBJKeeeeennnnn (four times) or zzeeeeeennnnnnn (four times)	C

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TABLE A-3. NITF image subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
IGEOLO (continued)	hemisphere). Non-significant digits of the field shall be replaced with BCS spaces (0x20). For the UTM coordinate representation, coordinates shall be expressed either in plain UTM coordinates or using MGRS. Normally UTM/MGRS coordinates should be rounded to the nearest 10 meters to match the precision of the geographic coordinates. Plain UTM coordinates use the format zzeeeeeennnnnnn where zz represents the UTM zone number, and eeeeee, nnnnnnn represents Easting and Northing. Hemisphere (N or S) for plain UTM is expressed in the ICORDS field (appendix B, figure B-1.). UTM coordinates should be in terms of the same zone, to ensure a unified image on the grid. UTM expressed in MGRS use the format zzBJKeeeeennnnn where zzBJK represents the zone, band and 100 km square within the zone and eeeee, nnnnn represents residuals of Easting and Northing. (MaxRow, 0).MaxCol and MaxRow shall be determined from the values contained, respectively, in the NCOLS field and the NROWS field. MaxCol is equal to the value contained in the NCOLS field minus 1 (MaxCol = NCOLS -1). Valid corner locations in geographic coordinates shall be expressed as latitude and longitude. The format ddmmssXdddmmssY represents latitude and longitude. The first half, ddmmssX, represents degrees, minutes, and seconds of latitude with X representing North or South (N for North, S for South). The second half, dddmmssY, represents degrees, minutes, and seconds of longitude with Y representing East or West (E for East, W for West), respectively. Coordinates shall only be populated in the IGEOLO field to the known precision of the corner coordinates. Non-significant digits of the field shall be replaced with BCS spaces (0x20). An example of the 60 character field with two spaces depicting the absence of arc seconds is ddmm Xdddmm Yddmm Xdddmm Yddmm Xdddmm Yddmm Xdddmm Y. Decimal degrees are expressed as ±dd.ddd±ddd.ddd (four times) where ±dd.ddd equals latitude (+ represents northern hemisphere, - represents southern hemisphere) and ±ddd.ddd equals longitude (+ represents eastern hemisphere, - represents western hemisphere). Non-significant digits of the field shall be replaced with BCS spaces (0x20).			

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TABLE A-3. NITF image subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
IGEOLO (continued)	For the UTM coordinate representation, coordinates shall be expressed either in plain UTM coordinates or using MGRS. Normally UTM/MGRS coordinates should be rounded to the nearest 10 meters to match the precision of the geographic coordinates. Plain UTM coordinates use the format zzeeeeeennnnnnn where zz represents the UTM zone number, and eeeeee, nnnnnnn represents Easting and Northing. Hemisphere (N or S) for plain UTM is expressed in the ICORDS field (appendix B, figure B-1.). UTM coordinates should be in terms of the same zone, to ensure a unified image on the grid. UTM expressed in MGRS use the format zzBJKeeeeennnnn where zzBJK represents the zone, band and 100 km square within the zone and "eeeee," nnnnn represents residuals of Easting and Northing. NOTE: Provide the value only to the decimal places (precision) warranted by the sources and methods used to determine the location. The remaining places will be (BCS spaces (0x20). There is no implied accuracy associated with the data in this field. Additional information associated with precise geo-referencing (e.g., accuracy, datums, etc.) are provided in geospatial related extensions if present in the file.			
NICOM	Number of Image Comments. This field shall contain the valid number of ICOMn field(s) that follow to be used as free text image comments.	1	BCS-N 0-9	R
. . . . . Start for each Image Comment ICOMn (if the value of the NICOM field is not equal to zero).				
ICOMn	Image Comment n. The field (ICOM1 to ICOMn), when present, shall contain free-form UT1 text. They are intended for use as a single comment block and should be used that way. This field shall contain the n^{th} free text image comment, where n is defined as follows: $1 \leq n \leq$ the value of the NICOM field. If the image comment is classified, it shall be preceded by the classification, including codeword(s). This field shall be omitted if the value in the NICOM field is 0.	80	UT1 User defined	C
. . . . . End for each ICOMn field; the number of loop repetitions is the value specified in the NICOMn field.				

TABLE A-3. NITF image subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
IC	Image Compression. This field shall contain a valid code indicating the form of compression used in representing the image data. Valid values for this field are, C1 to represent bi-level, C3 to represent JPEG, C4 to represent Vector Quantization, C5 to represent lossless JPEG, I1 to represent down sampled JPEG, and NC to represent the image is not compressed. Also valid are M1, M3, M4, and M5 for compressed images, and NM for uncompressed images indicating an image that contains a block mask and/or a pad pixel mask. C6 and M6 are reserved values that will represent a future correlated multicomponent compression algorithm. The format of a mask image is identical to the format of its corresponding non-masked image except for the presence of an Image Data Mask at the beginning of the image data area. The format of the Image Data Mask is described in paragraph 5.4.3.2 and is shown in table A-3(A). The definitions of the compression schemes associated with codes C1/M1, C3/M3, C4/M4, and C5/M5 are given, respectively, in ITU-T T.4, AMD2, MIL-STD-188-198A, MIL-STD-188-199, and NIMA N0106-97. C1 is found in ITU-T T.4 AMD2, C3 is found in MIL-STD-188-198A, C4 ~~=~~is found in MIL-STD-188-199, and C5 and I1 are found in NIMA N0106-97.	2	BCS-A NC, NM, C1, C3, C4, C5, C6, I1, M1, M3, M4, M5, M6	R
COMRAT	Compression Rate Code. If the IC field contains~~,~~ C1, C3, C4, C5, M1, M3, M4, M5, or I1, this field shall be present and contain a code indicating the compression rate for the image. If the value in IC is C1 or M1, the valid codes are 1D, 2DS, and 2DH, where: 1D represents One-dimensional Coding 2DS represents Two-dimensional Coding Standard Vertical Resolution (K=2) 2DH represents Two-dimensional Coding High Vertical Resolution (K=4) Explanation of these codes can be found in ITU-T T.4, AMD2. If the value in IC is C3, M3, C5, M5, or I1, the value of this field shall be 00.0. The value 00.0 represents embedded tables and is required by JPEG. Explanation of embedded tables can be found in MIL-STD-188-198A and NIMA N0106-97. If the value in IC is C4 or M4, this field shall contain a value given in the form nn.n representing the number of bits-per-pixel for the compressed image. Explanation of the compression rate for vector quantization can be found in MIL-STD-188-199. This field is omitted if the value in IC is NC or NM.	4	BCS-A Depending on the value of the IC field. (See description for constraints.)	C

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TABLE A-3. NITF image subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
NBANDS	Number of Bands. This field shall contain the number of data bands within the specified image. This field and the IREP field are interrelated and independent of the IMODE field. The corresponding values for the IREP and NBANDS fields are NODISPLY, 0 to 9; MONO, 1; RGB, 3; RGB/LUT, 1; YCbCr601, 3; NVECTOR, 0 to 9; POLAR, 2; VPH, 2; MULTI, 0, 2 to 9; and BCS zero (0x30) for multiple band images or matrices with greater than 9 bands.	1	BCS-A 0-9 BCS zero (0x30) (See description for details)	R
XBANDS	Number of Multi-spectral Bands. When NBANDS contains the value BCS zero (0x30), this field shall contain the number of bands or data points comprising the multiple band image. Otherwise this field shall be omitted if the value of the NBANDS field is 1 to 9.	5	BCS-N 00010-99999	C
. . . . . Start for each IREPBANDn to LUTDnm fields.				
NOTE: The fields IREPBANDn to LUTDnm fields repeat the number of times indicated in the NBANDS field or the XBANDS field.				
IREPBANDn	n[th] Band Representation. This field shall contain a valid indicator of the processing required to display the n[th] band of the image with regard to the general image type as recorded in the IREP field. The significance of each band in the image can be derived from the combination of the ICAT, and ISUBCATn fields. Valid values of the IREPBANDn field depend on the value of the IREP field. The following standard values shall apply: • R, G, B respectively for a Red, Green, Blue representation of the band, • LU for a LUT representation of the band (e.g., a three table LUT for RGB and a single table LUT for shades of grey), • M for a monochrome representation of the band, BCS spaces (code 0x20) for a band not designated for display, but may be displayed if desired, • Y, Cb, Cr respectively for the Luminance, Chrominance (blue), and Chrominance (red) representation of a YCbCr601 (compressed case only) image, The only valid values when IREP contains MULTI are M, R, G, B, and LU: • It is strongly recommended that 3 of the multiple bands have the IREPBANDn fields populated with R, G, and B. • When bands marked as LU, R, G, B, and M are present, the RGB designated bands are the default bands for display. If R, G, B are not present, the default displayable band is the LU band. If R, G, B, or LU are not present, the default displayable band is the first M band. When no bands are	2	BCS-A (Default is BCS spaces (0x20)) Standard values are: LU, R, G, B, M, Y, Cb, Cr Additional values are allowed through the registration process.	<R>

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TABLE A-3. NITF image subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
IREPBANDn (continued)	marked with LU, R,G, B, or M the first three bands may be displayed as R, G, and B respectively. For consistency, multispectral images cannot have more than one band, each marked as R, G, and B. • IREPBANDn shall be filled with the M value, if the band is to be represented as monochrome. • IREPBANDn shall be filled with the LU value, if the band is to be represented using a LUT. • When IREPBANDn is filled with BCS spaces (code 0x20), no specific representation is defined for the band, but it may be displayed if desired. Additional values are reserved for specific interpretations and shall be co-ordinated with the Custodian to regulate their use. The only valid values when IREP contains MONO images is M or BCS spaces (code 0x20). The only valid values when IREP contains RGB images are R, G and B. The only valid value when IREP contains RGB/LUT images is LU. The only valid values when IREP contains YCbCr601 images are Y, Cb and Cr. Note: There may be more than one band that contains M or LU where the default conditions are such that the first M or LU band is the band to be displayed. This is only the default display to be presented to the user. Any other band or combination of bands may be displayed by user intervention.			

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TABLE A-3. NITF image subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
ISUBCATn	nth Band Subcategory. The purpose of this field is to provide the significance of the nth bands of the image with regard to the specific category (ICAT field) of the overall image. The use of this field is user-defined except for the following: For MultiSpectral imagery (ICAT contains MS), HyperSpectral imagery (ICAT contains HS), and Infrared imagery (ICAT contains IR), ISUBCATn contains the wavelength in nanometers. When ICAT contains SAR, ISUBCATn contains I for the inphase and Q for the quadrature components or M for the magnitude and P for the phase components. When ICAT contains WIND or CURRENT, ISUBCATn contains SPEED for wind or water speed , or DIRECT for wind or water direction. For location grids, the number of bands is strictly equal to 2, consequently, there are only 2 fields, the ISUBCAT1 field and the ISUBCAT2 field. Standard values of these fields of location grids are either CGX and CGY for the cartographic X (Easting) and Y (Northing) bands, or GGX and GGY with the geographic X representing the longitude band and Y representing the latitude band. Standard values for the matrix (ICAT contains MATR) and elevation (ICAT contains DTEM) data should be taken from DIGEST, part 3, annex B.	6	BCS-A I, Q, M, P, SPEED, DIRECT, User-defined When ICAT contains MS, HS, or IR the value range is the wave length. When ICAT contains LOCG the value range is CGX, CGY (Cartographic) GGX, GGY (Geographic). (Default is BCS spaces (0x20))	<R>
IFCn	nth Band Image Filter Condition. This field shall contain the value N (to represent none). Other values are reserved for future use.	1	BCS-A N	R
IMFLTn	nth Band Standard Image Filter Code. This field is reserved for future use. It shall be filled with BCS spaces (0x20).	3	BCS-A Fill with BCS spaces (0x20)	<R>

TABLE A-3. NITF image subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
NLUTSn	Number of LUTS for the nth Image Band. This field shall contain the number of LUTs associated with the nth band of the image. LUTs are allowed only if the value of the PVTYPE field is INT or B. If the nth band of the image is monochromatic, this field can contain the value 1 or 2. If the value is 2, the first and second LUTs shall map respecively the most significant byte and the least significant byte of the 16 bit values. NOTE: If a system cannot support more than 256 different values, it may use only the values of the first LUT. in this case, the number of entries in the LUT (NELUTn) may exceed 256. If the nth band of the image is color-coded (the value of the IREPBNDn field is LU), this field shall contain the value 3. The first, second, and third LUTs, in this case, shall map the image to the red, green, and blue display bands respectively. The value 4 is reserved for future use.	1	BCS-N 0-4 (Default is BCS zero (0x30) if no LUTs are included.)	<R>
NELUTn	Number of LUT Entries for the nth Image Band. This field shall contain the number of entries in each of the LUTs for the nth image band. This field shall be omitted if the value in NLUTSn is BCS zero (0x30).	5	BCS-N 00001-65536	<R>
. . . . . Start for each LUT LUTDnm				
LUTDnm	nth Image Band, mth LUT. This field shall be omitted if the Number of LUTs (NLUTSn) is BCS zero (0x30). Otherwise, this field shall contain the data defining the m~~m~~th LUT for the nth image band. Each entry in the LUT is composed of one byte, ordered from MSB to LSB, representing a binary value from zero (0x00) to 255 (0xFF). To use the LUT, for each integer k, 0 ≤ k ≤ (value of the NELUTn field) -1, the pixel value k in the nth image band shall be mapped to the value of the kth byte of this field (the LUT). NOTE: This is a repeating field based on the value of the NLUTSn field. When there are more than one LUT (value of the NELUTn field is greater than 1), the net effect is to have the LUT ordered in band sequential fashion, e.g., all the red values followed by the green values followed by the blue values.	†[3]	Unsigned binary integer LUT Values	~~<~~C~~>~~
. . . . . End for each LUTDnm field; the number of looprepetitions is the value specified in the NLUTSn field.				
. . . . . End for each IREPBANDn to LUTDnm fields; the number of loop repetitions is the value specified in the NBANDS field or the XBANDS field.				
ISYNC	Image Sync code. This field is reserved for future use. This field shall contain BCS zero (0x30).	1	BCS-N 0 = No Sync Code	R

TABLE A-3. NITF image subheader - Continued.

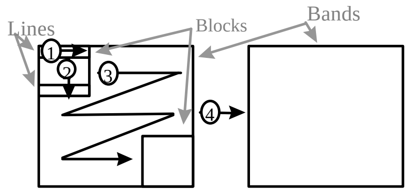
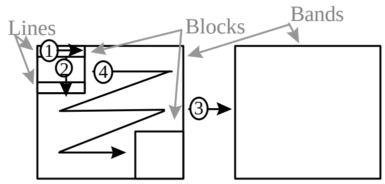
FIELD	NAME	SIZE	VALUE RANGE	TYPE
IMODE	Image Mode. This field shall indicate how the Image Pixels are stored in the NITF file. Valid values are B, P, R, and S. The interpretation of IMODE is dependent on whether the image is JPEG compressed (IC = C3, C5, I1, M3, or M5), VQ compressed (IC = C4, or M4), or uncompressed (IC = NC or NM). a. Uncompressed. The value S indicates band sequential, where all blocks for the first band are followed by all blocks for the second band, and so on: [(block1, band1), (block2, band1), ... (blockM, band1)], [(block1, band2), (block2, band 2), ... (blockM, band2)] ... [(block1, bandN), (block2, bandN), ... (blockM, bandN)]. Note that, in each block, the pixels of the first line appears first, followed by the pixels of the second line, and so on.  Band Sequential (IMODE = S) The value B indicates band interleaved by block. This implies that within each block, the bands follow one another: [(block1, band1), (block1, band2), ...(block1, bandN)], [(block2, band1), (block2, band2), ... (block2, bandN)], ... [(blockM, band1), (blockM, band2), ... (blockM, bandN)]. Note that, in each block, the pixels of the first line appears first and the pixels of the last line appears last.  Band Interleaved by block (IMODE = B) The value P indicates band interleaved by pixel within each block: such as, for each block, one after the other, the full pixel vector (all band values) appears for every pixel in the block, one pixel after another, the block column index varying faster than the block row index.	1	BCS-A B represents Band Interleaved by Block. P represents Band Interleaved by Pixel. R represents Band Interleaved by Row. S represents Band Sequential.	R

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TABLE A-3. NITF image subheader - Continued.

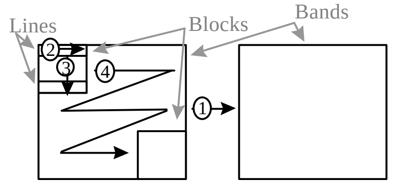
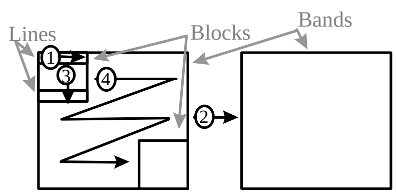
FIELD	NAME	SIZE	VALUE RANGE	TYPE
IMODE (continued)	 Band Interleaved by pixel (IMODE = P) The value R indicates band interleaved by row. The ordering mechanism for this case stores the pixel values of each band in row sequential order. Within each block, all pixel values of the first row of the first band are followed by pixel values of the first row of the second band continuing until all values of the first row are stored The remaining rows are stored in a similar fashion until the last row of values has been stored. Each block shall be zero filled to the next octet boundary when necessary.  Band Interleaved by row (IMODE = R) If the value of the NBANDS field is 1, the cases B and S coincide. In this case, this field shall contain B. If the Number of Blocks is 1 (the NBPR field and the NBPC field contain 1), this field shall contain B for non-interleaved by pixel, and P for interleaved by pixel. The value S is only valid for images with multiple blocks and multiple bands. b. JPEG-compressed. The presence of B, P, or S implies specific ordering of data within the JPEG image data representation. For this case the interpretation of the various values of the IMODE field is specified in MIL-STD-188-198A. When IC contains I1, IMODE contains B. c. Vector Quantization compressed. VQ compressed images are normally either RGB with a color look-up table or monochromatic. In either case, the image is single band, and the IMODE field defaults to B. d. Bi-Level Compressed. When the value of the IC field is C1 or M1, the value of the IMODE field is B.			

TABLE A-3. NITF image subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
NBPR	Number of Blocks Per Row. This field shall contain the number of image blocks in a row of blocks (paragraph 5.4.2.2) in the horizontal direction. If the image consists of only a single block, this field shall contain the value one.	4	BCS-N 0001-9999	R
NBPC	Number of Blocks Per Column. This field shall contain the number of image blocks in a column of blocks (paragraph 5.4.2.2) in the vertical direction. If the image consists of only a single block, this field shall contain the value one.	4	BCS-N 0001-9999	R
NPPBH	Number of Pixels Per Block Horizontal. This field shall contain the number of pixels horizontally in each block of the image. It shall be the case that the product of the values of the NBPR field and the NPPBH field is greater than or equal to the value of the NCOLS field (NBPR $*$ NPPBH $\geq$ NCOLS).	4	BCS-N 0001-8192	R
NPPBV	Number of Pixels Per Block Vertical. This field shall contain the number of pixels vertically in each block of the image. It shall be the case that the product of the values of the NBPC field and the NPPBV field is greater than or equal to the value of the NROWS field (NBPC $*$ NPPBV $\geq$ NROWS).	4	BCS-N 0001-8192	R
NBPP	Number of Bits Per Pixel Per Band. If IC contains NC, NM, C4, or M4, this field shall contain the number of storage bits used for the value from each component of a pixel vector. The value in this field always shall be greater than or equal to Actual Bits Per Pixel (ABPP). For example, if 11-bit pixels are stored in 16 bits, this field shall contain 16 and Actual Bits Per Pixel shall contain 11. If IC = C3, M3, C5, M5, or I1 this field shall contain the value 8 or the value 12. If IC = C1, this field shall contain the value 1.	2	BCS-N 01-96	R
IDLVL	Image Display Level. This field shall contain a valid value that indicates the display level of the image relative to other displayed file components in a composite display. The valid values are 001 to 999. The display level of each displayable segment (image or graphic) within a file shall be unique; that is, each number from 001 to 999 is the display level of, at most, one segment. Display level is discussed in paragraph 5.3.3. The image or graphic segment in the file having the minimum display level shall have attachment level 0 (ALVL000) (BCS zeros (code 0x30)).	3	BCS-N 001-999	R

TABLE A-3. NITF image subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
IALVL	Attachment Level. This field shall contain a valid value that indicates the attachment level of the image. Valid values for this field are BCS zeros (0x30), and the display level value of any other image or graphic in the file. The meaning of attachment level is discussed in paragraph 5.3.4. The image or graphic segment in the file having the minimum display level shall have attachment level 0 (ALVL000) (BCS zeros (0x30)).	3	BCS-N 000-998 (Default is BCS zeros (0x30))	R
ILOC	Image Location. The image location is the location of the first pixel of the first line of the image. This field shall contain the image location offset from the ILOC or SLOC value of the segment to which the image is attached or from the origin of the CCS when the image is unattached (IALVL contains 000). A row or column value of 00000 indicates no offset. Positive row and column values indicate offsets down and to the right while negative row and column values indicate offsets up and to the left.	10	BCS-N RRRRRCCCCC For positive row and column values RRRRR and CCCCC are both in the range 00000 to 99999. For negative row and column values RRRRR and CCCCC are both in the range -0001 to -9999.	R
IMAG	Image Magnification. This field shall contain the magnification (or reduction) factor of the image relative to the original source image. Decimal values are used to indicate magnification, and decimal fraction values indicate reduction. For example, “2.30” indicates the original image has been magnified by a factor of “2.30,” while “0.5” indicates the original image has been reduced by a factor of 2. The default value is 1.0, indicating no magnification or reduction. In addition, the following values shall be used for reductions that are reciprocals of non-negative powers of 2: /2 (for 1/2), /4 (for 1/4), /8 (for 1/8), /16 (for 1/16), /32 (for 1/32), /64 (for 1/64), /128 (for 1/128). The values are left justified and BCS spaces (0x20) filled to the right.	4	BCS-A decimal value, /2 followed by 2 spaces, /4 followed by 2 spaces, /8 followed by 2 spaces, /16 followed by a space, /32 followed by a space, /64 followed by a space, or /128 (Default is 1.0 followed by BCS space (0x20))	R
UDIDL	User Defined Image Data Length. A value of BCS zeros (0x30) shall denote that no TREs are included in the UDID field. If a TREs exists, the field shall contain the sum of the length of all the TREs (paragraph 5.8.1) appearing in the UDID field plus 3 bytes (length of UDOFL field). If a TRE is too long to fit in the UDID field or the IXSHD field, it shall be put in the TRE overflow DES with DESID set to the value TRE_OVERFLOW (paragraph .5.8.3.1)	5	BCS-N 00000 or 00003-99999	R

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TABLE A-3. NITF image subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
UDOFL	User Defined Overflow. If present, this field shall contain BCS zeros (0x30) if the TREs in UDID do not overflow into a DES, or shall contain the sequence number of the DES into which they do overflow. This field shall be omitted if the field UDIDL contains BCS zeros (0x30).	3	BCS-N 000-999	C
UDID	User Defined Image Data. If present, this field shall contain user-defined TREs (paragraph 5.8.1). The length of this field shall be the length specified by the field UDIDL minus 3. TREs in this field for an image shall contain information pertaining specifically to the image. TREs shall appear one after the other with no intervening bytes. The first byte of this field shall be the first byte of the first TRE appearing in the field. The last byte of this field shall be the last byte of the last TRE to appear in the field. This field shall be omitted if the field UDIDL contains BCS zeros (0x30).	††[3]	TRE(s)	C
IXSHDL	Image Extended Subheader Data Length. A value of BCS zeros (0x30) shall represent that no TREs are included in the IXSHD field. If a TRE exists, the field shall contain the sum of the length of all the TREs (paragraph 5.8.1) appearing in the IXSHD field plus 3 (length of IXSOFL field) in bytes. If a TRE is too long to fit in the IXSHD field or the UDID field, it shall may be put in the TRE overflow DES with DESID set to the value TRE_OVERFLOW (paragraph 5.8.3.1).	5	BCS-N 00000 or 00003-99999	R
IXSOFL	Image Extended Subheader Overflow. If present, this field shall contain BCS zeros (0x30) if the TREs in IXSHD do not overflow into a DES, or shall contain the sequence number of the DES into which they do overflow. This field shall be omitted if the field IXSHDL contains BCS zeros (0x30).	3	BCS-N 000-999	C
IXSHD	Image Extended Subheader Data. If present, this field shall contain TREs (paragraph 5.8.1) approved and under configuration management by the ISMC. The length of this field shall be the length specified by the field IXSHDL minus 3. TREs in this field for an image shall contain information pertaining specifically to the image. TREs shall appear one after the other in this field with no intervening bytes. The first byte of this field shall be the first byte of the first TRE appearing in the field. The last byte of this field shall be the last byte of the last TRE to appear in the field. This field shall be omitted if the field IXSHDL contains BCS zeros (0x30).	†††[3]	TRE(s)	C

†[3] A value as specified in the NELUTn field (in bytes).
††[3] A value as specified in the UDIDL field minus 3 (in bytes)
†††[3] A value as specified in the IXSHDL field minus 3(in bytes)

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TABLE A-3(A). NITF image data mask table.
(TYPE "R" = Required, "C" = Conditional, "< >" = BCS spaces allowed for entire field)
("†" annotations are explained at the end of the table)

FIELD	NAME	SIZE	VALUE RANGE	TYPE
IMDATOFF	Blocked Image Data Offset. This field is included if the IC value equals NM, M1, M3, M4, or M5. It identifies the offset from the beginning of the Image Data Mask to the first byte of the blocked image data. This offset, when used in combination with the offsets provided in the BMRnBND fields, can provide random access to any recorded image block in any image band.	4	Unsigned binary integer: range of values: 0 to 2^{32} - 1	C
BMRLNTH	Block Mask Record Length. This field is included if the IC value equals NM, M1, M3, M4, or M5. It identifies the length of each Block Mask Record in bytes. When present, the length of each Block Mask Record is 4 bytes. The total length of all the Block Mask Records is equal to BMRLNTH ∗ NBPR ∗ NBPC ∗ NBANDS (one 4 byte record for each block of each band in the image). If all of the image blocks are recorded, this value may be set to 0x0000, and the conditional BMRnBNDm fields are not recorded/transmitted. Otherwise, the value may be set to 0x0004, and the conditional BMRnBNDm fields are recorded/transmitted and can be used as an offset index for each image block in each band of the image. If this field is present, but coded as 0x0000, then only a pad pixel mask is included.	2	Unsigned binary integer; 0x0000 denotes No Block Mask Record; 0x0004 denotes Block Mask Records (4 bytes each) are present.	C
TMRLNTH	Pad Pixel Mask Record Length. This field is included if the IC value equals NM, M1, M3, M4, or M5. It identifies the length of each Pad Pixel Mask Record in bytes. When present, the length of each Pad Pixel Mask Record is 4 bytes. The total length of the Pad Pixel Mask Records is equal to TMRLNTH ∗ NBPR ∗ NBPC ∗ NBANDS (one 4 byte record for each block for each band in the image). If none of the image blocks contain pad pixels, this value is set to 0x0000, and the conditional TMRnBNDm fields are not recorded/transmitted. For IC value of M3, the value shall be set to 0x0000. If this field is present, but coded as 0x0000, then a Block Mask is included.	2	Unsigned binary integer; 0x0000 denotes no Pad Pixel Mask Records; 0x0004 denotes Pad Pixel Mask Records (4 bytes each) are present.	C

TABLE A-3(A). NITF image data mask table - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
TPXCDLNTH	Pad Output Pixel Code Length. This field is included if the IC value equals NM, M1, M3, M4, or M5. It identifies the length in bits of the Pad Output Pixel Code. If coded as 0x0000, then no pad pixels are present, and the TPXCD field is not recorded. For IC value of M3, the value shall be set to 0x000.	2	Unsigned binary integer; 0x0000 denotes no Pad Pixels; or Pad Pixel Code length in bits (Length must be as specified in NBPP)	C
TPXCD	Pad Output Pixel Code. This field is included if the IC value equals NM, M1, M3, M4, or M5 and TPXCDLNTH is not zeros (0x0000). It contains the output pixel code that represents a pad pixel in the image. This value is unique within the image, and allows the user to identify pad pixels. The pad output pixel code length is determined by TPXCDLNTH. If the number of bits used by TPXCD is less than the number of bits available for storage, the value shall be justified in accordance with the PJUST field in the image subheader (L for left, R for right justified.)	†[3A]	Unsigned binary integer; range of values: 0 to 2^n -1 where n is the value contained by the TPXCDLNTH field	C
. . . . . Start for each BMRnBNDm and TMRnBNDm record.				
NOTE: The BMRnBNDm record repeats; one 4 byte record for each block of each band in the image.				
BMRnBNDm	Block n, Band m Offset. This field shall contain the n^{th} Block Mask Record of band m. It is recorded/transmitted only if the BMRLNTH field does not contain zeros (0x0000). The field shall contain an offset in bytes from the beginning of the Blocked Image Data to the first byte of block n of band m. If block n of band m is not recorded/transmitted, the offset value is defaulted to 0xFFFFFFFF. If the value of the IMODE field is S, the offsets for all blocks in band 1 are recorded followed by block offsets for band 2, etc. (band sequential). The number of BMR records for each band is NBPR * NBPC.	4	Unsigned binary integer Increment n prior to m $0 \le n \le NBPR*NBPC - 1$ $0 \le m \le max(NBANDS,XBANDS)$ (Default is 0xFFFFFFFF if the block is not recorded)	C
. . . .				
NOTE: The TMRnBNDm record repeats; one 4 byte record for each block of each band in the image. This results in a table containing an offset value (or 0xFFFFFFFF) for each block of each band of the image.				
TMRnBNDm	Pad Pixel n, Band m. This field shall contain the n^{th} Pad Pixel for band m. It is recorded/transmitted only if the TMRLNTH field does not contain zeros (0x0000). The field shall contain an offset in bytes from the beginning of the Blocked Image Data to the first byte of block n of the image data of band m if block n contains pad pixels, or the default value 0xFFFFFFFF to indicate that this block does not contain pad pixels. The offsets for all blocks in band 1 are recorded followed by block offsets for band 2, etc. (band sequential). The number of TMR records for each band is NBPR * NBPC.	4	Unsigned binary integer Increment n prior to m $0 \le n \le NBPR*NBPC.-1$ $0 \le m \le max(NBANDS,XBANDS)$ (Default is 0xFFFFFFFF if the block is not recorded)	C

†[3A] The length of the TPXCD field is the next highest number of bytes that can contain the number of bits identified in the TPXCDLNTH field. For example, a TPXCDLNTH value of 12 would be stored in a TPXCD field of two bytes.

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TABLE A-4. Security control markings.

ATOMAL	AT
CNWDI	CN
CODEW0RD	DIGRAPH
CONFIDENTIAL	C
COPYRIGHT	PX
COSMIC	CS
CRYPTO	CR
EFTO	TX
FORMREST DATA	RF
FOUO	FO
GENERAL SERVICE	GS
LIM OFF USE (UNCLAS)	LU
LIMDIS	DS
NATO	NS
NO CONTRACT	NC
NONCOMPARTMENT	NT
ORCON	OR
OTHER CODEWORDS	USE APPROPRIATE DIGRAPH
PERSONAL DATA	IN
PROPIN	PI
RESTRICTED DATA	RD
SAO	SA
SAO-1	SL
SAO-2	HA
SAO-3	HB
SAO-SI-2	SK
SAO-SI-3	HC
SAO-SI-4	HD
SECRET	S
SIOP	SH
SIOP/ESI	SE
SPECIAL CONTROL	SC
SPECIAL INTEL	SI
TOP SECRET	TS
UNCLASSIFIED	U
US ONLY	UO
WARNING NOTICE - SEC CLAS IS BASED ON THE FACT OF EXISTENCE AND AVAIL OF THIS GRAPHIC	WN
WNINTEL	WI

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TABLE A-5. NITF graphic subheader.

(TYPE “R” = Required, “C” = Conditional, “< >“ = BCS spaces allowed for entire field)
(“†” annotations are explained at the end of the table)

FIELD	NAME	SIZE	VALUE RANGE	TYPE
SY	File Part Type. This field shall contain the characters SY to identify the subheader as a graphic subheader.	2	BCS-A SY	R
SID	Graphic ~~ID~~ Identifier. This field shall contain a valid alphanumeric identification code associated with the graphic. The valid codes are determined by the application.	10	BCS-A User defined	R
SNAME	Graphic name. This field shall contain an alphanumeric name for the graphic.	20	UT1 (Default is UT1 spaces (0x20))	<R>
SSCLAS	Graphic Security Classification. This field shall contain a valid value representing the classification level of the graphic. Valid values are T (=Top Secret), S (=Secret), C (=Confidential), R (=Restricted), U (=Unclassified).	1	UT1 T, S, C, R, or U	R
NOTE: If SSCLAS is T, S, C, or R, then SSCLSY must be populated with a valid code for the security classification system used.				
SSCLSY	Graphic Security Classification System. This field shall contain valid values indicating the national or multinational security system used to classify the graphic. Country Codes per FIPS PUB 10-4 shall be used to indicate national security systems. If this field is all UT1 spaces (0x20), it shall imply that no security classification system applies to the graphic.	2	UT1 (Default is UT1 spaces (0x20))	<R>
NOTE: If any of the following fields are populated with anything other than spaces, then SSCLSY must be populated with a valid code for the security classification system used: SSCODE, SSREL, SSDCTP, SSDCDT, SSDCXM, SSDG, SSDGDT, SSCLTX, SSCATP, SSCAUT, SSCRSN, SSSRDT, and SSCTLN.				
SSCODE	Graphic Codewords. This field shall contain a valid indicator of the security compartments associated with the graphic. Valid values include one or more of the digraphs found in table A-4. Multiple entries shall be separated by a single UT1 space~~s~~ (0x20). The selection of a relevant set of codewords is application specific. If this field is all UT1 spaces (0x20), it shall imply that no codewords apply to the graphic.	11	UT1 (Default is UT1 spaces (0x20))	<R>
SSCTLH	Graphic Control and Handling. This field shall contain valid additional security control and/or handling instructions (caveats) associated with the graphic. Values include digraphs found in table A-4. The digraph may indicate single or multiple caveats. The selection of a relevant caveat(s) is application specific. If this field is all UT1 spaces (0x20), it shall imply that no additional control and handling instructions apply to the graphic.	2	UT1 (Default is UT1 spaces (0x20))	<R>

TABLE A-5. NITF graphic subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
SSREL	Graphic Releasing Instructions. This field shall contain a valid list of country and/or multilateral entity codes to which countries and/or multilateral entities the graphic is authorized for release. Valid items in the list are one or more country codes as found in FIPS PUB 10-4 and/or codes identifying multilateral entities. If this field is all UT1 spaces (0x20), it shall imply that no graphic release instructions apply.	20	UT1 (Default is UT1 spaces (0x20))	<R>
SSDCTP	Graphic Declassification Type. This field shall contain a valid indicator of the type of security declassification or downgrading instructions which apply to the graphic. Valid values are DD (=declassify on a specific date), DE (=declassify upon occurrence of an event), GD (=downgrade to a specified level on a specific date), GE (=downgrade to a specified level upon occurrence of an event), O (=OADR), and X (= exempt from automatic declassification). If this field is all UT1 spaces (0x20), it shall imply that no graphic security declassification or downgrading instructions apply.	2	UT1 DD, DE, GD, GE, O, X (Default is UT1 spaces (0x20))	<R>
SSDCDT	Graphic Declassification Date. This field shall indicate the date on which a graphic is to be declassified if the value in Graphic Declassification Type is DD. If this field is all UT1 spaces (0x20), it shall imply that no graphic declassification date applies.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	R
SSDCXM	Graphic Declassification Exemption. This field shall indicate the reason the graphic is exempt from automatic declassification if the value in Graphic Declassification Type is X. Valid values are X1 to X8 and X251 to X259. X1 to X8 correspond to the declassification exemptions found in DOD 5200.1-R, paragraphs 4-202b(1) to (8) for material exempt from the 10-year rule. X251 to X259 correspond to the declassification exemptions found in DOD 5200.1-R, paragraphs 4-301a(1) to (9) for permanently valuable material exempt from the 25-year declassification system. If this field is all UT1 spaces (0x20), it shall imply that a graphic declassification exemption does not apply.	4	UT1 X1 to X8, X251 to X259 (Default is UT1 spaces (0x20))	<R>
SSDG	Graphic Downgrade. This field shall indicate the classification level to which a graphic is to be downgraded if the values in Graphic Declassification Type are GD or GE. Valid values are S (=Secret), C (=Confidential), R (= Restricted). If this field contains a UT1 space (0x20), it shall imply that graphic security downgrading does not apply.	1	UT1 S, C, R Default is UT1 space (0x20))	<R>

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TABLE A-5. NITF graphic subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
SSDGDT	Graphic Downgrade Date. This field shall indicate the date on which a graphic is to be downgraded if the value in Graphic Declassification Type is GD. If this field is all UT1 spaces (0x20), it shall imply that a graphic security downgrading date does not apply.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	R
SSCLTX	Graphic Classification Text. This field shall be used to provide additional information about graphic classification to include identification of a declassification or downgrading event if the values in Graphic Declassification Type are DE or GE. It may also be used to identify multiple classification sources and/or any other special handling rules. Values are user defined free text. If this field is all UT1 spaces (0x20), it shall imply that additional information about graphic classification does not apply.	43	UT1 User-defined free text (Default is UT1 spaces (0x20))	<R>
SSCATP	Graphic Classification Authority Type. This field shall indicate the type of authority used to classify the graphic. Valid values are O (= original classification authority), D (= derivative from a single source), and M (= derivative from multiple sources). If this field contains a UT1 space (0x20), it shall imply that graphic classification authority type does not apply.	1	UT1 O, D, M (Default is UT1 space (0x20))	<R>
SSCAUT	Graphic Classification Authority. This field shall identify the classification authority for the graphic dependent upon the value in Graphic Classification Authority Type. Values are user defined free text which should contain the following information: original classification authority name and position or personal identifier if the value in Graphic Classification Authority Type is O; title of the document or security classification guide used to classify the graphic if the value in Graphic Classification Authority Type is D; and Derive-Multiple if the graphic classification was derived from multiple sources. In the latter case, the graphic originator will maintain a record of the sources used in accordance with existing security directives. One of the multiple sources may also be identified in Graphic Classification Text if desired. If this field is all UT1 spaces (0x20), it shall imply that no graphic classification authority applies.	40	UT1 User-defined free text (Default is UT1 spaces (0x20))	<R>
SSCRSN	Graphic Classification Reason. This field shall contain values indicating the reason for classifying the graphic. Valid values are A to G. These correspond to the reasons for original classification per E.O. 12958, Section 1.5.(a) to (g). If this field contains a UT1 space (0x20), it shall imply that no graphic classification reason applies.	1	UT1 A to G (Default is UT1 space (0x20))	<R>

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TABLE A-5. NITF graphic subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
SSSRDT	Graphic Security Source Date. This field shall indicate the date of the source used to derive the classification of the graphic. In the case of multiple sources, the date of the most recent source shall be used. If this field is all UT1 spaces (0x20), it shall imply that a graphic security source date does not apply.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	R
SSCTLN	Graphic Security Control Number. This field shall contain a valid security control number associated with the graphic. The format of the security control number shall be in accordance with the regulations governing the appropriate security channel(s). If this field is all UT1 spaces (0x20), it shall imply that no graphic security control number applies.	15	UT1 (Default is UT1 spaces (0x20))	<R>
ENCRYP	Encryption. This field shall contain the value BCS zero (0x30) until such time as this specification is updated to define the use of other values.	1	BCS-N 0=Not Encrypted	R
SFMT	Graphic Type. This field shall contain a valid indicator of the representation type of the graphic. The valid value is C, which represents Computer Graphics Metafile. The graphic data contain a Computer Graphics Metafile in binary format that defines the graphic according to MIL-STD-2301A. Future versions of the NITF may include additional CGM profiles.	1	BCS-A C for CGM	R
SSTRUCT	Reserved for Future Use. Reserved.	13	BCS-N 0000000000000- 9999999999999 (Default is BCS zeros (0x30))	R
SDLVL	Graphic Display Level. This field shall contain a valid value that indicates the graphic display level of the graphic relative to other displayed file components in a composite display. The valid values are 001 to 999. The display level of each displayable file component (image or graphic) within a file shall be unique; that is, each number from 001 to 999 is the display level of, at most, one item. The meaning of display level is discussed in paragraph 5.3.3. The graphic or image component in the file having the minimum display level shall have attachment level 0 (ALVL000) (BCS zeros (0x30)).	3	BCS-N 001-999	R
SALVL	Graphic Attachment Level. This field shall contain a valid value that indicates the attachment level of the graphic. Valid values for this field are 0 and the display level value of any other image or graphic in the file. The meaning of attachment level is discussed in paragraph 5.3.4. The graphic or image component in the file having the minimum display level shall have attachment level 0 (ALVL000) (BCS zeros (0x30)).	3	BCS-N 000-998 (Default is BCS zeros (0x30))	R

TABLE A-5. NITF graphic subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
SLOC	Graphic Location. The graphics location is specified by providing the location of the graphic's origin point relative to the position (location of the CCS, image, or graphic to which it is attached. This field shall contain the graphic location offset from the ILOC or SLOC value of the CCS, image, or graphic to which the graphic is attached or from the origin of the CCS when the graphic is unattached (SALVL000). A row and column value of 000 indicates no offset. Positive row and column values indicate offsets down and to the right, while negative row and column values indicate offsets up and to the left.	10	BCS-N RRRRRCCCCC For positive row and column values RRRRR and CCCCC are both in the range 00000 to 99999. For negative row and column values RRRRR and CCCCC are both in the range -0001 to -9999.	R
SBND1	First Graphic Bound Location. This field shall contain an ordered pair of integers defining a location in Cartesian coordinates for use with CGM graphics. It is the upper left corner of the bounding box for the CGM graphic. See paragraph 5.5.2.1 for a description. The format is rrrrrccccc, where rrrrr is the row and ccccc is the column offset from ILOC or SLOC value of the item to which the graphic is attached. If the graphic is unattached (value of the SALVL field is equal to BCS Zeros (0x30)), rrrrr and ccccc represent offsets from the origin of the coordinate system that is common to all images and graphics in the file having the value of BCS zeros (0x30) in the SALVL field. The range for rrrrr and ccccc shall be -9999 to 99999.	10	BCS-N rrrrrccccc with -9999≤rrrrr≤99999 -9999≤ccccc≤99999 (Default is BCS zeros (0x30))	R
SCOLOR	Graphic Color. If SFMT = C, this field shall contain a C if the CGM contains any color pieces or an M if it is monochrome (i.e., black, white, or levels of grey).	1	BCS-A C, M	R
SBND2	Second Graphic Bound Location. This field shall contain an ordered pair of integers defining a location in Cartesian coordinates for use with CGM graphics. It is the lower right corner of the bounding box for the CGM graphic. See paragraph 5.5.2.1 for a description. The format is rrrrrccccc, where rrrrr is the row and ccccc is the column offset from ILOC or SLOC value of the item to which the graphic is attached. If the graphic is unattached (SALVL field value is BCS zeros(0x30)), rrrrr and ccccc represent offsets from the origin of the coordinate system that is common to all images and graphics in the file having the value of BCS zeros (0x30) in the SALVL field. The range for rrrrr and ccccc shall be -9999 to 99999.	10	BCS-N rrrrrccccc with -9999≤rrrrr≤99999 -9999≤ccccc≤99999 (Default is BCS zeros (0x30))	R
SRES2	Reserved for Future Use. This field is reserved for future use. The default value shall be BCS zeros (0x30).	2	BCS-N 00 - 99 (Default is BCS zeros (0x30))	R

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TABLE A-5. NITF graphic subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
SXSHDL	Graphic Extended Subheader Data Length. A value of BCS zero (0x30) shall represent that no TREs are included in the graphic subheader. If a tagged record extension exists, the field shall contain the sum of the length of all the TREs (paragraph 5.8.1) appearing in the SXSHD field plus 3 bytes (length of SXSOFL field). If a tagged record extension is too long to fit in the SXSHD field, it shall be put in the TRE overflow DES with DESID set to the value TRE_OVERFLOW (paragraph 5.8.3.1).	5	BCS-N 00000 or 00003-09741 (Default is BCS zeros (0x30))	R
SXSOFL	Graphic Extended Subheader Overflow. If present, this field shall contain BCS zeros (0x30) if the TREs in SXSHD do not overflow into a DES or shall contain the sequence number of the DES into which they do overflow. This field shall be omitted if the field SXSHDL contains BCS zeros (0x30).	3	BCS-N 000-999	C
SXSHD	Graphic Extended Subheader Data. If present, this field shall contain TREs (paragraph 5.8.1) approved and under configuration management by the ISMC. The length of this field shall be the length specified by the field SXSHDL minus 3 bytes. TREs in this field for a graphic shall contain information pertaining specifically to the graphic. TREs shall appear one after the other in this field with no intervening bytes. The first byte of this field shall be the first byte of the first TREs appearing in the field. The last byte of this field shall be the last byte of the last TRE to appear in the field. This field shall be omitted if the field SXSHDL contains BCS zeros (0x30).	†[5]	TRE(s)	C

†[5] A value ~~as~~ specified by the SHSHDL field minus 3 (in bytes)

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TABLE A-6. NITF text subheader.
(TYPE "R" = Required, "C" = Conditional, "< >" = BCS spaces allowed for entire field)
("†" annotations are explained at the end of the table)

FIELD	NAME	SIZE	VALUE RANGE	TYPE
TE	File Part Type. This field shall contain the characters "TE" to identify the subheader as a text subheader.	2	BCS-A TE	R
TEXTID	Text Identifier. This field shall contain a valid alphanumeric identification code associated with the text item. The valid codes are determined by the application.	7	BCS-A User defined	R
TXTALVL	Text Attachment Level. This field shall contain a valid value that indicates the attachment level of the text. Valid values for this field are 000 (BCS zeros (0x30)) or the display level value of any image or graphic in the file.	3	BCS-N 000-998 (Default is BCS zeros (0x30))	R
TXTDT	Text Date and Time. This field shall contain the time (UTC) (Zulu) of origination of the text in the format CCYYMMDDhhmmss, where CC is the century (00-99), YY is the last two digits of the year (00-99), MM is the month (01-12), DD is the day (01-31), hh is the hour (00-23), mm is the minute (00-59), and ss is the second (00-59). UTC (Zulu) is assumed to be the time zone designator to express the time of day.	14	BCS-N CCYYMMDDhhmmss	R
TXTITL	Text Title. This field shall contain the title of the text item.	80	UT1 (Default is UT1 spaces (0x20))	<R>
TSCLAS	Text Security Classification. This field shall contain a valid value representing the classification level of the text. Valid values are T (=Top Secret), S (=Secret), C (=Confidential), R (=Restricted), U (=Unclassified).	1	UT1 T, S, C, R, or U	R
NOTE: If TSCLAS is T, S, C, or R, then TSCLSY must be populated with a valid code for the security classification system used.				
TSCLSY	Text Security Classification System. This field shall contain valid values indicating the national or multinational security system used to classify the text. Country Codes per FIPS PUB 10-4 shall be used to indicate national security systems. If this field is all UT1 spaces (0x20), it shall imply that no security classification system applies to the text.	2	UT1 (Default is UT1 spaces (0x20))	<R>
NOTE: If any of the following fields are populated with anything other than spaces, then TSCLSY must be populated with a valid code for the security classification system used: TSCODE, TSREL, TSDCTP, TSDCDT, TSDCXM, TSDG, TSDGDT, TSCLTX, TSCATP, TSCAUT, TSCRSN, TSSRDT, and TSCTLN.				
TSCODE	Text Codewords. This field shall contain a valid indicator of the security compartments associated with the text. Values include one or more of the digraphs found in table A-4. Multiple entries shall be separated by a single UT1 spaces (0x20): The selection of a relevant set of codewords is application specific. If this field is all UT1 spaces (0x20), it shall imply that no codewords apply to the text.	11	UT1 (Default is UT1 spaces (0x20))	<R>

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TABLE A-6. NITF text subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
TSCTLH	Text Control and Handling. This field shall contain valid additional security control and/or handling instructions (caveats) associated with the text. Values include digraphs found in table A-4. The digraph may indicate single or multiple caveats. The selection of a relevant caveat(s) is application specific. If this field is all UT1 spaces (0x20), it shall imply that no additional control and handling instructions apply to the text.	2	UT1 (Default is UT1 spaces (0x20))	<R>
TSREL	Text Releasing Instructions. This field shall contain a valid list of country and/or multilateral entity codes to which countries and/or multilateral entities the text is authorized for release. Valid items in the list are one or more country codes as found in FIPS PUB 10-4 and/or codes identifying multilateral entities. If this field is all UT1 spaces (0x20), it shall imply that no text release instructions apply.	20	UT1 (Default is UT1 spaces (0x20))	<R>
TSDCTP	Text Declassification Type. This field shall contain a valid indicator of the type of security declassification or downgrading instructions which apply to the text. Valid values are DD (=declassify on a specific date), DE (=declassify upon occurrence of an event), GD (=downgrade to a specified level on a specific date), GE (=downgrade to a specified level upon occurrence of an event), O (=OADR), and X (= exempt from automatic declassification). If this field is all UT1 spaces (0x20), it shall imply that no text security declassification or downgrading instructions apply.	2	UT1 DD, DE, GD, GE, O, X (Default is UT1 spaces (0x20))	<R>
TSDCDT	Text Declassification Date. This field shall indicate the date on which a text is to be declassified if the value in Text Declassification Type is DD. If this field is all UT1 spaces (0x20), it shall imply that no text declassification date applies.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	<R>
TSDCXM	Text Declassification Exemption. This field shall indicate the reason the text is exempt from automatic declassification if the value in Text Declassification Type is X. Valid values are X1 to X8 and X251 to X259. X1 to X8 correspond to the declassification exemptions found in DOD 5200.1-R, paragraphs 4-202b(1) to (8) for material exempt from the 10-year rule. X251 to X259 correspond to the declassification exemptions found in DOD 5200.1-R, paragraphs 4-301a(1) to (9) for permanently valuable material exempt from the 25-year declassification system. If this field is all UT1 spaces (0x20), it shall imply that a text declassification exemption does not apply.	4	UT1 X1 to X8, X251 to X259 (Default is UT1 spaces (0x20))	<R>
TSDG	Text Downgrade. This field shall indicate the classification level to which a text is to be downgraded if the values in Text Declassification Type are GD or GE. Valid values are S (=Secret), C (=Confidential), R (= Restricted). If this field contains a UT1 space (0x20), it shall imply that text security downgrading does not apply.	1	UT1 S, C, R (Default is UT1 space (0x20))	<R>

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TABLE A-6. NITF text subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
TSDGDT	Text Downgrade Date. This field shall indicate the date on which a text is to be downgraded if the value in Text Declassification Type is GD. If this field is all UT1 spaces (0x20), it shall imply that a text security downgrading date does not apply.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	<R>
TSCLTX	Text Classification Text. This field shall be used to provide additional information about text classification to include identification of a declassification or downgrading event if the values in Text Declassification Type are DE or GE.. It may also be used to identify multiple classification sources and/or any other special handling rules. Values are user defined free text. If this field is all UT1 spaces (0x20), it shall imply that additional information about text classification does not apply.	43	UT1 User-defined free text (Default is UT1 spaces (0x20))	<R>
TSCATP	Text Classification Authority Type. This field shall indicate the type of authority used to classify the text. Valid values are O (= original classification authority), D (= derivative from a single source), and M (= derivative from multiple sources). If this field contains a UT1 space (0x20), it shall imply that text classification authority type does not apply.	1	UT1 O, D, M (Default is UT1 space (0x20))	<R>
TSCAUT	Text Classification Authority. This field shall identify the classification authority for the text dependent upon the value in Text Classification Authority Type. Values are user defined free text which should contain the following information: original classification authority name and position or personal identifier if the value in Text Classification Authority Type is O; title of the document or security classification guide used to classify the text if the value in Text Classification Authority Type is D; and Derive-Multiple if the text classification was derived from multiple sources. In the latter case, the text originator will maintain a record of the sources used in accordance with existing security directives. One of the multiple sources may also be identified in Text Classification Text if desired. If this field is all UT1 spaces (0x20), it shall imply that no text classification authority applies.	40	UT1 User-defined free text (Default is UT1 spaces (0x20))	<R>
TSCRSN	Text Classification Reason. This field shall contain values indicating the reason for classifying the text. Valid values are A to G. These correspond to the reasons for original classification per E.O. 12958, Section 1.5.(a) to (g). If this field contains a UT1 space (0x20), it shall imply that no text classification reason applies.	1	UT1 A to G (Default is UT1 space (0x20))	<R>
TSSRDT	Text Security Source Date. This field shall indicate the date of the source used to derive the classification of the text. In the case of multiple sources, the date of the most recent source shall be used. If this field is all UT1 spaces (0x20), it shall imply that a text security source date does not apply.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	<R>

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TABLE A-6. NITF text subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
TSCTLN	Text Security Control Number. This field shall contain a valid security control number associated with the text. The format of the security control number shall be in accordance with the regulations governing the appropriate security channel(s). If this field is all UT1 spaces (0x20), it shall imply that no text security control number applies.	15	UT1 (Default is UT1 spaces (0x20))	<R>
ENCRYP	Encryption. This field shall contain the value BCS zero (0x30) until such time as this specification is updated to define the use of other values.	1	BCS-A (Default is BCS zero (0x30)) 0=Not Encrypted	R
TXTFMT	Text Format. This field shall contain a valid three-character code indicating the format or type of text data. Valid codes are MTF to indicate USMTF (Refer to MIL-STD-6040 for examples of the USMTF format), STA to indicate BCS-A, and UT1 to indicated 1-octet coded characters, Basic Latin and Latin Supplement 1. Refer to paragraph 5.7.1 for additional discussion of standards and the BCS.	3	BCS-A MTF, STA, UT1	R
TXSHDL	Text Extended Subheader Data Length. A value of BCS zeros (0x30) shall represent that no TREs are included in the text subheader. If a TRE exists, the field shall contain the sum of the length of all the TREs (paragraph 5.8.1) appearing in the TSXHD field plus 3 bytes (length of TSXOFL field). If a TRE is too long to fit in the TXSHD field, it shall be put in the TRE overflow DES with DESID set to the value TRE_OVERFLOW (paragraph 5.8.3.1).	5	BCS-N 00000 or 00003-09717 (Default is BCS zero (0x30))	R
TXSOFL	Text Extended Subheader Overflow. If present, this field shall contain BCS zeros (0x30) if TREs in TXSHD do not overflow into a DES, or shall contain the sequence number in the file of the DES into which they do overflow. This field shall be omitted if the field TXSHDL contains BCS zeros (0x30).	3	BCS-N 000-999	C
TXSHD	Text Extended Subheader Data. If present, this field shall contain TREs (paragraph 5.8.1) approved and under configuration management by the ISMC. The length of this field shall be the length specified by the field TXSHDL minus 3. TREs in this field shall contain information pertaining specifically to the text. TREs shall appear one after the other in this field with no intervening bytes. The first byte of this field shall be the first byte of the first TRE appearing in the field. The last byte of this field shall be the last byte of the last TRE to appear in the field. This field shall be omitted if the field TXSHDL contains BCS zeros (0x30).	†[6]	BCS-A	C

†[6] A value as specified by the value in the TXSHDL field minus 3 (in bytes).

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TABLE A-7. Registered and controlled tagged record extension format.
(TYPE “R” = Required, “C” = Conditional, “< >“ = BCS spaces allowed for entire field)
(“†” annotations are explained at the end of the table)

FIELD	NAME	SIZE	VALUE RANGE	TYPE
RETAG or CETAG	Unique Extension Type Identifier. This field shall contain a valid alphanumeric identifier properly registered with the ISMC.	6	BCS-A	R
REL or CEL	Length of REDATA Field. This field shall contain the length in bytes of the data contained in REDATA or CETAG. The TRE’s length is 11 plus the size of the REL field or the CEL field.	5	BCS-N 00001 to 99985	R
REDATA or CEDATA where appropriate	User-Defined Data. This field shall contain data of either binary or character data types defined by and formatted according to user specification. The length of this field shall not cause any other NITF field length limits to be exceeded, but is otherwise fully user-defined.	†[7]	User-defined	R

†[7] A value as indicated in the REL field or the CEL field (in bytes).

TABLE A-8. NITF Data Extension Segment (DES) subheader.
(TYPE “R” = Required, “C” = Conditional, “< >“ = BCS spaces allowed for entire field)
(“†” annotations are explained at the end of the table)

FIELD	NAME	SIZE	VALUE RANGE	TYPE
DE	File Part Type. This field shall contain the characters “DE” to identify the subheader as a data extension.	2	BCS-A DE	R
DESID	Unique DES Type Identifier. This field shall contain a valid alphanumeric identifier properly registered with the ISMC.	25	BCS-A Registered value only	R
DESVER	Version of the Data Definition. This field shall contain the alphanumeric version number of the use of the tag. The version number is assigned as part of the registration process.	2	BCS-N 01 to 99	R
DECLAS	Data Extension File Security Classification. This field shall contain a valid value representing the classification level of the DES. Valid values are T for Top Secret, S for Secret, C for Confidential, R for Restricted, or U for Unclassified.	1	UT1 T, S, C, R, or U	R
NOTE: If the value of the DESCLAS field is T, S, C, or R, then the DESCLSY field must be populated with a valid code for the security classification system used.				
DESCLSY	DES Security Classification System. This field shall contain valid values indicating the national or multinational security system used to classify the DES. Country Codes per FIPS PUB 10-4 are used to indicate national security systems. If this field is all UT1 spaces (0x20), it shall imply that no Security Classification System applies to the DES.	2	UT1 (Default is UT1 spaces (0x20))	<R>
NOTE: If any of the following fields are populated with anything other than spaces, then the DESCLSY field must be populated with a valid code for the security classification system used: DESCODE, DESREL, DESDCTP, DESDCDT, DESDCXM, DESDG, DESDGDT, DESCLDES, DESCATP, DESCAUT, DESCRSN, DESSRDT, and DESCTLN.				

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TABLE A-8. NITF Data Extension Segment (DES) subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
DESCODE	DES Codewords. This field shall contain a valid indicator of the security compartments associated with the DES. Values include one or more of the digraphs found in table A-4. Multiple entries shall be separated by a single UT1 space (0x20). The selection of a relevant set of codewords is application specific. If this field is all UT1 spaces (0x20), it shall imply that no codewords apply to the DES.	11	UT1 (Default is UT1 spaces (0x20))	<R>
DESCTLH	DES Control and Handling. This field shall contain valid additional security control and/or handling instructions (caveats) associated with the DES. Values include digraphs found in table A-4. The digraph may indicate single or multiple caveats. The selection of a relevant caveat(s) is application specific. If this field is all UT1 spaces (0x20), it shall imply that no additional control and handling instructions apply to the DES.	2	UT1 (Default is UT1 spaces (0x20))	<R>
DESREL	DES Releasing Instructions. This field shall contain a valid list of countries to which the DES is authorized for release. Typical values include one or more country codes as found in FIPS PUB 10-4 separated by a single BCS space (0x20). If this field is all UT1 spaces (0x20), it shall imply that no DES release instructions apply.	20	UT1 (Default is UT1 spaces (0x20))	<R>
DESDCTP	DES Declassification Type. This field shall contain a valid indicator of the type of security declassification or downgrading instructions which apply to theDES. Valid values are DD for declassify on a specific date, DE for declassify upon occurrence of an event, GD for downgrade to a specified level on a specific date, GE for downgrade to a specified level upon occurrence of an event, O for OADR, and X for exempt from automatic declassification. If this field is all UT1 spaces (0x20), it shall imply that no DES security declassification or downgrading instructions apply.	2	UT1 DD, DE, GD, GE, O, X (Default is UT1 spaces (0x20))	<R>
DESDCDT	DES Declassification Date. This field shall indicate the date on which a DES is to be declassified if the value in DESDCTP is DD. If this field is all UT1 spaces (0x20), it shall imply that no DES declassification date applies.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	<R>

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TABLE A-8. NITF Data Extension Segment (DES) subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
DESDCXM	DES Declassification Exemption. This field shall indicate the reason the DES is exempt from automatic declassification if the value in DESDCTP is X. Valid values are X1 to X8 and X251 to X259. X1 to X8 correspond to the declassification exemptions found in DOD 5200.1-R, paragraphs 4-202b(1) to (8) for material exempt from the 10-year rule. X251 to X259 correspond to the declassification exemptions found in DOD 5200.1-R, paragraphs 4-301a(1) to (9) for permanently valuable material exempt from the 25-year declassification system. If this field is all UT1 spaces (0x20), it shall imply that a DES declassification exemption does not apply.	4	UT1 X1 to X8, X251 to X259 (Default is UT1 spaces (0x20))	<R>
DESDG	DES Downgrade. This field shall indicate the classification level to which aDES is to be downgraded if the values in DESDCTP are GD or GE. Valid values are S for Secret, C for Confidential, R for Restricted. If this field contains a UT1 space (0x20), it shall imply that DES security downgrading does not apply.	1	UT1 S, C, R (Default is UT1 space (0x20))	<R>
DESDGDT	DES Downgrade Date. This field shall indicate the date on which a DES is to be downgraded if the value in DESDCTP is GD. If this field is all UT1 spaces (0x20), it shall imply that a DES security downgrading date does not apply.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	<R>
DESCLTX	DES Classification Text. This field shall be used to provide additional information about DES classification to include identification of a declassification or downgrading event if the values in DESDCTP are DE or GE. It may also be used to identify multiple classification sources and/or any other special handling rules. Values are user-defined free text. If this field is all UT1 spaces (0x20), it shall imply that additional information about DES classification does not apply.	43	UT1 User-defined free text (Default is UT1 spaces (0x20))	<R>
DESCATP	DES Classification Authority Type. This field shall indicate the type of authority used to classify the DES. Valid values are O for original classification authority, D for derivative from a single source, and M for derivative from multiple sources. If this field contains a UT1 space (0x20), it shall imply that DES DESCATP does not apply.	1	UT1 O, D, M (Default is UT1 space (0x20))	<R>

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TABLE A-8. NITF Data Extension Segment (DES) subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
DESCAUT	DES Classification Authority. This field shall identify the classification authority for the DES dependent upon the value in DESCATP. Values are user-defined free text which should contain the following information: original classification authority name and position or personal ID if the value in DESCATP is O; title of the document or security classification guide used to classify the DES if the value in DESCATP is D; and Deriv-Multiple if the DES classification was derived from multiple sources. In the latter case, the DES originator will maintain a record of the sources used in accordance with existing security directives. One of the multiple sources may also be identified in DESCLTX if desired. If this field is all UT1 spaces (0x20), it shall imply that no DES file classification authority applies.	40	UT1 User-defined free text (Default is UT1 spaces (0x20))	<R>
DESCRSN	DES Classification Reason. This field shall contain a value indicating the reason for classifying the DES. Valid values are A to G. These correspond to the reasons for original classification per E.O. 12958, Section 1.5.(a) to(g). If this field contains a UT1 spaces (0x20), it shall imply that no DES classification reason applies.	1	UT1 A to G (Default is UT1 space (0x20))	<R>
DESSRDT	DES Security Source Date. This field shall indicate the date of the source used to derive the classification of the DES. In the case of multiple sources, the date of the most recent source shall be used. If this field is all UT1 spaces (0x20), it shall imply that a DES security source date does not apply.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	<R>
DESCTLN	DES Security Control Number. This field shall contain a valid security control number associated with the DES. The format of the security control number shall be in accordance with the regulations governing the appropriate security channel(s). If this field is all UT1 spaces (0x20), it shall imply that no DES security control number applies.	15	UT1 (Default is UT1 spaces (0x20))	<R>
DESOFLW	DES Overflowed Header Type. This field shall be present if DESID = TRE_OVERFLOW. Its presence indicates that the DES contains a TRE that would not fit in the file header or segment subheader where it would ordinarily be located. Its value indicates the segment type to which the enclosed TRE is relevant.	6	BCS-A XHD, IXSHD, SXSHD, TXSHD, UDHD, UDID	C
DESITEM	DES Data Item Overflowed. This field shall be present if DESOFLW is present. It shall contain the number of the data item in the file, of the type indicated in DESOFLW to which the TREs in the segment apply. For example, if DESOFLW = UDID and DESITEM = 003, then the TREs in the segment apply to the third image in the file. If the value of DESOFLW = UDHD, the value of DESITEM shall be BCS zeros (0x30).	3	BCS-N 000 to 999	C

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TABLE A-8. NITF Data Extension Segment (DES) subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
DESSHL	DES User-defined Subheader Length. This field shall contain the number of bytes in the field DESSHF. If this field contains BCS zeros (0x30), DESSHF shall not appear in the DES subheader. This field shall contain BCS zeros (0x30) if DESID = "Registered Extensions" or "Controlled Extensions."	4	BCS-N 0000-9999	R
DESSHF	DES User-defined Subheader Fields. This field shall contain user-defined fields. Data in this field shall be alphanumeric, formatted according to user specification.	†8	BCS-A User defined	C
DESDATA	DES User-Defined Data. This field shall contain data of either binary or character types defined by and formatted according to the user's specification. However, if DESID=TRE_OVERFLOW, the TREs shall appear according to their definition with no intervening bytes. The length of this field shall not cause another NITF field length limits to be exceeded, but is otherwise fully user-defined.	††8	User defined	R

†8 Value of the DESSHL (in bytes)
††8 Determined by user. If the DESID is set to the value TRE_OVERFLOW, this signifies the sum of the lengths of the included TREs.

TABLE A-8(A). Tagged Record Extension Overflow (TRE_OVERFLOW) Data Extension Segment (DES) subheader.
TYPE R = Required, C = Conditional, < > = BCS spaces (code 0x20) are allowed for the entire field
(† annotations are explained at the end of the table)

FIELD	NAME	SIZE	VALUE RANGE	TYPE
DE	Data Extension Subheader. This field shall contain the characters DE to identify the subheader as a data extension.	2	BCS-A DE	R
DESID	Unique DES Type Identifier. This field shall contain TRE_OVERFLOW	25	BCS-A TRE_OVERFLOW	R
DESVER	Version of the Data Definition. This field shall contain the alphanumeric version number of the use of the Tag. The version number is assigned as part of the registration process.	2	BCS-N positive integer 01	R
DECLAS	Data Extension File Security Classification. This field shall contain a valid value representing the classification level of the DES. Valid values are T for Top Secret, S for Secret, C for Confidential, R for Restricted, or U for Unclassified.	1	UT1 T, S, C, R, or U	R
NOTE: If the value of the DESCLAS field is T, S, C, or R, then the DESCLSY field must be populated with a valid code for the security classification system used.				
DESCLSY	DES Security Classification System. This field shall contain valid values indicating the national or multinational security system used to classify the DES. Country Codes per FIPS PUB 10-4 are used to indicate national security systems. If this field is all UT1 spaces (code 0x20), it shall imply that no Security Classification System applies to the DES.	2	UT1 (Default is UT1 spaces (0x20))	<R>
NOTE: If any of the following fields are populated with anything other than spaces, then the DESCLSY field must be populated with a valid code for the security classification system used: DESCODE, DESREL, DESDCTP, DESDCDT, DESDCXM, DESDG, DESDGDT, DESCLDES, DESCATP, DESCAUT, DESCRSN, DESSRDT, and DESCTLN.				

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TABLE A-8(A). Tagged Record Extension Overflow (TRE OVERFLOW) Data Extension Segment (DES) subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
DESCODE	DES Codewords. This field shall contain a valid indicator of the security compartments associated with the DES. Values include one or more of the digraphs found in table A-4. Multiple entries shall be separated by a single UT1 space (0x20). The selection of a relevant set of codewords is application specific. If this field is all UT1 spaces (0x20), it shall imply that no codewords apply to the DES.	11	UT1 (Default is UT1 spaces (0x20))	<R>
DESCTLH	DES Control and Handling. This field shall contain valid additional security control and/or handling instructions (caveats) associated with the DES. Values include digraphs found in table A-4. The digraph may indicate single or multiple caveats. The selection of a relevant caveat(s) is application specific. If this field is all UT1 spaces (0x20), it shall imply that no additional control and handling instructions apply to the DES.	2	UT1 (Default is UT1 spaces (0x20))	<R>
DESREL	DES Releasing Instructions. This field shall contain a valid list of countries to which the DES is authorized for release. Typical values include one or more country codes as found in FIPS PUB 10-4 separated by a single BCS space (0x20). If this field is all UT1 spaces (0x20), it shall imply that no DES release instructions apply.	20	UT1 (Default is UT1 spaces (0x20))	<R>
DESDCTP	DES Declassification Type. This field shall contain a valid indicator of the type of security declassification or downgrading instructions which apply to the DES. Valid values are DD for declassify on a specific date, DE for declassify upon occurrence of an event, GD for downgrade to a specified level on a specific date, GE for downgrade to a specified level upon occurrence of an event, O for OADR, and X for exempt from automatic declassification. If this field is all UT1 spaces (code 0x20), it shall imply that no DES security declassification or downgrading instructions apply.	2	UT1 DD, DE, GD, GE, O, X (Default is UT1 spaces (0x20))	<R>
DESDCDT	DES Declassification Date. This field shall indicate the date on which a DES is to be declassified if the value of the DESDCTP field is DD. If this field is all UT1 spaces (code 0x20), it shall imply that no DES declassification date applies.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	<R>

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TABLE A-8(A). Tagged Record Extension Overflow (TRE OVERFLOW) Data Extension Segment (DES) subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
DESDCXM	DES Declassification Exemption. This field shall indicate the reason the DES is exempt from automatic declassification if the value of the DESDCTP field is X. Valid values are X1 to X8 and X251 to X259. X1 to X8 correspond to the declassification exemptions found in DOD 5200.1-R, paragraphs 4-202b(1) to (8) for material exempt from the 10-year rule. X251 to X259 correspond to the declassification exemptions found in DOD 5200.1-R, paragraphs 4-301a(1) to (9) for permanently valuable material exempt from the 25-year declassification system. If this field is all UT1 spaces (code 0x20), it shall imply that a DES declassification exemption does not apply.	4	UT1 X1 to X8 X251 to X259 (Default is UT1 spaces (0x20))	<R>
DESDG	DES Downgrade. This field shall indicate the classification level to which a DES is to be downgraded if the value of the DESDCTP field is GD or GE. Valid values are S for Secret, C for Confidential, R for Restricted. If this field contains a UT1 space (code 0x20), it shall imply that DES security downgrading does not apply.	1	UT1 S, C, R (Default is UT1 space (0x20))	<R>
DESDGDT	DES Downgrade Date. This field shall indicate the date on which a DES is to be downgraded if the value of the DESDCTP field is GD. If this field is all UT1 spaces (code 0x20), it shall imply that a DES security downgrading date does not apply.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	<R>
DESCLTX	DES Classification Text. This field shall be used to provide additional information about DES classification to include identification of a declassification or downgrading event if the value of the DESDCTP field is DE or GE. It may also be used to identify multiple classification sources and/or any other special handling rules. Values are user-defined free text. If this field is all UT1 spaces (code 0x20), it shall imply that additional information about DES classification does not apply.	43	UT1 User-defined free text (Default is UT1 spaces (0x20))	<R>
DESCATP	DES Classification Authority Type. This field shall indicate the type of authority used to classify the DES. Valid values are O for original classification authority, D for derivative from a single source, and M for derivative from multiple sources. If this field contains a UT1 space (code 0x20), it shall imply that DES classification authority type does not apply.	1	UT1 O, D, M (Default is UT1 space (0x20))	<R>

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TABLE A-8(A). Tagged Record Extension Overflow (TRE OVERFLOW) Data Extension Segment (DES) subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
DESCAUT	DES Classification Authority. This field shall identify the classification authority for the DES dependent upon the value of the DESCATP field. Values are user-defined free text which should contain the following information: original classification authority name and position or personal ID if the of the DESCATP field is O; title of the document or security classification guide used to classify the DES if the of the DESCATP field is D; and Deriv-Multiple if the DES classification was derived from multiple sources and the value of the DESCATP field is M. In the latter case, the DES originator will maintain a record of the sources used in accordance with existing security directives. One of the multiple sources may also be identified by the DESCLTX field if desired. If this field is all UT1 spaces (code 0x20), it shall imply that no DES classification authority applies.	40	UT1 User-defined free text (Default is UT1 spaces (0x20))	<R>
DESCRSN	DES Classification Reason. This field shall contain values indicating the reason for classifying the DES. Valid values are A to G. These correspond to the reasons for original classification per E.O. 12958, Section 1.5.(a) to (g). If this field contains a UT1 spaces (code 0x20), it shall imply that no DES classification reason applies.	1	UT1 A to G (Default is UT1 space (0x20))	<R>
DESSRDT	DES Security Source Date. This field shall indicate the date of the source used to derive the classification of the DES. In the case of multiple sources, the date of the most recent source shall be used. If this field is all UT1 spaces (code 0x20), it shall imply that a DES security source date does not apply.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	<R>
DESCTLN	DES Security Control Number. This field shall contain a valid security control number associated with the DES. The format of the security control number shall be in accordance with the regulations governing the appropriate security channel(s). If this field is all UT1 spaces (code 0x20), it shall imply that no DES security control number applies.	15	UT1 (Default is UT1 spaces (0x20))	<R>
DESOFLW	Overflowed Header Type. This field shall be present if DESID contains TRE_OVERFLOW. Its presence indicates that the DES contains a TRE that would not fit in the NITF file header or segment subheader where it would ordinarily be located. Its value indicates the data type to which the enclosed TRE is relevant.	6	BCS-A UDHD, UDID, XHD, IXSHD, SXSHD, TXSHD; otherwise, field is omitted.	C

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TABLE A-8(A). Tagged Record Extension Overflow (TRE OVERFLOW)
Data Extension Segment (DES) subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
DESITEM	Data Item Overflowed. This field shall be present if the DESOFLW field is present. It shall contain the number of the data item in the NITF file, of the type indicated in the DESOFLW field to which the TREs in the segment apply. If the value of the DESOFLW field is UDHD or XHD the value of the DESITEM field shall be 000.	3	BCS-N positive integer 000 to 999	C
DESSHL	Length of DES-Defined Subheader Fields.	4	BCS-N positive integer 0000	R
DESDATA	DES-Defined Data Field. This field shall contain data of either binary or character types defined by and formatted according to the user's specification. The length of this field shall not cause any other NITF field length limits to be exceeded, but is otherwise fully user-defined.	†	User-defined TREs with no intervening octets.	R

† Profile defined.

TABLE A-8(B). Streaming File Header (STREAMING_FILE_HEADER)
Data Extension Segment (DES) subheader.
TYPE R = Required, C = Conditional, < > = BCS spaces (code 0x20) are allowed for the entire field
(† annotations are explained at the end of the table)

FIELD	NAME	SIZE	VALUE RANGE	TYPE
DE	Data Extension Subheader. This field shall contain the characters DE to identify the subheader as a data extension.	2	BCS-A DE	R
DESID	Unique DES Type Identifier. This field shall contain STREAMING_FILE_HEADER.	25	BCS-A STREAMING_FILE_HEADER	R
DESVER	Version of the Data Definition. This field shall contain the alphanumeric version number of the use of the Tag. The version number is assigned as part of the registration process.	2	BCS-N positive integer 01	R
DECLAS	Data Extension File Security Classification. This field shall contain a valid value representing the classification level of the DES. Valid values are T for Top Secret, S for Secret, C for Confidential, R for Restricted, or U for Unclassified.	1	UT1 T, S, C, R, or U	R
NOTE: If the value of the DESCLAS field is T, S, C, or R, then the DESCLSY field must be populated with a valid code for the security classification system used.				
DESCLSY	DES Security Classification System. This field shall contain valid values indicating the national or multinational security system used to classify the DES. Country Codes per FIPS PUB 10-4 are used to indicate national security systems. If this field is all UT1 spaces (code 0x20), it shall imply that no Security Classification System applies to the DES.	2	UT1 (Default is UT1 spaces (0x20))	<R>
NOTE: If any of the following fields are populated with anything other than spaces, then the DESCLSY field must be populated with a valid code for the security classification system used: DESCODE, DESREL, DESDCTP, DESDCDT, DESDCXM, DESDG, DESDGDT, DESCLDES, DESCATP, DESCAUT, DESCRSN, DESSRDT, and DESCTLN.				

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TABLE A-8(B). Streaming File Header (STREAMING FILE HEADER) Data Extension Segment (DES) subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
DESCODE	DES Codewords. This field shall contain a valid indicator of the security compartments associated with the DES. Values include one or more of the digraphs found in table A-4. Multiple entries shall be separated by a single UT1 space (0x20). The selection of a relevant set of codewords is application specific. If this field is all UT1 spaces (0x20), it shall imply that no codewords apply to the DES.	11	UT1 (Default is UT1 spaces (0x20))	<R>
DESCTLH	DES Control and Handling. This field shall contain valid additional security control and/or handling instructions (caveats) associated with the DES. Values include digraphs found in table A-4. The digraph may indicate single or multiple caveats. The selection of a relevant caveat(s) is application specific. If this field is all UT1 spaces (0x20), it shall imply that no additional control and handling instructions apply to the DES.	2	UT1 (Default is UT1 spaces (0x20))	<R>
DESREL	DES Releasing Instructions. This field shall contain a valid list of countries to which the DES is authorized for release. Typical values include one or more country codes as found in FIPS PUB 10-4 separated by a single BCS space (0x20). If this field is all UT1 spaces (0x20), it shall imply that no DES release instructions apply.	20	UT1 (Default is UT1 spaces (0x20))	<R>
DESDCTP	DES Declassification Type. This field shall contain a valid indicator of the type of security declassification or downgrading instructions which apply to the DES. Valid values are DD for declassify on a specific date, DE for declassify upon occurrence of an event, GD for downgrade to a specified level on a specific date, GE for downgrade to a specified level upon occurrence of an event, O for OADR, and X for exempt from automatic declassification. If this field is all UT1 spaces (code 0x20), it shall imply that no DES security declassification or downgrading instructions apply.	2	UT1 DD, DE, GD, GE, O, X (Default is UT1 spaces (0x20))	<R>
DESDCDT	DES Declassification Date. This field shall indicate the date on which a DES is to be declassified if the value of the DESDCTP field is DD. If this field is all UT1 spaces (code 0x20), it shall imply that no DES declassification date applies.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	<R>

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TABLE A-8(B). Streaming File Header (STREAMING_FILE_HEADER) Data Extension Segment (DES) subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
DESDCXM	DES Declassification Exemption. This field shall indicate the reason the DES is exempt from automatic declassification if the value of the DESDCTP field is X. Valid values are X1 to X8 and X251 to X259. X1 to X8 correspond to the declassification exemptions found in DOD 5200.1-R, paragraphs 4-202b(1) to (8) for material exempt from the 10-year rule. X251 to X259 correspond to the declassification exemptions found in DOD 5200.1-R, paragraphs 4-301a(1) to (9) for permanently valuable material exempt from the 25-year declassification system. If this field is all UT1 spaces (code 0x20), it shall imply that a DES declassification exemption does not apply.	4	UT1 X1 to X8 X251 to X259 (Default is UT1 spaces (0x20))	<R>
DESDG	DES Downgrade. This field shall indicate the classification level to which a DES is to be downgraded if the value of the DESDCTP field is GD or GE. Valid values are S for Secret, C for Confidential, R for Restricted. If this field contains a UT1 space (code 0x20), it shall imply that DES security downgrading does not apply.	1	UT1 S, C, R (Default is UT1 space (0x20))	<R>
DESDGDT	DES Downgrade Date. This field shall indicate the date on which a DES is to be downgraded if the value of the DESDCTP field is GD. If this field is all UT1 spaces (code 0x20), it shall imply that a DES security downgrading date does not apply.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	<R>
DESCLTX	DES Classification Text. This field shall be used to provide additional information about DES classification to include identification of a declassification or downgrading event if the value of the DESDCTP field is DE or GE. It may also be used to identify multiple classification sources and/or any other special handling rules. Values are user-defined free text. If this field is all UT1 spaces (code 0x20), it shall imply that additional information about DES classification does not apply.	43	UT1 User-defined free text (Default is UT1 spaces (0x20))	<R>
DESCATP	DES Classification Authority Type. This field shall indicate the type of authority used to classify the DES. Valid values are O for original classification authority, D for derivative from a single source, and M for derivative from multiple sources. If this field contains a UT1 space (code 0x20), it shall imply that DES classification authority type does not apply.	1	UT1 O, D, M (Default is UT1 space (0x20))	<R>

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TABLE A-8(B). Streaming File Header (STREAMING_FILE_HEADER) Data Extension Segment (DES) subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
DESCAUT	DES Classification Authority. This field shall identify the classification authority for the DES dependent upon the value of the DESCATP field. Values are user-defined free text which should contain the following information: original classification authority name and position or personal ID if the of the DESCATP field is O; title of the document or security classification guide used to classify the DES if the of the DESCATP field is D; and Deriv-Multiple if the DES classification was derived from multiple sources and the value of the DESCATP field is M. In the latter case, the DES originator will maintain a record of the sources used in accordance with existing security directives. One of the multiple sources may also be identified by the DESCLTX field if desired. If this field is all UT1 spaces (code 0x20), it shall imply that no DES Classification authority applies.	40	UT1 User-defined free text (Default is UT1 spaces (0x20))	<R>
DESCRSN	DES Classification Reason. This field shall contain values indicating the reason for classifying the DES. Valid values are A to G. These correspond to the reasons for original classification per E.O. 12958, Section 1.5.(a) to (g). If this field contains a UT1 spaces (code 0x20), it shall imply that no DES classification reason applies.	1	UT1 A to G (Default is UT1 space (0x20))	<R>
DESSRDT	DES Security Source Date. This field shall indicate the date of the source used to derive the classification of the DES. In the case of multiple sources, the date of the most recent source shall be used. If this field is all UT1 spaces (code 0x20), it shall imply that a DES security source date does not apply.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	<R>
DESCTLN	DES Security Control Number. This field shall contain a valid security control number associated with the DES. The format of the security control number shall be in accordance with the regulations governing the appropriate security channel(s). If this field is all UT1 spaces (code 0x20), it shall imply that no DES security control number applies.	15	UT1 (Default is UT1 spaces (0x20))	<R>
DESSHL	Length of DES-Defined Subheader Fields.	4	BCS-N positive integer 0000	R
SFH_L1	SFH Length 1. This field shall contain the number of bytes in the SFH_DR field.	7	BCS-N positive integer 0 to 9999999	R
SFH_DELIM1	SFH Delimiter 1. This field shall contain the hexadecimal value 0x0A6E1D97. It provids a unique value that can be identified as the beginning of the replacement data.	4	BCS-A 0x0A6E1D97	R

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TABLE A-8(B). Streaming File Header (STREAMING FILE HEADER) Data Extension Segment (DES) subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
SFH_DR	Replacement Data. This field shall contain the type string replacement for the NITF file header beginning with the FHDR field and continuing for the number of bytes indicated in the SFH_L1 or SFH_2 field. The NITF file header replication shall at least continue through all the NITF file header fields that are marked incomplete.	†		R
SFH_DELIM2	SFH Delimiter 2. This field shall contain the hexadecimal value 0x0ECA14BF. It provides a unique value that can be identified as the end of the replacement data.	4	BCS-A 0x0ECA14BF	R
SFH_L2	SFH Length 2. A repeat of SFH-L1, this field shall contain the number of bytes in the SFHDR field.	7	BCS-N positive integer 0 to 9999999	R

† As specified in SFH_L1 and SFH_L2.

TABLE A-9. NITF Reserved Extension Segment (RES) subheader.
(TYPE “R” = Required, “C” = Conditional, “< >“ = BCS spaces allowed for entire field)
(“†” annotations are explained at the end of the table)

FIELD	NAME	SIZE	VALUE RANGE	TYPE
RE	File Part Type. This field shall contain the characters “RE” to identify the subheader as a reserved extension.	2	BCS-A RE	R
RESID	Unique RES Type Identifier. This field shall contain a valid alphanumeric identifier properly registered with the ISMC.	25	BCS-A Registered value only	R
RESVER	Version of the Data Definition. This field shall contain the alphanumeric version number of the use of the tag. The version number is assigned as part of the registration process.	2	BCS-N 01 to 99	R
RECLAS	Reserved Extension File Security Classification. This field shall contain a valid value representing the classification level of the RES. Valid values are T for Top Secret, S for Secret, C for Confidential, R for Restricted, or U for Unclassified.	1	UT1 T, S, C, R, or U	R
NOTE: If the value of the RECLAS field is T, S, C, or R, then the RECLSY field must be populated with a valid code for the security classification system used.				
RECLSY	RES Security Classification System. This field shall contain valid values indicating the national or multinational security system used to classify the RES. Country Codes per FIPS PUB 10-4 are used to indicate national security systems. If this field is all UT1 spaces (0x20), it shall imply that no security classification system applies to the RES.	2	UT1 (Default is UT1 spaces (0x20))	<R>
NOTE: If any of the following fields are populated with anything other than spaces, then the RECLSY field must be populated with a valid code for the security classification system used: RECODE, REREL, REDCTP, REDCDT, REDCXM, REDG, REDGDT, RECLTX, RECATP, RECAUT, RECRSN, RESRDT, and RECTLN.				

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TABLE A-9. NITF Reserved Extension Segment (RES) subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
RECODE	RES Codewords. This field shall contain a valid indicator of the security compartments associated with the RES. Values include one or more of the digraphs found in table A-4. The selection of a relevant set of codewords is application specific. If this field is all UT1 spaces 0x20), it shall imply that no codewords apply to the RES.	11	UT1 (Default is UT1 spaces (0x20))	<R>
RECTLH	RES Control and Handling. This field shall contain valid additional security control and/or handling instructions (caveats) associated with the RES. Values include digraphs found in table A-4. The digraph may indicate single or multiple caveats. The selection of a relevant caveat(s) is application specific. If this field is all UT1 spaces (0x20), it shall imply that no additional control and handling instructions apply to the RES.	2	UT1 (Default is UT1 spaces (0x20))	<R>
REREL	RES Releasing Instructions. This field shall contain a valid list of countries to which the RES is authorized for release. Typical values include one or more country codes as found in FIPS PUB 10-4 separated by a single BCS space (0x20). If this field is all UT1 spaces (0x20), it shall imply that no RES release instructions apply.	20	UT1 (Default is UT1 spaces (0x20))	<R>
REDCTP	RES Declassification Type. This field shall contain a valid indicator of the type of security declassification or downgrading instructions which apply to the RES. Valid values are DD for declassify on a specific date, DE for declassify upon occurrence of an event, GD for downgrade to a specified level on a specific date, GE for downgrade to a specified level upon occurrence of an event, O for OADR, and X for exempt from automatic declassification. If this field is all UT1 spaces (0x20), it shall imply that no RES security declassification or downgrading instructions apply.	2	UT1 DD, DE, GD, GE, O, X (Default is UT1 spaces (0x20))	<R>
REDCDT	RES Declassification Date. This field shall indicate the date on which a RES is to be declassified if the value in REDCTP is DD. If this field is all UT1 spaces (0x20), it shall imply that no RES declassification date applies.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	<R>

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TABLE A-9. NITF Reserved Extension Segment (RES) subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
REDCXM	RES Declassification Exemption. This field shall indicate the reason the RES is exempt from automatic declassification if the value in REDCTP is X. Valid values are X1 to X8 and X251 to X259. X1 to X8 correspond to the declassification exemptions found in DOD 5200.1-R, paragraphs 4-202b(1) to (8) for material exempt from the 10-year rule. X251 to X259 correspond to the declassification exemptions found in DOD 5200.1-R, paragraphs 4-301a(1) to (9) for permanently valuable material exempt from the 25-year declassification system. If this field is all UT1 spaces (0x20), it shall imply that a file declassification exemption does not apply.	4	UT1 X1 to X8, X251 to X259, (Default is UT1 spaces (0x20))	<R>
REDG	RES Downgrade. This field shall indicate the classification level to which a RES is to be downgraded if the values in REDCTP are GD or GE. Valid values are S for Secret, C for Confidential, R for Restricted. If this field contains a UT1 space (0x20), it shall imply that RES security downgrading does not apply.	1	UT1 S, C, R (Default is UT1 space (0x20))	<R>
REDGDT	RES Downgrade Date. This field shall indicate the date on which a RES is to be downgraded if the value in REDCTP is GD. If this field is all BCS spaces (0x20), it shall imply that a RES security downgrading date does not apply.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	<R>
RECLTX	RES Classification Text. This field shall be used to provide additional information about the RES classification to include identification of a declassification or downgrading event if the values in REDCTP are DE or GE. It may also be used to identify multiple classification sources and/or any other special handling rules. Values are user-defined free text. If this field is all UT1 spaces (0x20), it shall imply that additional information about RES classification does not apply.	43	UT1 User-defined free text (Default is UT1 spaces (0x20))	<R>
RECATP	RES Classification Authority Type. This field shall indicate the type of authority used to classify the RES. Valid values are O for original classification authority, D for derivative from a single source, and M for derivative from multiple sources. If this field contains a UT1 space (0x20), it shall imply RECATP does not apply.	1	UT1 O, D, M (Default is UT1 space (0x20))	<R>

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TABLE A-9. NITF Reserved Extension Segment (RES) subheader - Continued.

FIELD	NAME	SIZE	VALUE RANGE	TYPE
RECAUT	RES Classification Authority. This field shall identify the classification authority for the RES dependent upon the value in RECATP. Values are user-defined free text which should contain the following information: original classification authority name and position or personal ID if the value in RECATP is O; title of the document or security classification guide used to classify the RES if the value in RECATP is D; and Deriv-Multiple if the RES classification was derived from multiple sources. In the latter case, the RES originator will maintain a record of the sources used in accordance with existing security directives. One of the multiple sources may also be identified in RECLTX if desired. If this field is all UT1 spaces (0x20), it shall imply that no RES classification authority applies.	40	UT1 User-defined free text (Default is UT1 spaces (0x20))	<R>
RECRSN	RES Classification Reason. This field shall contain values indicating the reason for classifying the RES. Valid values are A to G. These correspond to the reasons for original classification per E.O. 12958, Section 1.5.(a) to (g). If this field contains a UT1 space (0x20), it shall imply that no RES classification reason applies.	1	UT1 A to G (Default is UT1 space (0x20))	<R>
RESRDT	RES Security Source Date. This field shall indicate the date of the source used to derive the classification of the RES. In the case of multiple sources, the date of the most recent source shall be used. If this field is all UT1 spaces (0x20), it shall imply that a RESRDT does not apply.	8	UT1 CCYYMMDD (Default is UT1 spaces (0x20))	<R>
RECTLN	RES Security Control Number. This field shall contain a valid security control number associated with the RES. The format of the security control number shall be in accordance with the regulations governing the appropriate security channel(s). If this field is all UT1 spaces (0x20), it shall imply that no RECTLN applies.	15	UT1 (Default is UT1 spaces (0x20))	<R>
RESSHL	RES User-defined Subheader Length. This field shall contain the number of bytes in the field RESSHF. If this field contains BCS zeros (0x30), RESSHF shall not appear in the RES subheader.	4	BCS-N 0000-9999	R
RESSHF	RES User-Defined Subheader Fields. This field shall contain user-defined fields. Data in this field shall be alphanumeric, formatted according to user specification.	†[9]	BCS-A User-defined	C
RESDATA	RES User-Defined Data. This field shall contain data of either binary or character types defined by and formatted according to the user's specification. The length of this field shall not cause any other NITF field length limits to be exceeded, but is otherwise fully user defined.	††[9]	User defined	R

†[9] Value of the RESSHL field (in bytes)
††[9] Determined by the definition of the specific RES as registered and controlled with the ISMC.

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TABLE A-10. NITF 02.10 Complexity Level (CLEVEL).

NITF File Features	Complexity Level (CLEVEL) 3	5	6	7
Common Coordinate System Extent (Pixels)	(00000000, 00000000) to (00002047, 00002047)	(00000000, 00000000) to (00008191, 00008191)	(00000000, 00000000) to (00065535, 00065535)	(00000000, 00000000) to (99999999, 99999999)
Maximum File Size	50 Mbyte -1byte (52,428,799 bytes)	1 Gbyte -1 byte (1,073,741,823 bytes)	2 Gbyte -1 byte (2,147,483,647 bytes)	10Gbyte -1 byte (10,737,418,239 bytes)
Image Size (Image(s) placed within CCS extent)	00000002 to 00002048 Rows X 00000002 to 00002048 Columns (R and C ≤ 2048)	00000002 to 00008192 Rows X 00000002 to 00008191 Columns (R or C > 2048)	00000002 to 00065536 Rows X 00000002 to 00065536 Columns (R or C > 8192)	00000002 to 99999999 Rows X 00000002 to 99999999 Columns (R or C > 65536)
Image Blocking (Rectangular Blocks allowed)	Single and Multiple Blocks 0002 to 2048 Rows X 0002 to 2048 Columns	Single and Multiple Blocks 0002 to 8192 Rows X 0002 to 8192 Columns	Multiple blocking is mandatory for images that exceed 8192 Pixels per Row or Column. 0002 to 8192 Rows X 0002 to 8192 Columns	
Monochrome (MONO) No Compression	Single Band 1, 8, 12, 16, 32, and 64-Bits per Pixel (NBPP) With and without LUT IC = NC, NM IMODE = B			
Color 1 and 8-Bit (RGB / LUT) No Compression	Single Band 1 and 8-Bits per Pixel (NBPP) With LUT IC = NC, NM IMODE = B			
Colour 24 Bit (RGB) No Compression	Three Band 8-Bits per Pixel (NBPP) No LUT IC = NC, NM IMODE = B, P, R, S			
Multispectral (MULTI) No Compression	2 to 9 Bands, 8, 16, 32, and 64-Bits per Pixel per Band With and without LUT in each Band IMODE = B, P, R, S	2 to 256 Bands, 8, 16, 32, and 64-Bits per Pixel per Band With and without LUT in each Band IMODE = B, P, R, S		2 to 999 Bands, 8, 16, 32, and 64-Bits per Pixel per Band With and without LUT in each Band IMODE = B, P, R, S
JPEG DCT Compression Monochrome (MONO)	Single Band 8 and 12-Bit Sample (NBPP) No LUT IC = C3, M3 IMODE = B			
JPEG DCT Compression 24-Bit Colour (RGB)	Three Bands 8-Bit Sample per Band (NBPP) No LUT IC = C3, M3 IMODE = P			
JPEG DCT Compression 24-Bit Colour (YCbCr601)	Three Bands 8-Bit Sample per Band (NBPP) No LUT IC = C3, M3 IMODE = P			

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TABLE A-10. NITF 02.10 Complexity Level (CLEVEL) - Continued.

NITF File Features	Complexity Level (CLEVEL) 3	5	6	7
Downsampled JPEG DCT Monochrome (MONO)	Single Band Single Block Only 8-Bit Sample (NBPP) No LUT IC = I1 IMODE = B (Image size may not exceed 2048 Pixels per Row or Column.)			
JPEG Lossless Compression Monochrome (MONO)	Single Band 8, 12, and 16-Bit Sample per Band (NBPP) No LUT IC = C5, M5 IMODE = B (This feature is optional for implementation.)			
JPEG Lossless Compression 24-Bit Colour (RGB)	Three Bands 8-Bit Sample per Band (NBPP) No LUT IC = C5, M5 IMODE = P (This feature is optional for implementation.)			
Bi-Level Compression (MONO)	Single Band/Block 1-Bit per Pixel (NBPP) With and without LUT IC = C1, M1 IMODE = B COMRAT = 1D, 2DS, 2DH (Image size may not exceed 8192 Pixels per Row by 2560 Pixels per Column.)			
Bi-Level Compression (RGB/LUT)	Three Band/Block 1-Bit per Pixel (NBPP) With and without LUT IC = C1, M1 IMODE = B COMRAT = 1D, 2DS, 2DH (Image size may not exceed 8192 Pixels per Row by 2560 Pixels per Column.)			
VQ Compression	Single Band/Block 8-Bits per Pixel (NBPP) 4 x 4 Kernel organised in 4 Tables IC = C4, M4 IMODE = B			
VQ Monochrome (MONO)	With and without LUT IMODE = B			
VQ 8-Bit Colour (RGB/LUT)	With LUT IMODE = B			
Multispectral (MULTI) Individual Band JPEG Compression	2 to 9 Bands 8 and 12-Bits per Pixel per Band No LUT IC = C3, M3 IMODE = B, S	2 to 256 Bands 8 and 12-Bits per Pixel per Band No LUT IC = C3, M3 IMODE = B, S		2 to 999 Bands 8 and 12-Bits per Pixel per Band No LUT IC = C3, M3 IMODE = B, S

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TABLE A-10. NITF 02.10 Complexity Level (CLEVEL) - Continued.

NITF File Features	Complexity Level (CLEVEL) 3	5	6	7
Multispectral (MULTI) Multi-Component Compression	2 to 9 Bands 8 and 12-Bits per Pixel per Band No LUT IC = C6, M6 IMODE = B, P,S (This feature is optional for implementation.)	2 to 256 Bands 8, and 12-Bits per Pixel per Band No LUT IC = C6, M6 IMODE = B, P, S (This feature is optional for implementation.)		2 to 999 Bands 8 and 12-Bits per Pixel per Band No LUT IC = C6, M6 IMODE = B, P, S (This feature is optional for implementation.)
Elevation Data (NODISPLY)	Single Band 8, 12, 16, 32, and 64-Bits per Pixel (NBPP) No LUT IC = NC IMODE = B ICAT = DTEM, ISUBCATn code from DIGEST, Part 3, Annex B (or BCS Spaces (0x20) Applicable TREs: Geospatial Support Data Extensions (GEOSDE), DIGEST, Part 2, Annex D (This feature is optional for implementation.)			
Location Grid (NODISPLY)	Two Bands 8, 12, 16, 32, and 64-Bits per Pixel (NBPP) No LUT IC = NC IMODE = B, P ICAT = LOCG, ISUBCATn = CGX, CGY, or GGX, GGY Applicable TREs: Geospatial Support Data Extensions (GEOSDE), DIGEST, Part 2, Annex D (This feature is optional for implementation.)			
Matrix Data (NODISPLY)	2 to 9 Bands 8, 16, 32, and 64-Bits per Pixel per Band No LUT in any Band IMODE = B, P,R, S (This feature is optional for implementation.)	2 to 256 Bands 8, 16, 32, and 64-Bits per Pixel per Band No LUT in any Band IMODE = B, P, R, S (This feature is optional for implementation.)		2 to 999 Bands 8, 16, 32, and 64-Bits per Pixel per Band No LUT in any Band IMODE = B, P, R, S (This feature is optional for implementation.)
Number of Image Segments per File	0 to 20	0 to 100		
Number of CGM Graphic Segments per File	0 to 100			
Aggregate Size of Graphic Segments	1 Mbyte maximum	2 Mbyte maximum		
CGM Graphic Profile	MIL-STD-2301A			
Number of Text Segments per File	0 to 32 Segments			
Text Format Codes Supported	STA, MTF, UT1			
Text Data per Segment	00001 to 99999 Characters			
Tagged Record Extensions (TREs)	TREs may appear in the UDHD, XHD, UDID, IXSHD, SXSHD, and TXSHD fields and TRE_OVERFLOW DES(s) regardless of CLEVEL.			

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TABLE A-10. NITF 02.10 Complexity Level (CLEVEL) - Continued.

NITF File Features	Complexity Level (CLEVEL)			
	3	5	6	7
Number of Data Extension Segments (DESs) per File	0 to 10			
Currently Registered DESs	TRE_OVERFLOW STREAMING_FILE_HEADER			
Number of Reserved Extension Segments (RESs) per File	None			
Currently Approved RESs	None			

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APPENDIX B

IMPLEMENTATION CONSIDERATIONS

B.1 SCOPE

B.1.1 This appendix is not a mandatory part of the standard. The information contained in it is explanatory and intended for guidance only.

B.1.2 NITF implementation guidelines. The NITF has been developed to provide image exchange capabilities among computer systems of various designs and capabilities. This appendix discusses general considerations pertinent to successful implementation of the NITF. Guidelines will be presented, and potential problems will be highlighted. The NITF preprocessor and postprocessor software, the software necessary to write and read a NITF file based on host files containing the data items to be included, are to be written by the user. The combination of the preprocessor and postprocessor hereafter will be referred to as the "NITF implementation." Preprocessing is sometimes called "packing," and postprocessing is called "unpacking." NITF implementation sample software is available through your point of contact. NITF2.1 implementations will be able to pack and unpack NITF2.0 files for interoperability considerations.

B.2 APPLICABLE DOCUMENTS

Though not referenced, the following related documents are listed for information only.

NATIONAL IMAGERY AND MAPPING AGENCY PUBLICATION

DMA TR 8358.1	-	Datums, Ellipsoids, Grids, and Grid Reference System

STANDARDIZATION AGREEMENTS

AC 224(AG/4)D-67	-	NATO Secondary Imagery Format (NSIF) Compliance and Interoperability Test and Evaluation Program Plan
NATO C-M(55) (Final)	-	Security within the North Atlantic Treaty Organisation, Document, Volume I, Enclosures A, B, C, and E, Issue 4: 31 July 1972
NATO Study 4559	-	NATO Standard Image Library (NSIL) Interface Technical Support Team
Q-STAG 509	-	Military Symbols
STANAG 1059	-	National Distinguishing Letters for use by NATO Forces
STANAG 2211	-	Geodetic Datums, Ellipsoids, Grids and Grid References
STANAG 2215	-	Evaluation of Land Maps, Aeronautical Charts and Digital Topographic Data
STANAG 2019	-	Military Symbols for Land Based Systems
STANAG 3277	-	Air Reconnaissance Request/Task form
STANAG 4420	-	Display Symbology and Colours for NATO Maritime Units

STANAG 4545	-	NATO Secondary Imagery Format (NSIF), Ratification Draft 2
STANAG 5500	-	NATO Message Text Formatting System (FORMETS) - ADatP-3
STANAG 7023	-	Air Reconnaissance Imagery Data Architecture
STANAG 7024	-	Imagery Air Reconnaissance Tape Recorder Standard
STANAG 7085	-	Interoperable Data Links for Imaging Systems

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO 8601	-	Data elements and interchange formats - Information interchange - Representation of dates and times
ISO 8879	-	Information processing - Text and office systems - Standard Generalized Mark-up Language (SGML)
ISO/IEC 9069	-	Information processing - SGML support facilities - SGML Document Interchange Format (SDIF)
ISO/IEC 10918-3	-	Information technology - Digital compression and coding of continuous-tone still images: Extensions
ISO 11172-1	-	Information technology - Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s - Part 1: Systems
ISO 11172-2	-	Information technology - Coding of moving pictures and associated audio for digital storage media at up to about 1~~.~~,5 Mbit/s~~.~~ - Part 2: Video
ISO 11172-3	-	Information technology - Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s - Part 3: Audio
ISO 11172-4	-	Information technology - Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s - Part 4: Conformance testing
ISO 11172-5	-	Information technology - Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mbit/s - Part 5: Software simulation
ISO/IEC 13818-1	-	Information technology - Generic coding of moving pictures and associated audio information~~:~~ - Part 1: Systems
ISO/IEC 13818-2	-	Information technology - Generic coding of moving pictures and associated audio information~~:~~ - Part 2: Video
ISO/IEC 13818-3	-	Information technology - Generic coding of moving pictures and associated audio information~~:~~ - Part 3: Audio
ISO/IEC 13818-4	-	Information technology - Generic coding of moving pictures and associated audio information - Part 4: Compliance testing

ISO/IEC 13818-5	-	Information technology - Generic coding of moving pictures and associated audio information - Part 5: Software simulation (future TR)
ISO/IEC 13818-6	-	Information technology - Generic coding of moving pictures and associated audio information - Part 6: Extensions for DSM-CC is a full software implementation
ISO/IEC 13818-9	-	Information technology - Generic coding of moving pictures and associated audio information - Part 9: Extension for real time interface for system decoders

B.3 DEFINITIONS

The definitions in section 3 of this standard apply to this appendix.

B.4 GENERAL REQUIREMENTS

B.4.1 Scope of NITF implementation. NITF describes the format of images and graphics and text within the NITF file only. It does not define the image or text requirements of the host system. The host system is responsible for the handling of unpacked image and text files, as well as image and text display capabilities.

B.4.2 Creating headers and subheaders. This standard specifies legal values for the header and subheader fields. The NITF preprocessor for any particular host system will be responsible for enforcing the field values as stated in this standard.

B.4.3 Character counts. The NITF uses explicit byte counts to delimit fields. No end-of-field characters are used. These byte counts are critical for the proper interpretation of a NITF file. The NITF preprocessor should compute these byte counts based on file contents to insure accuracy. All fields in the NITF header and subheaders must be present exactly as specified in the NITF header and subheader descriptions, and no additional fields may be inserted. The NITF uses various conditional fields whose presence is determined by previous fields and counts. If an expected conditional field is missing, the remainder of the file will be misinterpreted. A similar result will occur if a conditional field is inserted when it is not required. For these reasons, the item count fields are critical, and every effort must be made to ensure their accuracy. The NITF preprocessor should compute these item counts based on file contents whenever possible.

B.4.4 Data entry. To reduce any operator workload imposed by the preprocessor, each preprocessor should provide for the automatic entry of data. Global default values for the particular NITF version should be inserted automatically in the file. System default values, such as the standard size parameters for a base image, also should be entered automatically by the preprocessor. Values that are known to the system, such as the time or the computed size of an overlay, also should be entered automatically.

B.4.5 Out of bounds field values. The file creator is responsible for ensuring that all NITF field values are within the bounds specified by the NITF document.

B.4.6 Use of images in NITF. The NITF specifies a format for images contained within a NITF file only. A NITF implementation must be capable of translating this format to and from the host system's local format. Some host systems have multiple formats for binary data. In these cases, the NITF implementation must use the appropriate host format to provide the necessary data exchange services with other system packages. When imagery data of less than M bits-per-pixel is displayed on an M-bit (2^M grey shades) display device, it must be transformed into the dynamic range of the device. One way to do this is to modify the LUTs of the display device. However, if M-bit and less than M-bit imagery is displayed simultaneously, the M-bit image will appear distorted. The recommended method is to convert the less than M-bit imagery into M-bit imagery, then use the standard LUTs. The following equation will transform a less than M-bit pixel into and M-bit pixel:

N = number of bits-per-pixel
P_N = N-bit pixel value
P_M = M-bit pixel value

$$P_M = \frac{2^M - 1}{2^N - 1} P_N$$

B.4.7 Use of text files in the NITF. The text format field is provided to help the reader of the file determine how to interpret the text data received. The file reader is responsible for interpreting the various text formats.

B.4.7.1 STA. All lines within a NITF STA TS will be separated by carriage return/line feed pairs. It is the responsibility of the local system to translate these pairs into the local format. NITF STA has no standard line length. The host system must be capable of processing lines that are longer than the local standard.

B.4.7.2 MTF. MTF formatted text is a specialized case of STA formatted text as defined in MIL-STD-6040. It is intended to be machine interpretable while still being human readable. As a minimum, NITF interpret implementations must be able to present the text as required for STA formatted text. MTF does not use carriage returns, line feeds, and form feeds in the text stream. As an option, an implementation may structure the presentation to align the text for improved human viewing according to the provisions of MIL-STD-6040. An implementation may also pass the content of the MTF text to an MTF capable application.

B.4.7.3 UCS. The UCS is used for expressing text in many languages of the world as defined by ISO/IEC 10646-1. The specific character set selected from UCS shall be identified by a profile. The profile shall identify the adopted form, the adopted implementation level, and the adopted subset (list of collections and/or characters) in accordance with the structures defined in ISO/IEC 10646-1. When a profile defined UCS is used in a NITF file, the coding shall contain an explicit declaration of identification of features (escape sequence) as specified in ISO/IEC 10646-1. When no declaration escape sequence is included, the default shall be that defined for BCS (paragraph 5.7.1).

B.4..7.3.1 UT1. As described in ISO 4873, UT1 indicates 1-octet coded UCS characters, Basic Latin and Latin Supplement 1. This code is primarily intended for general information interchange within an 8-bit environment among data processing systems and associated equipment, and within data communications systems. The need for graphic characters and control functions in data processing has been taken into account. The code includes the 10 digits as well as the 52 lower and upper case letters of the basic Latin alphabet and includes accented letters, special Latin letters, and the letters of one or several non-Latin alphabet(s). The UT1 codes contained in tables B-1 and B-2 are used in this standard.

B.4.7.3 Formatted Documents. The TS is intended to convey plain text, not marked up text typical of word processed documents. Documents formatted to such things as Standardized Graphic Mark-up Language (SGML), Hypertext Mark-up Language (HTML), Rich Text Format (RTF), etc. can be accommodated through the use of a DES specialized for this purpose. At the time of publication, a DES to contain formatted documents had not been defined. Such a DES may be developed and submitted for use through the registration process described in appendix C.

B.4.8 Converting color to grey scale. Full color may be specified as the file background and for various attributes of segments within a NITF file (e.g. color imagery and color annotations). Color items for receiving systems unable to support the presentation of full colors must be mapped to colors that are able to be supported and displayed.

B.4.8.1 Eight-bit grey scale presentation. For 8-bit grey scale systems an appropriate conversion is:

GREY (8-bit) = 0.299*RED + 0.587*GREEN + 0.114*BLUE

B.4.8.2 One-bit grey scale presentation. For 1-bit bi-tonal (e.g. black and white) systems, an appropriate conversion is to first calculate the grey scale conversion as shown above. Then,

BITONE(1-bit) = 1 (white), when GREY (8-bit) > 127

BITONE(1-bit) = 0 (black), when GREY (8-bit) <= 127

B.4.8.3 Greater than eight-bit grey scale presentation. For 8+ bit grey scale systems, color components can first be converted to 8-bit grey scale followed by a dynamic range adjustment to the bit range supported by the presentation device.

B.4.8.4 Washout. The potential exists for overlays to be inadvertently hidden or washed out when compared to the background over which they are placed, particularly when converting from color to grey scale. The application developer should take a design approach that obviates the potential for a recipient to inadvertently overlook presentation material caused by inadequate lack of contrast in the presentation.

TABLE B-1. Basic Latin character set.
(Shaded areas are not used for NITF BCS. Unshaded is NITF BCS.)
(Column headings are the Most Significant 4 bits.)
and row headings are the Least Significant 4 bits.)

	0	1	2	3	4	5	6	7
0	000	016	SP 032	0 048	@ 064	P 080	` 096	p 112
1	001	017	! 033	1 049	A 065	Q 081	a 097	q 113
2	002	018	“ 034	2 050	B 066	R 082	b 098	r 114
3	003	019	# 035	3 051	C 067	S 083	c 099	s 115
4	004	020	$ 036	4 052	D 068	T 084	d 100	t 116
5	005	021	% 037	5 053	E 069	U 085	e 101	u 117
6	006	022	& 038	6 054	F 070	V 086	f 102	v 118
7	007	023	‘ 039	7 055	G 071	W 087	g 103	w 119
8	008	024	(040	8 056	H 072	X 088	h 104	x 120
9	009	025	) 041	9 057	I 073	Y 089	i 1~~0~~05	y 121
A	010	026	* 042	: 058	J 074	Z 090	j 106	z 122
B	011	027	+ 043	; 059	K 075	[091	k 107	{ 123
C	012	028	‘ 044	< 060	L 076	\ 092	1 108	124
D	013	029	- 045	= 061	M 077	] 093	m 109	} 125
E	014	030	. 046	> 062	N 078	^ 094	n 110	~ 126
F	015	031	/ 047	? 063	O 079	_ 095	o 111	127

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TABLE B-2. Latin 1 supplement character set.
(Shaded areas are non-ASCII.)
(Unshaded areas are additional characters used in UT1.)

	8	9	A	B	C	D	E	F
0	128	144	NB SP 160	° 176	À 192	Ð 208	à 224	ð 240
1	129	145	¡ 161	± 177	Á 193	Ñ 209	á 225	ñ 241
2	130	146	¢ 162	² 178	Â 194	Ò 210	â 226	ò 242
3	131	147	£ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
4	132	148	¤ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
5	133	149	¥ 165	µ 181	Å 197	Õ 213	å 229	õ 245
6	134	150	¦ 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
7	135	151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
8	136	152	¨ 168	¸ 184	È 200	Ø 216	è 232	ø 248
9	137	153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
A	138	154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
B	139	155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
C	140	156	¬ 172	¼ 188	Ì 204	Ü 220	ì 236	ü 252
D	141	157	- 173	½ 189	Í 205	Ý 221	í 237	ý 253
E	142	158	® 174	¾ 190	Î 206	Þ 222	î 238	þ 254
F	143	159	¯ 175	¿ 191	Ï 207	ß_ 223	ï 239	ÿ 255

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TABLE B-3. Basic Latin character set explanation.

Decimal	Hex	Name
032	20	SPACE
033	21	EXCLAMATION MARK
034	22	QUOTATION MARK
035	23	NUMBER SIGN
036	24	DOLLAR SIGN
037	25	PERCENT SIGN
038	26	AMPERSAND
039	27	APOSTROPHE
040	28	LEFT PARENTHESIS
041	29	RIGHT PARENTHESIS
042	2A	ASTERISK
043	2B	PLUS SIGN
044	2C	COMMA
045	2D	HYPHEN-MINUS
046	2E	FULL STOP
047	2F	SOLIDUS
048	30	DIGIT ZERO
049	31	DIGIT ONE
050	32	DIGIT TWO
051	33	DIGIT THREE
052	34	DIGIT FOUR
053	35	DIGIT FIVE
054	36	DIGIT SIX
055	37	DIGIT SEVEN
056	38	DIGIT EIGHT
057	39	DIGIT NINE
058	3A	COLON
059	3B	SEMICOLON
060	3C	LESS-THAN SIGN
061	3D	EQUALS SIGN
062	3E	GREATER-THAN SIGN
063	3F	QUESTION MARK
064	40	COMMERCIAL AT
065	41	LATIN CAPITAL LETTER A
066	42	LATIN CAPITAL B
067	43	LATIN CAPITAL C
068	44	LATIN CAPITAL D
069	45	LATIN CAPITAL E
070	46	LATIN CAPITAL F
071	47	LATIN CAPITAL G
072	48	LATIN CAPITAL H
073	49	LATIN CAPITAL I
074	4A	LATIN CAPITAL J
075	4B	LATIN CAPITAL K
076	4C	LATIN CAPITAL L
077	4D	LATIN CAPITAL M
078	4E	LATIN CAPITAL N
079	4F	LATIN CAPITAL O
080	50	LATIN CAPITAL P
081	51	LATIN CAPITAL Q

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TABLE B-3. Basic Latin character set explanation - Continued.

Decimal	Hex	Name
082	52	LATIN CAPITAL R
083	53	LATIN CAPITAL S
084	54	LATIN CAPITAL T
085	55	LATIN CAPITAL U
086	56	LATIN CAPITAL V
087	57	LATIN CAPITAL W
088	58	LATIN CAPITAL X
089	59	LATIN CAPITAL Y
090	5A	LATIN CAPITAL Z
091	5B	LEFT SQUARE BRACKET
092	5C	REVERSE SOLIDUS
093	5D	RIGHT SQUARE BRACKET
094	5E	CIRCUMFLEX ACCENT
095	5F	LOW LINE
096	60	GRAVE ACCENT
097	61	LATIN SMALL LETTER A
098	62	LATIN SMALL LETTER B
099	63	LATIN SMALL LETTER C
100	64	LATIN SMALL LETTER D
101	65	LATIN SMALL LETTER E
102	66	LATIN SMALL LETTER F
103	67	LATIN SMALL LETTER G
104	68	LATIN SMALL LETTER H
105	69	LATIN SMALL LETTER I
106	6A	LATIN SMALL LETTER J
107	6B	LATIN SMALL LETTER K
108	6C	LATIN SMALL LETTER L
109	6D	LATIN SMALL LETTER M
110	6E	LATIN SMALL LETTER N
111	6F	LATIN SMALL LETTER O
112	70	LATIN SMALL LETTER P
113	71	LATIN SMALL LETTER Q
114	72	LATIN SMALL LETTER R
115	73	LATIN SMALL LETTER S
116	74	LATIN SMALL LETTER T
117	75	LATIN SMALL LETTER U
118	76	LATIN SMALL LETTER V
119	77	LATIN SMALL LETTER W
120	78	LATIN SMALL LETTER X
121	79	LATIN SMALL LETTER Y
122	7A	LATIN SMALL LETTER Z
123	7B	LEFT CURLY BRACKET
124	7C	VERTICAL LINE
125	7D	RIGHT CURLY BRACKET
126	7E	TILDE

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TABLE B-4. BCS-A character set explanation.

Decimal	Hex	Name
160	A0	NO BREAK SPACE
161	A1	INVERTED EXCLAMATION MARK
162	A2	CENT SIGN
163	A3	POUND SIGN
164	A4	CURRENCY SIGN
165	A5	YEN SIGN
166	A6	BROKEN BAR
167	A7	SECTION SIGN
168	A8	DIAERESIS
169	A9	COPYRIGHT
170	AA	FEMININE ORDINAL INDICATOR
171	AB	LEFT-POINTING DOUBLE ANGLE QUOTATION MARK
172	AC	NOT SIGN
173	AD	SOFT HYPHEN
174	AE	REGISTERED SIGN
175	AF	MACRON
176	B0	DEGREE SIGN
177	B1	PLUS-MINUS SIGN
178	B2	SUPERSCRIPT TWO
179	B3	SUPERSCRIPT THREE
180	B4	ACUTE ACCENT
181	B5	MICRO SIGN
182	B6	PILCROW SIGN
183	B7	MIDDLE DOT
184	B8	CEDILLA
185	B9	SUPERSCRIPT ONE
186	BA	MASCULINE ORDINAL INDICATOR
187	BB	RIGHT POINTING DOUBLE ANGLE QUOTATION MARK
188	BC	VULGAR FRACTION ONE QUARTER
189	BD	VULGAR FRACTION ONE HALF
190	BE	VULGAR FRACTION THREE QUARTERS
191	BF	INVERTED QUESTION MARK
192	C0	LATIN CAPITAL LETTER A WITH GRAVE
193	C1	LATIN CAPITAL LETTER A WITH ACUTE
194	C2	LATIN CAPITAL LETTER A WITH CIRCUMFLEX
195	C3	LATIN CAPITAL LETTER A WITH TILDE
196	C4	LATIN CAPITAL LETTER A WITH DIAERESIS
197	C5	LATIN CAPITAL LETTER A WITH RING ABOVE
198	C6	LATIN CAPITAL LIGATURE AE
199	C7	LATIN CAPITAL LETTER C WITH CEDILLA
200	C8	LATIN CAPITAL LETTER E WITH GRAVE
201	C9	LATIN CAPITAL LETTER E WITH ACUTE
202	CA	LATIN CAPITAL LETTER E WITH CIRCUMFLEX
203	CB	LATIN CAPITAL LETTER E WITH DIAERESIS
204	CC	LATIN CAPITAL LETTER I WITH GRAVE
205	CD	LATIN CAPITAL LETTER I WITH ACUTE
206	CE	LATIN CAPITAL LETTER I WITH CIRCUMFLEX
207	CF	LATIN CAPITAL LETTER I WITH DIAERESIS
208	D0	LATIN CAPITAL LETTER ETH (ICELANDIC)
209	D1	LATIN CAPITAL LETTER N WITH TILDE

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TABLE B-4. BCS-A character set explanation - Continued.

Decimal	Hex	Name
210	D2	LATIN CAPITAL LETTER O WITH GRAVE
211	D3	LATIN CAPITAL LETTER O WITH ACUTE
212	D4	LATIN CAPITAL LETTER O WITH CIRCUMFLEX
213	D5	LATIN CAPITAL LETTER O WITH TILDE
214	D6	LATIN CAPITAL LETTER O WITH DIAERESIS
215	D7	MULTIPLICATION SIGN
216	D8	LATIN CAPITAL LETTER O WITH STROKE
217	D9	LATIN CAPITAL LETTER U WITH GRAVE
218	DA	LATIN CAPITAL LETTER U WITH ACUTE
219	DB	LATIN CAPITAL LETTER U WITH CIRCUMFLEX
220	DC	LATIN CAPITAL LETTER U WITH DIAERESIS
221	DD	LATIN CAPITAL LETTER Y WITH ACUTE
222	DE	LATIN CAPITAL LETTER THORN (ICELANDIC)
223	DF	LATIN SMALL LETTER SHARP S (GERMAN)
224	E0	LATIN SMALL LETTER A WITH GRAVE
225	E1	LATIN SMALL LETTER A WITH ACUTE
226	E2	LATIN SMALL LETTER A WITH CIRCUMFLEX
227	E3	LATIN SMALL LETTER A WITH TILDE
228	E4	LATIN SMALL LETTER A WITH DIAERESIS
229	E5	LATIN SMALL LETTER A WITH RING ABOVE
230	E6	LATIN SMALL LIGATURE AE
231	E7	LATIN SMALL LETTER C WITH CEDILLA
232	E8	LATIN SMALL LETTER E WITH GRAVE
233	E9	LATIN SMALL LETTER E WITH ACUTE
234	EA	LATIN SMALL LETTER E WITH CIRCUMFLEX
235	EB	LATIN SMALL LETTER E WITH DIAERESIS
236	EC	LATIN SMALL LETTER I WITH GRAVE
237	ED	LATIN SMALL LETTER I WITH ACUTE
238	EE	LATIN SMALL LETTER I WITH CIRCUMFLEX
239	EF	LATIN SMALL LETTER I WITH DIAERESIS
240	F0	LATIN SMALL LETTER ETH (ICELANDIC)
241	F1	LATIN SMALL LETTER N WITH TILDE
242	F2	LATIN SMALL LETTER O WITH GRAVE
243	F3	LATIN SMALL LETTER O WITH ACUTE
244	F4	LATIN SMALL LETTER O WITH CIRCUMFLEX
245	F5	LATIN SMALL LETTER O WITH TILDE
246	F6	LATIN SMALL LETTER O WITH DIAERESIS
247	F7	DIVISION SIGN
248	F8	LATIN SMALL LETTER O WITH STROKE
249	F9	LATIN SMALL LETTER U WITH GRAVE
250	FA	LATIN SMALL LETTER U WITH ACUTE
251	FB	LATIN SMALL LETTER U WITH CIRCUMFLEX
252	FC	LATIN SMALL LETTER U WITH DIAERESIS
253	FD	LATIN SMALL LETTER Y WITH ACUTE
254	FE	LATIN SMALL LETTER THORN (ICELANDIC)
255	FF	LATIN SMALL LETTER Y WITH DIAERESIS

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B.4.9 File system constraints. A NITF file is presented as a stream of contiguous bytes. This format may not be suitable for some file systems (e.g. those that store files on block boundaries vice byte boundaries). The translation of files to and from the local file format for a system should be examined for potential incompatibilities before an implementation is attempted.

B.4.10 Security considerations. A NITF file contains sufficient security information in the file header, and subheaders to allow implementors to meet virtually any security requirement for displaying classification data. Exact security information handling requirements generally are specified by appropriate accreditation authorities or specific user requirements. It is recommended that implementors extract the classification data from the header and ensure that the information is always displayed whenever the NITF file or any of its segments is displayed. Implementations should not rely on graphic overlays alone to present security and handling instructions. Panning, roaming, zooming, and other imagery manipulation operations may cause security label graphics to move off the screen or not be printed.

B.4.11 NITF printer incompatibilities. Some printers do not allow for transparent pixels in imagery (e.g., Postscript level 1 and 2). If a NITF composition uses CGM elements under images with NITF image padding (transparent pixels) the CGM will not be visible in any areas under the pad pixels. This problem can be avoided in two different ways.

a. Instead of using a CGM element, the background color may be specified with the FBKGC field in the main NITF file header. The background shape and size may be specified with the BGWIDTH and BGHIGHT fields of the BCKGDA TAG. (The BCKGDA TAG also specifies the background color and pixel size. The color specified in FBKGC must be the same as the color specified in the BCKGDA. If they are not the same, the BCKGDA TAG colors take precedence.) If the BCKGDA TAG is not present, the color specified in FBKGC applies to the entire CCS up to the size of the C-level.

b. The CGM rectangle can be broken down into four (or more if the composition is complex) CGM rectangles that do not coincide with (obscure or lie under) the imagery. These CGM rectangles would then be specified with higher display levels than any of the images.

B.4.12 Universal Transverse Mercator (UTM) coordinate hemisphere resolution. The Image Coordinate Representation (ICORDS) field allows one value for an image's UTM hemispheric designation, N for northern or S for southern. When the Image Coordinate Location (IGEOLO) field is filled with UTM coordinates, image presentations that cross the Equator have northing values that are ambiguous, and it is not immediately obvious which corners are on which side of the Equator. Given their UTM coordinates and zone, the following method resolves the hemispheric designation of four individual corners of an image.

B.4.12.1 North (N)/South (S) Method. When used for pure UTM coordinates, the ICORDS field contains one of two values: N if the northernmost corner is on or north of the Equator, S if the northernmost point is south of the Equator. When the ICORDS field contains S, all 4 corners are south of the Equator. When the ICORDS field contains N, the following process resolves the hemispheres of the individual corners:

a. Assume that the north-south spread of the image is within 5000km (about 45 degrees).

b. Compute the smallest northing (nmin) from the 4 corners. (The corner with that northing value is certain to be one of the corners on or north of the Equator.)

c. Then any corner.with a northing in excess of [nmin + 5 million] is located on or north of the Equator.

NEW PAGE

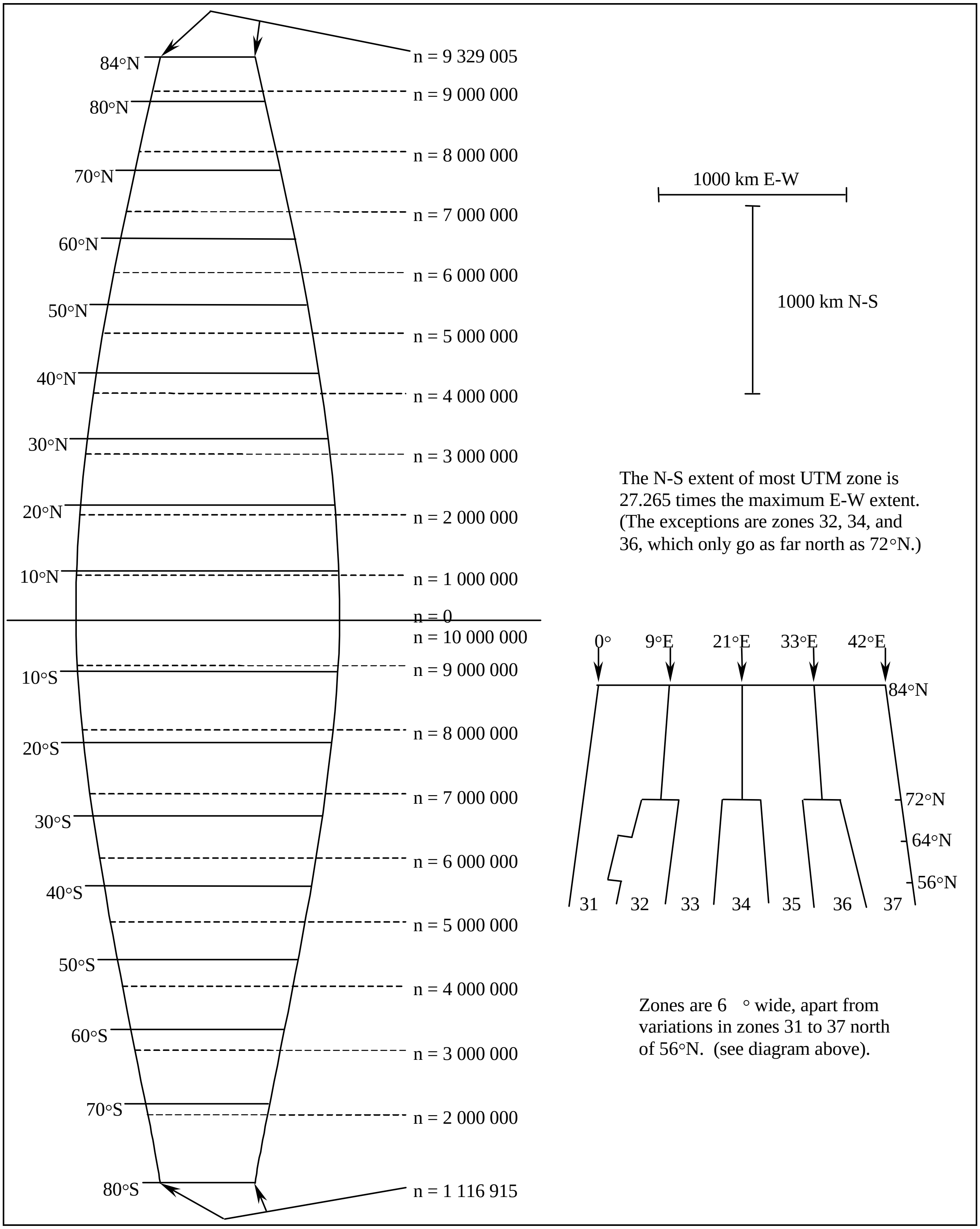

FIGURE B-1. A typical World Geodetic System 1984 (WGS 84) UTM zone (compressed).

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APPENDIX C

DATA EXTENSION

C.1 SCOPE

C.1.1 Scope. This appendix contains information about the definition, registration and control of data extensions (tags) used within NITF 2.1 files. The three varieties of data extensions include: TREs, RE, and CE, DES, and RES. This appendix is a mandatory part of the standard. The information contained herein is intended for compliance.

C.2 APPLICABLE DOCUMENTS

C.2.1. NITFS Data Extension Register. Implementers and acquiring agencies should contact the NTB Registrar to identify the current issue(s) of the data extensions and associated documentation applicable to their specific requirements. Otherwise, the documents listed in section 2 of this standard apply to this appendix. The NITFS Data Extension Register is maintained as a World Wide Web on-line document. Access can be obtained through the following Universal Resource Locators (URLs):

http://jitc-emh.army.mil/nitf/nitf.htm
http://www.nima.mil

C.3 DEFINITIONS

C.3.1 Acronyms used in this appendix. The acronyms in section 3 of this standard apply to this appendix.

C.3.2 Definitions used in this standard. The definitions in section 3 of this standard apply to this appendix.

C.4 GENERAL REQUIREMENTS

C.4.1 Registration. All data extensions (RE, CE, DES, and RES) shall be registered with the Imagery Standards Management Committee's (ISMC's) NTB before use within NITF files.

C.4.2 Registrar. The NIMA is the designated registrar. The JITC serves as the executive agent to NIMA for oversight of registration activities and maintaining the register. The contact information for the NTB registrar is:

National Imagery and Mapping Agency
MS P-24
12310 Sunrise Valley Drive,
Reston, VA 20191-3449
(703)262-4416

Commander, Joint Interoperability Test Command
ATTN: NITFS Certification Test Facility
Building 57305
Fort Huachuca, AZ 85616-7020
(520) 538-5458

C.4.3 Registration submissions. Submissions for registering data extensions shall include the following:

a. Identification of the submitting organization and point of contact for the submission.

b. Identification of the preparing organization and point of contact for the preparing activity.

c. Purpose and general description of the proposed data extension(s).

d. Rationale and justification for including the submission within NITF.

e. Copy of the documentation defining the data extension to be registered.

f. For REs only, analysis and rationale describing how use of the proposed RE will not adversely impact community use of the standardized features defined within NITF.

C.4.4 Configuration management. The NIMA registrar exercises configuration management of the register. The register identifies the approved issue(s) and version(s) of data extensions and associated specifications and documentation allowed for use within NITF. Although another agency may be the proponent, author and/or configuration manager of data extension specifications and documentation, only those issue(s) and version(s) identified and authorized in the register managed by NIMA are allowed for use within NITF.

C.5 DETAILED REQUIREMENTS

C.5.1 Registered Extension (RE).

a. Only REs accepted and registered by the NTB shall be used.

b. REs shall not be used nor submitted for registration if they adversely impact the utility of the standard features otherwise defined within the NITF and its controlled extensions.

c. Nominated REs will be recorded in the “Register” upon NTB approval At that time, the NTB will establish and record a RE expiration date (typically two years from registration). A RE(s) proponent may submit a request for registration renewal to the NTB, or a request for the RE(s) to become “Controlled”, prior to expiration of the RE(s) registration. Otherwise, the RE(s) will be removed from the Register.

d. A sequence of REs may appear in either (or both) of the User Defined Header Data and Extended Header Data fields of the NITF file header. REs may also appear in either (or both) of the User Defined Subheader and Extended Subheader Data fields for any standard data type item in the file.

e. When the RE carries data that is associated with the file as a whole, it shall appear in the file header. If the RE carries data associated with a standard data item in the file, it shall appear in the sub-header of that specific data item.

f. REs may appear in a TRE_OVERFLOW DES when sufficient space is not available in the appropriate header or sub-header fields.

g. Upon receipt of a file which contains REs, a NITF compliant system shall ignore the REs and properly interpret the other NITF file components.

C.5.2 Controlled Extension (CE).

a. Only CEs accepted and registered by the NTB shall be used.

b. A sequence of CEs may appear in either (or both) of the User Defined Header Data and Extended Header Data fields of the NITF file header. CEs may also appear in either (or both) the User Defined Subheader and Extended Subheader Data fields for any standard data type item in the file.

c. When the CE carries data that is a associated with the file as a whole, it shall appear in the file header. If the CE carries data associated with a standard data item in the file, it shall appear in the sub-header of that specific data item.

d. CEs may appear in a TRE_OVERFLOW DES when sufficient space is not available in the appropriate header or sub-header fields.

e. Upon receipt of a file which contains CEs, a NITFS compliant system shall ignore the CEs and properly interpret the other NITF file components.

C.5.3 Data Extension Segment (DES).

a. Only DESs accepted and registered by the NTB shall be used. The registry specifies the DES as mandatory or optional.

b. Upon receipt of a file which contains DESs, a NITFS compliant system shall ignore the DESs and properly interpret the other NITF file components.

C.5.3.1 TRE_OVERFLOW DES. This DES is used when a series of REs and/or CEs is to appear in a DES as overflow from the NITF file header or any subheader. The format and use of the TRE_OVERFLOW-DES is as described in paragraph 5.8.3.1 and table A-8(A).

C.5.3.2 STREAMING_FILE_HEADER. This DES allows NITF file creation or transfer before all NITF file header fields are populated. The format and use of the STREAMING_FILE_HEADER DES as described in paragraphs 5.2.1, 5.8.3.2, and table A-8(B).

C.5.4 Reserved Extension Segments (RES).

a. Only RESs accepted and registered by the NTB shall be used. The registry specifies the RES as mandatory or optional.

b. Upon receipt of a file which contains a RES(s) that is not defined as mandatory by the registry, a NITFS compliant system shall ignore the RES(s) and properly interpret the other NITF file components.

CONCLUDING MATERIAL

Custodians:
Army - CR
Navy - OM
Air Force - 90

Review activities:
OASD - DO, IR
Army - TM2, IE, ET, AC, PT, SC1, SC2
Air Force - 02, 13
DLA - DH
Misc - NS, DC4, DC7

Civil agency coordinating activities:
COM - NIST
DOE
EPA
GPO
HHS - NIH
DOI - BLM, GES, MIN
DOT - CGCT

Preparing activity:
Misc - MP

Agent:
Not applicable

(Project INST-000203)

SUPERSEDES PAGE 110 OF MIL-STD-2500B

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1,2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER **MIL-STD-2500B**	2. DOCUMENT DATE (YYMMDD) **970822**

3. DOCUMENT TITLE
National Imagery Transmission Format Version 2.1

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First, Middle Initial)*	b. ORGANIZATION	
c. ADDRESS *(Include Zip Code)*	d. TELEPHONE *(Include Area Code)* (1) Commercial (2) AUTOVON *(If applicable)*	7. DATE SUBMITTED *(YYMMDD)*

8. PREPARING ACTIVITY
NATIONAL IMAGERY AND MAPPING AGENCY

a. NAME **Danny Rajan**	b. TELEPHONE *(Include Area Code)* (1) Commercial **(703) 262-4416** (2) AUTOVON
c. ADDRESS *(Include Zip Code)* **MS P-24** **12310 Sunrise Valley Drive** **Reston, VA 20191-3449**	**IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:** Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340