RESEARCH

Tagged Record Extensions (TRE)

Version 0.6

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for the

National Imagery Transmission Format

of the

National Imagery Transmission Format Standards

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1.0 SCOPE

1.1 Scope.

This appendix specifies the format and content of a set of registered tagged record extensions for the NITF file format. The specified tagged records incorporate relevant research metadata. The information which makes up the TRE is derived from referenced interface documents. Systems using research imagery formatted according to NITF should be designed to extract the needed data from the tagged records described herein. Raw or processed sensor data (some of which may not be "viewable") is stored as the image. Information on how to interpret this data is stored using the sensor (VISMAS) SDEs and the complex TRE (if required). The purpose of this TRE is to supplement this data by storing research-specific data.

1.2 Content.

This appendix provides a detailed description of the overall structure, as well as specification of the valid data content and format, for all fields defined within each specified TRE. In addition, technical information is presented to provide a general understanding of the significance of the included fields.

1.3 Applicability.

The applicability of this appendix is inherited from the NITF standard. It is applicable to all Department of Defense research projects, having a requirement to transfer supplemental research metadata associated with imagery. These systems shall conform to the NITF standard, including the TREs described in this appendix.

1.4 Certification.

Pertinent compliance requirements are defined in Joint Interoperability Engineering Organization (JIEO) Circular 9008, National Imagery Transmission Format Certification Test and Evaluation Plan.

1.5 Comments.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to Target Signature Branch, AFRL/SNAS Bldg 23, 2010 Fifth St., Wright-Patterson AFB OH 45433-7001.

2.0 APPLICABLE DOCUMENTS

2.1 Government documents

2.1.1 Specifications, standards and handbooks.

The following standards form a part of this document to the extent specified. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS).

MILITARY STANDARDS

MIL-STD-2500B	National Imagery Transmission Format (NITF) for the National Imagery Transmission Format Standards (NITFS), 2 October 1998.

(Copies of the above NITFS document may be obtained from DODSSP, Subscription Services Desk, 700 Robbins Avenue, Bldg. 4D, Philadelphia, PA 19111-5094, telephone (215) 697-2569.)

MILITARY HANDBOOKS

MIL-HDBK-1300	National Imagery Transmission Format Standard (NITFS) Handbook, 30 June 1993.

(Copies of the above NITFS document may be obtained from DODSSP, Subscription Services Desk, 700 Robbins Avenue, Bldg. 4D, Philadelphia, PA 19111-5094, telephone (215) 697-2569.)

2.1.2 Other Government documents, drawings, and publications.

The following other Government documents form a part of this document to the extent specified. Unless otherwise specified, the issues of these documents are those cited in the solicitation.

DISA/JIEO Circular 9008	NITFS Certification Test and Evaluation Program Plan

(Copies of the above NITFS document may be obtained from Joint Interoperability Test Command, Attn: TCDBA, Bldg 57305, Ft, Huachuca, AZ 85613-7020, telephone (602) 538-5154.)

2.2 Non-Government publications.

The following documents form a part of this document to the extent specified. Unless otherwise specified, the issues of the documents that are adopted by the DOD are those listed in the issue of the DODISS cited in the solicitation.

INTERNATIONAL STANDARDS

None.

NATIONAL STANDARDS

ANSI X3.4 – 1986	American National Standard Code for Information Interchange (ASCII), 1986.

(Copies of the above document are available from American National Standards Institute (ANSI) Sales Department, 1430 Broadway, New York, NY 10018, telephone: (212) 642-4900.)

3.0 DEFINITIONS

3.1 Acronyms

Field Names and Values contained in the various tables of this document are not replicated in this list.

A/C	Aircraft
ANSI	American National Standards Institute
ARP	Aircraft Reference Point
ASCII	American National Standard Code for Information Interchange
ASARS	Advanced Synthetic Aperture Radar System
BE	Basic Encyclopedia
ECF	Earth Centered Fixed Coordinate System
ETRAC	Enhanced Tactical Radar Correlator
FPN	Focus Plane Normal Vector
FTI	Fixed Target Indication
GMT	Greenwich Mean Time
ID	Identification
INS	Inertial Navigation System
JIEO	Joint Interoperability Engineering Organization
JITC	Joint Interoperability Test Command
MIES	Modernized Imagery Exploitation System
MSL	Mean Sea Level
MTI	Moving Target Indication
NED	North East Down Coordinate System
NITF	National Imagery Transmission Format
NITFS	National Imagery Transmission Format Standards
RCS	Radar Cross Section
RGM	Mid-Array Ground Plane Range
RSM	Mid-Array Slant Plane Range
SAR	Synthetic Aperture Radar
SDE	Support Data Extension
TRE	Tagged Record Extension
TRAC	Tactical Radar Correlator
WAMTI	Wide Area Moving Target Information

4.0 GENERAL REQUIREMENTS

4.1 Tagged Record Extensions (TREs).

That set of support data needed to accomplish the mission of a system receiving a NITF file is referred to as "appropriate" support data. The appropriate support data may vary across systems receiving NITF files. A system receiving a NITF file may add or subtract support data before passing the file to another system with a different mission. This strategy implies a modular support data definition approach.

4.1.1 Sources of support data.

Image providers produce NITF files with support data from other formats which also contain support information. The extensions described here define the format for that support information within a NITF file containing research imagery.

4.1.2 Defined Support Data Extensions.

Table 1 lists all the TREs that are defined for use with research imagery. Several are similar to existing and proposed extensions developed by other related programs. Reserved data fields maintain alignment between the original and aliased extensions where original fields are not applicable to research imagery.

Each tag ends with the letter "A". Revised tags will have names ending in "B" ("C","D", etc.) as revisions are approved. A transition plan for implementing tag changes shall accompany any such revisions. Typically, both the "A" and "B" versions should be supported by receivers of NITF products for some reasonable period of time.

Table 1. Research Related Support Data Extensions

CLCTNA	**General Collection Information**
CLCTNB	**General Collection Information**
PLTFMA	**Sensor Platform Information**
SNSRA	**Sensor Information**
OBJCTA	**Object Information**
TRGTA	**Target Information**
IMGDTA	**Image Data**

4.2 Technical Notes on Coordinate Systems

4.2.1 Locations.

Figure 1 shows the earth coordinate frame, the local North-East-Down (NED) coordinate frame, and the platform location parameters: latitude and longitude. The platform location parameters define the location in earth coordinates of the sensor platform, or more specifically, the platform center of navigation. The center of navigation is the origin of the local NED coordinate frame. The local NED coordinates are North (N), East (E), and Down (D) as shown.

The location of the center of navigation within the platform is defined uniquely for each platform and sensor.

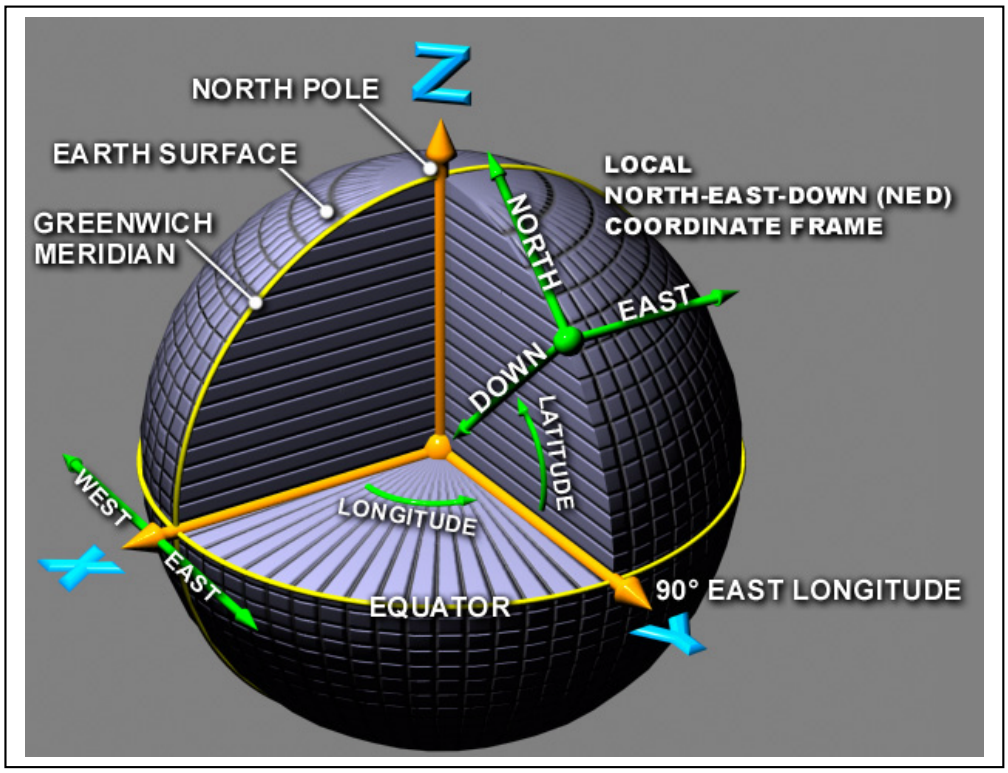

Figure 1 Platform Location Coordinates

The earth surface in Figure 1 is described in the World Geodetic System of 1984 (WGS-84) as two different model surfaces. The two surfaces are an ellipsoid and a geoid (see Figure 2). The ellipsoid is an ideal mathematical surface; the geoid is the mean-sea-level surface of the earth as determined by gravitational potential (elevation of the geoid relative to the ellipsoid varies with location from -102 to +74 meters). Platform latitude and longitude are referenced to the ellipsoid, while platform altitude mean sea level (MSL) is defined with respect to the geoid: Altitude MSL is the vertical distance from mean sea level to the platform. The Global Positioning System is referenced to the ellipsoid.

The Down-axis (D) of the NED coordinate frame lies normal to the geoid. That is, D lies in the direction of gravitational acceleration. The North-axis (N) and East-axis (E) lie in the geometric plane perpendicular to D (the horizontal plane), with N in the direction of True North.

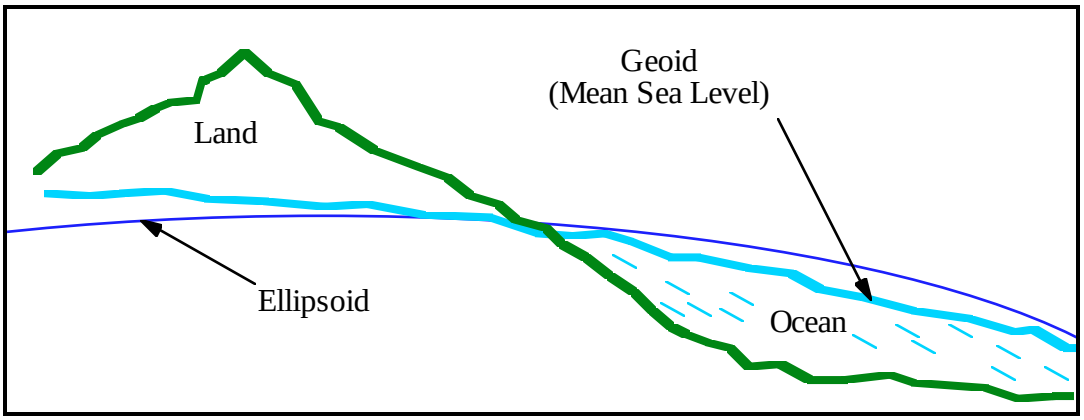

Figure 2 Ellipsoid and Geoid Models of the Earth Surface

4.2.2 Attitude Parameters: Heading, Pitch, And Roll.

Heading, pitch, and roll relate the platform body coordinate frame to the local NED frame. Figure 3 shows the platform body coordinates. X_a is positive forward, along the roll axis. Y_a is positive right, along the pitch axis. Z_a is positive down, along the yaw axis. The platform body frame, like the local NED frame, has its origin at the center of navigation. Heading is the angle from north to the NED horizontal projection of the platform positive roll axis, X_a (positive from north to east). Pitch is the angle from the NED horizontal plane to the platform positive roll axis, X_a (positive when X_a is above the NED horizontal plane), and is limited to values between ±90 degrees. Roll is the rotation angle about the platform roll axis. Roll is positive if the platform positive pitch axis, Y_a (right wing) lies below the NED horizontal plane.

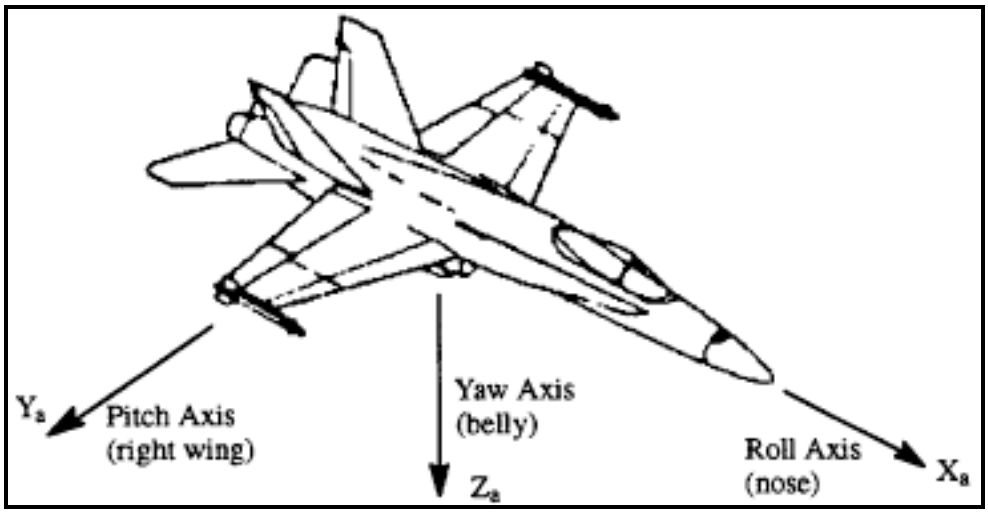

Figure 3 Platform Body Coordinate Frame

4.2.3 SAR Image coordinate system

The historic coordinate system for synthetic Aperture radar (SAR) is a left to right, bottom up system, with scan lines oriented in the direction of the radar beam (cross-track) and pixel locations representing distance (range). When mapping on the right side of the aircraft, the first pixel of each scan line is at minimum range with subsequent pixels at increasing range; when mapping on the left side, the first pixel of each scan line is at maximum range with subsequent pixels at decreasing range. See figure 4.

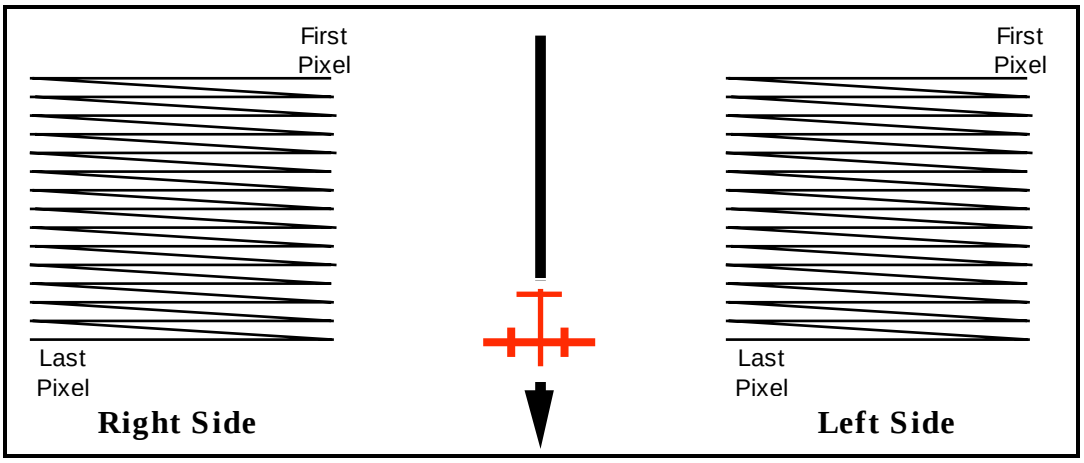

Figure 4. SAR Scanning Patterns

The NITF coordinate system is a left to right, top to bottom, coordinate system. Column numbers increase to the right, and row numbers increase downwards. The first pixel within a block is at the upper left, with subsequent pixels to the right along the row, until the last pixel of a row is followed by the left-most pixel of the next lower row. See figure 5.

The order of pixels within each image row might need to be reversed before a SAR image is imbedded within a NITF file in order to prevent a mirrored view of the scene from being displayed on NITF screens.

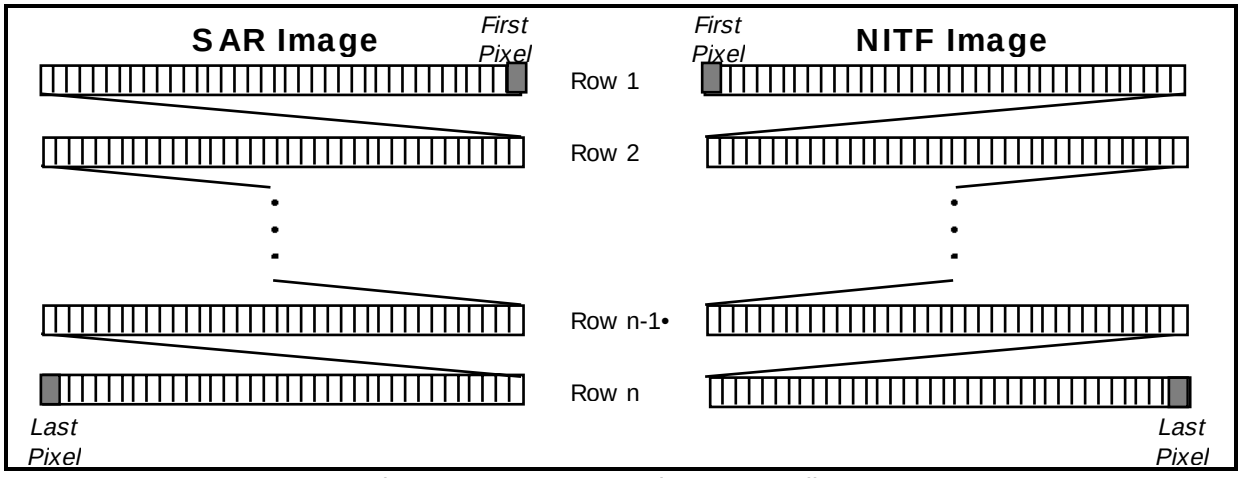

Figure 5. SAR and NITF Coordinate Systems

4.2.4 SAR Sensor Geometry

In general the target parameters are measured in the ground reference plane and the sensor paramenters are measured in or referenced to the sensor or aircraft horizontal reference plane (shown as the pink grid in figure 6). Depression Angle is the angle between the sensor local horizontal reference plane and the line of sight to the aimpoint (see arrow 4 in figure 6). Squint Angle can be defined in two ways: the ground plane squint angle as measured in the horizontal reference plane from broad side (see arrow 3 in figure 6), and the slant plane squint angle as measured in the slant plane from the broadside vertical plane (see arrow 2 in figure 6). In both cases the sensor look (left or right) must be known and squint angles forward of broadside are positive. The azimuth angle is in the ground reference plane and measured clockwise from the roll axis of the target to the projected line of sight (see arrow 1 in figure 6).

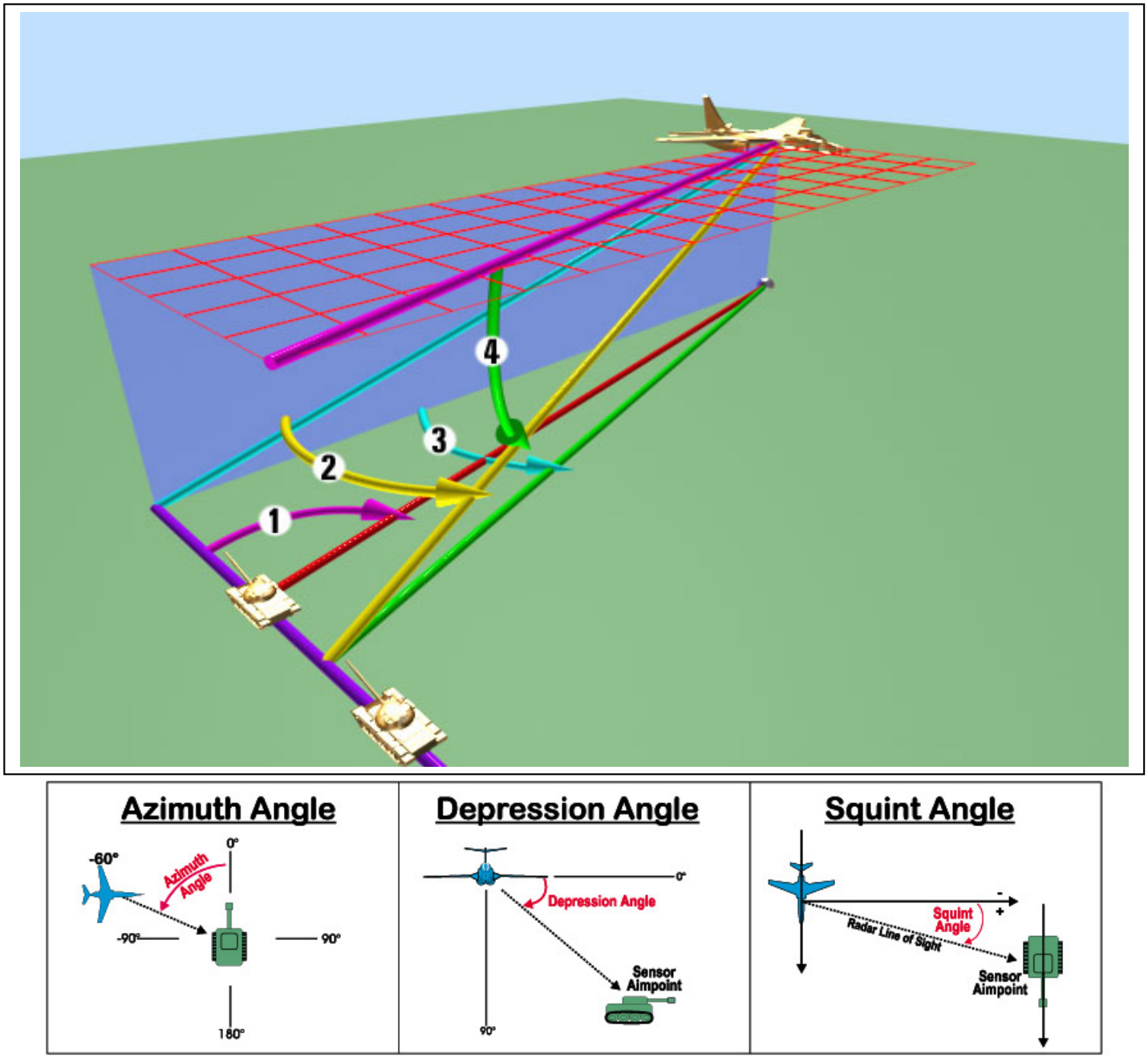

Figure 6. SAR Sensor Coordinate Systems

4.2.5 EO/IR Sensor Geometry

Again, in general the target parameters are measured in the ground reference plane and the sensor paramenters are measured in or referenced to the sensor or aircraft horizontal reference plane (shown as the pink grid in figure 7). Azimuth Look Angle is the angle between the roll axis of the platform and the line of sight to the aimpoint in the sensor local horizontal reference plane (see arrow 1 in figure 7). It is measured +- 180 with right side positive. Elevation Look Angle is the angle between the sensor local horizontal reference plane and the line of sight to the aimpoint in the vertical reference plane (see arrow 2 in figure 7). Negitive elevation look angles are down. The azimuth angle is in the ground reference plane and measured clockwise from the roll axis of the target to the projected line of sight (see arrow 3 in figure 7).

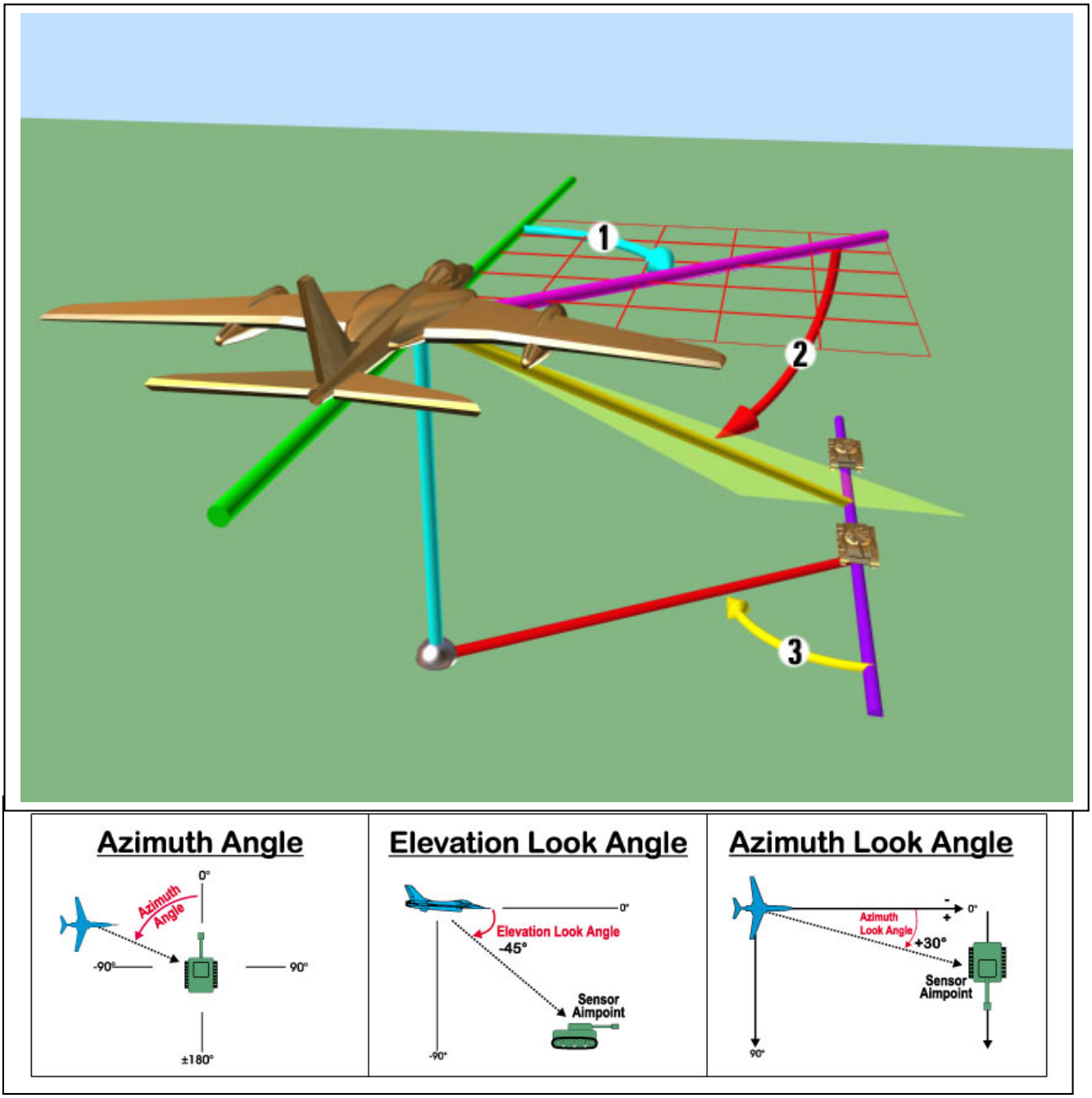

Figure 7. EO/IR Sensor Coordinate Systems

5.0 DETAILED REQUIREMENTS

5.1 Generic Tagged Extension Mechanism

The tagged record extensions (TRE) defined in this document are "registered extensions" as defined in Section 5.8 of the NITF 2.1 standard. The tagged record extension format is summarized here for ease of reference. Tables 2 and 3 describe the general format of a registered TRE.

Table 2. Registered tagged record extension format

(R) = required, <R> = blanks allowed, (O) = optional, and (C) = conditional

FIELD	NAME	SIZE	VALUE RANGE	UNITS	TYPE
RETAG	Unique extension type identifier	6	Alphanumeric	n/a	R
REL	Length of REDATA field	5	00001 to 99988	Bytes	R
REDATA	User-defined data	*	User-defined	n/a	R

* equal to value of REL field.

Table 3. Registered tagged record extension field descriptions

FIELD	VALUE DEFINITIONS AND CONSTRAINTS
RETAG	This field shall contain a valid alphanumeric identifier properly registered with the NITF Technical Board.
REL	This field shall contain the length in bytes of the data contained in REDATA. The tagged record's length is 11+ the value of REL.
REDATA	This field shall contain data primarily of character data type (binary data is acceptable for extensive data arrays, such as color palettes or look-up tables) 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.

The RETAG and REL fields essentially form a small (11 byte) tagged record subheader. The format and meaning of the data within the REDATA field is the subject of this document for several, individual controlled tagged record extensions.

Multiple tagged extensions can exist within the tagged record extension area. There are several such areas, each of which can contain 99,999 bytes worth of tagged extensions. There is also an overflow mechanism, should the sum of all tags in an area exceed 99,999 bytes. The overflow mechanism allows for up to several Gbytes of tags.

While the extensions defined in this document will typically be found in the image subheader, it is possible that they could appear in a Data Extension Segment which is being used as an overflow of the image subheader or in the file header.

If the information contained within an extension is not available, the extension will not be present in the file. The set of extensions stored within the file can change over the lifetime of the image, due to additional information or removal of outdated information. When an

extension is present, all of the information listed as required must be filled in with valid information. A conditional field (type = C) 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 fields marked with "< >", BCS Spaces are allowed for entire field. Reserved fields support applications beyond the scope of this document, and normally contain spaces where no value is explicitly specified; however, other values are possible.

5.1.1 CLCTNx — General Collection Information

The General Collection Information tag is intended to be the most basic support data extension for research data, and is a prerequisite for all other tags defined in this document. The format for the user-defined fields of the CLCTNA extension is detailed in Table 4A, and the descriptions of these fields are detailed in Table 5A. The details of the CLCTNB extension are in Tables 4B and 5B. A single CLCTNx is placed in the NITF File Header.

Table 4A. CLCTNA — General Collection Information extension format

TYPE "R" = Required, "C" = Conditional, "< >" = BCS Spaces allowed for entire field

FIELD	NAME	SIZE	VALUE RANGE	UNITS	TYPE
RETAG	Unique Extension Identifier	6	CLCTNA	N/a	R
REL	Length of Entire Tagged Record	5	00952	Bytes	R
The following fields define CLCTNA					
VERNUM	Version Number	4	AA.B		<R>
CLCTN_NAME	Collection Name	25	BCS-A		R
CLCTN_DESCRIPT	Collection Description	255	BCS-A		R
CLCTN_STDATE	Collection Start Date	8	YYYYMMDD		R
CLCTN_SPDATE	Collection Stop Date	8	YYYYMMDD		R
CLCTN_LOC	Collection Latitude and Collection Longitude	11	ddmmXdddmmY		<R>
COUNTRY	Country Code	2	Values from FIPS 10-4		R
SPONSOR	Collection Sponsor	20	BCS-A		R
PERSONNEL	Key Personnel	100	BCS-A		<R>
SCLCTN_NAME	SubCollection Name	20	BCS-A		<R>
SCLCTN_DESCRIPT	SubCollection Description	255	BCS-A		<R>
SCLCTN_Z_OFF	SubCollection Zulu offset	3	±12	hr	<R>
SCLCTN_STDATE	SubCollection Start Date	8	YYYYMMDD		<R>
SCLCTN_SPDATE	SubCollection Stop Date	8	YYYYMMDD		<R>
SECURITY	Security Classification	7	BCS-A		R
SCG	Security Classification Guide	15	BCS-A		<R>
SITE	Site Name	15	BCS-A		R
SITE_NUM	Site Number	3	1-999		<R>
SCN_NUM	Scene Number	3	1-999		<R>
FLIGHT_NUM	Flight Number	2	01 to 09, A1 to A9 … Z1 to Z9		<R>
PASS_NUM	Pass Number	2	01 to 09, A1 to A9 … Z1 to Z9		<R>
SCN_CNTR	Scene Latitude and Scene Longitude	11	ddmmXdddmmY		<R>
ALTITUDE	Terrain Altitude (Sea Level Ref)	5	-2500 to 25000Ft.		<R>
SCN_CONTENT	Scene Content Description	50	BCS-A		<R>
Environment:					
BGRND_TYPE	Background Type	50	BCS-A		<R>

FIELD	NAME	SIZE	VALUE RANGE	UNITS	TYPE
WX_ STATION	Weather Station Name	20	BCS-A		<R>
WX_OVERVIEW	Weather Overview	15	BCS-A		<R>
WX_FILE	Weather File	30	BCS-A		<R>

Table 5A. CLCTNA – General Collection Information field descriptions

FIELD	VALUE DEFINITIONS AND CONSTRAINTS
VERNUM	Version Number of this TRE. It is in an AA.B format where the AA number is increments for structural changes such as adding of removing a field. The B number indicates the version of the data contents and should only be non-zero for re-issued data.
CLCTN_NAME	Collection Name – This is the name of the overall data gathering effort. Collections generally last several days. It is made up of multiple subcollections.
CLCTN_DESCRIPT	General textual description of the collection.
CLCTN_STDATE	Collection Start Date This field shall contain the start date of the collection in the format YYYYMMDD, in which DD is the day of the month (00-31), MM is the number of the month (01-12), and YYYY is the digits of the year (1998).
CLCTN_SPDATE	Collection Stop Date This field shall contain the last date of the collection in the format YYYYMMDD, in which DD is the day of the month (00-31), MM is the number of the month (01-12), and YYYY is the digits of the year (1998).
CLCTN_LOC	Collection Latitude and Collection Longitude – General location near center of the portion of the test range used for the collection.
COUNTRY	Two letter code defining the country for the reference point of the image segment.
SPONSOR	Collection Sponsor – The name of the organization/division/group sponsoring the collection.
PERSONNEL	List on key personnel and contact information (last name, first name, position, phone #, email address) Repeat for each individual separated by a ";"
SubCollection:	
SCLCTN_NAME	SubCollection Name A subcollection is defined primarily by constant ground conditions (ground truth) such as target location and condition.
SCLCTN_DESCRIPT	General textual description of the subcollection.
SCLCTN_Z_OFF	SubCollection Zulu offset – the time difference between local time at the subcollection site and Greenwich Mean Time (GMT).
SCLCTN_STDATE	SubCollection Start Date This field shall contain the start date of the subcollection in the format YYYYMMDD, in which DD is the day of the month (00-31), MM is the number of the month (01-12), and YYYY is the digits of the year (1998).
SCLCTN_SPDATE	SubCollection Stop Date This field shall contain the last date of the subcollection in the format YYYYMMDD, in which DD is the day of the month (00-31), MM is the number of the month (01-12), and YYYY is the digits of the year (1998).
SECURITY	Security Classification
SCG	Security Classification Guide
SITE	Name of the site. A site is a pre-defined subset of the test range, generally associated with a tactical situation (river crossing, overnight hide, defensive arrangement, partial cover). The "main" site is often all the target in the open for calibration.
SITE_NUM	Site Number.
SCN_NUM	Scene Number. A scene is an arrangement of targets/objects at a site.

FLIGHT_NUM	Each flight shall be identified by a flight number in the range 01 to 09. Flight 01 shall be the first flight of the day, flight 02 the second, etc. In order to ensure uniqueness in the image id, if the aircraft mission extends across midnight GMT, the flight number shall be 0x (where x is in the range 0 to 9) on images acquired before midnight GMT and Ax on images acquired after midnight GMT; for extended missions Bx, … Zx shall designate images acquired on subsequent days.
PASS_NUM	Each pass shall be identified by a pass number in the range 01 to 09. Pass 01 shall be the first pass of the day, pass 02 the second, etc. In order to ensure uniqueness in the image id, if the aircraft mission extends across midnight GMT, the pass number shall be 0x (where x is in the range 0 to 9) on images acquired before midnight GMT and Ax on images acquired after midnight GMT; for extended missions Bx, … Zx shall designate images acquired on subsequent days.
SCN_CNTR	Location of the collection, provides rough indication of geographic coverage. The format ddmmX represents degrees (00-89) and minutes (00-59) of latitude, with X = N or S for north or south, and dddmmY represents degrees (000-179) and minutes (00-59) of longitude, with Y = E or W for east or west, respectively.
ALTITUDE	The collection altitude is the altitude in feet of the general collection area above mean sea level (MSL).
SCN_CONTENT	Scene Content Description. General description of the scene. (Ex. Targets hidden in trees).
Environment:	
BGRND_TYPE	Background Type. A general description of the background around the targets. (ex: scrub brush, deep forest, sand beach, etc.)
WX_ STATION	The name of the Weather Station which provided the data
WX_OVERVIEW	Weather Overview (ex: cloudy, windy, damp, hot, cool, clear)
WX_FILE	Name of file containing complete weather data (& Text Segment number) Supplementary weather data (balloon data, time stamped temperature/wind etc.) is combined into a supplementary file. This file is can be included as a text segment where appropriate, in which case a pointer to the segment is added here.

Table 4B. CLCTNB — General Collection Information extension format

TYPE "R" = Required, "C" = Conditional, "< >" = BCS Spaces allowed for entire field

FIELD	NAME	SIZE	VALUE RANGE	UNITS	TYPE
RETAG	Unique Extension Identifier	6	CLCTNB	N/a	R
REL	Length of Entire Tagged Record	5	009??	Bytes	R
The following fields define CLCTNA					
VERNUM	Version Number	4	AA.B		<R>
CLCTN_NAME	Collection Name	25	BCS-A		R
CLCTN_DESCRIPT	Collection Description	255	BCS-A		R
CLCTN_STDATE	Collection Start Date	8	YYYYMMDD		R
CLCTN_SPDATE	Collection Stop Date	8	YYYYMMDD		R
CLCTN_LOC	Collection Latitude and Collection Longitude	11	ddmmXdddmmY		<R>
SITE	Site Name	15	BCS-A		R
COUNTRY	Country Code	2	Values from FIPS 10-4		R
SPONSOR	Collection Sponsor	20	BCS-A		R
PERSONNEL	Key Personnel	100	BCS-A		<R>
SubCollection:					
NUM_SITES		1	0-9		
Repeat the next 11 fields NUM_SITES times					
SCLCTN_NAME	SubCollection Name	20	BCS-A		<R>
SCLCTN_DESCRIPT	SubCollection Description	255	BCS-A		<R>
SITE_NUM	Site Number	3	0-999		<R>
SCN_NUM	Scene Number	3	0-999		<R>
SCLCTN_STDATE	SubCollection Start Date	8	YYYYMMDD		<R>
SCLCTN_SPDATE	SubCollection Stop Date	8	YYYYMMDD		<R>
SCN_CNTR	Scene Latitude and Scene Longitude	11	ddmmXdddmmY		<R>
ALTITUDE	Terrain Altitude (Sea Level Ref)	5	-2500 to 25000Ft.		<R>
SCN_CONTENT	Scene Content Description	50	BCS-A		<R>
BGRND_TYPE	Background Type	50	BCS-A		<R>

FIELD	NAME	SIZE	VALUE RANGE	UNITS	TYPE
SITE_COV	Site Coverage	1	F, P, C, M		R
SCLCTN_Z_OFF	SubCollection Zulu offset	3	±12	hr	<R>
SECURITY	Security Classification	7	BCS-A		R
SCG	Security Classification Guide	15	BCS-A		<R>
FLIGHT_NUM	Flight Number	2	01 to 09, A1 to A9 B1 to B9 … Z1 to Z9		<R>
PASS_NUM	Pass Number	2	01 to 09, A1 to A9 B1 to B9 … Z1 to Z9		<R>
Environment:					
WX_ STATION	Weather Station Name	20	BCS-A		<R>
WX_OVERVIEW	Weather Overview	15	BCS-A		<R>
WX_FILE	Weather File	30	BCS-A		<R>

Table 5B. CLCTNB — General Collection Information field descriptions

FIELD	VALUE DEFINITIONS AND CONSTRAINTS
VERNUM	Version Number of this TRE. It is in an AA.B format where the AA number is increments for structural changes such as adding of removing a field. The B number indicates the version of the data contents and should only be non-zero for re-issued data.
CLCTN_NAME	Collection Name – This is the name of the overall data gathering effort. Collections generally last several days. It is made up of multiple subcollections.
CLCTN_DESCRIPT	General textual description of the collection.
CLCTN_STDATE	Collection Start Date This field shall contain the start date of the collection in the format YYYYMMDD, in which DD is the day of the month (00-31), MM is the number of the month (01-12), and YYYY is the digits of the year (1998).
CLCTN_SPDATE	Collection Stop Date This field shall contain the last date of the collection in the format YYYYMMDD, in which DD is the day of the month (00-31), MM is the number of the month (01-12), and YYYY is the digits of the year (1998).
CLCTN_LOC	Collection Latitude and Collection Longitude – General location near center of the portion of the test range used for the collection.
SITE	Name of the site. A site is a pre-defined subset of the test range, generally associated with a tactical situation (river crossing, overnight hide, defensive arrangement, partial cover). The “main” site is often all the target in the open for calibration.
COUNTRY	Two letter code defining the country for the reference point of the image segment.
SPONSOR	Collection Sponsor – The name of the organization/division/group sponsoring the collection.
PERSONNEL	List on key personnel and contact information (last name, first name, position, phone #, email address) Repeat for each individual separated by a “;”
SubCollection:	
NUM_SITE	Number of sites within an image
SCLCTN_NAME	SubCollection Name A subcollection is defined primarily by constant ground conditions (ground truth) such as target location and condition.
SCLCTN_DESCRIPT	General textual description of the subcollection.
SITE_NUM	Site Number. 0= N/A
SCN_NUM	Scene Number. A scene is an arrangement of targets/objects at a site. 0=N/A
SCLCTN_STDATE	SubCollection Start Date This field shall contain the start date of the subcollection in the format YYYYMMDD, in which DD is the day of the month (00-31), MM is the number of the month (01-12), and YYYY is the digits of the year (1998).
SCLCTN_SPDATE	SubCollection Stop Date This field shall contain the last date of the subcollection in the format YYYYMMDD, in which DD is the day of the month (00-31), MM is the number of the month (01-12), and YYYY is the digits of the year (1998).

SCN_CNTR	Location of the collection, provides rough indication of geographic coverage. The format ddmmX represents degrees (00-89) and minutes (00-59) of latitude, with X = N or S for north or south, and dddmmY represents degrees (000-179) and minutes (00-59) of longitude, with Y = E or W for east or west, respectively.
ALTITUDE	The collection altitude is the altitude in feet of the general collection area above mean sea level (MSL).
SCN_CONTENT	Scene Content Description. General description of the scene. (Ex. Targets hidden in trees).
BGRND_TYPE	Background Type. A general description of the background around the targets. (ex: scrub brush, deep forest, sand beach, etc.)
SITE_COV	Site Coverage - F(ull), P(artial), C(arry-over), or M(over-day) A carry-over site is one that is visible within an image but is "left over" from an earlier subcollection or one that is being set-up for a later sub-collection. In either case, the targets may or may not be at their proper locations. A mover-day describes a scene in which targets are moving site to site i.e. site info is N/A.
SCLCTN_Z_OFF	SubCollection Zulu offset – the time difference between local time at the subcollection site and Greenwich Mean Time (GMT).
SECURITY	Security Classification
SCG	Security Classification Guide
FLIGHT_NUM	Each flight shall be identified by a flight number in the range 01 to 09. Flight 01 shall be the first flight of the day, flight 02 the second, etc. In order to ensure uniqueness in the image id, if the aircraft mission extends across midnight GMT, the flight number shall be 0x (where x is in the range 0 to 9) on images acquired before midnight GMT and Ax on images acquired after midnight GMT; for extended missions Bx, … Zx shall designate images acquired on subsequent days.
PASS_NUM	Each pass shall be identified by a pass number in the range 01 to 09. Pass 01 shall be the first pass of the day, pass 02 the second, etc. In order to ensure uniqueness in the image id, if the aircraft mission extends across midnight GMT, the pass number shall be 0x (where x is in the range 0 to 9) on images acquired before midnight GMT and Ax on images acquired after midnight GMT; for extended missions Bx, … Zx shall designate images acquired on subsequent days.
Environment:	
WX_ STATION	The name of the Weather Station which provided the data
WX_OVERVIEW	Weather Overview (ex: cloudy, windy, damp, hot, cool, clear)
WX_FILE	Name of file containing complete weather data (& Text Segment number) Supplementary weather data (balloon data, time stamped temperature/wind etc.) is combined into a supplementary file. This file is can be included as a text segment where appropriate, in which case a pointer to the segment is added here.

5.1.2 PLTFMA — Sensor Platform Information

The format for the user-defined fields of the PLTFMA extension is detailed in Table 6, and the descriptions of these fields are detailed in Table 7. A single PLTFMA is placed in the Image Subheader.

Table 6. PLTFMA — Sensor Platform Information extension format

TYPE "R" = Required, "C" = Conditional, "< >" = BCS Spaces allowed for entire field

FIELD	NAME	SIZE	VALUE RANGE	UNITS	TYPE
RETAG	Unique Extension Identifier	6	PLTFMA	n/a	R
REL	Length of Entire Tagged Record	5	00101,00271	Bytes	R
The following fields define PLTFMA					
VERNUM	Version Number	4	AA.B		<R>
P_NAME	Platform Name	12	BCS-A		R
P_DESCR	Platform Description	40	BCS-A		R
P_DATE	Platform/Collection Date	8	YYYYMMDD		R
P_TIME	Platform Start Time (GMT)	9	00000.000 to 86399.999	Seconds	R
P_TYPE	Platform Type	1	Ground,Tower, Mobile tower or Aircraft (G,T,M,A)		R
Non-Aircraft: The next 3 items are conditional on P_TYPE=G, T or M					
SNSR_HT	Sensor Height	3	1-999	ft. AGL	C
SNSRLOC	Sensor Location	21	ddmmss.ssXdddmmss.ssY ±dd.dddddd±ddd.dddddd		C
SNSRHDNG	Sensor Heading	3	000 to 359	Degrees	C
Aircraft: The rest of this table is conditional on P_TYPE=A					
AC_TYPE	Aircraft Type	15	BCS-A		C
AC_SERIAL	Aircraft Serial Number	12	BCS-A		<C>
AC_T_NUM	Aircraft Tail Number	10	BCS-A		<C>
AC_PITCH	Aircraft Pitch Angle	5	±90.0	degrees	C
AC_ROLL	Aircraft Roll Angle	5	±90.0	degrees	C
AC_HDNG	Aircraft Heading	3	0-359	degrees	C
AC_REF_PT	Aircraft Reference point for 9 AC fields	1	E=ECEF, G=Geoid point (~surface point)		C
AC_POS_X	Aircraft Location,	9	±99999999	ft.	C
AC_POS_Y	"	9	±99999999	ft.	C
AC_POS_Z	"	9	±99999999	ft.	C
AC_VEL_X	Aircraft Velocity	9	±99999.99	ft/sec	C
AC_VEL_Y	"	9	±99999.99	ft/sec	C
AC_VEL_Z	"	9	±99999.99	ft/sec	C
AC_ACC_X	Aircraft Acceleration	8	±100.000	ft/sec^2	<C>
AC_ACC_Y	"	8	±100.000	ft/sec^2	<C>
AC_ACC_Z	"	8	±100.000	ft/sec^2	<C>
AC_SPEED	Aircraft Speed	5	00000 to 99999	ft/sec	C

ENTLOC	Entry Location	21	ddmmss.ssXdddmmss.ssY ±dd.dddddd±ddd.ddddd		C
ENTALT	Entry Altitude	6	-01000 to +30000	ft.	C
EXITLOC	Exit Location	21	ddmmss.ssXdddmmss.ssY ±dd.dddddd±ddd.ddddd		<C>
EXITALT	Exit Altitude	6	-01000 to +30000	ft.	<C>
INS_V_NC	Ins Platform Velocity, North	5	00000 to 99999	ft/sec	<C>
INS_V_EC	Ins Platform Velocity, East	5	00000 to 99999	ft/sec	<C>
INS_V_DC	Ins Platform Velocity, Down	5	00000 to 99999	ft/sec	<C>

Table 7. PLTFMA — Sensor Platform Information field descriptions

FIELD	VALUE DEFINITIONS AND CONSTRAINTS
VERNUM	Version Number of this TRE. It is in an AA.B format where the AA number is increments for structural changes such as adding of removing a field. The B number indicates the version of the data contents and should only be non-zero for re-issued data.
P_NAME	Platform Name A platform can be a plane, satellite, ship, truck, tower, or a person. Anything, moving or stationary, that can hold a sensor during data collection.
P_DESCR	Platform Description – General textual description.
P_DATE	Platform/Collection Date – This field shall contain the date of the collection in the format YYYYMMDD, in which DD is the day of the month (00-31), MM is the number of the month (01-12), and YYYY is the digits of the year (1998).
P_TIME	Platform Start Time in seconds past midnight GMT (Time at which the data below is valid)
P_TYPE	Platform Type (G,T,M,A): Ground(handheld or tripod),Tower, Mobile tower (boom trucks) or Aircraft
SNSR_HT	Sensor Height AGL. Conditional on P_TYPE=G, T or M
SNSRLOC	Sensor Location – latitude/longitude position of the sensor, The location may be expressed in either degrees-minutes-seconds or in decimal degrees. The format ddmmss.ssX represents degrees (00 to 89), minutes (00 to 59), seconds (00 to 59), and hundredths of seconds (00 to 99) of latitude, with X = N for north or S for south, and dddmmss.ssY represents degrees (000 to 179), minutes (00 to 59), seconds (00 to 59), and hundredths of seconds (00 to 99) of longitude, with Y = E for east or W for west. The format ±dd.dddddd indicates degrees of latitude (north is positive), and ±ddd.dddddd represents degrees of longitude (east is positive). Conditional on P_TYPE=G, T or M
SNSRHDNG	The direction the sensor is pointing measured in degrees relative to true North. The measurement is clockwise about the vertical from North and is valid at the time specified by P_TIME. Conditional on P_TYPE=G, T or M
AC TYPE	Type of aircraft, Ex. F-16. Conditional on P_TYPE=A.
AC_SERIAL	Aircraft Serial Number
AC_T_NUM	Aircraft Tail Number
AC_PITCH	Aircraft Pitch – Angle between roll axis and horizon Positive = nose up
AC_ROLL	Aircraft Roll – Angle between pitch axis and horizon Positive = Right Wing Down
AC_HDNG	Aircraft Heading – measured in degrees relative to true North. The measurement is clockwise about the vertical from North to the projection of the aircraft roll axis into the level plane, and is valid at the time specified by P_TIME.
AC_REF_PT	Aircraft Reference point for 9 AC fields below: E=ECEF, G=Geoid point
AC_POS_X AC_POS_Y AC_POS_Z	The Aircraft Reference Point position at P_TIME is given in a North, East, Down, earth fixed coordinate system. For AC_REF_PT = G, the origin is at a earth surface reference point specified in ENTLOC. For AC_REF_PT = E, the origin is at the center of the Earth.
AC_VEL_X AC_VEL_Y AC_VEL_Z	The Aircraft Reference Point velocity at P_TIME is given in a North, East, Down, earth fixed coordinate system. For AC_REF_PT = G, the origin is at a earth surface reference point specified in ENTLOC. For AC_REF_PT = E, the origin is at the center of the Earth.

AC_ACC_X AC_ACC_Y AC_ACC_Z	The Aircraft Reference Point acceleration at P_TIME is given in a North, East, Down, earth fixed coordinate system. For AC_REF_PT = G, the origin is at a earth surface reference point specified in ENTLOC. For AC_REF_PT = E, the origin is at the center of the Earth.
AC_SPEED	Aircraft Speed – forward velocity of aircraft in AC_HDNG direction.
ENTLOC ENTALT EXITLOC EXITALT	In Search / Strip modes, the entry and exit locations are the specified latitude, longitude and elevation above mean sea level (MSL) of the planned entry and exit points on the image centerline of the area to be imaged. In Spot modes, the entry location is the specified reference point (intened image center/ desired aimpoint) latitude/longitude/elevation, and the exit location is not used. The location may be expressed in either degrees-minutes-seconds or in decimal degrees. The format ddmmss.ssX represents degrees (00 to 89), minutes (00 to 59), seconds (00 to 59), and hundredths of seconds (00 to 99) of latitude, with X = N for north or S for south, and dddmmss.ssY represents degrees (000 to 179), minutes (00 to 59), seconds (00 to 59), and hundredths of seconds (00 to 99) of longitude, with Y = E for east or W for west. The format ±dd.dddddd indicates degrees of latitude (north is positive), and ±ddd.dddddd represents degrees of longitude (east is positive).
INS_V_N INS_V_E INS_V_D	The Inertial Navigator Platform velocity is given in a North, East, Down earth-fixed coordinate system. The measurements are given in units of feet/second. These parameters are valid at the time specified by P_TIME.

5.1.3 SNSRA — Sensor Information

The format for the user-defined fields of the SNSRA extension is detailed in Table 8, and the descriptions of these fields are detailed in Table 9. SNSRA is placed in the Image Subheader. Where several Image Subheaders relate to a single scene SNSRA is placed in the first Image Subheader.

Table 8 SNSRA — Sensor Information extension format

TYPE "R" = Required, "C" = Conditional, "< >" = BCS Spaces allowed for entire field

FIELD	NAME	SIZE	VALUE RANGE	UNITS	TYPE
RETAG	Unique Extension Identifier	6	SNSRA	n/a	R
REL	Length of Entire Tagged Record	5	102+((22+39*Band) or(19+59*Band))	Bytes	R
The following fields define SNSRA					
VERNUM	Version Number	4	AA.B		<R>
SENNAME	Sensor Name	20	BCS-A		R
SENTYPE	Sensor Type	1	BCS-A e.g. EO, IR, RADAR (E,I,R)		R
SENMODE	Sensor Mode	10	e.g. Spotlight, Stripmap, LineScan….		R
SENSCAN	Sensor scanning format	12	e.g., pushbroom, whiskbroom, raster, staring		R
SENSOR_ID	Sensor ID. Identifies which specific sensor produced the image.	10	BSC-A		<R>
MPLAN	Mission Plan Mode. Defines the current collection mode.	3	001 to 019		<R>
SENSERIAL	Sensor Serial Number	4	0001 to 9999		<R>
SENOPORG	Sensor Operating Organization	10	BCS-A		R
SENMFG	Sensor manufacturer.	12	BCS-A		<R>
ABSWVER	Airborne SW Version	7	Vvvv.rr		<R>
AVG_ALT	Average Altitude	5		Ft MSL	<R>
The following 12 fields are conditional on SENTYPE=R					
FOC_Xn	Focus Plane Normal Vector	7	±1.0000		C
FOC_Yn	"	7	±1.0000		C
FOC_Zn	"	7	±1.0000		C
NUM_SENBAND		1	1-9		C
Repeat the next 8 fields NUM_SENBAND times					
SENBANDn	Sensor Band	10	BCS-A		C
SEN_BANDWn	Sensor Bandwidth n	3		MHz	C
SEN_CEN_Fn	Sensor Center Frequency n	3		GHz	C
POLARIZATIONn	Polarization	2	HH,HV,VH,VV		C
AZ_BWIDTHn	Azimuth Beamwidth	6	ddd.dd	deg	C
EL_BWIDTHn	Elevation Beamwidth	6	ddd.dd	deg	C
DYN_RNGE	Linear Dynamic Range	4		dB	R
SENCALFACn	Sensor Calibration Factor	15	xxxx.ddddddddd		C
The following 21 fields are conditional on SENTYPE=I or E					
NUM_SENBAND		1	1-9		C
Repeat the next 20 fields NUM_SENBAND times					
SENBANDn	Sensor Band	10	BCS-A		C

SEN_FOV_Tn	Sensor FOV Track	3		degrees	C
SEN_FOV_T_Un	Sensor FOV Track Unit	1	u/m micro/mili radians		C
SEN_IFOV_Tn	Sensor IFOV Track	3		µr/mr	C
SEN_IFOV_T_Un	Sensor IFOV Track Unit	1	u/m micro/mili radians		C
SEN_FOV_CTn	Sensor FOV Cross-Track	5	ddd.d	degrees	C
SEN_IFOV_CTn	Sensor IFOV Cross-Track	3		µr/mr	C
SEN_IFOV_CT_Un	Sensor IFOV Cross-Track Unit	1	u/m micro/mili radians		C
SEN_FOR_Tn	Sensor FOR Track	3		degrees	C
SEN_FOR_CTn	Sensor FOR Cross-Track	3		degrees	C
SEN_L_WAVEn	Sensor Lower Wavelength n	4		nm	C
SEN_U_WAVEn	Sensor Upper Wavelength n	4		nm	C
SUBBANDSn	Number of Sensor Subbands	3	1-999		C
SENFLENGTHn	Sensor Focal Length	4		mm	C
SENFNUMn	Sensor F Number	4	xx.x		C
LINESAMPLESn	Number of Samples per Line	4			C
DETECTTYPEn	Detector Type	12	BCS-A		C
POLARIZATIONn	Polarization	2	"NO"		C
DYN_RNGE	Linear Dynamic Range	4		dB	R
SENCALFACn	Sensor Calibration Factor	15	xxxx.ddddddddd		C

Table 9 SNSRA — Sensor Information field descriptions

FIELD	VALUE DEFINITIONS AND CONSTRAINTS
VERNUM	Version Number of this TRE. It is in an AA.B format where the AA number is increments for structural changes such as adding of removing a field. The B number indicates the version of the data contents and should only be non-zero for re-issued data.
SENNAME	Sensor Name – Name of the sensor, Ex. TRWIS III
SENTYPE	Sensor Type e.g. EO, IR, RADAR (E,I,R)
SENMODE	Sensor Mode e.g. Spotlight, Stripmap, LineScan….
SENSCAN	Sensor Scanning Format e.g. pushbroom, whiskbroom, raster, starring
SENSOR_ID	Sensor ID Identifies which specific sensor produced the image. Examples: For Radar Imagery: ASARS-1 (Advanced SAR on SR-71) ASARS-2 (Advanced SAR on U-2) GHR (Global Hawk Radar) TSAR (Tactical SAR on Predator) For EO-IR, the first four characters of Sensor ID are expressed as ccff where cc indicates the sensor category: IH (High Altitude / Long Range IR) IM (Medium Altitude IR) IL (Low Altitude IR) VH (Visible High Altitude / Long Range) VM (Visible Medium Altitude) VL (Visible Low Altitude) VF (Video Frame) And ff indicates the sensor format: FR (Frame) LS (Line Scan) PB (Pushbroom) PS (Pan Scan)

MPLAN	Mission Plan Mode Defines the current collection mode. For ASARS-1: 001 - 005 = Search, submodes 1-5 006 - 010 = Op Spot, submodes 1-5 011 - 015 = Wideband Spot, submodes 1-5 For ASARS-2: 001 – Search 002 – Spot 3 004 – Spot 1 007 – Continuous Spot 3 008 – Continuous Spot 1 009 – EMTI Wide Frame Search 010 – EMTI Narrow Frame Search 011 – EMTI Augmented Spot 012 – EMTI Wide Area MTI (WAMTI) 013 – Monopulse Calibration 014 – GMTI 015 – Low Resolution Search 016 – Medium Resolution Search 017 – High Resolution Search 018 – Point Imaging 019 – SMTI For EO-IR: 001-003 – Reserved 004 – EO Spot 005 – EO Point Target 006 – EO Wide Area Search 014 – IR Spot 015 – IR Point Target 016 – IR Wide Area Search
SENSERIAL	Sensor (Receiver/Exciter) Serial Number
SENOPORG	Sensor Operating Organization – Organization name
SENMFG	Sensor Manufacturer – Manufacturer's name
ABSWVER	Version (vvvv) and revision (rr) numbers for the airborne software
AVG_ALT	Average Altitude, ft MSL.
FOC_XN FOC_YN FOC_ZN	X, Y, and Z components of Focal Plane Normal (FPN) Vector in Earth Centered Fixed (ECF) coordinate system.
NUM_SENBAND	Number of major Sensor Bands – Ex. The TRWIS III has two major bands composed of 256 and 128 subbands respectively. Therefore NUM_SENBAND = 2
SENBANDn	Sensor Band Abbreviation for major band n (ex. VNIR, SWIR, LWIR, XBand…)
SEN_BANDWn	Sensor Bandwidth for major band n
SEN_CEN_Fn	Sensor Center Frequency for major band n
POLARIZATIONn	Polarization – Polarization of the major band n. (Ex. HH, HV, VH, VV, No)
AZ_BWIDTHn	Azimuth Beamwidth for major band n – Beamwidth in degrees.
EL_BWIDTHn	Elevation Beamwidth for major band n – Beamwidth in degrees.
DYN_RNGE	Linear Dynamic Range, dB
SENCALFACn	Sensor Calibration Factor for major band n. - Factor used to scale raw image data to the return of a calibrated reference reflector or active source.
NUM_SENBAND	Number of major Sensor Bands – Ex. The TRWIS III has two major bands composed of 256 and 128 subbands respectively. Therefore NUM_SENBAND = 2
SENBANDn	Sensor Band Abbreviation for major band n (ex. VNIR, SWIR, LWIR, XBand…)

SEN_FOV_Tn	Sensor Field Of View Track (for major band n) – Elevation field-of-view, defined as the solid angle viewed through the sensor's optical system in the elevation plane.
SEN_FOV_T_Un	Sensor Field Of View Track Units (for major band n) – Units (u=micro, m=milli radians)
SEN_IFOV_Tn	Sensor Instantaneous Field Of View Track (for major band n) – Elevation instantaneous field-of-view, defined as the solid angle viewed by a single detector element through the sensor's optical system in the elevation plane.
SEN_IFOV_T_Un	Sensor Instantaneous Field Of View Track Units (for major band n) - Units (u=micro, m=milli radians)
SEN_FOV_CTn	Sensor Field Of View Cross-Track (for major band n) – Azimuth field-of-view, defined as the solid angle viewed through the sensor's optical system in the azimuth plane.
SEN_IFOV_CTn	Sensor Instantaneous Field Of View Cross-Track (for major band n) – Azimuth instantaneous field-of-view, defined as the solid angle viewed by a single detector element through the sensor's optical system in the azimuth plane.
SEN_IFOV_CT_Un	Sensor Instantaneous Field Of View Cross-Track Units (for major band n) – Units (u=micro, m=milli radians)
SEN_FOR_Tn	Sensor Field Of Regard Track (for major band n) - ???
SEN_FOR_CTn	Sensor FOR Cross-Track for major band n - ???
SEN_L_WAVEn	Sensor Lower Wavelength (for major band n) – Minimum wavelengh limit of major sensor band n.
SEN_U_WAVEn	Sensor Upper Wavelength (for major band n) – Maximum wavelength limit of major sensor band n.
SUBBANDSn	Number of Sensor Subbands for the nth Band (If the field is > 1 then see BANDS TRE) – Ex. The TRWIS III has two major bands composed of 256 and 128 subbands.
SENFLENGTHn	Sensor Focal Length for major band n – Focal length of major sensor band n's collection optics.
SENFNUMn	Sensor F Number (for major band n) – F/number of the major band n's sensor collection optics (F/number = focal length / aperture diameter)
LINESAMPLESn	Number of detector elements per Scan Line for major band n
DETECTTYPEn	Detector Type – Makeup of the detector for major band n (Ex. Si, InSb, HgCdTe, etc.)
POLARIZATIONn	Polarization – Polarization of the major band n. – The orientation of the received electric field of an electromagnetic wave in major band n. (Ex. HH = , HV = , VH = , VV = , No = unpolarized (passive sensors))
DYN_RNGE	Linear Dynamic Range, dB
SENCALFACn	Sensor Calibration Factor for major band n - Factor used to scale raw image data to the return of a calibrated reference reflector or active source.

5.1.4 OBJCTA — Object Information

The format for the user-defined fields of the OBJCTA extension is detailed in Table 10, and the descriptions of these fields are detailed in Table 11. This extension is primarily intended for calibration objects and markers.

Table 10 OBJCTA — Object Information extension format

TYPE "R" = Required, "C" = Conditional, "< >" = BCS Spaces allowed for entire field

FIELD	NAME	SIZE	VALUE RANGE	UNITS	TYPE
RETAG	Unique Extension Identifier	6	OBJCTA	N/a	R
REL	Length of Entire Tagged Record	5	20+(206 or 136) * NUM_OBJ R or EO/IR	Bytes	R
The following fields define OBJCTA					
VERNUM	Version Number	4	AA.B		<R>
NUM_OBJ	Number of Objects	3	001 to 256		R
OBJ_REF	Object Reference Point	10	e.g. center, LF, RR		R
NUM_SCENE_OBJ	Number of Object in Scene	3			<R>
Repeat the following for NUM_OBJ (each object)					
OBJ_TY	Object Type	20	BSC-A		
OBJ_NM	Object Name	15	BSC-A		
OBJ_POS	Position of object in Scene	2	1-99		
OBJ_SN	Object Serial Number	10	BSC-A		
OBJ_LL	Object Latitude and Longitude	21	ddmmss.ssXdddmmss.ssY±dd.dddddd±ddd.dddddd		
OBJ_ELEV	Object Elevation	8	xxxxx.xx	Ft MSL	
OBJ_ROW	Object Pixel Row	8	0-99,999,999		
OBJ_COL	Object Pixel Col	8	0-99,999,999		
OBJ_PROW	Object Pixel Parent Row	8	0-99,999,999		<R>
OBJ_PCOL	Object Pixel Parent Col	8	0-99,999,999		<R>
OBJ_ATTR	Object Attributes	20	BSC-A		<R>
OBJ_SEN	Object Sensor	2	R-radar, IR, EO		R
The following 8 fields are conditional on OBJ_SEN=R					
OBJ_AZ_3dB_WIDTH	Object Cross Range 3dB Width	7		Ft	C
OBJ_RNG_3dB_WIDTH	Object Range 3dB Width	7		Ft	C
OBJ_AZ_18dB_WIDTH	Object Cross Range 18dB Width	7		Ft	C
OBJ_RNG_18dB_WIDTH	Object Range 18dB Width	7		Ft	C

OBJ_AZ_3_18dB_RATIO	Object Cross Range 3dB_18dB Ratio	8			C
OBJ_RNG_3_18dB_RATIO	Object Range 3dB_18dB Ratio	8			C
OBJ_AZ_PK_SL_RATIO	Object Cross Range Peak Sidelobe Ratio	8		Db	C
OBJ_RNG_PK_SL_RATIO	Object Range Peak Sidelobe Ratio	8		Db	C
OBJ_AZ_INT_SL_RATIO	Object Cross Range Integrated Sidelobe Ratio	8		Db	C
OBJ_RNG_INT_SL_RATIO	Object Range Integrated Sidelobe Ratio	8		Db	C
The following 1 fields are conditional on OBJ_SEN=IR or EO					
OBJ_CAL_TEMP	Calibration Temperature	6			C
…	…	…	…	…	…

Table 11 OBJCTA — Object Information extension descriptions

FIELD	VALUE DEFINITIONS AND CONSTRAINTS
VERNUM	Version Number of this TRE. It is in an AA.B format where the AA number is increments for structural changes such as adding of removing a field. The B number indicates the version of the data contents and should only be non-zero for re-issued data.
NUM_OBJ	Total number of objects in image/data. – The number of objects that were scanned and present in the data. The image / data is usually a subset of the entire scene.
OBJ_REF	Object Reference Point – this field specifies the reference point on the object from which all measurements are based. Generally it will be the center of the object but could be the top handle etc. The reference point will be uniform for all objects within a image.
NUM_SCENE_OBJ	Number of Objects in Scene – The image / data scanned is usually a subset of the entire scene.
OBJ_TY	Object n's type. Objects are landmarks that serve as reference points and provide calibration data. Ex. Trihedral Array
OBJ_NM	Object Name Textual description. Ex. Reflector Array A.
OBJ_POS	Position of object in Scene. Position numbers are used to number the objects in the entire scene. This field stores the scene object number for cross-referencing the OBJCTA object number to the original scene object number.
OBJ_SN	Object n's serial number

OBJ_LL	Object n's Lat/Long Location. The location may be expressed in either degrees-minutes-seconds or in decimal degrees. The format ddmmss.ssX represents degrees (00 to 89), minutes (00 to 59), seconds (00 to 59), and hundredths of seconds (00 to 99) of latitude, with X = N for north or S for south, and dddmmss.ssY represents degrees (000 to 179), minutes (00 to 59), seconds (00 to 59), and hundredths of seconds (00 to 99) of longitude, with Y = E for east or W for west. The format ±dd.dddddd indicates degrees of latitude (north is positive), and ±ddd.dddddd represents degrees of longitude (east is positive).
OBJ_ELEV	Object Elevation Feet above Mean Sea Level.
OBJ_ROW	Object Pixel Row – Location of the object's reference point in the image data. Row 0 is the top-most row, and row height – 1 is the bottom-most row in the image data.
OBJ_COL	Object Pixel Col – Location of the object's reference point in the image data. Column 0 is the left-most column, and width – 1 is the right-most column in the image data.
OBJ_PROW	Object Pixel Parent Row - If the data image is a chip from a full scene image, the parent pixel row is the object's reference point's full scene image row location. Blank if not a chip.
OBJ_PCOL	Object Pixel Parent Col - If the data image is a chip from a full scene image, the parent pixel column is the object's reference point's full scene image row location. Blank if not a chip.
OBJ_ATTR	Description of object n's relevant attributes. Ex. ????
OBJ_SEN	Object Sensor – sensor type for which this calibration object applies
OBJ_AZ_3dB_WIDTH	Object Cross Range 3dB Width – 3 dB system impulse response width in the cross-range direction.
OBJ_RNG_3dB_WIDTH	Object Range 3dB Width – 3 dB system impulse response width in the down-range direction.
OBJ_AZ_18dB_WIDTH	Object Cross Range 18dB Width – 18 dB system impulse response width in the cross-range direction
OBJ_RNG_18dB_WIDTH	Object Range 18dB Width 18 dB system impulse response width in the down-range direction.
OBJ_AZ_3_18dB_RATIO	Object Cross Range 3dB_18dB Ratio – Ratio of the 3 dB to 18 dB system impulse response width in the cross-range direction.
OBJ_RNG_3_18dB_RATIO	Object Range 3dB_18dB Ratio - Ratio of the 3 dB to 18 dB system impulse response width in the down-range direction.
OBJ_AZ_PK_SL_RATIO	Object Cross Range Peak Sidelobe Ratio – Ratio of the peak sidelobe intensity to the peak mainlobe intensity in the cross-range direction.
OBJ_PK_SIDELOBE_RATIO	Object Range Peak Sidelobe Ratio - Ratio of the peak sidelobe intensity to the peak mainlobe intensity in the down-range direction.
OBJ_AZ_INT_SL_RATIO	Object Cross Rnge Integrated Sidelobe Ratio – Ratio of all energy in the sidelobes of the system impulse response to the energy in the mainlobe in the cross-range direction.
OBJ_RNG_INT_SL_RATIO	Object Range Integrated Sidelobe Ratio – Ratio of all energy in the sidelobes of the system impulse response to the energy in the mainlobe in the down-range direction.
OBJ_CAL_TEMP	Object calibration temperature in ???

5.1.5 TRGTA — Target Information

The format for the user-defined fields of the TRGTA extension is detailed in Table 12, and the descriptions of these fields are detailed in Table 13.

Table 12 TRGTA — Target Information extension format

TYPE "R" = Required, "C" = Conditional, "< >" = BCS Spaces allowed for entire field

FIELD	NAME	SIZE	VALUE RANGE	UNITS	TYPE
RETAG	Unique Extension Identifier	6	TRGTA	n/a	R
REL	Length of Entire Tagged Record	5	min: 00436	Bytes	R
The following fields define TRGTA					
VERNUM	Version Number	4	AA.B		<R>
NO_VALID_TGTS	Number of Valid Targets	3	001 to 256		R
NO_SCENE_TGTS	Number of Targets in Scene	3			<R>
Repeat TGT_NAME to TGT_PCOL NO_VALID_TGTS times					
TGT_NAME	Target Name	25	BCS-A		R
TGT_TYPE	Target Type	15	BCS-A		R
TGT_VER	Target Version	6	BCS-A		
TGT_CAT	Target Category	5	H,T,U,W		<R>
TGT_BE	BE of Target	17	Alphanumeric		<R>
TGT_SN	Target Serial Number	10	BCS-A		<R>
TGT_POSNUM	Position Number of Target in Scene	2			<R>
TGT_ATTITUDE	Target Attitude	18	P,R,Y	Deg	<R>
TGT_DIM	Target Dimensions	15	L, W, H	In	<R>
TGT_AZIMUTH	Target Azimuth Angle	6	0.00-359.00	Deg	<R>
TGT_CLTR_RATIO	Target to Clutter Ratio	8		dB	<R>
TGT_STATE	Target State	10	e.g. cold, idling, hot, …		<R>
TGT_COND	Target Condition	30	e.g. clean, dry, wet, dusty, muddy		<R>
TGT_OBSCR	Target Obscuration	20	BCS-A		<R>
TGT_OBSCR%	Target Obscuration Percent	3	Percent		<R>
TGT_CAMO	Target Camouflage	20	BCS-A		<R>
TGT_CAMO%	Target Camouflage Percent	3	Percent		<R>
R TGT_UNDER	Target Under-lying Terrain	12	BCS-A		<R>
TGT_OVER	Target Over-lying Terrain	30	BCS-A		<R>
TGT_TTEXTURE	Target Terrain Texture	45	BCS-A		<R>
TGT_PAINT	Target Paint Scheme	40	BCS-A		<R>
TGT_SPEED	Target Estimated Ground Speed	3	000 to 999	feet/sec	<R>
TGT_HEADING	Target Heading	3	000 to 359	degrees	<R>
TGT_QC_NUM	Number of Target Visual Quality Comments	1	0-9		R
TGT_QCOMMENT	Visual Quality Comments about Target (repeated TGT_QC_NUM times)	40	BCS-A		<R>
TGT_CC_NUM	Number of Target Configuration Comments	1	0-9		R
TGT_CCOMMENT	Configuration Comments about Target (repeated TGT_CC_NUM times)	40	BCS-A		<R>
NO_REF_PT	Number of Reference Points	1	0-9		R

Repeat next 8 fields NO_REF_PT times					
TGT_REF	Target Reference Point	10	e.g. center, LF, RR		R
TGT_LL	Target Latitude and Longitude	21	Ddmmss.ssXDddmmss.ssY ±dd.dddddd±ddd.dddddd		R
TGT_ELEV	Target Elevation	8	xxxxx.xx	Ft MSL	<R>
TGT_BAND	Target Band	3			<R>
TGT_ROW	Target Pixel Row	8			<R>
TGT_COL	Target Pixel Col	8			<R>
TGT_PROW	Target Parent Pixel Row	8			<R>
TGT_PCOL	Target Parent Pixel Col	8			<R>
Attributes:					
NO_ATTRIBUTES	Total number of Attributes	3	000 to 999		R
Repeat next 4 fields NO_ATTRIBUTES times					
ATTR_TGT_NUM	Target Number w/Attribute	3	001 to 256		R
ATTR_NAME	Name of Attribute	30			R
ATTR_CONDTN	Condition of Attribute	35			R
ATTR_VALUE	Value of Attribute	10			<R>
…	…	…	…	…	…

Table 13 TRGTA — Target Information field descriptions

FIELD	VALUE DEFINITIONS AND CONSTRAINTS
VERNUM	Version Number of this TRE. It is in an AA.B format where the AA number is increments for structural changes such as adding of removing a field. The B number indicates the version of the data contents and should only be non-zero for re-issued data.
NO_VALID_TGTS	Number of Valid Targets – Number of targets in the area scanned and stored in the image data.
NO_SCENE_TGTS	Number of Targets in Scene – Number of targets in the full scene. The image scan is only a portion of the entire scene.
TGT_NAME	Target n's textual Name
TGT_TYPE	Target n's Type (e.g. tank, APC, truck, etc.)
TGT_VER	Target Version

TGT_CAT	Target n's classification category of the nth target – comprised of 5 sub-categorys: SUB1: H = Helicopter S = Structure A = Aircraft N = Naval Vessel T = Tracked P = Parked Aircraft U = Unknown R = Runway, Road, RR W = Wheeled X = Weapon SUB2: F = Fixed G = Ground Vehicle A = Air Vehicle W = Water Vehicle SUB3: M= Military C = Commercial O = Other SUB4: A = Armored O = Other SUB5: A = Air Defense O = Other The classification subcategories are stored in this field sequentially ex. HAMOO for helicopter, air vehicle, military, other, other.
TGT_BE	Basic Encyclopedia ID of target n (DIAM 65-3-1) BBBBBBBBBBFFFFFCC, consisting of ten characters of BE (Basic Encyclopedia) identifier, followed by five characters of functional category code, followed by the two character country code as specified in FIPS PUB 10-4.
TGT_SN	Target n's Serial Number
TGT_POSNUM	Position Number of Target in Scene. Position numbers are used to number the targets in the entire scene. This field stores the scene target number for cross-referencing the TRGTA target number to the original scene target number.
TGT_ATTITUDE	Target n's Attitude (Pitch, Roll, Yaw) Pitch is the angle between roll axis and horizon. Positive is nose up. Roll is the angle between the pitch axis and horizon. Positive is Right Wing Down. Yaw is measured in degrees relative to true North. The measurement is clockwise about the vertical from North to the projection of the roll axis into the level plane, and is valid at the time specified by C_TIME.
TGT_DIM	Target n's Dimensions (Length, Width, Height), in inches.
TGT_AZIMUTH	Target Azimuth Angle. Angle of target relative to the sensor line-of-sight. The angle is CW positive and CCW negative from the target's longitudinal axis.
TGT_CLTR_RATIO	Target to Clutter Ratio – Ratio of the peak image intensity of a target to the average image intensity of the surrounding background.
TGT_STATE	Target State - State of the target (ex. Cold, idling, hot, etc.)
TGT_COND	Target Condition - Condition of the target (ex. Clean, dry, wet, dusty, muddy, etc.)
TGT_OBSCR	Target n's Obscuration Description - Obscuration of the target (ex. Revetment)
TGT_OBSCR%	Target n's Obscuration Percent – Percentage of target obscured
TGT_CAMO	Target n's Camouflage Description – Description of the type of camouflage (ex. Radar scattering net)
TGT_CAMO%	Target n's Camouflage Percent – Percentage of target covered by camouflage
TGT_UNDER	Target n's Under-lying Terrain – General shape of terrain (e.g., smooth, flat, hilly, sloping, etc.)
TGT_OVER	Target n's Over-lying Terrain – Terrain composition and vegetation (e.g., sand, grass, scrub trees, etc.)

TGT_TTEXTURE	Target Terrain Texture – Terrain texture features (e.g., 1 ft shrubs, 20 ft tall tree line, scrub grass)
TGT_PAINT	Target Paint Scheme – Paint scheme of target (e.g., olive drab, compass ghost grey, etc.)
TGT_SPEED	Target Estimated Ground Speed in feet per second of the nth moving target.
TGT_HEADING	Direction that the nth target is moving, rounded to the nearest degree and referenced to True North. 0=North, 90=East, 180=South, and 270=West. Blank for speed=0
TGT_QC_NUM	Number of Target Visual Quality Comments
TGT_QCOMMENT	Visual Quality Comments about Target
TGT_CC_NUM	Number of Target Visual Quality Comments
TGT_CCOMMENT	Comments about Target additional notes about condition or state. Ex: "gun barrel is longer than standard"
NO_REF_PT	Number of Reference Points
TGT_REF	Target Reference Point (e.g. center, LF = left front, RR = right rear)
TGT_LL	Target n's Location. The location may be expressed in either degrees-minutes-seconds or in decimal degrees. The format ddmmss.ssX represents degrees (00 to 89), minutes (00 to 59), seconds (00 to 59), and hundredths of seconds (00 to 99) of latitude, with X = N for north or S for south, and dddmmss.ssY represents degrees (000 to 179), minutes (00 to 59), seconds (00 to 59), and hundredths of seconds (00 to 99) of longitude, with Y = E for east or W for west. The format ±dd.dddddd indicates degrees of latitude (north is positive), and ±ddd.dddddd represents degrees of longitude (east is positive).
TGT_ELEV	Target Elevation – elevation of target above mean sea level (MSL)
TGT_BAND	Band in which target pixel locations are identified. (Applicable to MSI/HSI)
TGT_ROW	Target Pixel Row – Location of the target's reference point in the image data. Row 0 is the top-most row, and row height – 1 is the bottom-most row in the image data.
TGT_COL	Target Pixel Col - Location of the target's reference point in the image data. Column 0 is the left-most column, and width – 1 is the right-most column in the image data.
TGT_PROW	Target Parent Pixel Row – If the target is a chip from a full scene image, the parent pixel row is the target reference point's full scene image row location.
TGT_PCOL	Target Parent Pixel Col – If the target is a chip from a full scene image, the parent pixel column is the target reference point's full scene image column location.
NO_ATTRIBUTES	Total number of Attributes
ATTR_TGT_NUM	Number of target (n) to which this attribute applies
ATTR_NAME	Name of Attribute ex: Turret
ATTR_CONDTN	Condition of Attribute ex: elevated
ATTR_VALUE	Value of Attribute ex: 15 degrees

5.1.6 IMGDTA — Image Data

The format for the user-defined fields of the IMGDTA extension is detailed in Table 8, and the descriptions of these fields are detailed in Table 9. IMGDTA is placed in the Image Subheader.

Table 14 IMGDTA — Image Data extension format
TYPE "R" = Required, "C" = Conditional, "< >" = BCS Spaces allowed for entire field

FIELD	NAME	SIZE	VALUE RANGE	UNITS	TYPE
RETAG	Unique Extension Identifier	6	IMGDTA	n/a	R
REL	Length of Entire Tagged Record	5	223+(25*V)+(156 or 24)	Bytes	R
The following fields define IMGDTA					
VERNUM	Version Number	4	AA.B		<R>
FILENAME	Filename	32	e.g. D1S100001_001.img		R
PARENT_FNAME	Parent Filename	32	e.g. D1S100001.img		<R>
CHECKSUM	Data Checksum	32			R
ISIZE	Data Size	10		Bytes	R
STATUS	Data Status	1	Seq./Dist.		R
CDATE	Collection Date	8	YYYYMMDD		R
CTIME	Collection Time	10	HHMMSS.SSS		R
PDATE	Processing Date	8	YYYYMMDD		R
SENTYPE	Sensor Type	1	BCS-A e.g. EO, IR, RADAR (E,I,R)		R
DATA_PLANE	Data Plane	1	Slant/Ground		<R>
DATA_TYPE	Data Type	4	MP, IQ,…		R
NUM_ROWS	Number of Rows	6			R
NUM_COLS	Number of Columns	6			R
SEN_POS	Sensor Position	1	T,B,L,R,N		R
SEN_CAL_FAC	Sensor Calibration Factor	15	xxxx.ddddddddd		<R>
IMGQUAL	Image Quality Description	50	BCS-A		<R>
NUM_VER	Number of version numbers to be stored	2	00-99		R
Repeat next 2 fields NUM_VER times					
VER_NAME	Version Number Name	15			<R>
VER_NUM	Version Number	10	AAAAAaa.bb		<R>
The following 21 fields are conditional on SENTYPE=R					
SEN_LOOK	Sensor Look	1	L,R,N		C
CR_RES	Cross Range Resolution	7	99.9999	ft	C
RANGE_RES	Range Resolution	7	99.9999	ft	C
CR_PIXELSP	Cross Range Pixel Spacing	7	99.9999	ft	C
RANGE_PIXELSP	Range Pixel Spacing	7	99.9999	ft	C
CR_WEIGHT	Cross Range Weighting	40	e.g. 35db Tayor		C
RANGE_WEIGHT	Range Weighting	40	e.g. 35db Tayor		C
R_OVR_SAMP	Range Over Sampling Factor	6			C

CR_OVR_SAMP	Cross Range Over Sampling Factor	6			C
Desired Data:					
D_DEPRES	Desired Depression Angle	6	00.000-90.000	degrees	C
D_GP_SQ	Desired Ground Plane Squint	7	+-90.000	degrees	C
D_SP_SQ	Desired Slant Plane Squint	7	+-90.000	degrees	C
D_RANGE	Desired Range	7	0 to 65536.0	ft	C
D_AP_LL	Desired AimPoint Latitude/Longitude	21	ddmmss.ssXdddmmss.ss Y ±dd.dddddd±ddd.dddddd		C
D_AP_ELV	Desired AimPoint Elevation	7	xxxxx.x	ft	C
Measured Data:					
M_DEPRES	Measured Depression Angle	6	00.000-90.000	degrees	C
M_GP_SQ	Measured Ground Plane Squint	7	+-90.000	degrees	C
M_SP_SQ	Measured Slant Plane Squint	7	+-90.000	degrees	C
M_RANGE	Measured Range	7	0 to 65536.0	ft	C
M_AP_LL	Measured AimPoint Latitude/Longitude	21	ddmmss.ssXdddmmss.ss Y ±dd.dddddd±ddd.dddddd		C
M_AP_ELV	Measured AimPoint Elevation	7	xxxxx.x	ft	C
The following 8 fields are conditional on SENTYPE=I or E					
GRNDSAMPDIS	Ground Sample Distance	6	xx.xxx	ft	C
SWATHSIZE	Swath Size	6	xxxx.x	ft	C
Desired Data:					
D_RANGE	Desired Range	7	0 to 65536.0	ft	C
D_AZ_LOOK	Desired Azimuth Look Angle	6	+-180.0	degrees	C
D_EL_LOOK	Desired Elevation Look Angle	5	+-90.0	degrees	C
Measured Data:					
M_RANGE	Measured Range	7	0 to 65536.0	ft	C
M_AZ_LOOK	Measured Azimuth Look Angle	6	+-180.0	degrees	C
M_EL_LOOK	Measured Elevation Look Angle	5	+-90.0	degrees	C

Table 15 IMGDTA — Image Data field descriptions

FIELD	VALUE DEFINITIONS AND CONSTRAINTS
VERNUM	Version Number of this TRE. It is in an AA.B format where the AA number is increments for structural changes such as adding of removing a field. The B number indicates the version of the data contents and should only be non-zero for re-issued data.
FILENAME	Image filename
PARENT_FNAME	Parent Filename
CHECKSUM	Unique identifier for identifying signature/image data. An MD5 Checksum is run on the signature/image portion of the file.
I_SIZE	Image size, in bytes.
STATUS	Data Status Freely Distributed (D) or Sequestered (S)
CDATE	Collection Date This field shall contain the start date of the collection in the format YYYYMMDD, in which DD is the day of the month (00-31), MM is the number of the month (01-12), and YYYY is the digits of the year (1998).
CTIME	Collection Time – This field shall contain the collection time in HHMMSS.SSS format where HH is hours (0-23), MM is minutes (0-59), and SS.SSS is seconds (00.000-59.999)
PDATE	Processing Date – SAR: when raw data is converted to imagery. EO-IR: when image file is created. YYYY is the year, MM is the month (01–12), and DD is the day of the month (00-31). This date changes at midnight UTC.
SENTYPE	Sensor Type E = EO, I = IR, R = radar
DATA_PLANE	Data Plane – Plane of image data. S= slant plane, G = ground plane
DATA_TYPE	Data Type - MP = mag/phase, INT = integer, REAL, IQ = complex float, RI = Real/Imaginary, VPH = Video Phase History
NUM_ROWS	Number of Rows – Number of horizontal rows in the image data. Rows are numbered from zero to rows – 1.
NUM_COLS	Number of Columns – Number of vertical columns (width) of the image data. Columns are numbered from 0 to width – 1.
SEN_POS	Sensor's Position with respect to image (T)op, (B)ottom, (R)ight, (L)eft, (N)ader
SEN_CAL_FAC	Sensor Calibration Factor – Factor used to scale raw image data to the return of a calibrated reference reflector or active source.
IMGQUAL	Image Quality Description (ex. good, poor)
NUM_VER	Number of version numbers to be stored
VER_NAME	Version Number Name
VER_NUM	Version Number
SEN_LOOK	Direction of sensor look angle with respect to platform (L)eft, (R)ight, (N)ader
CR_RES	Cross Range Resolution – Resolution of the sensor system in the cross-range direction.
RANGE_RES	Range Resolution – Resolution of the sensor system in the down-range direction.
CR_PIXELSP	Cross Range Pixel Spacing – Center-to-center pixel spacing in the cross-range direction.
RANGE_PIXELSP	Range Pixel Spacing – Center-to-center pixel spacing in the down-range direction.
CR_WEIGHT	Cross Range Weighting – Weighting function applied in the cross-range direction during the image formation process.
RANGE_WEIGHT	Range Weighting – Weighting function applied in the down-range direction during the image formation process.
R_OVR_SAMP	Range Over Sampling Factor – Factor by which a resolution cell is over-sampled in the down-range direction during the image formation process.
CR_OVR_SAMP	Cross Range Over Sampling Factor - Factor by which a resolution cell is over-sampled in the cross-range direction during the image formation process.

D_DEPRES	The measurement in DEG of the desired angle between the radar line-of-sight and the horizontal reference plane. Referenced from the aircraft.
D_GP_SQ	The desired angle of the radar line-of-site projected into the ground plane relative to the aircraft broadside
D_SP_SQ	The desired angle of the radar line-of-site projected into the slant plane relative to the aircraft broadside
D_RANGE	The desired distance in meters of the antenna to the scene center.
D_AP_LL	The degree of latitude of the desired aim point. The location may be expressed in either degrees-minutes-seconds or in decimal degrees. The format ddmmss.ssX represents degrees (00 to 89), minutes (00 to 59), seconds (00 to 59), and hundredths of seconds (00 to 99) of latitude, with X = N for north or S for south, and dddmmss.ssY represents degrees (000 to 179), minutes (00 to 59), seconds (00 to 59), and hundredths of seconds (00 to 99) of longitude, with Y = E for east or W for west. The format ±dd.dddddd indicates degrees of latitude (north is positive), and ±ddd.dddddd represents degrees of longitude (east is positive).
D_AP_ELV	Desired AimPoint Elevation – Desired elevation of the sensor aimpoint, given as geodetic (i.e. referenced to the ellipsoid) height in feet.
M_DEPRES	Measured Depression Angle between the sensor line-of-sight and the local horizontal reference plane.
M_GP_SQ	Measured Ground Plane Squint – Measured angle between the sensor line-of-sight and the lateral axis of the aircraft as projected into the ground plane.
M_SP_SQ	Measured Slant Plane Squint - Measured angle between the sensor line-of-sight and the lateral axis of the aircraft as projected into the slant plane.
M_RANGE	Measured Range – Measured slant range between the sensor aperture and the scene center
M_AP_LL	Measured AimPoint Latitude/Longitude – The location may be expressed in either degrees-minutes-seconds or in decimal degrees. The format ddmmss.ssX represents degrees (00 to 89), minutes (00 to 59), seconds (00 to 59), and hundredths of seconds (00 to 99) of latitude, with X = N for north or S for south, and dddmmss.ssY represents degrees (000 to 179), minutes (00 to 59), seconds (00 to 59), and hundredths of seconds (00 to 99) of longitude, with Y = E for east or W for west. The format ±dd.dddddd indicates degrees of latitude (north is positive), and ±ddd.dddddd represents degrees of longitude (east is positive).
M_AP_ELV	Measured AimPoint Elevation – Measured elevation of the sensor aimpoint, given as geodetic (i.e. referenced to the ellipsoid) height in feet.
GRNDSAMPDIS	Ground Sample Distance – Distance in the ground plane covered by the instantaneous field-of-view of a single detector in the sensor array.
SWATHSIZE	Swath Size – Cross-track distance in the ground plane covered by the scanned sensor array.
D_RANGE	Desired Range – Desired (planned) slant range between the sensor aperture and the scene center.
D_AZ_LOOK	Desired Azimuth Look Angle – Desired (planned) angle between the roll axis of the platform and the line of sight to the aimpoint in the sensor local horizontal reference plane (see arrow 1 in figure 7). The azimuth angle is in the ground reference plane and measured clockwise from the roll axis of the target to the projected line of sight (see arrow 3 in figure 7).
D_EL_LOOK	Desired Elevation Look Angle - Desired (planned) angle between the sensor local horizontal reference plane and the line of sight to the aimpoint in the vertical reference plane (see arrow 2 in figure 7). Negative elevation look angles are down.

M_RANGE	Measured Range – Measured slant range between the sensor aperture and the scene center.
M_AZ_LOOK	Measured Azimuth Look Angle – Measured angle between the roll axis of the platform and the line of sight to the aimpoint in the sensor local horizontal reference plane (see arrow 1 in figure 7). The azimuth angle is in the ground reference plane and measured clockwise from the roll axis of the target to the projected line of sight (see arrow 3 in figure 7).
M_EL_LOOK	Measured Elevation Look Angle – Measured angle between the sensor local horizontal reference plane and the line of sight to the aimpoint in the vertical reference plane (see arrow 2 in figure 7). Negative elevation look angles are down.

6.0 NOTES

6.1 Subject Term (key word) Listing

Research Imagery

Truth Data

Ground Truth

National Imagery Transmission Format

NITF

SAR

Synthetic Aperture Radar

EO

Electro-Optical

IR

Infrared