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DOPPLER RADAR, DATA EXCHANGE CONTROL
DOCUMENT**

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REVISION RECORD

Rev.	Modification N.	Date	Description	Author/s
A, Draft 1	N.A.	22/09/2023	Preliminary issue, rev. A draft 1.	N. Bianchini
A, Draft 2	N.A.	17/06/2019	Preliminary issue, rev. A draft 2. <ul style="list-style-type: none"> Updated the transfer type for the message A5 (it can be RT-to-RT or BC –to-RT alternatively, depending on the bus architecture) 	N. Bianchini
A	N.A.	17/06/2019		N. Bianchini
B, Draft 1	N.A.	14/10/2019	Preliminary issue, rev. B draft 1 <ul style="list-style-type: none"> Para 7.2.6.5 Note 7 Remark b) : 640 ms changed to 200ms. 	N. Bianchini
B, Draft 2	N.A.	30/11/2020	Preliminary issue, rev. B draft 2 <ul style="list-style-type: none"> Para 7.2.6.8 and 7.2.6.9 Note 1: removed the word AGR because is not applicable. 	N. Bianchini
B, Draft 3	N.A.	14/12/2020	Preliminary issue, rev. B draft 3 <ul style="list-style-type: none"> Para 7.1.4.1 : <i>Cursor Rates Invalid</i> replaced with <i>Cursor Rates Valid</i>; Note 12 of this para amended as follows: <i>If this bit is set to "0", the Cursor Rates data (field A of word 19 and field A of word 20 of message A4) are not valid and have to be disregarded by the Radar.</i>	N. Bianchini
B	ECO035399-01	16/05/2022	Formal Release	N. Bianchini

C, Draft 1	N.A.	13/04/2023	Preliminary issue, rev. C draft 1 <ul style="list-style-type: none"> Para 3.9.1 : <i>Rewording of para to incorporate the new requirements related to Time Tag generation/management requested by LAD.</i> 	N.Bianchini
C	ECO046740-01	27/04/2023	Formal Release <ul style="list-style-type: none"> Para 3.9.1 : <i>Rewording of para to incorporate the new requirements related to Time Tag generation/management requested by LAD.</i> 	N.Bianchini
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D	ECO048519-01	22/09/2023	Formal Release <ul style="list-style-type: none"> Para 7.2.8.16 : <i>Fields C and D marked as "spare".</i> Para 7.2.8.17 : <i>Field C marked as "spare".</i> 	G. Rogolino

ACRONYMS AND ABBREVIATIONS

A/A	Air to Air
A/C	AirCRAFT
A/S	Air to Surface
ACM	Air Combat Mode
AGR	Air to Ground Ranging
ASM	Adaptive Search Mode
BCN	BeaCoN
DBS	Doppler Beam Sharpening
DTT	Dual Target Track
EL	ELevation
FTT	Fixed Target Track
FYT	Fly To
G	Gravity Acceleration
GM	Ground Map
GMTI	Ground Moving Target Indicator
GMTT	Ground Moving Target Track
HPT	High Priority Target
IF	Intermediate Frequency
INU	Inertial Navigation Unit
ISAR	Inverse SAR
LOS	Line Of Sight
LRU	Line Replaceable Unit
MC	Mission Computer
MTG	Moving Target Gain
MTR	Moving Target Rejection
NAM	Normal Air Mode
NM	Nautical Mile
PPI	Plan Position Indicator
RBM	Real Beam Map
RDR	RaDaR
RF	Radio Frequency
RWS	Range While Search
S/N	Signal-to Noise ratio
SAM	Situation Awareness Mode
SAR	Synthetic Aperture Radar
SES	Leonardo
SLEW	SLEWable
SMTT	Sea Moving Target Track
SPOI	Selected Point Of Interest
SPT	Secondary Priority Target

SSAR	Spotlight SAR
SSTT	Sea Single Target Track
STBY	StanD-BY
STT	Single Target Track
TA	Terrain Avoidance
TWS	Track While Scan
VS	Velocity Search
WA	Weather Avoidance

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1. SCOPE

This document defines the data exchange interface based on the MIL-STD-1553 Bus interface of the GRIFO-346FA Airborne Pulse Doppler Radar intended for the M346 Light Fighter Family of Aircraft.

2. APPLICABLE DOCUMENTS

The following documents in the revision indicated are to be considered as integral part of this Interface Control Document to the extent specified therein.

The last available revision is applicable for those documents whose issue is not indicated.

If in this document the referenced documents are not recalled for the purpose of defining their applicability, they shall be referred to as guideline only.

In the event of conflict between this document and the documents referenced herein, the content of this document shall take precedence.

2.1 Military Standards

MIL-STD-1553B Digital Time Division Command/Response Multiplex Data Bus

Notice 2

2.2 Military Specifications

SNU 84-1 Rev. D Specification for USAF Standard Form, Fit and Function (F3) Medium Accuracy Inertial Navigation Unit.

2.3 Leonardo Documents

ICD7033160 GRIFO-346FA, Electrical Interface Control Document

ICD7033161 GRIFO-346FA, Logic of Operation for

2.4 Avionic Integrator Documents

None

2.5 Other DocumentsMIL-HDBK-1553 Multiplex Application Handbook
Nov. 1984

3. CHARACTERISTICS OF THE MIL-STD-1553 BUS INTERFACE

3.1 Bus Operation

The Radar RT shall operate as a Remote Terminal in accordance with MIL-STD-1553B and Notice 2 thereto. Sole control of information transmission shall reside with the BUS Controller, which shall initiate all transmissions.

In case of conflict, Requirements contained herein shall supersede those contained in MIL-STD-1553B.

3.2 Information Transfer Modes

The Radar RT shall accept only the following modes of information transfer:

- Bus Controller (BC) to Remote Terminal (RT) transfer
- Remote Terminal (RT) to Bus Controller (BC) transfer
- Remote Terminal (RT) to Remote Terminal (RT) transfer

Broadcast commands are not allowed for data or information transfer. The Radar RT does not produce any declaration of error or any malfunction whenever a broadcast command is received.

3.3 Data formats

Digital data shall be transmitted in a form compatible with the message and word formats defined in section 7.

In establishing the message and word formats guidelines set in MIL-HDBK-1553 shall be followed, as far as practicable.

3.4 Address

The Radar RT address shall be hardwired at the connector 4J3 of the Processor LRU.

Before setting the discrete signal FCR RT READY (whose characteristics are described in Leonardo (SES) Document ICD7033160) to logic "1", the Radar shall determine its address (by reading the connector hardware programming).

Upon reception of each command word, the Radar shall compare the hard-wired address with the address contained in the command word.

In the case the command word contains an invalid Radar RT address or in the case the parity check is not successful, the Radar shall ignore such command word.

The address parity information shall be hardwired in the Processor connector 4J3.

3.5 Subaddress/Mode

The subaddress field in the command word indicates the message to be transmitted or to be received by the Radar. The subaddress values of 0000 and 1111 are reserved for special purpose (i.e. to indicate the presence of a mode code) and shall not be utilized for any other function.

3.6 Mode Codes

The Radar RT shall implement the following mode codes in accordance with MIL-STD-1553B (Notice 2):

Mode Code

00001 Synchronize (without Data Word)
00010 Transmit Status Word
00011 Initiate self test (RT)
00100 Transmitter Shut Down
00101 Override Transmitter Shut Down
00110 Inhibit Terminal Flag Bit
00111 Override Inhibit Terminal Flag Bit
01000 Reset Remote Terminal
10001 Synchronize (with Data Word)
10010 Transmit Last Command
10011 Transmit BIT Word

3.6.1 Synchronize (with data word)

This Mode Code is sent by the Avionic System to the Radar to command the synchronization of the time tags of the Radar and of the different components of the Avionic System. The MC generates the Synchronize with data word at an approximate rate of 0.24 Hz. The format of the Data word is reported here below.

Word Name	: Time Tag		
Word ID	: NA	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: Asynchronous	Accuracy	: NA
Signal Type	: Unsigned numeric	MSB	: 2,097,152.0
Units	: μ sec	LSB	: 64.0
		Full scale	: 4,194,240.0

Field Name	Bit No	Description
A	00-N MSB	Time Tag
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

3.6.2 Transmit BIT Word

Any bit(s) set to logic "1" in the BIT Word shall indicate a failure in the Radar 1553 Remote Terminal.

3.7 Status Word

The following bits:

- Message Error Bit
- Busy Bit
- Subsystem Flag Bit
- Terminal Flag Bit

shall be implemented as specified in para 4.3.3.5.3.3; 4.3.3.5.3.8; 4.3.3.5.3.9 and 4.3.3.5.3.11 of MIL-STD-1553B.

The following bits:

- Instrumentation
- Service Request Bit
- Reserved Status Bit
- Broadcast Command Received Bit
- Dynamic Bus Control Acceptance Bit

shall not be implemented and shall be set to logic "0".

3.7.1 Message Error Bit Management

This bit is managed in accordance with MIL-STD-1553B (Notice 2) to indicate illegal or invalid command detection.

A command is considered illegal when it contains a subaddress and/or word count different from those listed in 3.5 or a mode code different from those listed in 3.6.

3.7.2 Busy Bit Management

Any busy condition in the Radar RT that would affect communication over the bus shall be conveyed via the busy bit. Busy conditions, and thus the setting of the busy bit, shall occur only as a result of particular commands/messages sent to the Radar RT.

The Busy Bit will not be set as a result of failure within the Radar RT. In such a case the Terminal Flag Bit and/or the Subsystem Flag Bit will be set accordingly.

3.7.3 Subsystem Flag Bit Management

This bit is set to logic "1" whenever the Main Control Processor of the Radar Main Computer is in a failure condition, and is unable to communicate on 1553 bus.

3.7.4 Terminal Flag Bit Management

This bit is set to logic "1" whenever the Radar RT interface circuitry is in a failure condition.

3.7.5 Status Word Parity

Odd parity shall be used for status word.

3.8 Coupling on the BUS

Transformer coupling as defined in paragraph 4.5.1.5.1 of MIL-STD-1553B shall be used.

3.9 Time Tag

- a) Time Tag (transmit): Time information relevant to the data flowing from Radar to the Avionic System shall be implemented in the message format as specified in section 7. The timer shall be free running with an LSB of 64 μ sec. The time tag shall reflect the time at which the associated data are sampled.
- b) Time Tag (receive): Data relevant to the aircraft altitude, attitude, attitude rates and acceleration, velocity and acceleration shall be transmitted to the Radar with time tag information. This timer shall have a resolution of 64 μ sec. The Time Tag shall reflect the time at which the associated data are sampled.

3.9.1 Time Tags Synchronization

The timing origin for Transmit timer (time tags transmitted by the radar) shall be preset to the value provided by the Synchronize with Data Word Mode command. The timing origin for the receive time (time tags received by the radar) shall be preset to zero exactly 1920 microseconds before the send of the transmit timer Synchronize with Data Word Mode command.

3.10 Data Wraparound

The Radar RT shall implement a data wraparound capability with subaddress 30 (11110). The Radar RT shall be capable of receiving and transmitting 32 data words at this subaddress. A valid Receive message with this subaddress to the Radar RT shall cause the Radar RT to store the commanded number of data words.

A valid Transmit command with this subaddress to the Radar RT shall cause the Radar RT to transmit the commanded number of stored data words. The data words shall be transmitted in the same order as the words received by this subaddress. Any intervening valid receive command to the Radar RT may alter the content of the stored data.

The stored data words are available for the transmission if the Transmit command occurs not before 80 msec after the reception of a valid Receive message.

3.11 List of Messages

Messages exchanged between the Radar and the Avionic System are listed in Tab. 3-1 and in Tab. 3-2 with the relevant subaddresses and transmission rates.

Tab. 3-1 List of RX messages

Message Identifier		Subaddress		Transmission Rate (Hz)	Document Section
A1	RDR Operational Setting and Parameter Transfer	00001	01	10	7.1.1
A2	RDR Operation Command	00010	02	25	7.1.2
A3	Graphic Setting	00011	03	10	7.1.3
A4	Navigation Data and Acquisition Cursor Data	00100	04	50	7.1.4
A5	INU High Speed Vector	00101	05	50	7.1.5
A6	Not Used	00110	06	N/A	7.1.6
A7	Data Link Targets (Message#1)	00111	07	10	7.1.7
A8	Data Link Targets (Message#2)	01000	08	6.25	7.1.8
A9	Reserved RX Message (Debug Message)	01001	09	50	7.1.9

Tab. 3-2 - List of TX messages

Message Identifier		Subaddress		Transmission Rate (Hz)	Document Section
B1	TWS Status and Targets 1 and 2	01011	11	10	7.2.1
B2	TWS Targets 3, 4, 5	01100	12	10	7.2.2
B3	TWS Targets 6, 7, 8	01101	13	10	7.2.3
B4	SPT Target Message	01110	14	50	7.2.4
B5	Tracked Target Message	01111	15	50	7.2.5
B6	RDR Operat. Setting and Param. Transf. Tell-back	10000	16	10	7.2.6
B7	RDR status Tell-back	10001	17	25	7.2.7
B8	BIT Report Message	10010	18	10	7.2.8
B9	Reserved Message #1 (Search Target Message)	10011	19	50	7.2.9
B10	Reserved Message #2 (Mode Data Message)	10100	20	50	7.2.10
B11	Reserved TX Message (Debug Message)	10101	21	50	7.2.11

The message A9 is inserted in the frame only when needed, for debug purposes.

The message B8 is asynchronous and can be inserted in the frame only when needed.

The messages B9 and B10 are inserted in the frame only when needed, for diagnostic purposes.

The message B11 is inserted in the frame only when needed, for debug purposes.

The structure of the sequence of transmission of the messages listed in Tab. 3-1 and in Tab. 3-2 will be in accordance to the following rules:

- 1) The nominal transmission rate of each message will be in accordance with Tab. 3-1 and Tab. 3-2.
- 2) The radar can accept, without any malfunction, a reduction of the rate of transmission of the messages. However, the following limitations have to be considered:
 - a) The rate of messages A2 and A4 should comply with the minimum rate required to prevent the declaration of back-up conditions, as described in section 5.
 - b) A reduction in the rate of messages A2 and B7 should induce unacceptable effect in the Man Machine Interface, as far as the mode transition is concerned
 - c) A reduction in the rate of message B1, B2, B3 and B4, B5 produces corresponding degradation in the quality and accuracy of the tracking data provided to the Avionics.
- 3) The average transmission rate will be such that no more than 10 messages are transmitted each 20 msec.
- 4) The messages A7 and A8, when present in the frame, will be always inserted consecutively.
- 5) The messages B1, B2 and B3 will be always inserted in the frame consecutively.
- 6) Message B1, B2 or B3 has not to be inserted in the frame within 80 ms from the transmission of the last B3 message.
- 7) The messages B4 and B5 will be always inserted in the frame consecutively.
- 8) The messages B9 and B10, when present in the frame, will be always inserted consecutively.

4. INERTIAL NAVIGATION UNIT

The radar performs as required in conjunction with an Inertial Navigation Unit meeting the requirements established in Tab. 4-1.

Tab. 4-1 - Inertial Navigation Unit performance requirements

Parameter	Accuracy (rms)	Jitter (rms)
X – Velocity	2.5 ft/sec	0.002 ft/sec
Y – Velocity	2.5 ft/sec	0.002 ft/sec
Z – Velocity	2.0 ft/sec	0.002 ft/sec
X – Acceleration	0.064 ft/sec ²	0.49 ft/sec ²
Y – Acceleration	0.064 ft/sec ²	0.49 ft/sec ²
Z – Acceleration	0.064 ft/sec ²	0.49 ft/sec ²
Platform Azimuth	0.1 deg	0.012 deg
Roll	0.1 deg	0.012 deg
Pitch	0.1 deg	0.012 deg
Yaw Rate	0.043 deg/sec	0.036 deg/sec
Roll Rate	0.043 deg/sec	0.036 deg/sec
Pitch Rate	0.043 deg/sec	0.036 deg/sec
Yaw Acceleration	10 deg/ sec ²	2 deg/ sec ²
Roll Acceleration	10 deg/ sec ²	2 deg/ sec ²
Pitch Acceleration	10 deg/ sec ²	2 deg/ sec ²
Present Position (horizontal position Latitude and Longitude)	69 ft (95% CEP)	
Altitude	56 ft	

Present Position performance is related to CI-MAGR-300 when employing Precise Positioning Service.

5. RADAR OPERATION IN DEGRADED CONDITION

The radar is designed to operate, with degraded performance and limited capability, when part of the data received via 1553 bus from the Mission Computer (MC) and/or from the INU are absent or invalid.

In any case, the radar is designed to avoid any uncontrolled behaviour and any damage in case of failure of the MC. In particular the following provisions are taken:

- If the MC does not provide a valid message A2 (RDR Operational Command) for a time greater than 2 sec, the radar enters STBY (on RWS mode) whatever is the current status.
- If the value of the time tag, provided by the MC in word 02 of message A4, does not change for a time greater than 2 sec, the radar enters STBY (on RWS mode) whatever is the current status.

The detailed description of the back-up operation of the radar as a consequence of the absence of data is in SES document ICD7033161.

6. REFERENCE SYSTEMS

This section describes the reference co-ordinate systems that are used both in the Radar and in the Avionics to define the data transferred on the 1553 Bus between Radar and MC.

6.1 Cartesian and Polar Systems

All the cartesian coordinate systems used are orthogonal right hand.

This means that an observer with own feet on the X-Y plane and lying along the positive direction of the Z-axis sees the rotation of X-axis toward the Y-axis through 90° to occur counter clockwise (CCW).

Whenever a spherical polar coordinate system is associated to a XYZ Cartesian system, it will have the same origin (O).

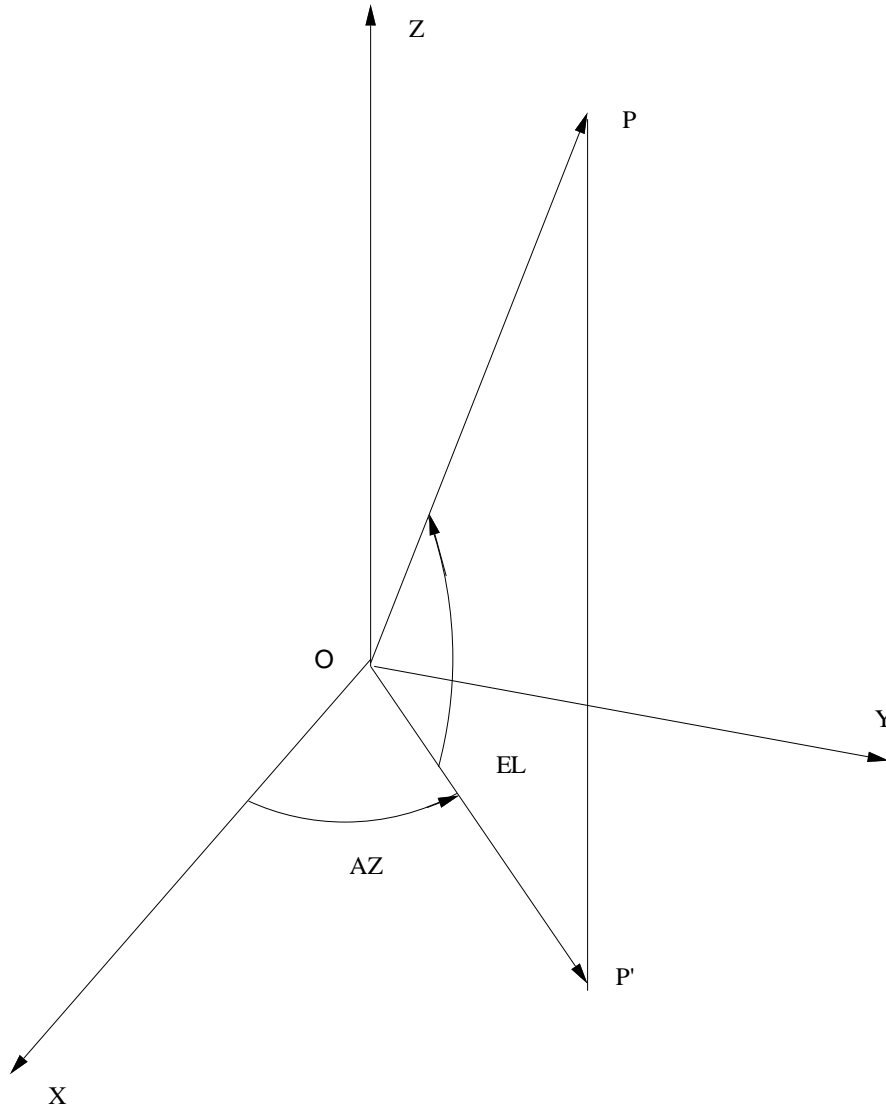
Let OP be the vector from the origin to the point of interest P.

The Azimuth Angle (AZ or ψ) is the minimum angle between the positive direction of the X-axis and the projection of the vector OP on the X-Y plane (OP').

Such angle is positive if the rotation of the positive direction of the X-axis toward the projection OP' of OP through the minimum angle is seen to occur counter clockwise by the positive direction of the Z-axis.

The Elevation Angle will be measured in a plane perpendicular to the X-Y plane containing both the Z-axis and the point of interest (P). The Elevation angle is the angle in such plane between the vector OP and the X-Y plane. The Elevation Angle (EL or θ) is positive if the point of interest (P) is in the same half space as the positive direction of the Z-axis.

The relationship between a XYZ Cartesian system and the associated polar spherical system is shown in Fig. 6.1-1.



OP = point of interest vector

OP' = projection of OP on X-Y plane

AZ or ψ = Azimuth Angle of P (positive as indicated)

EL or θ = Elevation Angle of P (positive as indicated)

R = Range to P = modulo of OP

Fig. 6.1-1 - Relationship between Cartesian and Spherical Polar reference systems

6.2 Coordinate Frame Definition

6.2.1 Earth-Centred Earth-Fixed Frame (E-Frame: X_E, Y_E, Z_E)

The origin is located at the mass centre of the Earth.

X_E is directed North, along the polar axis. Y_E and Z_E are in the equatorial plane, with Z_E directed through the Greenwich meridian, and Y_E directed through 90 degree W longitude.

Geographic position, denoted in terms of geodetic latitude (ϕ) longitude (λ) and altitude (h) is defined with respect to the earth-centred earth-fixed system as shown in Fig. 6.2-1.

6.2.2 Local Geodetic Frame (G-Frame: X_G, Y_G, Z_G)

The origin is located at the computed specific force origin of the INU. This point is the point in the instrument cluster from which the INU manufacturer computes accelerations, velocities and translations.

X_G and Y_G are in a plane parallel to a plane that is tangent to the reference ellipsoid at the geographic location of the INU, with X_G pointed toward the True North and Y_G pointed toward the True West. Z_G is perpendicular to the ellipsoid and pointed up.

This frame is shown in Fig. 6.2-1.

6.2.3 Navigation Frame (N-Frame: X, Y, Z)

The origin is the same as that of X_G, Y_G, Z_G (Local Geodetic) Frame.

The Z-axis is aligned with Z_G , X and Y axes are in the same plane as X_G and Y_G . The angle from X_G to X is defined as Wander Angle (alpha) and depends on the INU characteristics. The sign convention of the Wander Angle is defined in Fig. 6.2-2 and in Fig. 6.2-4.

The polar system associated to the Navigation Frame, in accordance with the rule exposed in para 6.1 will be referred to as NP-Frame: R, ψ, θ .

6.2.4 Rotated Navigation Frame (RN-Frame: X_R, Y_R, Z_R)

The origin is the same as that of X, Y, Z (Navigation) and X_G, Y_G, Z_G (Local Geodetic) Frames.

With reference to the Navigation frame, the Z_R -axis is aligned with Z, X_R and Y_R axes are in the same plane as X and Y. The angle from X_R to X is the Platform Azimuth defined in Fig. 6.2-2 and in Fig. 6.2-4.

With reference to the Local Geodetic frame, the Z_R -axis is aligned with Z_G ; X_R and Y_R axes are in the same plane as X_G and Y_G . The angle from X_R to X_G is the True Heading defined in Fig. 6.2-2 and in Fig. 6.2-4.

The polar system associated to the Rotated Navigation Frame, in accordance with the rule exposed in para 6.1 will be referred to as RNP-Frame: R_R, ψ_R, θ_R .

6.2.5 Aircraft Body Frame (B-Frame: X_B, Y_B, Z_B)

The origin is the same as that of X, Y, Z (Navigation) and X_G, Y_G, Z_G (Local Geodetic) Frames.

X_B is positive out the nose and it is coincident with the A/C centre line or aircraft roll axis, Y_B is positive out the right wing (looking toward the positive direction of X_B) and Z_B direction is such to make the X_B, Y_B, Z_B system right-hand (Z_B is out the belly of the aircraft), as shown in Fig. 6.2-2.

The Euler angles of the Navigation Frame with respect to the Body Frame are:

- – platform azimuth
- pitch
- roll + π

The Euler angles of the Local Geodetic Frame with respect to the Body Frame are:

- – true heading
- pitch

- roll + π

The polar system associated to the Body frame, in accordance with the rule exposed in para 6.1, will be referred to as BP-Frame: R_B, ψ_B, θ_B .

6.2.6 Bulkhead Fuselage Station Frame (FS-Frame: X_{FS}, Y_{FS}, Z_{FS})

The origin is the intersection of the X_B axis of the Body Frame with the Fuselage Station where the Bulkhead is installed.

The orientation of the axes is the same as that of the Body Frame.

This frame is obtained from the Body Frame with a translation, accounting for the displacement of the Bulkhead plane with respect to the origin of the Body Frame, and a rotation, taking into account the imperfect bulkhead installation and the dynamic deformation of the Aircraft fuselage during flight. The parameters characterizing the transformation are described in section 6.2.11.

6.2.7 Antenna Frame (A-Frame: X_A, Y_A, Z_A)

The origin is the pivot point of the antenna gimbal as shown in Fig. 6.1-1.

The AZ pivot point and the EL pivot point of the antenna gimbal are coincident. The gimbal order is (from the Flat Plate Array Antenna) Elevation over Azimuth.

The X_A axis is perpendicular to the surface determined by the Pedestal mounting feet and is positive from the array into the space. The Z_A axis is the rotation axis of the Azimuth movement. The Z_A positive direction is that of an observer which sees the antenna scanning from the left to the right in the counter clockwise direction. The Y_A axis orientation is such to make the X_A, Y_A, Z_A system right-hand.

This frame is obtained from the Bulkhead Fuselage Station Frame with a rotation, which takes into account the installation of the Antenna Assy on the bulkhead, and a translation, taking into account the physical dimensions of the Antenna Assy, i.e. the displacement of the Antenna Pivot Point with respect to the mounting surface of the Antenna Assy.

The Euler angles of the transformation are described in section 6.2.10; the translation is as derived from Fig. 6.2-3.

6.2.8 Target polar system (T-Frame: ψ_T, θ_T, R_T)

The target polar system has the same origin as the A-frame.

The azimuth (ψ_T) and elevation (θ_T) angles are those measured by the azimuth and elevation encoders of the Antenna Assy and their orientation are given by the rule which associates this polar frame to the A-frame in accordance with section 6.1.

The Antenna Array and the Antenna Pedestal are manufactured and trimmed in factory in such a way that the Target Polar System (T-Frame) is aligned with the Antenna Frame (A-Frame).

6.2.9 Definition of INU Azimuth angles

The INU azimuth angles of interest in the XY plane of the Navigation Frame are defined in Fig. 6.2-4.

6.2.10 Antenna harmonization

The purpose of the antenna harmonization procedure is the measurement of the angular relationship between the Bulkhead Fuselage Station Frame and the Antenna Frame (X_A, Y_A, Z_A) when the Antenna Assy is mounted on the aircraft bulkhead.

This angular relationship is expressed through the three Euler angles (ψ_H (yaw), θ_H (pitch), ϕ_H (roll)) between the Antenna Frame and the Bulkhead Fuselage Station Frame. The sign convention for the three angles is

the same as for the platform azimuth, pitch and roll angles defined in section 6.2.5 and shown in Fig. 6.2-2. In particular, φ_H (roll angle) is positive for a clockwise rotation of the Y_A axis, as seen by the pilot; θ_H (pitch angle) is positive up, with respect to the fuselage, and ψ_H (yaw) is positive for a rotation toward the right wing.

The three Euler angles can be provided to the Radar via the words A1/09-10 (parameter transfer) of the 1553 bus.

6.2.11 Aircraft Flexure Data

The displacement of the Bulkhead Fuselage Station Frame with respect to the Body Frame depends on the aircraft structural characteristics and on the dynamic deformation of the Aircraft fuselage during flight.

The relative displacement of the FS Frame with respect to the Body Frame is completely determined by:

- Coordinates of the origin of the FS frame in the Body Frame (three parameters), which can be provided to the Radar via the words A1/09-10 (parameter transfer) of the 1553 bus.
- Euler angles of the FS frame with respect to the Body Frame (three parameters).

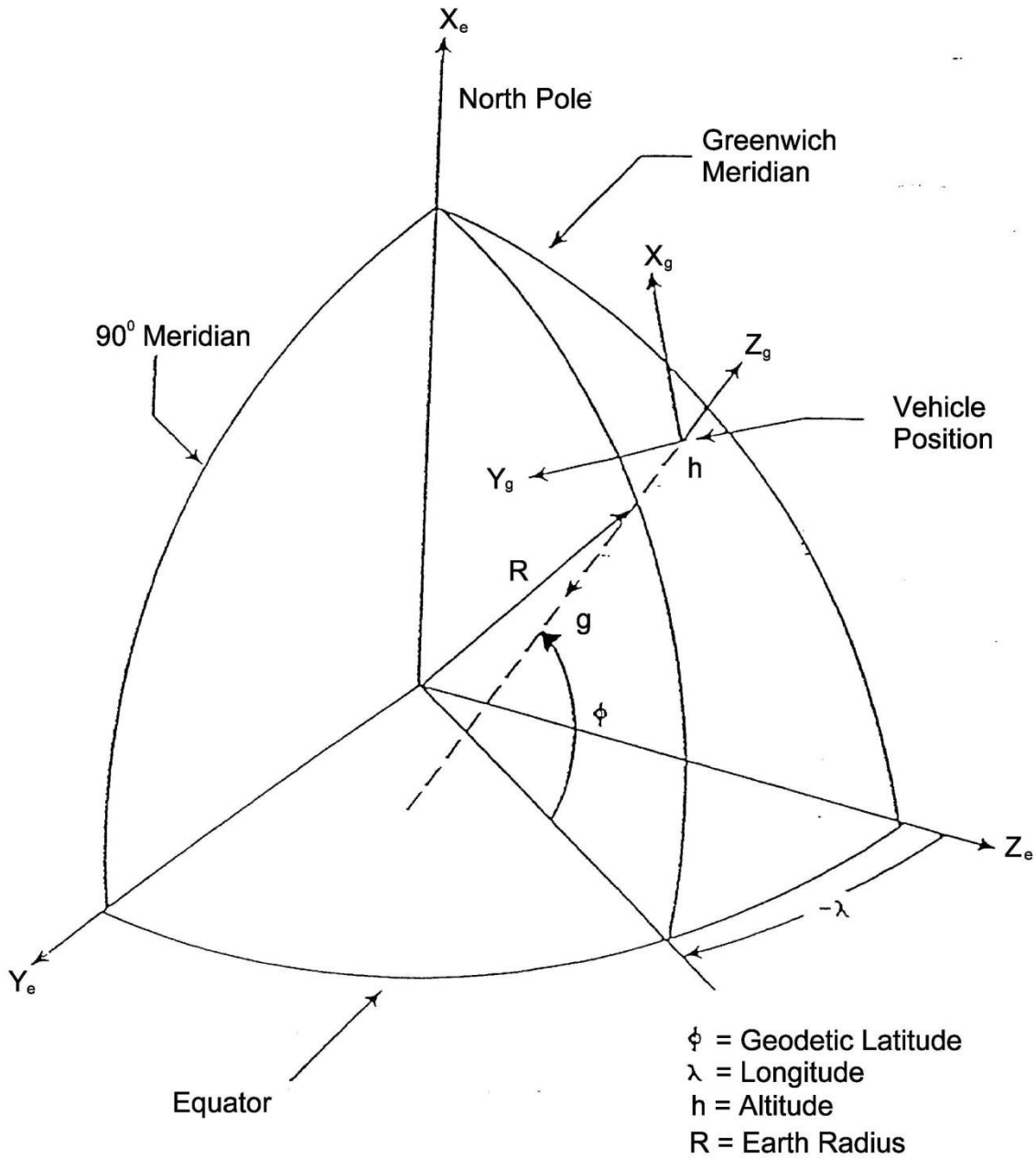


Fig. 6.2-1 - Earth-Centred and Local Geodetic Frames

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X,Y,Z = Navigation Frame
 X_b, Y_b, Z_b = Body Frame
 α = Wander Angle
 ψ_T = True Heading
 ψ_{AZ} = Platform Azimuth

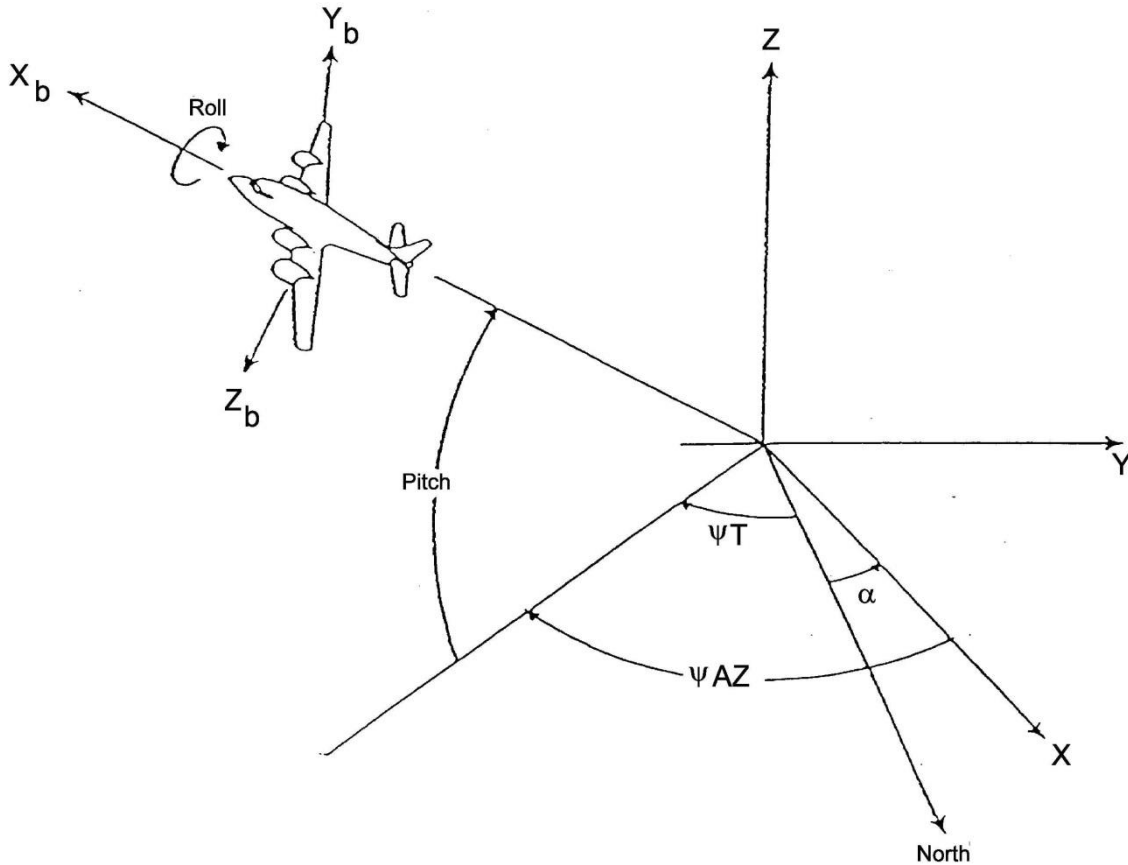
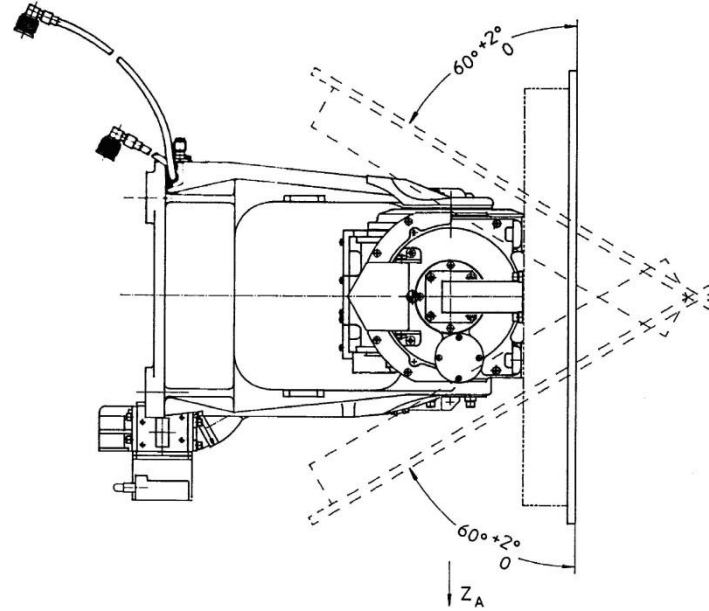


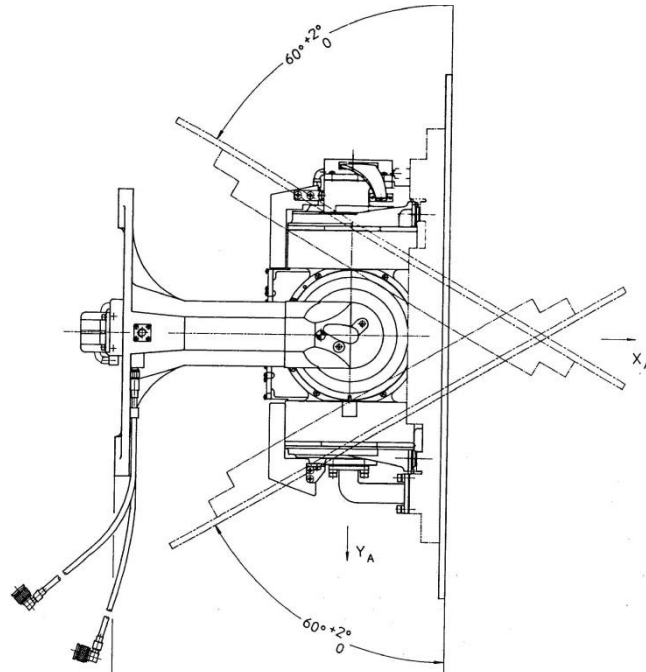
Fig. 6.2-2 - Body Frame and Navigation Frame Coordinate System

Note: Origin of Body Frame displaced from that of Nav Frame only for clarity of diagram, they are actually coincident at aircraft INU computed specific force origin

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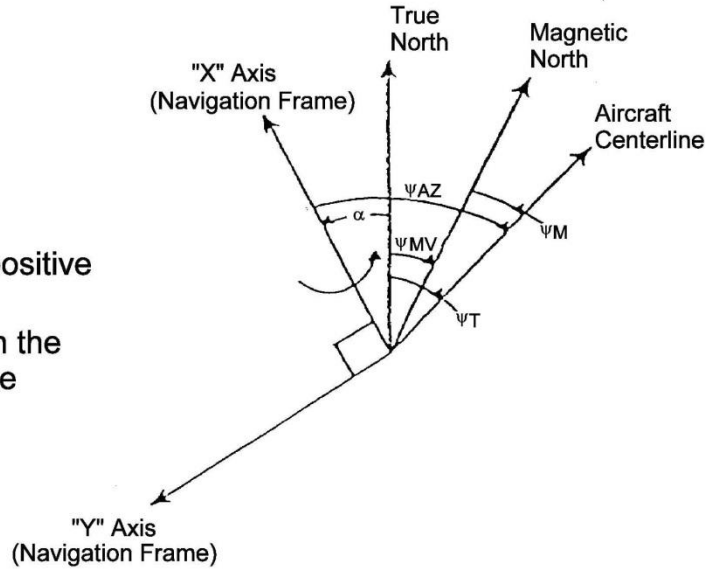
Lateral view (when the Antenna Assy is installed, Z_A is down)



Top view (when the Antenna Assy is installed, Y_A is in direction of the right wing)

Fig. 6.2-3 - Antenna Assy

- Ψ_{AZ} = Platform Azimuth
- Ψ_T = True Heading
- Ψ_{MV} = Magnetic Variation
- Ψ_M = Magnetic Heading
- α = Wander Angle
- "Z" platform axis is positive when directed up
- Latitude is positive in the Northern Hemisphere



- θ_{SC} = Selected Magnetic Course
- Ψ_G = True Ground Track
- Ψ_B = Steerpoint True Bearing
- θ_{RB} = Steerpoint Relative Bearing
- θ_{SE} = Great Circle Steering Error
- θ_{CD} = Course Deviation (positive when steering bar is to the right - a steer to the right is commanded)

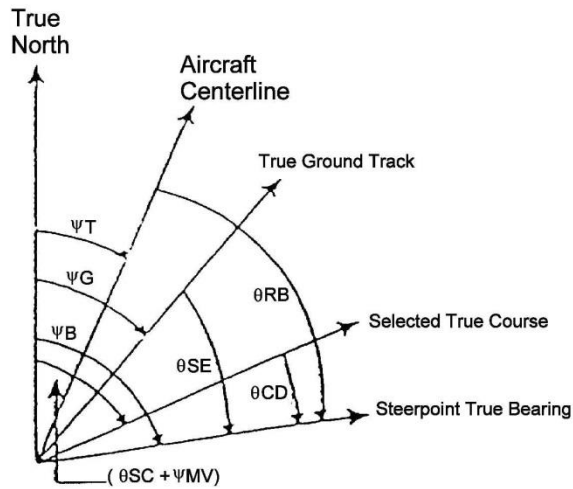


Fig. 6.2-4 - Definition of INU Azimuth Angles

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7. 1553 BUS MESSAGES

The following sections provide the details on the structure of the data exchanged on the 1553 bus between the avionics and the radar.

In particular, section 7.1 describes the messages transferred to the radar (Receive messages) and section 7.2 describes the messages transferred from the radar (Transmit messages).

7.1 Receive Messages

The following sections describe the content and the structure of each message transferred from the avionics to the radar and containing commands, settings, and navigation data for the radar.

7.1.1 Message A1: Radar Operational Setting and Parameter Transfer

Message Name : Radar Operational Setting and Parameter Transfer
Message ID : A1 **Transfer Type** : BC-to-RT
Source : MC **Word Count** : 10
Destination : RDR **Xmit Rate** : 10 Hz

Word Name	Word No	Description	Section
Receive Command Word	CW	To RDR, subaddress 00001 (01)	
Radar Setting	01	Radar general parameters	7.1.1.1
Freq. Agility Setting and Interleave Sel.	02	Required Freq. agility and WF interleaving parameters	7.1.1.2
Beacon delay and code	03	Beacon delay and Beacon code	7.1.1.3
Radar Gains and RF Chan. Grouping Opt.	04	IF and moving target gains and Channel grouping sel.	7.1.1.4
A/C Identifier	05	Contains A/C identifier	7.1.1.5
Date of Mission	06	Provides date of the mission – Synchronization for BIT	7.1.1.6
Time of Mission	07	Provides time of the mission – Synchronization for BIT	7.1.1.7
Parameter Identifier	08	Parameter to be recorded or transmitted by the Radar	7.1.1.8
Parameter Value (Word 1)	09	Value of the parameter to be received by the Radar	7.1.1.9
Parameter Value (Word 2)	10		
Status Word	ST	From RDR	

7.1.1.1 Word A1-01: Radar Setting

Sheet 1 of 4

Word Name	: Radar Setting		
Word ID	: A1/01	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: 10 Hz	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Coded and Numeric	MSB	: NA
Units	: NA	LSB	: NA
		Full scale	: NA

Field Name	Bit No	Description	
A	00-C MSB	Target History	(Note 1)
	01-C LSB		
B	02-N MSB	Radar Symbology Intensity	(Note 2)
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
C	09-C	Ground Target Rejected radial Velocity	(Note 3)
D	10-C	Min Detectable ground target radial velocity	(Note 4)
E	11-C	ALE Blanking Enable/Disable	(Note 5)
F	12-C MSB	Altitude Block Selection	(Note 6)
	13-C LSB		
G	14-C	LPRF/MPRF Look-Up Selection	(Note 7)
H	15	spare	

NOTE 1: Bit 00 and 01 compose a two bit binary coded word (MSB = Bit 00) defining the required target history display, as indicated in Tab. A1/01-A.

This field is served by the Radar only when the Radar is operating in one of the following Master Modes: RWS, TWS, as shown in field A of B7/01.

Tab. A1/01-A - Field A Description

Target History	Bit		Decimal Value	Remarks
	00	01		
Level 1	0	0	00	
Level 2	0	1	01	
Level 3	1	0	02	
Level 4	1	1	03	

NOTE 2: Bit 02 through bit 08 compose a seven bit binary coded word (MSB = Bit 02) which defines the max reference intensity level of the Radar symbology (alphanumeric messages and symbols). The intensity of the three categories A, B, C will be a defined fraction of this max reference value.

NOTE 3: Bit 09 controls the Decluttering level in Air-to-Air modes, as indicated in Tab. A1/01-C.

This field is served by the Radar only when the Radar is operating in one of the following Modes: RWS, SAM, TWS, ACM, VS, as shown in fields A and B of B7/01.

Tab. A1/01-C - Field C Description

Ground Target Rejected Radial Velocity	Bit 09	Decimal Value	Remarks
LOW	0	00	
HIGH	1	01	

NOTE 4: Bit 10 controls the required minimum detectable radial velocity in Air-to-Surface modes, as indicated in Tab. A1/01-D.

This field is served by the Radar only when the Radar is operating in one of the following Modes: SEA-2, GMTI, as shown in fields A and B of B7/01.

Tab. A1/01-D - Field D Description

Min Detect. Ground Target Radial Velocity	Bit 10	Decimal Value	Remarks
LOW	0	00	
HIGH	1	01	

NOTE 5: Bit 11 controls the enabling of the ALE Blanking Function of the Radar, as indicated in Tab. A1/01-E.

This field is served by the Radar only when the Radar is operating in one of the following Modes: RWS, SAM, TWS, as shown in fields A and B of B7/01.

Tab. A1/01-E - Field E Description

ALE Blanking Enable/Disable	Bit 11	Decimal Value	Remarks
ALE Blanking enable	0	00	
ALE Blanking disable	1	01	

NOTE 6: Bit 12 and 13 compose a two bit binary coded word (MSB = Bit 12) defining the required altitude block stabilization, as indicated in Tab. A1/01-F.

This field is served by the Radar only when the Radar is operating in one of the following Modes: RWS, SAM, TWS, VS, as shown in field A of B7/01.

Tab. A1/01-F - Field F Description

Altitude Block Selection	Bit		Decimal Value	Remarks
	12	13		
BTBK	0	0	00	
TPBK	0	1	01	
NORMAL	1	0	02	
spare	1	1	03	

NOTE 7: Bit 14 controls the selection between LPRF and MPRF Look-Up for Look-Up operation, as indicated in Tab. A1/01-G.

The content of this field is significant only if the Radar is operating in RWS, SAM.

Tab. A1/01-G - Field G Description

LPRF/MPRF Look-Up Selection	Bit 14	Decimal Value	Remarks
LPRF	0	00	
MPRF Look-Up	1	01	

7.1.1.2 Word A1-02: Frequency Agility Setting and Interleave selection

Sheet 1 of 4

Word Name	: Frequency Agility Setting and Interleave selection		
Word ID	: A1/02	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: 10 Hz	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Coded	MSB	: NA
Units	: NA	LSB	: NA
		Full scale	: NA

Field Name	Bit No	Description	
A	00-C MSB	Frequency Agility type	(Note 1)
	01-C LSB		
B	02-C	Frequency Group 1 selector	(Note 2)
	03-C	Frequency Group 2 selector	(Note 2)
	04-C	Frequency Group 3 selector	(Note 2)
	05-C	Frequency Group 4 selector	(Note 2)
	06-C	Frequency Group 5 selector	(Note 2)
C	07-C MSB	Frequency channel	(Note 3)
	08-C		
	09-C		
	10-C		
	11-C		
	12-C LSB		
D	13-C MSB	Waveform Interleave Selection	(Note 4)
	14-C LSB		
E	15-C	LPRF Threshold	(Note 5)

Remark:

1) The content of this word is not significant when the Radar is operating in Beacon Mode.

NOTE 1: Bit 00 and 01 compose a two bit binary coded word (MSB = Bit 00) defining the required type of frequency agility scheme to be used on the frequency groups selected in field B of A1/02, as indicated in Tab. A1/02-A.

Tab. A1/02-A - Field A Description

Frequency Agility Type	Bit		Decimal Value	Remarks
	00	01		
FIXED	0	0	00	
RANDOM	0	1	01	
ADAPTIVE	1	0	02	
spare	1	1	03	

NOTE 2: Bits 02, 03, 04, 05 and 06 control the selection of the frequency groups 1, 2, 3, 4 and 5 respectively, as indicated in Tab. A1/02-B.

If the field A of A1/02 is set to "FIXED", this field is disregarded by the Radar.

Tab. A1/02-B - Field B Description

Frequency Group Selector	Bit	Decimal Value	Remarks
Group 1	02		
Group 2	03		
Group 3	04		
Group 4	05		
Group 5	06		
NOT ACTIVE	0	00	
ACTIVE	1	01	

NOTE 3: Bit 07 through bit 12 compose a six bit coded word (MSB = BIT 07) defining the required frequency channel to be used.

The decimal value corresponding to the six bit binary coded word is the number of the selected channel.

The valid range is from 1 to 30.

If the field A of A1/02 is set to "RANDOM" or to "ADAPTIVE", this field is disregarded by the Radar.

NOTE 4: Bit 13 and 14 compose a two bit binary coded word (MSB = Bit 13) defining the selection of Waveform Interleave Scheme performed automatically by the Radar, as Indicated in Tab. A1/02-D.

The content of this field is significant only if the Radar is operating in RWS, SAM modes.

Tab. A1/02-D - Field D Description

Waveform Interleave Selection	Bit		Decimal Value	Remarks
	13	14		
Spare	0	0	00	
Interleave 1	0	1	01	
Interleave 2	1	0	02	
Interleave 3	1	1	03	

NOTE 5: Bit 15 controls the selection (Low/High) of the Threshold for Look-Up Operation, as indicated in Tab. A1/02-E.

The content of this field is significant only if the Radar is operating in RWS, SAM modes, and the LPRF/MPRF Look-Up Selection (field G of A1/01) assumes the value "LPRF".

Tab. A1/02-E - Field E Description

LPRF Threshold Selection	Bit 15	Decimal Value	Remarks
THRESHOLD LOW	0	00	
THRESHOLD HIGH	1	01	

7.1.1.3 Word A1-03: Beacon Delay and Code

Sheet 1 of 2

Word Name	: Beacon Delay and Code		
Word ID	: A1/03	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: NUMERIC and Coded	MSB	: 20.48 (Field A)
Units	: μ sec (Field A)	LSB	: 0.01 (Field A)
		Full scale	: 40.95 (Field A)

Field Name	Bit No	Description	
A	00-N MSB	Beacon Delay	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
B	11-N LSB	Beacon Code	(Note 2)
	12-C MSB		
	13-C		
	14-C		
	15-C LSB		

NOTE 1: Bit 00 through bit 11 represent a 12 bit binary coded word (MSB=BIT 00) indicating the beacon delay which has to be compensated for the beacon range computation. The valid range is from 0.01 to 40.95 μ sec.

This field is served by the Radar only when the Radar is operating in Beacon Master Mode, as shown in field A of B7/01.

NOTE 2: Bit 12 through bit 15 represent a four bit binary coded word (MSB = BIT 12) indicating the beacon code which is required to be decoded.

The valid range is from 0 to 15.

This field is served by the Radar only when the Radar is operating in Beacon Master Mode, as shown in field A of B7/01.

7.1.1.4 Word A1-04: Radar Gains and RF Channels Grouping Options

Sheet 1 of 3

Word Name	: Radar Gains and RF Channels Grouping options		
Word ID	: A1/04	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: CODED and NUMERIC	MSB	: NA
Units	: NA	LSB	: NA
		Full scale	: NA

Field Name	Bit No	Description	
A	00-N MSB	IF (Map) Gain Command	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
B	06-N LSB	Moving Target Gain	(Note 2)
	07-N MSB		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
C	13-N LSB	Frequency Grouping Option Selection	(Note 3)
	14-C		
D	15	spare	

NOTE 1: Bit 00 through 06 represent a 7 bit binary coded word (MSB=BIT 00) indicating the required IF Gain (Map Gain) of the Radar.

This field is served by the Radar only when the Radar is operating in one of the following raw video modes: GM, DBS, SEA-1, GMTI, WA as shown in fields A and B of B7/01.

The valid range is from 0 to 127.

NOTE 2: Bit 07 through 13 represent a 7 bit binary coded word (MSB=BIT 07) indicating the required Moving Target Gain (MTG) of the Radar.

This field is served by the Radar only when the Radar is operating in SEA-2 and GMTI Modes (as shown in fields A and B of B7/01).

Valid range is from 0 to 127

NOTE 3: Bit 14 selects the option of grouping of the RF channels, as indicated in Tab. A1/04-C.

Tab. A1/04-C - Field C Description

Frequency Grouping Selection	Bit 14	Decimal Value	Remarks
Option 1	0	00	
Option 2	1	01	

7.1.1.5 Word A1-05: A/C Identifier

Sheet 1 of 1

Word Name : A/C Identifier
Word ID : A1/05
Source(s) : MC
Comp Rate : NA
Xmit Rate : 10 Hz
Signal Type : Unsigned numeric
Units : NA

Max Value : 65535
Min Value : 0
Resolution : NA
Accuracy : NA
MSB : 32768
LSB : 1
Full scale : 65535

Field Name	Bit No	Description	
A	00-C MSB	A/C Identifier	(Note 1)
	01-C		
	02-C		
	03-C		
	04-C		
	05-C		
	06-C		
	07-C		
	08-C		
	09-C		
	10-C		
	11-C		
	12-C		
	13-C		
	14-C		
	15-C LSB		

NOTE 1: This word is used to identify the aircraft where the Radar is installed.

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7.1.1.6 Word A1-06: Date of Mission

Sheet 1 of 2

Word Name	: Date of Mission		
Word ID	: A1/06	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: NUMERIC	MSB	: NA
Units	: NA	LSB	: NA
		Full scale	: NA

Field Name	Bit No	Description	
A	00-N MSB	Year of mission	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N LSB		
B	06-N MSB	Month of mission	(Note 2)
	07-N		
	08-N		
	09-N LSB		
C	10-N MSB	Day of mission	(Note 3)
	11-N		
	12-N		
	13-N		
	14-N LSB		
D	15	spare	

- NOTE 1:** Bit 00 through bit 05 represent a six bit binary coded word (MSB=BIT 00) indicating the year of the mission. The valid range is from 0 to 63. The value 0 corresponds to year 2000, the value 63 corresponds to year 2063.
- NOTE 2:** Bit 06 through bit 09 represent a four bit binary coded word (MSB = BIT 06) indicating the month of the mission. The valid range is from 1 (which corresponds to January) to 12 (which corresponds to December).
- NOTE 3:** Bit 10 through bit 14 represent a five bit binary coded word (MSB = BIT 10) indicating the day of the mission. The valid range is from 1 to 31.

7.1.1.7 Word A1-07: Time of Mission

Sheet 1 of 1

Word Name	: Time of Mission		
Word ID	: A1/07	Max Value	: 86398
Source(s)	: MC	Min Value	: 0
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: NUMERIC	MSB	: 65536
Units	: sec	LSB	: 2
		Full scale	: 131070

Field Name	Bit No	Description	
A	00-N MSB	Time of mission	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word contains the Time of the day information relevant to the mission, starting from 0 at midnight, which is used by the Radar for time tagging the occurrence of failures detected by the BIT.

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7.1.1.8 Word A1-08: Parameter Identifier

Sheet 1 of 3

Word Name	: Parameter Identifier		
Word ID	: A1/08	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: CODED	MSB	: NA
Units	: NA	LSB	: NA
		Full scale	: NA

Field Name	Bit No	Description	
A	00-C	Parameter Transfer Enable	(Note 1)
B	01-C	Receive/Transmit Selector	(Note 2)
C	02-C MSB	Parameter Identifier	(Note 3)
	03-C		
	04-C		
	05-C		
	06-C		
	07-C		
	08-C		
	09-C LSB		
	D	10	spare
11		spare	
12		spare	
13		spare	
14		spare	
15		spare	

NOTE 1: Bit 00 indicates if the request for transmit/receive a parameter is active, as indicated in Tab. A1/08-A.

Each transfer request commanded in this field has to be held for at least 2 cycles (200 ms) and then reset to the value "NOT ACTIVE". The Radar shall not serve any other request until this field is reset to "NOT ACTIVE" for at least 2 cycles (200 ms).

Tab. A1/08-A - Field A Description

Parameter Transfer Enable	Bit 00	Decimal Value	Remarks
NOT ACTIVE	0	00	a)
ACTIVE	1	01	b)

Remark a) If this field is set to "NOT ACTIVE", no request of transmit/receive of parameters is present. Consequently, the content of fields B and C of this word and the content of words A1/09 and A1/10 are not significant

Remark b) If this field is set to "ACTIVE", a request of transmit/receive of the parameter indicated in field C is in progress.

NOTE 2: Bit 01 selects the operation to be done on the parameter, as indicated in Tab. A1/08-B.

Tab. A1/08-B - Field B Description

Receive/Transmit Selector	Bit 00	Decimal Value	Remarks
RECEIVE	0	00	a)
TRANSMIT	1	01	b)

Remark a) If this field is set to "RECEIVE", the parameter identified in field C is available in words A1/09 and A1/10, and can be read by the Radar.

Remark b) If this field is set to "TRANSMIT", the parameter identified in field C has to be provided in output by the Radar in message B9.

NOTE 3: Bit 02 through bit 09 compose an eight bit binary coded word (MSB = Bit 02) which identifies the parameter which has to be received/transmitted by the Radar.
 The parameters received/transmitted by the Radar are listed in the table here below:

Parameter Description	Parameter identifier	Remarks
Antenna harmonization angle: Yaw	01	a), d)
Antenna harmonization angle: Pitch	02	a), d)
Antenna harmonization angle: Roll	03	a), d)
Bulkhead X displacement	04	a), e)
Bulkhead Y displacement	05	a), e)
Bulkhead Z displacement	06	a), e)
Symbol intensity (Cat. A)	11	b), f)
Symbol intensity (Cat. B)	12	b), f)
Symbol intensity (Cat. C)	13	b), f)
Waveform Command	21	c), g)
Cut off Velocity	31	c), g)
Range threshold for AWS	41	c), g)
Test parameter #1 for new modes	51	c), g)
Test parameter #2 for new modes	52	c), g)
Test parameter #3 for new modes	53	c), g)
Test parameter #4 for new modes	54	c), g)
White Level for SAR images	61	b)
Black Level for SAR images	62	b)
Pre-Compression Factor for SAR images	63	b)
Data Recording	71	c), h)
Present Position	81	i)

- Remark a) When received from MC, the value of this parameter is stored by the Radar in EEPROM, and used starting from the next Power-On.
- Remark b) When received from MC, the value of this parameter is stored by the Radar in EEPROM, and used immediately.
- Remark c) When received from MC, the value of this parameter is used immediately. It is not stored in EEPROM, and consequently it is lost (and the default value resumed) at the next Radar Power-Off.
- Remark d) This parameter is defined in section 6.2.10.
- Remark e) This parameter is defined in section 6.2.11.
- Remark f) This parameter is defined in SES Document SA5169.
- Remark g) This parameter is reserved for experimental purposes.

- Remark h) This parameter is used to enable the recording of internal settings and signal at different point in the processing chain.
- Remark i) This parameter is 0 if present position is provided by INU, 1 if provided by the radar itself

7.1.1.9 Word A1-09/10: Parameter Value

Sheet 1 of 13

Word Name : Parameter Value (word 1 and 2)

Word ID : A1/09-10

Source(s) : MC

Comp Rate : NA

Xmit Rate : 10 Hz

Signal Type : CODED

Units : NA

Max Value : NA

Min Value : NA

Resolution : NA

Accuracy : NA

MSB : NA

LSB : NA

Full scale : NA

Field Name	Bit No	Description
MSW	00-C MSB	Parameter value (Word 1) (Note 1)
	01-C	
	02-C	
	03-C	
	04-C	
	05-C	
	06-C	
	07-C	
	08-C	
	09-C	
	10-C	
	11-C	
	12-C	
	13-C	
	14-C	
15-C		
LSW	00-C	Parameter value (Word 2)
	01-C	
	02-C	
	03-C	
	04-C	
	05-C	
	06-C	
	07-C	
	08-C	
	09-C	
	10-C	
	11-C	
	12-C	
	13-C	
	14-C	
15-C LSB		

NOTE 1: These two words contain the value of the parameter, identified by the value in field C of word A1/08, which has to be received by the Radar. These words are significant only when the field B of A1/08 is set to "RECEIVE". The format for all the parameters, except those reserved for experimental purposes, is described in the following pages.

Word Name	: Antenna harmonization angle: Yaw		
Word ID	: A1/09-10: Parameter 1	Max Value	: 1.0
Source(s)	: MC	Min Value	: -1.0
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 0.5
Units	: Semicircles	LSB	: 3.05176E-05
		Full scale	: 1.0

Field Name	Bit No	Description
MSW	00	spare
	01	spare
	02	spare
	03	spare
	04	spare
	05	spare
	06	spare
	07	spare
	08	spare
	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
15	spare	
LSW	00 SIGN	Antenna harmonization angle: Yaw
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N LSB		

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Word Name	: Antenna harmonization angle: Pitch		
Word ID	: A1/09-10: Parameter 2	Max Value	: 0.5
Source(s)	: MC	Min Value	: -0.5
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 0.5
Units	: Semicircles	LSB	: 3.05176E-05
		Full scale	: 1.0

Field Name	Bit No	Description
MSW	00	spare
	01	spare
	02	spare
	03	spare
	04	spare
	05	spare
	06	spare
	07	spare
	08	spare
	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
15	spare	
LSW	00 SIGN	Antenna harmonization angle: Pitch
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N LSB		

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Word Name : Antenna harmonization angle: Roll

Word ID : A1/09-10: Parameter 3

Source(s) : MC

Comp Rate : NA

Xmit Rate : 10 Hz

Signal Type : 2's complement

Units : Semicircles

Max Value : 1.0

Min Value : -1.0

Resolution : NA

Accuracy : NA

MSB : 0.5

LSB : 3.05176E-05

Full scale : 1.0

Field Name	Bit No	Description
MSW	00	spare
	01	spare
	02	spare
	03	spare
	04	spare
	05	spare
	06	spare
	07	spare
	08	spare
	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
15	spare	
LSW	00 SIGN	Antenna harmonization angle: Roll
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N LSB		

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Word Name	: Bulkhead X displacement		
Word ID	: A1/09-10: Parameter 4	Max Value	: 15,000
Source(s)	: MC	Min Value	: -15,000
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 16,384
Units	: Millimeters	LSB	: 1.0
		Full scale	: 32,767

Field Name	Bit No	Description
MSW	00	spare
	01	spare
	02	spare
	03	spare
	04	spare
	05	spare
	06	spare
	07	spare
	08	spare
	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
15	spare	
LSW	00 SIGN	Bulkhead X displacement
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
11-N		
12-N		
13-N		
14-N		
15-N LSB		

Word Name	: Bulkhead Y displacement		
Word ID	: A1/09-10: Parameter 5	Max Value	: 15,000
Source(s)	: MC	Min Value	: -15,000
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 16,384
Units	: Millimeters	LSB	: 1.0
		Full scale	: 32,767

Field Name	Bit No	Description
MSW	00	spare
	01	spare
	02	spare
	03	spare
	04	spare
	05	spare
	06	spare
	07	spare
	08	spare
	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
15	spare	
LSW	00 SIGN	Bulkhead Y displacement
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
11-N		
12-N		
13-N		
14-N		
15-N LSB		

Word Name	: Bulkhead Z displacement		
Word ID	: A1/09-10: Parameter 6	Max Value	: 15,000
Source(s)	: MC	Min Value	: -15,000
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 16,384
Units	: Millimeters	LSB	: 1.0
		Full scale	: 32,767

Field Name	Bit No	Description
MSW	00	spare
	01	spare
	02	spare
	03	spare
	04	spare
	05	spare
	06	spare
	07	spare
	08	spare
	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
15	spare	
LSW	00 SIGN	Bulkhead Z displacement
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
11-N		
12-N		
13-N		
14-N		
15-N LSB		

Word Name : Symbol Intensity (Cat. A)

Word ID : A1/09-10: Parameter 11

Source(s) : MC

Comp Rate : NA

Xmit Rate : 10 Hz

Signal Type : CODED

Units : NA

Max Value : NA

Min Value : NA

Resolution : NA

Accuracy : NA

MSB : NA

LSB : NA

Full scale : NA

Field Name	Bit No	Description
MSW	00	spare
	01	spare
	02	spare
	03	spare
	04	spare
	05	spare
	06	spare
	07	spare
	08	spare
	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
15	spare	
LSW	00	spare
	01	spare
	02	spare
	03	spare
	04	spare
	05	spare
	06	spare
	07	spare
	08	spare
	09	spare
10	spare	
11	spare	
12-C MSB	Symbol Intensity (Cat. A)	(Note 1)
13-C		
14-C		
15-C LSB		

NOTE 1: Bit 12 through bit 15 compose a four bit binary coded word (MSB = Bit 12) which identifies the Symbol intensity for Category A. The value 0 corresponds to max value and the value 15 corresponds to OFF.

Word Name : Symbol Intensity (Cat. B)

Word ID : A1/09-10: Parameter 12

Source(s) : MC

Comp Rate : NA

Xmit Rate : 10 Hz

Signal Type : CODED

Units : NA

Max Value : NA

Min Value : NA

Resolution : NA

Accuracy : NA

MSB : NA

LSB : NA

Full scale : NA

Field Name	Bit No	Description
MSW	00	spare
	01	spare
	02	spare
	03	spare
	04	spare
	05	spare
	06	spare
	07	spare
	08	spare
	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
15	spare	
LSW	00	spare
	01	spare
	02	spare
	03	spare
	04	spare
	05	spare
	06	spare
	07	spare
	08	spare
	09	spare
	10	spare
11	spare	
	12-C MSB	Symbol Intensity (Cat. B) (Note 1)
	13-C	
	14-C	
	15-C LSB	

NOTE 1: Bit 12 through bit 15 compose a four bit binary coded word (MSB = Bit 12) which identifies the Symbol intensity for Category B. The value 0 corresponds to max value and the value 15 corresponds to OFF.

Word Name	: Symbol Intensity (Cat. C)		
Word ID	: A1/09-10: Parameter 13	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: CODED	MSB	: NA
Units	: NA	LSB	: NA
		Full scale	: NA

Field Name	Bit No	Description	
MSW	00	spare	
	01	spare	
	02	spare	
	03	spare	
	04	spare	
	05	spare	
	06	spare	
	07	spare	
	08	spare	
	09	spare	
	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
15	spare		
LSW	00	spare	
	01	spare	
	02	spare	
	03	spare	
	04	spare	
	05	spare	
	06	spare	
	07	spare	
	08	spare	
	09	spare	
10	spare		
	11	spare	
	12-C MSB	Symbol Intensity (Cat. C)	(Note 1)
	13-C		
	14-C		
	15-C LSB		

NOTE 1: Bit 12 through bit 15 compose a four bit binary coded word (MSB = Bit 12) which identifies the Symbol intensity for Category C. The value 0 corresponds to max value and the value 15 corresponds to OFF.

Word Name	: White Level for SAR images		
Word ID	: A1/09-10: Parameter 61	Max Value	: 0.9999847
Source(s)	: MC	Min Value	: 0.0000
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Unsigned numeric	MSB	: 0.5000007629
Units	: NA	LSB	: 15.2590·10 ⁻⁶
		Full scale	: 0.9999847

Field Name	Bit No	Description	
MSW	00	spare	
	01	spare	
	02	spare	
	03	spare	
	04	spare	
	05	spare	
	06	spare	
	07	spare	
	08	spare	
	09	spare	
	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	
LSW	00-N MSB	White Level for SAR images	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: Bit 00 through bit 15 compose a sixteen bit word which identifies the value of White Level used when SAR images are displayed on Radar video.

Word Name : Black Level for SAR images

Word ID : A1/09-10: Parameter 62

Source(s) : MC

Comp Rate : NA

Xmit Rate : 10 Hz

Signal Type : Unsigned numeric

Units : NA

Max Value : 0.9999847

Min Value : 0.0000

Resolution : NA

Accuracy : NA

MSB : 0.5000007629

LSB : 15.2590·10⁻⁶

Full scale : 0.9999847

Field Name	Bit No	Description
MSW	00	spare
	01	spare
	02	spare
	03	spare
	04	spare
	05	spare
	06	spare
	07	spare
	08	spare
	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
	15	spare
LSW	00-N MSB	Black Level for SAR images (Note 1)
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

NOTE 1: Bit 00 through bit 15 compose a sixteen bit word which identifies the value of Black Level used when SAR images are displayed on Radar video.

Word Name	: Pre-Compression Factor for SAR images		
Word ID	: A1/09-10: Parameter 63	Max Value	: 0.9999847
Source(s)	: MC	Min Value	: 0.0000
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Unsigned numeric	MSB	: 0.5000007629
Units	: NA	LSB	: 15.2590·10 ⁻⁶
		Full scale	: 0.9999847

Field Name	Bit No	Description	
MSW	00	spare	
	01	spare	
	02	spare	
	03	spare	
	04	spare	
	05	spare	
	06	spare	
	07	spare	
	08	spare	
	09	spare	
	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	
LSW	00-N MSB	Pre-Compression Factor for SAR images	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: Bit 00 through bit 15 compose a sixteen bit word which identifies the value of Pre-Compression Factor used when SAR images are displayed on Radar video.

Word Name Data Recording Commands

Word ID	: A1/09-10: Parameter 71	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: CODED	MSB	: NA
Units	: NA	LSB	: NA
		Full scale	: NA

Field Name	Bit No	Description	
MSW	00	spare	
	01	spare	
	02	spare	
	03	spare	
	04	spare	
	05	spare	
	06	spare	
	07	spare	
	08	spare	
	09	spare	
	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
15	spare		
LSW	00	spare	
	01	spare	
	02	spare	
	03	spare	
	04	spare	
	05	spare	
	06	spare	
	07	spare	
	08	spare	
	09	spare	
	10	spare	
	11-C MSB	Data Recording	(Note 1)
	12-C		
	13-C		
	14-C		
15-C LSB			

NOTE 1: Bit 11 through bit 15 compose a five bit binary coded word (MSB = Bit 11) which identifies the configuration for data recording. The configurations set ranges from 0 to 20 according to the table below.

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Configuration ID	
0	No recording
1	DSP OUT – DSP IN – MTI OUT
2	DSP OUT – DSP IN – SH - MTI OUT
3	DSP OUT – DSP IN – SH - CFAR OUT
4	DSP OUT – DSP IN – MTI_IN
5	DSP OUT – DSP IN – TMC – MTI_OUT
6	DSP OUT – DSP IN – TMC – CFAR OUT
7	DSP OUT – DSP IN – PGA - MTI_OUT
8	DSP OUT – DSP IN – PGA - CFAR_OUT
9	DSP OUT – DSP IN – SH – MTI_IN
10	DSP OUT – DSP IN – SC – MTI_OUT
11	DSP OUT – DSP IN – RMC – MTI_OUT
12	DSP OUT – DSP IN – DELTA – MTI_OUT
13	Spare
14	Spare
15	Spare
16	Spare
17	Spare
18	Spare
19	Spare
20	Spare

Word Name	Present Position Selection for HR modes		
Word ID	: A1/09-10: Parameter 81	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: CODED	MSB	: NA
Units	: NA	LSB	: NA
		Full scale	: NA

Field Name	Bit No	Description
MSW	00	spare
	01	spare
	02	spare
	03	spare
	04	spare
	05	spare
	06	spare
	07	spare
	08	spare
	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
15	spare	
LSW	00	spare
	01	spare
	02	spare
	03	spare
	04	spare
	05	spare
	06	spare
	07	spare
	08	spare
	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
15-C	Present Position	

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7.1.2 Message A2: Radar Operation Command

Message Name : Radar Operation Command

Message ID : A2

Source : MC

Destination : RDR

Transfer Type : BC-to-RT

Word Count : 3

Xmit Rate : 25 Hz

Word Name	Word No	Description	Section
Receive Command Word	CW	To RDR, subaddress 00010 (02)	
Radar Mode Command	01	Required RDR mode	7.1.2.1
RDR functions and parameters (word#1)	02	Functions and parameters of the RDR mode (word#1)	7.1.2.2
RDR functions and parameters (word#2)	03	Functions and parameters of the RDR mode (word#2)	7.1.2.3
Status Word	ST	From RDR	

7.1.2.1 Word A2-01: Radar Mode Command

Sheet 1 of 6

Word Name	: RDR Mode Command		
Word ID	: A2/01	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: 25 Hz	Resolution	: NA
Xmit Rate	: 25 Hz	Accuracy	: NA
Signal Type	: Coded	MSB	: NA
Units	: NA	LSB	: NA

Field Name	Bit No	Description	
A	00-C MSB	Radar master Mode selection	(Note 1,2)
	01-C		
	02-C		
	03-C LSB		
B	04-C MSB	Designation Control	(Note 3)
	05-C		
	06-C LSB		
C	07-C	INT-BIT Function Selection	(Note 4)
D	08-C	STBY Function Selection	(Note 5)
E	09-C	FREEZE Function Selection	(Note 6)
F	10-C	Reserved (Power-Up Stop Function Selection)	(Note 7)
G	11-C	Reserved	(Note 8)
H	12-C	Reserved (Silence Function Selection)	(Note 9)
I	13	SAR Type selector	(Note 10)
J	14	spare	
	15	spare	

Remarks:

- The fields composing this word are served by the Radar with the following priority order:
 F - G - C - D - A - B - E - H - I
 If a transition is commanded in a field, another transition commanded in a field with lower priority is not served until the first transition is completed.

NOTE 1: Bit 00 through 03 compose a four bit binary coded word (MSB = Bit 00) defining the required Radar operating mode, as indicated in Tab. A2/01-A.

The content of this field represents the Master Mode in which the Radar is commanded to operate.

Whenever the field A of B7/01 is set to “DLY” or the field C of B7/01 is set to “INT-BIT In Progress”, this field is disregarded by the Radar.

Tab. A2/01-A - Field A Description

Master Mode Selection	Bit				Decimal Value	Remarks
	00	01	02	03		
RWS	0	0	0	0	00	
VS	0	0	0	1	01	
ACM	0	0	1	0	02	
TWS	0	0	1	1	03	
spare	0	1	0	0	04	
GM	0	1	0	1	05	
SEA-1	0	1	1	0	06	
SEA-2	0	1	1	1	07	
GMTI	1	0	0	0	08	
BCN	1	0	0	1	09	
AGR	1	0	1	0	10	
TA	1	0	1	1	11	
WA	1	1	0	0	12	

(Note: decimal values from 13 to 15 are for spare).

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NOTE 3:

Bit 04 through 06 compose a three bit binary coded word defining the required designation command, as indicated in Tab. A2/01-B.

The content of this field represents a request of transition among the status of the Master Mode currently performed by the Radar.

Each selection commanded in this field has to be held for at least 2 cycles (80 ms) and then reset to the value "NOT VALID". The Radar shall not serve any other transition neither in field A nor in field B until the field B is reset to "NOT VALID" for at least 2 cycles (80 ms).

Whenever the field A of B7/01 is set to "DLY", or the field C of B7/01 is set to "INT-BIT In Progress", or the field D of B7/01 is set to "STBY ON", this field is disregarded by the Radar.

Tab. A2/01-B - Field B Description

Designation Control	Bit			Decimal Value	Remarks
	04	05	06		
LOCK-ON Enable	0	0	0	00	
LOCK-ON Enable DTT	0	0	1	01	
Transfer HPT Bug	0	1	0	02	
REJECT	0	1	1	03	
LOCK-ON Enable STT	1	0	0	04	
DESIGNATE Track Label	1	0	1	05	
Execute SAR	1	1	0	06	
NOT VALID	1	1	1	07	

NOTE 4: Bit 07 controls the INT-BIT function of the Radar, as indicated in Tab. A2/01-C.
Whenever the field A of B7/01 is set to "DLY" this field is disregarded by the Radar.

Tab. A2/01-C - Field C Description

INT-BIT Function selection	Bit 07	Decimal Value	Remarks
NORMAL	0	00	
INT-BIT Request	1	01	

NOTE 5: Bit 08 controls the Stand-By function of the Radar, as indicated in Tab. A2/01-D.
Whenever the field A of B7/01 is set to "DLY" or the field C of B7/01 is set to "INT-BIT In Progress", this field is disregarded by the Radar.

Tab. A2/01-D - Field D Description

STBY Function selection	Bit 08	Decimal Value	Remarks
STBY OFF	0	00	
STBY ON	1	01	

NOTE 6: Bit 09 controls the FREEZE function of the Radar, as indicated in Tab. A2/01-E.

Whenever the field A of B7/01 is set to “DLY” or the field C of B7/01 is set to “INT-BIT In Progress” or the field D of B7/01 is set to “STBY ON”, this field is disregarded by the Radar.

This field is served by the Radar only when the Radar is operating in one of the following Master Modes: GM, SEA-1, SEA-2, GMTI, as indicated in field A of B7/01, and in BCN Master Mode, when one scan bar is performed, as indicated in field A of B7/01 and in field G of B7/02.

Tab. A2/01-E - Field E Description

FREEZE Function selection	Bit 09	Decimal Value	Remarks
NORMAL	0	00	
FREEZE	1	01	

NOTE 7: Bit 10 controls the Power-Up Stop function of the Radar, as indicated in Tab. A2/01-F.

This field is served by the Radar only when the Radar is performing the warm-up sequence (as indicated by the value “DLY” in field A of B7/01) and the first 90 seconds after the setting to “1” of the FRC RT READY discrete are elapsed.

This field is always set to “NORMAL” by the MC.

Tab. A2/01-F - Field F Description

Power-Up Stop Function selection	Bit 10	Decimal Value	Remarks
NORMAL	0	00	
STOP	1	01	

NOTE 8: This field is reserved.

It is always set to decimal value "00" by the MC.

NOTE 9: Bit 12 controls the SILENCE function of the Radar, as indicated in Tab. A2/01-H.

This field is always set to "SILENCE OFF" by the MC.

Tab. A2/01-H - Field H Description

Silence Function selection	Bit 12	Decimal Value	Remarks
SILENCE OFF	0	00	
SILENCE ON	1	01	

NOTE 10: Bit 13 controls the "type" of SAR selected, that could be requested as soon as "Execute SAR" commands is issued with Designation Control, as indicated in Tab. A2/01-I.

Tab. A2/01-I - Field I Description

SAR Type selection	Bit 13	Decimal Value	Remarks
SAR on Cursor	0	00	
SAR on SPOI	1	01	a)

a) Execute SAR in A2-01 field B, with "SAR on SPOI" selection shall be ignored when Radar is in track, i.e. when B7/01, field B value is STT, DTT, SAM, AGR Lock-On.

7.1.2.2 Word A2-02: Radar Functions and Parameters (word#1)

Sheet 1 of 8

Word Name	: RDR Functions and Parameters (word#1)	Max Value	: NA
Word ID	: A2/02	Min Value	: NA
Source(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 25 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00-C	RWS submode Selection	(Note 1)
B	01-C	SPOT function Selection	(Note 2)
C	02-C MSB	ACM submode Selection	(Note 3)
	03-C		
	04-C LSB		
D	05-C	GM submode Selection	(Note 4)
E	06-C MSB	Expand function Selection	(Note 5)
	07-C LSB		
F	08-C MSB	Range Scale Selection	(Note 6)
	09-C LSB		
G	10-C MSB	Number of Bars Selection	(Note 7)
	11-C LSB		
H	12-C MSB	Azimuth Scan Width Selection	(Note 8)
	13-C LSB		
I	14-C	Velocity Scale Selection	(Note 9)
J	15	spare	

Remark:

- Whenever the field A of B7/01 is set to "DLY" or the field C of B7/01 is set to "INT-BIT in Progress", this word is disregarded by the Radar.

NOTE 1: Bit 00 controls the RWS submode selection, as indicated in Tab. A2/02-A.

This field is served by the Radar only when the RWS Master Mode is selected, as shown by field A of A2/01.

Tab. A2/02-A - Field A Description

RWS Submode selection	Bit 00	Decimal Value	Remarks
RWS NAM	0	00	
RWS ASM	1	01	

NOTE 2: Bit 01 controls the SPOT function selection, as indicated in Tab. A2/02-B.

This field is served by the Radar only if the selected mode is RWS, VS, TWS or SAM, as shown by fields A and B of A2/01.

Tab. A2/02-B - Field B Description

SPOT Function selection	Bit 01	Decimal Value	Remarks
NORMAL	0	00	
SPOT	1	01	

NOTE 3: Bit 02 through bit 04 compose a three bit binary coded word (MSB=BIT 02) controlling the ACM submode selection, as indicated in Tab. A2/02-C.

This field is served by the Radar only when the mode ACM is selected, as shown by field A of A2/01.

Tab. A2/02-C - Field C Description

ACM submode selection	Bit			Decimal Value	Remarks
	02	03	04		
BORESIGHT	0	0	0	00	
NARROW	0	0	1	01	
HUD	0	1	0	02	
WIDE	0	1	1	03	
VERTICAL	1	0	0	04	
SLEWABLE	1	0	1	05	
spare	1	1	0	06	
spare	1	1	1	07	

NOTE 4: Bit 05 controls the GM submode selection, as indicated in Tab. A2/02-D.

This field is served by the Radar only when the mode GM is selected, as shown by field A of A2/01.

Tab. A2/02-D - Field D Description

GM Submode selection	Bit 05	Decimal Value	Remarks
RBM	0	00	
DBS	1	01	

NOTE 5: Bit 06 and 07 compose a two bit binary coded word (MSB=BIT 06) controlling the Expand function selection, as indicated in Tab. A2/02-E.

This field is not served by the Radar while RWS, VS, ACM, AGR, TWS (without HPT), STT, FTT, SMTT, GMTT, SSTT, WA, TA is being performed, as specified by fields A and B of B7/01.

This field is not served by the Radar also while BCN Master Mode is being performed, in the case that two bars are executed (BCN A/A), as indicated in field A of B7/01 and in field G of B7/02.

This field is not served by the Radar while the FREEZE function is being performed, as indicated by the value "FREEZE" in field E of B7/01.

Tab. A2/02-E - Field E Description

EXPAND Function selection	Bit		Decimal Value	Remarks
	06	07		
NORMAL	0	0	00	
EXPAND	0	1	01	
spare	1	0	02	
spare	1	1	03	

NOTE 6: Bit 08 and 09 compose a two bit binary coded word (MSB=BIT 08) defining the required range full scale, as indicated in Tab. A2/02-G.

Tab. A2/02-G - Field G Description

Range Scale selection	Bit		Decimal Value	Remarks
	08	09		
80 NM	0	0	00	a)
40 NM	0	1	01	b), c)
20 NM	1	0	02	
10 NM	1	1	03	d)

Remark a) The value "80 NM" in this field cannot be selected in DBS, GMTI, SEA-2, GMTT and SMTT modes.

Remark b) The value "40 NM" in this field cannot be selected in DBS mode.

Remark c) When the Radar is commanded to operate in VS (as indicated by field A of A2/01) this value has to be selected.

Remark d) When the Radar is commanded to operate in ACM, AGR or TA (as indicated by field A of A2/01) this value has to be selected.

NOTE 7: Bit 10 and 11 compose a two bit binary coded word (MSB=BIT 10) defining the required number of elevation bars, as indicated in Tab. A2/02-G.

This field is disregarded by the Radar when either the SPOT function is commanded (as indicated by field B of A2/02) or one of the following modes is selected: RWS or SAM (with ASM submode selected), TWS, ACM, GM, SEA-1, SEA-2, GMTI, AGR, TA, WA. This field is also disregarded if the radar is performing a Single Target Track mode (i.e. STT, FTT, SSTT, GMTT, SMTT).

In these cases the number of bars is either not applicable or automatically selected by the Radar.

Tab. A2/02-G - Field G Description

Number of Bars selection	Bit		Decimal Value	Remarks
	10	11		
1 bar	0	0	00	
2 bars	0	1	01	
spare	1	0	02	
4 bars	1	1	03	a)

Remark a) The value "4 bars" in this field cannot be selected in BCN mode.

NOTE 8: Bit 12 and 13 compose a two bit binary coded word (MSB=BIT 12) defining the required azimuth scan width as indicated in Tab. A2/02-I.

Azimuth scan width is defined as the azimuth angle scanned by the antenna Line-of-Sight (LOS) in the polar system associated to the X, Y, Z Navigation Frame.

This field is disregarded by the Radar when:

- The ASM submode of the RWS is selected (Field A of A2/01 set to "RWS" and field A of A2/02 set to "RWS ASM");
- The SPOT function is selected (field B of A2/02 set to "SPOT");
- ACM or AGR mode is selected (field A of A2/01 set to "ACM" or to "AGR");
- STT, FTT, SSTT or SMTT mode is being performed.

If the Radar is operating in SAM (Field A of B7/01 set to "RWS" and field B of B7/01 set to "SAM"), the content of this field represents the desired azimuth scan width.

Tab. A2/02-H - Field H Description

Azimuth Scan width selection	Bit		Decimal Value	Remarks
	12	13		
±60° (±45°)	0	0	00	a), c), d)
±30°	0	1	01	a)
±25°	1	0	02	b)
±15°	1	1	03	

Remark a) This value of the azimuth scan width cannot be selected when TWS Master Mode is commanded (field A of A2/01 set to "TWS").

Remark b) This value of the azimuth scan width can be selected only when TWS Master Mode is commanded (field A of A2/01 set to "TWS").

Remark c) When either GMTI or SEA-2 mode is commanded (field A of A2/01 set to "GMTI" or to "SEA-2"), this value of the azimuth scan width corresponds to ±45°, otherwise to ±60°.

Remark d) When TA mode is commanded (field A of A2/01 set to "TA"), this value of the azimuth scan width cannot be selected.

NOTE 9: Bit 14 defines the required radial closing velocity full scale, as indicated in Tab. A2/02-I.

This field is considered by the Radar only when VS mode is commanded.

Tab. A2/02-I - Field I Description

Radial closing velocity selection	Bit 14	Decimal Value	Remarks
2400 Kts	0	00	
1200 Kts	1	01	

7.1.2.3 Word A2-03: Radar Functions and Parameters (word#2)

Sheet 1 of 3

Word Name	: RDR Functions and Parameters (word#2)		
Word ID	: A2/03	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: 25 Hz	Resolution	: NA
Xmit Rate	: 25 Hz	Accuracy	: NA
Signal Type	: Coded	MSB	: NA
Units	: NA	LSB	: NA
		Full scale	: NA

Field Name	Bit No	Description	
A	00	spare	(Note 1)
	01	spare	
	02	spare	
	03	spare	
B	04-C MSB	Zoom Command	(Note 2)
	05-C LSB		
C	06-C MSB	SAR Map Orientation	(Note 3)
	07-C LSB		
D	08		
	09		
	10		
	11		
	12		
	13		
	14		
	15		

Sheet 2 of 3

NOTE 1: Not applicable

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NOTE 2: Bit 04 and 05 compose a two bit coded word (MSB=BIT 04) controlling the Zoom Command, as indicated in Tab. A2/03-B.
 This field is served by the Radar while either SSAR or ISAR is being performed, as specified by field A and B of B7/01, or the SAR mode is enabled, as specified by field E of B6/16.

Each selection commanded in this field has to be held for at least 2 cycles (80 ms) and then reset to value "NOT ACTIVE". The Radar shall not serve any further transition until the field E is reset to "NOT ACTIVE" for at least 2 cycles (80 ms).

This field is not served by the Radar while the FREEZE function is being performed, as indicated by the value "FREEZE" in field E of B7/01.

Tab. A2/03-B – Field B Description

Zoom Command	Bit		Decimal Value	Remarks
	04	05		
NOT ACTIVE	0	0	00	
ZOOM-IN	0	1	01	
ZOOM-OUT	1	0	02	
spare	1	1	03	

NOTE 3: Bit 06 and 07 compose a two bit binary coded word (MSB = Bit 06) identifying the Map Orientation selected for the representation of SAR images, as indicated in Tab. A2/03-C.

Tab. A2/03-C - Field C Description

SAR Map Orientation	Bit		Decimal Value	Remarks
	06	07		
A/C Nose Reference	0	0	00	
Slant/Cross Range	0	1	01	
Not Used	1	0	02	
Not Used	1	1	03	

7.1.3 Message A3: Graphic Settings
Message Name : Graphic Setting

Message ID : A3

Source : MC

Destination : RDR

Transfer Type : BC-to-RT

Word Count : 32

Xmit Rate : 10 Hz

Word Name	Word No	Description	Section
Receive Command Word	CW	To RDR, subaddress 00011 (03)	
Graphic Order	01		7.1.3.1
Time-to-Go to Cursor	02		7.1.3.2
Waypoint 1 Latitude/Selector/Qualifier (MSW)	03		7.1.3.3
Waypoint 1 Latitude/Selector/Qualifier (LSW)	04		
Waypoint 1 Longitude/Code (MSW)	05		7.1.3.4
Waypoint 1 Longitude/Code (LSW)	06		
Waypoint 2 Latitude/Selector/Qualifier (MSW)	07		7.1.3.5
Waypoint 2 Latitude/Selector/Qualifier (LSW)	08		
Waypoint 2 Longitude/Code (MSW)	09		7.1.3.6
Waypoint 2 Longitude/Code (LSW)	10		
Waypoint 3 Latitude/Selector/Qualifier (MSW)	11		7.1.3.7
Waypoint 3 Latitude/Selector/Qualifier (LSW)	12		
Waypoint 3 Longitude/Code (MSW)	13		7.1.3.8
Waypoint 3 Longitude/Code (LSW)	14		
Intercept Flight Director X/Selectors	15		7.1.3.9
Intercept Flight Director Y	16		7.1.3.10
Intercept Zone Rmin	17		7.1.3.11
Intercept Zone Rmax	18		7.1.3.12
No Escape Zone Rmax	19		7.1.3.13
Intercept Zone Target Tip	20		7.1.3.14
ASEC Radius and Selector	21		7.1.3.15
Attack Steering Cue X / Selector	22		7.1.3.16
Attack Steering Cue Y	23		7.1.3.17
Tracked tgt Info (Intercept and Data link)	24		7.1.3.18
HPT Call Sign (MSW)	25		7.1.3.19
HPT Call Sign (LSW)	26		
SPT Call Sign (MSW)	27		7.1.3.20
SPT Call Sign (LSW)	28		
Track Id of TWS Tracked tgts 01 and 02	29		7.1.3.21
Track Id of TWS Tracked tgts 03 and 04	30		7.1.3.22
Track Id of TWS Tracked tgts 05 and 06	31		7.1.3.23
Track Id of TWS Tracked tgts 07 and 08	32		7.1.3.24
Status Word	ST	From RDR	

7.1.3.1 Word A3-01: Graphic Order

Sheet 1 of 2

Word Name	: Graphic Order		
Word ID	: A3/01	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Coded	MSB	: NA
Units	: NA	LSB	: NA
		Full scale	: NA

Field Name	Bit No	Description	
A	00-C	Waypoint 1	(Note 1)
	01-C	Waypoint 2	(Note 1)
	02-C	Waypoint 3	(Note 1)
	03-C	Intercept Flight Director	(Note 1)
	04-C	Break Away Cue	(Note 1)
	05-C	Intercept zones and Target tip	(Note 1)
	06-C	Time-to-Go to Cursor	(Note 1)
	07-C	Allowable Steering Error Circle	(Note 1)
B	08-C	Attack Steering Cue	(Note 1)
	09-C	Bull's Eye Identifier	(Note 2)
C	10-C		
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

NOTE 1: If this bit is set to "1", the relevant alphanumeric message/symbol has to be displayed.

NOTE 2: Bit 09 and 10 compose a two bit binary coded word (MSB = Bit 09) identifying the Waypoint selected as Bull's Eye, as indicated in Tab. A3/01-B.

Tab. A3/01-B - Field B Description

Bull's Eye Identifier	Bit		Decimal Value	Remarks
	09	10		
No Bull's Eye	0	0	00	
Waypoint #1	0	1	01	
Waypoint #2	1	0	02	
Waypoint #3	1	1	03	

7.1.3.2 Word A3-02: Time-to-Go to Cursor

Sheet 1 of 1

Word Name	: Time-to-Go to Cursor		
Word ID	: A3/02	Max Value	: 65,535
Source(s)	: MC	Min Value	: 0
Comp Rate	: NA	Resolution	: 1
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Unsigned numeric	MSB	: 32,768
Units	: seconds	LSB	: 1
		Full scale	: 65,535

Field Name	Bit No	Description	
A	00-N MSB	Time-to-Go to Cursor	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: The content of this word is significant only if bit 08 of A3/01 is set to "1".

7.1.3.3 Word A3-03/04: Waypoint 1 Latitude, Selector and Qualifier

Sheet 1 of 2

Word Name	: Waypoint 1 Latitude/Selector/Qualifier		
Word ID	: A3/03-04	Max Value	: See Notes
Source(s)	: MC	Min Value	: See Notes
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: 2's complement/Coded	MSB	: See Notes
Units	: See Notes	LSB	: See Notes
		Full scale	: See Notes

Field Name	Bit No	Description	
A MSW	00 SIGN	Waypoint 1 Latitude	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
15-N			
LSW	00-N		
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
B	09-C	Waypoint/FYT Selector	(Note 1,3)
C	10-C	Waypoint Qualifier Validity	(Note 1,4)
D	11-C	Waypoint Qualifier Value	(Note 1,5,6)
	12-C		
E	13	spare	
	14		
	15		

- NOTE 1:** The content of this word is significant only if bit 00 of A3/01 is set to "1".
- NOTE 2:** Bit 00 through bit 16 of MSW and Bit 00 through bit 08 of LSW compose a twenty-five bit word represented in 2's complement format which defines the Latitude of the Waypoint 1 symbol. The units are Semicircles, the MAX value is 1.0, the MIN value is -1.0, the MSB is 0.5, the LSB is 5.96046 E-8 and the full scale is 1.0.
- NOTE 3:** Bit 09 of LSW controls the Waypoint/FYT selection, as indicated in Tab. A3/04-B.

Tab. A3/04-B - Field B Description

Waypoint/FYT Selection	Bit 09	Decimal Value	Remarks
WAYPOINT	0	00	
FYT	1	01	

- NOTE 4:** If this bit is set to "1", the Qualifier Info of the Waypoint 1 has to be displayed.
- NOTE 5:** The content of this field is significant only if bit 10 of A3/04 is set to "1".
- NOTE 6:** Bit 11 and 12 of the LSW compose a two bit binary coded word (MSB = Bit 11) identifying the value of the Qualifier of Waypoint 1, as indicated in Tab. A3/04-D.

Tab. A3/04-D - Field D Description

Waypoint 1 Qualifier	Bit		Decimal Value	Remarks
	11	12		
Left	0	0	00	
Right	0	1	01	
DTK	1	0	02	
Mark	1	1	03	

7.1.3.4 Word A3-05/06: Waypoint 1 Longitude and Code

Sheet 1 of 2

Word Name	: Waypoint 1 Longitude/Code		
Word ID	: A3/05-06	Max Value	: See Notes
Source(s)	: MC	Min Value	: See Notes
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: 2's complement/Coded	MSB	: See Notes
Units	: See Notes	LSB	: See Notes
		Full scale	: See Notes

Field Name	Bit No	Description	
A MSW	00 SIGN	Waypoint 1 Longitude	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
15-N			
LSW	00-N		
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
B	08-N LSB	Waypoint Code	(Note 1,3)
	09-C MSB		
	10-C		
	11-C		
	12-C		
	13-C		
	14-C		
	15-C LSB		

- NOTE 1:** The content of this word is significant only if bit 00 of A3/01 is set to "1".
- NOTE 2:** Bit 00 through bit 16 of MSW and Bit 00 through bit 08 of LSW compose a twenty-five bit word represented in 2's complement format which defines the Longitude of the Waypoint 1 symbol. The units are Semicircles, the MAX value is 1.0, the MIN value is -1.0, the MSB is 0.5, the LSB is 5.96046 E-8 and the full scale is 1.0.
- NOTE 3:** Bit 09 through bit 15 compose a seven bit binary coded word (MSB = Bit 09) which defines the code to be associated to the Waypoint symbol. The MAX value is 99, the MIN value is 0, the MSB is 64, the LSB is 1 and the full scale is 127.

7.1.3.5 Word A3-07/08: Waypoint 2 Latitude, Selector and Qualifier

Sheet 1 of 2

Word Name	: Waypoint 2 Latitude/Selector/Qualifier		
Word ID	: A3/07-08	Max Value	: See Notes
Source(s)	: MC	Min Value	: See Notes
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: 2's complement/Coded	MSB	: See Notes
Units	: See Notes	LSB	: See Notes
		Full scale	: See Notes

Field Name	Bit No	Description				
A MSW	00 SIGN	Waypoint 2 Latitude	(Note 1,2)			
	01-N MSB					
	02-N					
	03-N					
	04-N					
	05-N					
	06-N					
	07-N					
	08-N					
	09-N					
	10-N					
	11-N					
	12-N					
	13-N					
	14-N					
15-N						
LSW	00-N					
	01-N					
	02-N					
	03-N					
	04-N					
	05-N					
	06-N					
	07-N					
B	08-N LSB	Waypoint/FYT Selector	(Note 1,3)			
	09-C					
	C			10-C	Waypoint Qualifier Validity	(Note 1,4)
				11-C		
D	12-C	Waypoint Qualifier Value	(Note 1,5,6)			
	13					
	14					
	15					
E	13	spare				
	14					
	15					

- NOTE 1:** The content of this word is significant only if bit 01 of A3/01 is set to “1”.
- NOTE 2:** Bit 00 through bit 16 of MSW and Bit 00 through bit 08 of LSW compose a twenty-five bit word represented in 2’s complement format which defines the Latitude of the Waypoint 2 symbol. The units are Semicircles, the MAX value is 1.0, the MIN value is -1.0, the MSB is 0.5, the LSB is 5.96046 E-8 and the full scale is 1.0.
- NOTE 3:** Bit 09 of LSW controls the Waypoint/FYT selection, as indicated in Tab. A3/08-B.

Tab. A3/08-B - Field B Description

Waypoint/FYT Selection	Bit 09	Decimal Value	Remarks
WAYPOINT	0	00	
FYT	1	01	

- NOTE 4:** If this bit is set to “1”, the Qualifier Info of the Waypoint 2 has to be displayed.
- NOTE 5:** The content of this field is significant only if bit 10 of A3/08 is set to “1”.
- NOTE 6:** Bit 11 and 12 of the LSW compose a two bit binary coded word (MSB = Bit 11) identifying the value of the Qualifier of Waypoint 2, as indicated in Tab. A3/08-D.

Tab. A3/08-D - Field D Description

Waypoint 2 Qualifier	Bit		Decimal Value	Remarks
	11	12		
Left	0	0	00	
Right	0	1	01	
DTK	1	0	02	
Mark	1	1	03	

7.1.3.6 Word A3-09/10: Waypoint 2 Longitude and Code

Sheet 1 of 2

Word Name	: Waypoint 2 Longitude/Code		
Word ID	: A3/09-10	Max Value	: See Notes
Source(s)	: MC	Min Value	: See Notes
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: 2's complement/Coded	MSB	: See Notes
Units	: See Notes	LSB	: See Notes
		Full scale	: See Notes

Field Name	Bit No	Description	
A MSW	00 SIGN	Waypoint 2 Longitude	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
15-N			
LSW	00-N		
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
B	08-N LSB	Waypoint Code	(Note 1,3)
	09-C MSB		
	10-C		
	11-C		
	12-C		
	13-C		
	14-C		
	15-C LSB		

- NOTE 1:** The content of this word is significant only if bit 01 of A3/01 is set to "1".
- NOTE 2:** Bit 00 through bit 16 of MSW and Bit 00 through bit 08 of LSW compose a twenty-five bit word represented in 2's complement format which defines the Longitude of the Waypoint 2 symbol. The units are Semicircles, the MAX value is 1.0, the MIN value is -1.0, the MSB is 0.5, the LSB is 5.96046 E-8 and the full scale is 1.0.
- NOTE 3:** Bit 09 through bit 15 compose a seven bit binary coded word (MSB = Bit 09) which defines the code to be associated to the Waypoint symbol. The MAX value is 99, the MIN value is 0, the MSB is 64, the LSB is 1 and the full scale is 127.

7.1.3.7 Word A3-11/12: Waypoint 3 Latitude, Selector and Qualifier

Sheet 1 of 2

Word Name	: Waypoint 3 Latitude/Selector/Qualifier		
Word ID	: A3/11-12	Max Value	: See Notes
Source(s)	: MC	Min Value	: See Notes
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: 2's complement/Coded	MSB	: See Notes
Units	: See Notes	LSB	: See Notes
		Full scale	: See Notes

Field Name	Bit No	Description				
A MSW	00 SIGN	Waypoint 3 Latitude	(Note 1,2)			
	01-N MSB					
	02-N					
	03-N					
	04-N					
	05-N					
	06-N					
	07-N					
	08-N					
	09-N					
	10-N					
	11-N					
	12-N					
	13-N					
	14-N					
15-N						
LSW	00-N					
	01-N					
	02-N					
	03-N					
	04-N					
	05-N					
	06-N					
	07-N					
B	08-N LSB	Waypoint/FYT Selector	(Note 1,3)			
	09-C					
	C			10-C	Waypoint Qualifier Validity	(Note 1,4)
				11-C		
D	12-C	Waypoint Qualifier Value	(Note 1,5,6)			
	13					
	14					
	15					
E	13	spare				
	14					
	15					

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- NOTE 1:** The content of this word is significant only if bit 02 of A3/01 is set to "1".
- NOTE 2:** Bit 00 through bit 16 of MSW and Bit 00 through bit 08 of LSW compose a twenty-five bit word represented in 2's complement format which defines the Latitude of the Waypoint 3 symbol. The units are Semicircles, the MAX value is 1.0, the MIN value is -1.0, the MSB is 0.5, the LSB is 5.96046 E-8 and the full scale is 1.0.
- NOTE 3:** Bit 09 of LSW controls the Waypoint/FYT selection, as indicated in Tab. A3/12-B.

Tab. A3/12-B - Field B Description

Waypoint/FYT Selection	Bit 09	Decimal Value	Remarks
WAYPOINT	0	00	
FYT	1	01	

- NOTE 4:** If this bit is set to "1", the Qualifier Info of the Waypoint 3 has to be displayed.
- NOTE 5:** The content of this field is significant only if bit 10 of A3/12 is set to "1".
- NOTE 6:** Bit 11 and 12 of the LSW compose a two bit binary coded word (MSB = Bit 11) identifying the value of the Qualifier of Waypoint 3, as indicated in Tab. A3/12-D.

Tab. A3/12-D - Field D Description

Waypoint 3 Qualifier	Bit		Decimal Value	Remarks
	11	12		
Left	0	0	00	
Right	0	1	01	
DTK	1	0	02	
Mark	1	1	03	

7.1.3.8 Word A3-13/14: Waypoint 3 Longitude and Code

Sheet 1 of 2

Word Name	: Waypoint 3 Longitude/Code		
Word ID	: A3/13-14	Max Value	: See Notes
Source(s)	: MC	Min Value	: See Notes
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: 2's complement/Coded	MSB	: See Notes
Units	: See Notes	LSB	: See Notes
		Full scale	: See Notes

Field Name	Bit No	Description	
A MSW	00 SIGN	Waypoint 3 Longitude	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
15-N			
LSW	00-N		
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
B	08-N LSB	Waypoint Code	(Note 1,3)
	09-C MSB		
	10-C		
	11-C		
	12-C		
	13-C		
	14-C		
	15-C LSB		

- NOTE 1:** The content of this word is significant only if bit 02 of A3/01 is set to "1".
- NOTE 2:** Bit 00 through bit 16 of MSW and Bit 00 through bit 08 of LSW compose a twenty-five bit word represented in 2's complement format which defines the Longitude of the Waypoint 3 symbol. The units are Semicircles, the MAX value is 1.0, the MIN value is -1.0, the MSB is 0.5, the LSB is 5.96046 E-8 and the full scale is 1.0.
- NOTE 3:** Bit 09 through bit 15 compose a seven bit binary coded word (MSB = Bit 09) which defines the code to be associated to the Waypoint symbol. The MAX value is 99, the MIN value is 0, the MSB is 64, the LSB is 1 and the full scale is 127.

7.1.3.9 Word A3-15: Intercept Flight Director X and Selectors

Sheet 1 of 2

Word Name	: Intercept Flight Director X/Selectors		
Word ID	: A3/15	Max Value	: See Notes
Source(s)	: MC	Min Value	: See Notes
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Unsigned Numeric/Coded	MSB	: See Notes
Units	: See Notes	LSB	: See Notes
		Full scale	: See Notes

Field Name	Bit No	Description	
A	00-N MSB	X-Display coord. of the IFD symbol	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
B	09-C	Intercept Mode Selector	(Note 1,3)
C	10-C	Normal/Dashed Selector	(Note 1,4)
D	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

- NOTE 1:** The content of this word is significant only if bit 03 of A3/01 is set to "1".
- NOTE 2:** Bit 00 through bit 08 compose a nine bit binary coded word (MSB = Bit 00) which defines the X-Display coordinate of the Intercept Flight Director symbol. The units are Pixels, the MAX value is 483, the MIN value is 0, the MSB is 256, the LSB is 1 and the full scale is 511.
- NOTE 3:** Bit 09 controls the Intercept Mode selection, as indicated in Tab. A3/15-B.

Tab. A3/15-B - Field B Description

Intercept Mode Selection	Bit 09	Decimal Value	Remarks
REAR	0	00	
ALL	1	01	

- NOTE 4:** Bit 10 controls the IFD Symbol appearance, as indicated in Tab. A3/15-C

Tab. A3/15-C - Field C Description

Normal/Dashed Selection	Bit 10	Decimal Value	Remarks
NORMAL	0	00	
DASHED	1	01	

7.1.3.10 Word A3-16: Intercept Flight Director Y

Sheet 1 of 1

Word Name	: Intercept Flight Director Y		
Word ID	: A3/16	Max Value	: 483
Source(s)	: MC	Min Value	: 0
Comp Rate	: NA	Resolution	: 1
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Unsigned Numeric	MSB	: 256
Units	: Pixels	LSB	: 1
		Full scale	: 511

Field Name	Bit No	Description	
A	00-N MSB	Y-Display coord. of the IFD symbol	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
B	09	spare	
	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

NOTE 1: The content of this word is significant only if bit 03 of A3/01 is set to "1".

7.1.3.11 Word A3-17: Intercept Zone R_{min}

Sheet 1 of 1

Word Name	: Intercept Zone Rmin		
Word ID	: A3/17	Max Value	: 483
Source(s)	: MC	Min Value	: 0
Comp Rate	: NA	Resolution	: 1
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Unsigned Numeric	MSB	: 256
Units	: Pixels	LSB	: 1
		Full scale	: 511

Field Name	Bit No	Description	
A	00-N MSB	Y-Display coord. of the Rmin posit. of the Intercept Zone	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
B	09	spare	
	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

NOTE 1: The content of this word is significant only if bit 05 of A3/01 is set to "1".

7.1.3.12 Word A3-18: Intercept Zone R_{max}

Sheet 1 of 1

Word Name	: Intercept Zone Rmax		
Word ID	: A3/18	Max Value	: 483
Source(s)	: MC	Min Value	: 0
Comp Rate	: NA	Resolution	: 1
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Unsigned Numeric	MSB	: 256
Units	: Pixels	LSB	: 1
		Full scale	: 512

Field Name	Bit No	Description
A	00-N MSB	Y-Display coord. of the Rmax posit. of the Intercept Zone (Note 1)
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N LSB	
B	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
	15	spare

NOTE 1: The content of this word is significant only if bit 05 of A3/01 is set to "1".

7.1.3.13 Word A3-19: No Escape Zone R_{max}

Sheet 1 of 1

Word Name	: No Escape Zone R_{max}		
Word ID	: A3/19	Max Value	: 483
Source(s)	: MC	Min Value	: 0
Comp Rate	: NA	Resolution	: 1
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Unsigned Numeric	MSB	: 256
Units	: Pixels	LSB	: 1
		Full scale	: 511

Field Name	Bit No	Description	
A	00-N MSB	Y-Displ. coord. of the R_{max} pos. of the No Escape Zone	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
B	09	spare	
	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

NOTE 1: The content of this word is significant only if bit 05 of A3/01 is set to "1".

7.1.3.14 Word A3-20: Intercept Zone Target Tip

Sheet 1 of 1

Word Name	: Intercept Zone Target Tip		
Word ID	: A3/20	Max Value	: 483
Source(s)	: MC	Min Value	: 0
Comp Rate	: NA	Resolution	: 1
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Unsigned Numeric	MSB	: 256
Units	: Pixels	LSB	: 1
		Full scale	: 511

Field Name	Bit No	Description	
A	00-N MSB	Y-Display coord. of the Intercept Zone target Tip	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
B	09	spare	
	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

NOTE 1: The content of this word is significant only if bit 05 of A3/01 is set to "1".

7.1.3.15 Word A3-21: Allowable Steering Error Circle (ASEC) Radius and Selector

Sheet 1 of 2

Word Name	: Allowable Steering Error Circle (ASEC) Radius and Selector		
Word ID	: A3/21	Max Value	: See Notes
Source(s)	: MC	Min Value	: See Notes
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Unsigned Numeric/Coded	MSB	: See Notes
Units	: See Notes	LSB	: See Notes
		Full scale	: See Notes

Field Name	Bit No	Description	
A	00-N MSB	Radius of the ASEC	(Note 1, 2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
B	09-C	Normal/Blink selector	(Note 1, 3)
C	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

- NOTE 1:** The content of this word is significant only if bit 07 of A3/01 is set to "1".
- NOTE 2:** Bit 00 through bit 08 compose a nine bit binary coded word (MSB = Bit 00) which defines the Radius of the ASEC symbol. The units are Pixels, the MAX value is 250, the MIN value is 10, the MSB is 256, the LSB is 1 and the full scale is 511.
- NOTE 3:** Bit 09 controls the Normal/Blink presentation of the ASEC Symbol, as indicated in Tab. A3/21-B.

Tab. A3/21-B - Field B Description

Normal/Blink Selection	Bit 09	Decimal Value	Remarks
NORMAL	0	00	
BLINK	1	01	

7.1.3.16 Word A3-22: Attack Steering Cue (ASC) X and Selector

Sheet 1 of 2

Word Name	: Attack Steering Cue (ASC) X and Selector	Max Value	: See Notes
Word ID	: A3/22	Min Value	: See Notes
Source(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: See Notes
Signal Type	: Unsigned Numeric/Coded	LSB	: See Notes
Units	: See Notes	Full scale	: See Notes

Field Name	Bit No	Description	
A	00-N MSB	X-Display coord. of the ASC symbol	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
B	09-C	Normal/Blink selector	(Note 1,3)
C	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

- NOTE 1:** The content of this word is significant only if bit 08 of A3/01 is set to "1".
- NOTE 2:** Bit 00 through bit 08 compose a nine bit binary coded word (MSB = Bit 00) which defines the X-Display coordinate of the ASC symbol. The units are Pixels, the MAX value is 483, the MIN value is 0, the MSB is 256, the LSB is 1 and the full scale is 511.
- NOTE 3:** Bit 09 controls the Normal/Blink presentation of the ASC Symbol, as indicated in Tab. A3/22-B.

Tab. A3/22-B - Field B Description

Normal/Blink Selection	Bit 09	Decimal Value	Remarks
NORMAL	0	00	
BLINK	1	01	

7.1.3.17 Word A3-23: Attack Steering Cue (ASC) Y

Sheet 1 of 1

Word Name	: Attack Steering Cue (ASC) Y		
Word ID	: A3/23	Max Value	: 483
Source(s)	: MC	Min Value	: 0
Comp Rate	: NA	Resolution	: 1
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Unsigned Numeric	MSB	: 256
Units	: Pixels	LSB	: 1
		Full scale	: 511

Field Name	Bit No	Description	
A	00-N MSB	Y-Display coord. of the ASC symbol	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
B	09-N	spare	
	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

NOTE 1: The content of this word is significant only if bit 08 of A3/01 is set to "1".

7.1.3.18 Word A3-24: Tracked Target Info (Intercept and Data Link)

Sheet 1 of 2

Word Name	: Tracked Target Info (Intercept and Data Link)		
Word ID	: A3/24	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Coded	MSB	: NA
Units	: NA	LSB	: NA
		Full scale	: NA

Field Name	Bit No	Description	
A	00-C	HPT within Intercept Zone selector	(Note 1,4)
B	01-C	HPT Data Link Correlation selector	(Note 2,4)
C	02-C	HPT Friend/Foe selector	(Note 3,4)
D	03-C	SPT within Intercept Zone selector	(Note 1,5)
E	04-C	SPT Data Link Correlation selector	(Note 2,5)
F	05-C	SPT Friend/Foe selector	(Note 3,5)
G	06-C	TWS Tracked tgt 1 within Int. Zone selector	(Note 1,6)
	07-C	TWS Tracked tgt 2 within Int. Zone selector	(Note 1,6)
	08-C	TWS Tracked tgt 3 within Int. Zone selector	(Note 1,6)
	09-C	TWS Tracked tgt 4 within Int. Zone selector	(Note 1,6)
	10-C	TWS Tracked tgt 5 within Int. Zone selector	(Note 1,6)
	11-C	TWS Tracked tgt 6 within Int. Zone selector	(Note 1,6)
	12-C	TWS Tracked tgt 7 within Int. Zone selector	(Note 1,6)
	13-C	TWS Tracked tgt 8 within Int. Zone selector	(Note 1,6)
H	14	spare	
	15	spare	

- NOTE 1:** If this bit is set to "1", the relevant tracked target is within the Intercept Zone.
- NOTE 2:** If this bit is set to "1", the relevant tracked target is correlated with a Data Link target.
- NOTE 3:** Bit 02 (for HPT) and Bit 05 (for SPT) control the Data Link Id selection, as indicated in Tab. A3/24-C/F.

Tab. A3/24-C/F - Field C/F Description

Data Link Id	Bit	Decimal Value	Remarks
HPT	02		
SPT	05		
FRIEND	0	00	
FOE	1	01	

- NOTE 4:** The content of this field is significant only if the Radar is operating in SAM, STT (under any A/A Master Mode), DTT.
- NOTE 5:** The content of this field is significant only if the Radar is operating in DTT.
- NOTE 6:** The content of this field is significant only if the Radar is operating in TWS.
The number of each tracked target is the same used by the Radar in the TWS Messages B1, B2, B3.
The Track Identifier corresponding to each tracked target is indicated in words A3/29-30-31-32.

7.1.3.19 Word A3-25/26: HPT Call Sign

Sheet 1 of 1

Word Name	: HPT Call Sign		
Word ID	: A3/25-26	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Coded	MSB	: NA
Units	: NA	LSB	: NA
		Full scale	: NA

Field Name	Bit No	Description	
MSW	A	00-C MSB	Character 1 (Note 1, 2, 3)
		01-C	
		02-C	
		03-C	
		04-C	
		05-C	
		06-C	
B		07-C LSB	
	B	08-C MSB	Character 2 (Note 1, 2, 3)
		09-C	
		10-C	
		11-C	
		12-C	
		13-C	
	14-C		
LSW		15-C LSB	
	C	00-C MSB	Character 3 (Note 1, 2, 3)
		01-C	
		02-C	
		03-C	
		04-C	
		05-C	
	06-C		
D		07-C LSB	
	D	08-C MSB	Character 4 (Note 1, 2, 3)
		09-C	
		10-C	
		11-C	
		12-C	
		13-C	
	14-C		
	15-C LSB		

- NOTE 1:** The content of this word is significant only if the Radar is operating in STT or DTT and the field B of word A3/24 is set to "1" (i.e. the HPT is correlated with a DL target).
- NOTE 2:** Fields A and B (Word 25) and C and D (Word 26) contain the ASCII code relevant respectively to the first, second, third and fourth character of the HPT call sign.
- NOTE 3:** If all the four characters are blanks, no label is displayed.

7.1.3.20 Word A3-27/28: SPT Call Sign

Sheet 1 of 1

Word Name	: SPT Call Sign		
Word ID	: A3/27-28	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Coded	MSB	: NA
Units	: NA	LSB	: NA
		Full scale	: NA

Field Name	Bit No	Description	
MSW	A	00-C MSB	Character 1 (Note 1, 2, 3)
		01-C	
		02-C	
		03-C	
		04-C	
		05-C	
		06-C	
B	07-C LSB	08-C MSB	Character 2 (Note 1, 2, 3)
		09-C	
		10-C	
		11-C	
		12-C	
		13-C	
		14-C	
LSW	C	00-C MSB	Character 3 (Note 1, 2, 3)
		01-C	
		02-C	
		03-C	
		04-C	
		05-C	
		06-C	
D	07-C LSB	08-C MSB	Character 4 (Note 1, 2, 3)
		09-C	
		10-C	
		11-C	
		12-C	
		13-C	
		14-C	
15-C LSB			

- NOTE 1:** The content of this word is significant only if the Radar is operating in DTT and the field E of word A3/24 is set to "1" (i.e. the SPT is correlated with a DL target).
- NOTE 2:** Fields A and B (Word 27) and C and D (Word 28) contain the ASCII code relevant respectively to the first, second, third and fourth character of the SPT call sign.
- NOTE 3:** If all the four characters are blanks, no label is displayed.

7.1.3.21 Word A3-29: Track Id of TWS Tracked Targets 01 and 02

Sheet 1 of 1

Word Name	: Track Id of TWS Tracked targets 01 and 02		
Word ID	: A3/29	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Unsigned Numeric	MSB	: NA
Units	: NA	LSB	: NA
		Full scale	: NA

Field Name	Bit No	Description	
A	00-N MSB	Track Id. of TWS Tracked tgt 1	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N LSB		
B	08-N MSB	Track Id. of TWS Tracked tgt 2	(Note 1,3)
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: The content of this word is significant only if the Radar is operating in TWS.

NOTE 2: The content of this field represents the Track identifier of the Track number 01, as provided by the Radar in Message B1.

NOTE 3: The content of this field represents the Track identifier of the Track number 02, as provided by the Radar in Message B1.

7.1.3.22 Word A3-30: Track Id of TWS Tracked Targets 03 and 04

Sheet 1 of 1

Word Name	: Track Id of TWS Tracked targets 03 and 04		
Word ID	: A3/30	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Unsigned Numeric	MSB	: NA
Units	: NA	LSB	: NA
		Full scale	: NA

Field Name	Bit No	Description	
A	00-N MSB	Track Id. of TWS Tracked tgt 3	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N LSB		
B	08-N MSB	Track Id. of TWS Tracked tgt 4	(Note 1,3)
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: The content of this word is significant only if the Radar is operating in TWS.

NOTE 2: The content of this field represents the Track identifier of the Track number 03, as provided by the Radar in Message B1.

NOTE 3: The content of this field represents the Track identifier of the Track number 04, as provided by the Radar in Message B1.

7.1.3.23 Word A3-31: Track Id of TWS Tracked Targets 05 and 06

Sheet 1 of 1

Word Name	: Track Id of TWS Tracked targets 05 and 06		
Word ID	: A3/31	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Unsigned Numeric	MSB	: NA
Units	: NA	LSB	: NA
		Full scale	: NA

Field Name	Bit No	Description	
A	00-N MSB	Track Id. of TWS Tracked tgt 5	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N LSB		
B	08-N MSB	Track Id. of TWS Tracked tgt 6	(Note 1,3)
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: The content of this word is significant only if the Radar is operating in TWS.

NOTE 2: The content of this field represents the Track identifier of the Track number 05, as provided by the Radar in Message B1.

NOTE 3: The content of this field represents the Track identifier of the Track number 06, as provided by the Radar in Message B1.

7.1.3.24 Word A3-32: Track Id of TWS Tracked Targets 07 and 08

Sheet 1 of 1

Word Name	: Track Id of TWS Tracked targets 07 and 08		
Word ID	: A3/32	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Unsigned Numeric	MSB	: NA
Units	: NA	LSB	: NA
		Full scale	: NA

Field Name	Bit No	Description	
A	00-N MSB	Track Id. of TWS Tracked tgt 7	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
B	07-N LSB	Track Id. of TWS Tracked tgt 8	(Note 1,3)
	08-N MSB		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
15-N LSB			

NOTE 1: The content of this word is significant only if the Radar is operating in TWS.

NOTE 2: The content of this field represents the Track identifier of the Track number 07, as provided by the Radar in Message B1.

NOTE 3: The content of this field represents the Track identifier of the Track number 08, as provided by the Radar in Message B1.

7.1.4 Message A4: Navigation Data and Acquisition Cursor Data

Message Name	: Navigation Data and Acquisition Cursor Data		
Message ID	: A4	Transfer Type	: BC-to-RT
Source	: MC	Word Count	: 31
Destination	: RDR	Xmit Rate	: 50 Hz

Word Name	Word No	Description	Section
Receive Command Word	CW	To RDR, subaddress 00100 (04)	
Validity and Slew Data	01		7.1.4.1
Time tag	02		7.1.4.2
Present True Heading	03		7.1.4.3
Present Magnetic Heading	04		7.1.4.4
X Acceleration	05		7.1.4.5
Y Acceleration	06		7.1.4.6
Z Acceleration	07		7.1.4.7
True Air Speed (DADC)	08		7.1.4.8
Ownship Calibrated Air Speed (CAS)	09		7.1.4.9
Barometric/Inertial Altitude	10		7.1.4.10
Corrected Barometric Altitude	11		7.1.4.11
Radio Altimeter Altitude	12		7.1.4.12
SPOI Altitude Above Sea	13		7.1.4.13
Clearance Plane Distance	14		7.1.4.14
Wind Direction	15		7.1.4.15
Wind Speed	16		7.1.4.16
AZ Antenna Demand	17		7.1.4.17
EL Antenna Demand	18		7.1.4.18
Rate of Motion of Acq. Cursor-X /Selectors	19		7.1.4.19
Rate of Motion of Acquisition Cursor-Y	20		7.1.4.20
Acquisition Cursor-Range	21		7.1.4.21
Acquisition Cursor-Azimuth	22		7.1.4.22
Present Position Data Time Tag	23		7.1.4.23
Present Position Latitude (MSW)	24		7.1.4.24
Present Position Latitude (LSW)	25		
Present Position Longitude (MSW)	26		7.1.4.25
Present Position Longitude (LSW)	27		
SPOI Latitude (MSW)	28		7.1.4.26
SPOI Latitude (LSW)	29		
SPOI Longitude (MSW)	30		7.1.4.27
SPOI Longitude (LSW)	31		
Status Word	ST	From RDR	

7.1.4.1 Word A4-01: Validity and Slew Data

Sheet 1 of 4

Word Name : Validity and Slew Data

Word ID : A4/01

Source(s) : MC

Comp Rate : NA

Xmit Rate : 50 Hz

Signal Type : Coded

Units : NA

Max Value : NA

Min Value : NA

Resolution : NA

Accuracy : NA

MSB : NA

LSB : NA

Full scale : NA

Field Name	Bit No	Description	
A	00-C	Navigation Data Invalid	(Note 1)
B	01-C	Attitude Data Invalid	(Note 2)
C	02-C	Baro/Inertial Altitude Data Invalid	(Note 3)
D	03-C	Corrected Barometric Altitude Data Invalid	(Note 4)
E	04-C	Radio Altimeter Altitude Data Invalid	(Note 5)
F	05-C	SPOI Altitude Data Invalid	(Note 6)
G	06-C	SPOI Position Data Invalid	(Note 7)
H	07-C	TAS Data Invalid (DADC)	(Note 8)
I	08-C	CAS Data Invalid	(Note 9)
J	09-C	Present Position Data Invalid	(Note 10)
K	10-C	Antenna Slew	(Note 11)
L	11-C	Cursor Rates Valid	(Note 12)
M	12-C	Cursor Normal/Slave Selector	(Note 13)
N	13-C	Cursor Zero Command	(Note 14)
O	14-C	Cursor Snowplough Command	(Note 15)
P	15	spare	

- NOTE 1:** If this bit is set to “1”, the following Navigation data provided by the INU are not valid and have to be disregarded by the Radar:
- X, Y, Z Velocity (words 03÷08 of A5);
 - X, Y, Z Acceleration (words 05÷07 of A4);
 - nx, ny, nz Acceleration (words 15÷17 of A5).
- NOTE 2:** If this bit is set to “1”, the following Attitude data provided by the INU are not valid and have to be disregarded by the Radar:
- Present True Heading (word 03 of A4);
 - Present Magnetic Heading (word 04 of A4);
 - Platform Azimuth, Roll, Pitch (words 09÷11 of A5).
 - Roll rate, Pitch rate, Yaw rate (words 12÷14 of A5);
 - Roll, Pitch and Yaw Angular Accelerations (words 21÷23 of A5).
- NOTE 3:** If this bit is set to “1”, the content of word 10 of A4 (Inertial altitude provided by the INU, or Barometric altitude provided by the DADC) is not valid and has to be disregarded by the Radar.
- NOTE 4:** If this bit is set to “1”, the content of word 11 of A4 (Corrected Barometric altitude provided by the MC) is not valid and has to be disregarded by the Radar.
- NOTE 5:** If this bit is set to “1”, the Radio Altimeter Altitude data (word 12 of message A4) is not valid and has to be disregarded by the Radar.
- NOTE 6:** If this bit is set to “1”, the SPOI Altitude data (word 13 of message A4) is not valid and the Radar assumes the value ‘0’ as default.
- NOTE 7:** If this bit is set to “1”, the SPOI Position data (words 28÷31 of message A4) are not valid and have to be disregarded by the Radar.
- NOTE 8:** If this bit is set to “1”, the True Air Speed data provided by the DADC (word 08 of message A4) is not valid and has to be disregarded by the Radar.
- NOTE 9:** If this bit is set to “1”, the Calibrated Air Speed data (word 09 of message A4) is not valid and has to be disregarded by the Radar.
- NOTE 10:** If this bit is set to “1”, the Present Position data (time tag, latitude and longitude: words 23÷27 of message A4) are not valid and have to be disregarded by the Radar.

NOTE 11: If this bit is set to “1”, the EL Antenna Demand (word 18 of A4) is changing because of an action of the pilot (tilt up/down or “Antenna set” command).

NOTE 12: If this bit is set to “0”, the Cursor Rates data (field A of word 19 and field A of word 20 of message A4) are not valid and have to be disregarded by the Radar.

NOTE 13: Bit 12 controls the selection between Normal and Slave options for the cursor management, as indicated in Tab. A4/01-M.

This field is served by the Radar only when the Radar is operating in one of the following modes: RWS, SAM, TWS, VS, as shown in fields A and B of B7/01.

Tab. A4/01-M - Field M Description

Normal/Slave Selection	Bit 12	Decimal Value	Remarks
NORMAL	0	00	a)
SLAVE	1	01	b)

Remark a) If this field is set to “NORMAL”, the radar ignores the content of words 21 and 22 of message A4.

Remark b) If this field is set to “SLAVE”, the radar ignores the content of field A of word 19 and field A of word 20 of message A4.

NOTE 14: If this bit is set to “1”, the “Cursor Zero” command is active.

NOTE 15: Bit 14 controls the selection between Normal and Snowplough options for the cursor management in Air-to-Surface modes, as indicated in Tab. A4/01-O.

This field is served by the Radar only when the Radar is operating in one of the following modes: GM, GMTI, SEA-1, SEA-2, as shown in fields A and B of B7/01, and in BCN, when one scan bar is performed (A/S submode), as shown in field A of B7/01 and in field G of B7/02. Moreover, this field is served provided that neither Expand nor Freeze functions are selected.

Tab. A4/01-O - Field O Description

Normal/Snowplough Selection	Bit 14	Decimal Value	Remarks
NORMAL	0	00	a)
SNOWPLOUGH	1	01	

Remark a) If this field is set to "SNOWPLOUGH", the radar ignores the content of field A of word 19, field A of word 20, and the content of word 21 and 22 of message A4.

7.1.4.2 Word A4-02: Time Tag

Sheet 1 of 1

Word Name	: Time Tag		
Word ID	: A4/02	Max Value	: NA
Source(s)	: INU	Min Value	: NA
Comp Rate	: 50 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: Unsigned numeric	MSB	: 2,097,152.0
Units	: μ sec	LSB	: 64.0
		Full scale	: 4,194,240.0

Field Name	Bit No	Description
A	00-N MSB	Time Tag
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word is provided by the INU, and has the format defined for word 02 of block I01 of SNU-84-1 Rev. D Standard.

7.1.4.3 Word A4-03: Present True Heading

Sheet 1 of 1

Word Name	: Present True Heading		
Word ID	: A4/03	Max Value	: 1.0
Source(s)	: INU	Min Value	: -1.0
Comp Rate	: 50 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 0.5
Units	: Semicircles	LSB	: 3.05176E-05
		Full scale	: 1.0

Field Name	Bit No	Description
A	00 SIGN	A/C Present True Heading
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word is provided by the INU, and has the format defined for word 12 of block I01 of SNU-84-1 Rev. D Standard.

7.1.4.4 Word A4-04: Present Magnetic Heading

Sheet 1 of 1

Word Name	: Present Magnetic Heading		
Word ID	: A4/04	Max Value	: 1.0
Source(s)	: INU	Min Value	: -1.0
Comp Rate	: 50 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 0.5
Units	: Semicircles	LSB	: 3.05176E-05
		Full scale	: 1.0

Field Name	Bit No	Description
A	00 SIGN	A/C Present Magnetic Heading
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word is provided by the INU, and has the format defined for word 13 of block I01 of SNU-84-1 Rev. D Standard.

7.1.4.5 Word A4-05: X Acceleration

Sheet 1 of 1

Word Name	: X Acceleration		
Word ID	: A4/05	Max Value	: NA
Source(s)	: INU	Min Value	: NA
Comp Rate	: 50 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 512.0
Units	: Feet/sec ²	LSB	: 0.03125
		Full scale	: 1024.0

Field Name	Bit No	Description
A	00 SIGN	A/C Acceleration - X Component
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word is provided by the INU, and has the format defined for word 14 of block I01 of SNU-84-1 Rev. D Standard.

7.1.4.6 Word A4-06: Y Acceleration

Sheet 1 of 1

Word Name	: Y Acceleration		
Word ID	: A4/06	Max Value	: NA
Source(s)	: INU	Min Value	: NA
Comp Rate	: 50 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 512.0
Units	: Feet/sec ²	LSB	: 0.03125
		Full scale	: 1024.0

Field Name	Bit No	Description
A	00 SIGN	A/C Acceleration - Y Component
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word is provided by the INU, and has the format defined for word 15 of block I01 of SNU-84-1 Rev. D Standard.

7.1.4.7 Word A4-07: Z Acceleration

Sheet 1 of 1

Word Name	: Z Acceleration		
Word ID	: A4/07	Max Value	: NA
Source(s)	: INU	Min Value	: NA
Comp Rate	: 50 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 512.0
Units	: Feet/sec ²	LSB	: 0.03125
		Full scale	: 1024.0

Field Name	Bit No	Description
A	00 SIGN	A/C Acceleration - Z Component
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word is provided by the INU, and has the format defined for word 16 of block I01 of SNU-84-1 Rev. D Standard.

7.1.4.8 Word A4-08: True Air Speed (DADC)

Sheet 1 of 1

Word Name	: True Air Speed (DADC)		
Word ID	: A4/08	Max Value	: NA
Source(s)	: DADC	Min Value	: NA
Comp Rate	: 50 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 2048.0
Units	: Knots	LSB	: 0.125
		Full scale	: 4096.0

Field Name	Bit No	Description
A	00 SIGN	A/C TAS provided by the DADC
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

7.1.4.9 Word A4-09: Ownship Calibrated Air Speed

Sheet 1 of 1

Word Name	: Ownship Calibrated Air Speed		
Word ID	: A4/09	Max Value	: 999
Source(s)	: MC	Min Value	: 0
Comp Rate	: NA	Resolution	: 1
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: Unsigned numeric	MSB	: 512
Units	: Knots	LSB	: 1
		Full scale	: 1023

Field Name	Bit No	Description
A	00-N MSB	Ownship Calibrated Air Speed (CAS)
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N LSB	
B	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
	15	spare

7.1.4.10 Word A4-10: Barometric / Inertial Altitude

Sheet 1 of 1

Word Name	: Barometric/Inertial Altitude		
Word ID	: A4/10	Max Value	: NA
Source(s)	: INU-DADC	Min Value	: NA
Comp Rate	: 50 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 65,536.0
Units	: Feet	LSB	: 4.0
		Full scale	: 131,068

Field Name	Bit No	Description
A	00 SIGN	A/C Altitude with respect to the sea level
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word contains the inertial altitude provided by the INU or, in case of INU failure, contains the barometric altitude provided by the DADC. The format and the content of this word are as defined for word 25 of block I01 of SNU-84-1 Rev. D Standard.

7.1.4.11 Word A4-11: Corrected Barometric Altitude

Sheet 1 of 1

Word Name	: Corrected Barometric Altitude		
Word ID	: A4/11	Max Value	: NA
Source(s)	: MC-DADC	Min Value	: NA
Comp Rate	: 50 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 65,536.0
Units	: Feet	LSB	: 4.0
		Full scale	: 131,068

Field Name	Bit No	Description
A	00 SIGN	A/C Corrected Altitude with respect to the sea level
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

- 1) This word contains the Corrected Barometric altitude that is provided by the MC.

7.1.4.12 Word A4-12: Radio Altimeter Altitude

Sheet 1 of 1

Word Name	: Radio Altimeter Altitude		
Word ID	: A4/12	Max Value	: NA
Source(s)	: ALTMTR	Min Value	: NA
Comp Rate	: 25 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: Unsigned numeric	MSB	: 65,536.0
Units	: Feet	LSB	: 2.0
		Full scale	: 131,070

Field Name	Bit No	Description
A	00-N MSB	A/C Altitude provided by Radio Altimeter
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

7.1.4.13 Word A4-13: SPOI Altitude Above Sea Level

Sheet 1 of 1

Word Name	: SPOI Altitude Above Sea Level		
Word ID	: A4/13	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 32,768.0
Units	: Feet	LSB	: 1.0
		Full scale	: 65,535.0

Field Name	Bit No	Description
A	00 SIGN	SPOI Altitude with respect to sea level, provided by MC
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

- 1) This word contains the altitude of the Selected Point Of Interest with respect to the Sea Level, provided by the MC. Positive value of this word indicate a positive altitude of the SPOI with respect to the Sea Level.

7.1.4.14 Word A4-14: Clearance Plane Distance

Sheet 1 of 1

Word Name	: Clearance Plane Distance		
Word ID	: A4/14	Max Value	: 5,000.0
Source(s)	: MC	Min Value	: 0
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: Unsigned numeric	MSB	: 32,768.0
Units	: Feet	LSB	: 1.0
		Full scale	: 65,535.0

Field Name	Bit No	Description
A	00-N MSB	Distance of second clearance plane in TA Mode
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

NOTE 1: The content of this word is significant only if the Radar is operating in TA.

7.1.4.15 Word A4-15: Wind Direction

Sheet 1 of 1

Word Name	: Wind Direction		
Word ID	: A4/15	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: 2.5 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 0.5
Units	: Semicircles	LSB	: 3.05176E-05
		Full scale	: 1

Field Name	Bit No	Description
A	00 SIGN	Wind Velocity Angle
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

- 1) This word contains the wind direction with respect to the True North, as provided by the INU, with the format defined for word 20 of block I07 of SNU-84-1 Rev. D Standard.

7.1.4.16 Word A4-16: Wind Speed

Sheet 1 of 1

Word Name	: Wind Speed		
Word ID	: A4/16	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: 2.5 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: Unsigned numeric	MSB	: 256.0
Units	: Knots	LSB	: 0.0625
		Full scale	: 511.9375

Field Name	Bit No	Description
A	00-N MSB	Wind Velocity amplitude
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N LSB	
B	13	spare
	14	spare
	15	spare

Remark:

- 1) This word contains the amplitude of the wind velocity, as provided by the INU, with the format defined for word 21 of block I07 of SNU-84-1 Rev. D Standard.

7.1.4.17 Word A4-17: AZ Antenna Demand

Sheet 1 of 2

Word Name	: AZ Antenna Demand		
Word ID	: A4/17	Max Value	: 1.0
Source(s)	: MC	Min Value	: -1.0
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 0.5
Units	: Semicircles	LSB	: 3.05176E-05
		Full scale	: 1

Field Name	Bit No	Description	
A	00 SIGN	Commanded Antenna Azimuth angle	(Note 1)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

- NOTE 1:** The content of this word is significant only when the Radar is operating in one of the following modes:
- ACM-NARROW
 - ACM-WIDE
 - AGR
- as resulting from fields A and B of B7/01 and from field C of B7/02.

7.1.4.18 Word A4-18: EL Antenna Demand

Sheet 1 of 2

Word Name	: EL Antenna Demand		
Word ID	: A4/18	Max Value	: 0.5
Source(s)	: MC	Min Value	: -0.5
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 0.5
Units	: Semicircles	LSB	: 3.05176E-05
		Full scale	: 1

Field Name	Bit No	Description	
A	00 SIGN	Commanded Antenna Elevation angle	(Note 1)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: The content of this word is not significant when the Radar is operating in one of the following modes:

- ACM-BORESIGHT
- ACM-HUD
- ACM-VERTICAL
- ACM-SLEWABLE
- TWS (with HPT present)
- DTT
- STT A/A
- SSTT
- SMTT
- GMTT

7.1.4.19 Word A4-19: Rate of Motion of Acquisition Cursor X and Selectors

Sheet 1 of 2

Word Name	: Rate of Motion of Acquisition Cursor-X/Selectors		
Word ID	: A4/19	Max Value	: 255 (Field A)
Source(s)	: MC	Min Value	: -256 (Field A)
Comp Rate	: NA	Resolution	: 1 (Field A)
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's Complement/Coded (Field A)	MSB	: 128 (Field A)
Units	: Pixels/second (Field A)	LSB	: 1 (Field A)
		Full scale	: 255 (Field A)

Field Name	Bit No	Description	
A	00 Sign	Rate of motion of the Acq. Cursor on X-Display coord.	(Note 1)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
B	09-C	Normal/Ghost Selector	(Note 2)
C	10-C	DTT Enabled Selector	(Note 3)
D	11-C	SAR Enabled Selector	(Note 4)
E	12	spare	
	13	spare	
	14	spare	
	15	spare	

NOTE 1: A positive value of this field corresponds to a motion from the left to the right side of the display.

NOTE 2: Bit 09 controls the Normal/Ghost presentation of the Acquisition cursor symbol, as indicated in Tab. A4/19-B.

Tab. A4/19-B - Field B Description

Normal/Ghost Selection	Bit 09	Decimal Value	Remarks
NORMAL	0	00	
GHOST	1	01	

NOTE 3: Bit 10 controls the DTT Enabled presentation of the Acquisition cursor symbol, as indicated in Tab. A4/19-C.

Tab. A4/19-C - Field C Description

DTT Enabled Selection	Bit 10	Decimal Value	Remarks
NORMAL	0	00	
DTT ENABLED	1	01	

NOTE 4: Bit 11 controls the SAR Enabling and the relevant presentation, as indicated in Tab. A4/19-D.

Tab. A4/19-D - Field D Description

SAR Enabled Selection	Bit 11	Decimal Value	Remarks
NORMAL	0	00	
SAR ENABLED	1	01	

7.1.4.20 Word A4-20: Rate of Motion of Acquisition Cursor Y

Sheet 1 of 1

Word Name	: Rate of Motion of Acquisition Cursor-Y		
Word ID	: A4/20	Max Value	: 255
Source(s)	: MC	Min Value	: -256
Comp Rate	: NA	Resolution	: 1
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's Complement	MSB	: 128
Units	: Pixels/second	LSB	: 1
		Full scale	: 255

Field Name	Bit No	Description	
A	00 SIGN	Rate of motion of the Acq. Cursor on Y-Display coord.	(Note 1)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
B	09	spare	
	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

NOTE 1: A positive value of this field corresponds to a motion from the top to the bottom side of the display.

7.1.4.21 Word A4-21: Acquisition Cursor - Range

Sheet 1 of 1

Word Name	: Acquisition Cursor Range		
Word ID	: A4/21	Max Value	: 520,000
Source(s)	: MC	Min Value	: 0
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: Unsigned numeric	MSB	: 262,144
Units	: feet	LSB	: 8
		Full scale	: 524,287

Field Name	Bit No	Description	
A	00-N MSB	Range of Acquisition Cursor	(Note 1, 2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the Range of the Acquisition Cursor as used by the Radar, expressed in the polar frame associated to the XYZ Navigation frame.

NOTE 2: The content of this word is significant only when the cursor is managed in "SLAVE" option.

7.1.4.22 Word A4-22: Acquisition Cursor - Azimuth

Sheet 1 of 1

Word Name	: Acquisition Cursor Azimuth		
Word ID	: A4/22	Max Value	: 1.0
Source(s)	: MC	Min Value	: -1.0
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 0.5
Units	: Semicircles	LSB	: 3.05176E-05
		Full scale	: 1

Field Name	Bit No	Description	
A	00 SIGN	Azimuth of Acquisition Cursor	(Note 1, 2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This field represents the Azimuth of the Acquisition Cursor as used by the Radar, expressed in the polar frame associated to the XYZ Navigation frame.

NOTE 2: The content of this word is significant only when the cursor is managed in "SLAVE" option.

7.1.4.23 Word A4-23: Present Position Data Time Tag

Sheet 1 of 1

Word Name	: Present Position Data Time Tag		
Word ID	: A4/23	Max Value	: NA
Source(s)	: INU	Min Value	: NA
Comp Rate	: 50 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: Unsigned numeric	MSB	: 2,097,152.0
Units	: μ sec	LSB	: 64.0
		Full scale	: 4,194,240.0

Field Name	Bit No	Description
A	00-N MSB	Time Tag of Present Position Data
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word is provided by the INU, and has the format defined for word 02 of block I01 of SNU-84-1 Rev. D Standard. It represents the time of validity of the present position data, contained in words 24÷27.

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7.1.4.24 Word A4-24/25: Present Position Latitude

Sheet 1 of 1

Word Name	: Present Position Latitude		
Word ID	: A4/24-25	Max Value	: 1.0
Source(s)	: INU	Min Value	: -1.0
Comp Rate	: 50 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 0.5
Units	: Semicircles	LSB	: 4.65661E-10
		Full scale	: 1.0

Field Name	Bit No	Description
MSW	00 SIGN	Present Position Latitude
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N		
LSW	00-N	
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N LSB		

Remark:

1. This word contains the latitude of the present position provided by the INU. The format and the content of this word are as defined for words 21 and 22 of block I0I of SNU-84-1 Rev. D Standard.

7.1.4.25 Word A4-26/27: Present Position Longitude

Sheet 1 of 1

Word Name	: Present Position Longitude		
Word ID	: A4/26-27	Max Value	: 1.0
Source(s)	: INU	Min Value	: -1.0
Comp Rate	: 50 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 0.5
Units	: Semicircles	LSB	: 4.65661E-10
		Full scale	: 1.0

Field Name	Bit No	Description
MSW	00 SIGN	Present Position Longitude
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N		
LSW	00-N	
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N LSB		

Remark:

1. This word contains the latitude of the present position provided by the INU. The format and the content of this word are as defined for words 08 and 09 of block I07 of SNU-84-1 Rev. D Standard.

7.1.4.26 Word A4-28/29: SPOI Latitude

Sheet 1 of 1

Word Name	: SPOI Latitude		
Word ID	: A4/28-29	Max Value	: 1.0
Source(s)	: MC	Min Value	: -1.0
Comp Rate	: 50 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 0.5
Units	: Semicircles	LSB	: 4.65661E-10
		Full scale	: 1.0

Field Name	Bit No	Description
MSW	00 SIGN	SPOI Latitude
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N		
LSW	00-N	
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N LSB		

7.1.4.27 Word A4-30/31: SPOI Longitude

Sheet 1 of 1

Word Name	: SPOI Longitude		
Word ID	: A4/30-31	Max Value	: 1.0
Source(s)	: MC	Min Value	: -1.0
Comp Rate	: 50 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 0.5
Units	: Semicircles	LSB	: 4.65661E-10
		Full scale	: 1.0

Field Name	Bit No	Description
MSW	00 SIGN	SPOI Longitude
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N		
LSW	00-N	
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N LSB		

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7.1.5 Message A5: INU High Speed Vector
Message Name : INU High Speed Vector

Message ID : A5

Source : INU

Destination : RDR

Transfer Type : RT-to-RT or BC-to-RT

Word Count : 23

Xmit Rate : 50 Hz

Word Name	Word No	Description	Section
Receive Command Word	CW	To RDR, subaddress 00101 (05)	
Transmit Command Word	CW	To INU, subaddress 10011 (19)	
Status Word	ST	Status Word from INU	
INU Mode Word	01		7.1.5.1
INU Control Word 2 (Time tag)	02		7.1.5.2
X Velocity (MSW)	03		7.1.5.3
X Velocity (LSW)	04		
Y Velocity (MSW)	05		7.1.5.4
Y Velocity (LSW)	06		
Z Velocity (MSW)	07		7.1.5.5
Z Velocity (LSW)	08		
Platform Azimuth	09		7.1.5.6
Roll	10		7.1.5.7
Pitch	11		7.1.5.8
Roll Rate	12		7.1.5.9
Pitch Rate	13		7.1.5.10
Yaw Rate	14		7.1.5.11
Longitudinal Acceleration (nx)	15		7.1.5.12
Lateral Acceleration (ny)	16		7.1.5.13
Normal Acceleration (nz)	17		7.1.5.14
Platform Azimuth Time tag	18		7.1.5.15
Roll Time tag	19		7.1.5.16
Pitch Time tag	20		7.1.5.17
Roll Axis Angular Acceleration	21		7.1.5.18
Pitch Axis Angular Acceleration	22		7.1.5.19
Yaw Axis Angular Acceleration	23		7.1.5.20
Status Word	ST	Status Word from RDR	

Remarks:

1. This message replicates the content, the format and the accuracies defined for block I09 of INU by SNU-84-1 Rev. D.
2. Transfer type for the message can be either RT-to-RT or BC-to-RT, depending on the bus architecture

7.1.5.1 Word A5-01: INU Mode Word

Sheet 1 of 1

Word Name	: INU Mode Word		
Word ID	: A5/01	Max Value	: NA
Source(s)	: INU	Min Value	: NA
Comp Rate	: 200 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: Coded	MSB	: NA
Units	: NA	LSB	: NA
		Full scale	: NA

This word is disregarded by the Radar

7.1.5.2 Word A5-02: INU Control Word 2 (Time Tag)

Sheet 1 of 1

Word Name	: INU Control Word 2 (Time Tag)	Max Value	: NA
Word ID	: A5/02	Min Value	: NA
Source(s)	: INU	Resolution	: NA
Comp Rate	: 200 Hz	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 2,097,152.0
Signal Type	: Unsigned numeric	LSB	: 64.0
Units	: μ sec	Full scale	: 4,194,240.0

Field Name	Bit No	Description
A	00-N MSB	Time Tag
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word has the format defined for word 02 of block I09 of SNU-84-1 Rev. D Standard.

7.1.5.3 Word A5-03/04: X Velocity

Sheet 1 of 1

Word Name	: X Velocity		
Word ID	: A5/03-04	Max Value	: NA
Source(s)	: INU	Min Value	: NA
Comp Rate	: 200 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 4096
Units	: feet/sec	LSB	: 3.81470E-06
		Full scale	: 8192

Field Name	Bit No	Description
MSW	00 SIGN	A/C Velocity - X Component
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N		
LSW	00-N	
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N LSB		

Remark:

1. These words have the format defined for words 03/04 of block I09 of SNU-84-1 Rev. D Standard.

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7.1.5.4 Word A5-05/06: Y Velocity

Sheet 1 of 1

Word Name	: Y Velocity		
Word ID	: A5/05-06	Max Value	: NA
Source(s)	: INU	Min Value	: NA
Comp Rate	: 200 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 4096
Units	: feet/sec	LSB	: 3.81470E-06
		Full scale	: 8192

Field Name	Bit No	Description
MSW	00 SIGN	A/C Velocity - Y Component
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N		
LSW	00-N	
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N LSB		

Remark:

1. These words have the format defined for words 05/06 of block I09 of SNU-84-1 Rev. D Standard.

7.1.5.5 Word A5-07/08: Z Velocity

Sheet 1 of 1

Word Name	: Z Velocity		
Word ID	: A5/07-08	Max Value	: NA
Source(s)	: INU	Min Value	: NA
Comp Rate	: 200 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 4096
Units	: feet/sec	LSB	: 3.81470E-06
		Full scale	: 8192

Field Name	Bit No	Description
MSW	00 SIGN	A/C Velocity - Z Component
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N		
LSW	00-N	
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N LSB		

Remark:

1. These words have the format defined for words 07/08 of block I09 of SNU-84-1 Rev. D Standard.

7.1.5.6 Word A5-09: Platform Azimuth

Sheet 1 of 1

Word Name	: Platform Azimuth		
Word ID	: A5/09	Max Value	: 1.0
Source(s)	: INU	Min Value	: -1.0
Comp Rate	: 200 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 0.5
Units	: Semicircles	LSB	: 3.05176E-05
		Full scale	: 1.0

Field Name	Bit No	Description
A	00 SIGN	A/C Present Platform Azimuth
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word has the format defined for word 09 of block I09 of SNU-84-1 Rev. D Standard.

7.1.5.7 Word A5-10: Roll

Sheet 1 of 1

Word Name	: Roll		
Word ID	: A5/10	Max Value	: 1.0
Source(s)	: INU	Min Value	: -1.0
Comp Rate	: 200 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 0.5
Units	: Semicircles	LSB	: 3.05176E-05
		Full scale	: 1.0

Field Name	Bit No	Description
A	00 SIGN	A/C Present Roll
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word has the format defined for word 10 of block I09 of SNU-84-1 Rev. D Standard.

7.1.5.8 Word A5-11: Pitch

Sheet 1 of 1

Word Name	: Pitch		
Word ID	: A5/11	Max Value	: 1.0
Source(s)	: INU	Min Value	: -1.0
Comp Rate	: 200 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 0.5
Units	: Semicircles	LSB	: 3.05176E-05
		Full scale	: 1.0

Field Name	Bit No	Description
A	00 SIGN	A/C Present Pitch
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word has the format defined for word 11 of block I09 of SNU-84-1 Rev. D Standard.

7.1.5.9 Word A5-12: Roll Rate

Sheet 1 of 1

Word Name	: Roll Rate		
Word ID	: A5/12	Max Value	: NA
Source(s)	: INU	Min Value	: NA
Comp Rate	: 200 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 2.0
Units	: Semicircles/sec	LSB	: 1.22070E-04
		Full scale	: 4.0

Field Name	Bit No	Description
A	00 SIGN	A/C Present Roll rate
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word has the format defined for word 12 of block I09 of SNU-84-1 Rev. D Standard.

7.1.5.10 Word A5-13: Pitch Rate

Sheet 1 of 1

Word Name	: Pitch Rate		
Word ID	: A5/13	Max Value	: NA
Source(s)	: INU	Min Value	: NA
Comp Rate	: 200 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 2.0
Units	: Semicircles/sec	LSB	: 1.22070E-04
		Full scale	: 4.0

Field Name	Bit No	Description
A	00 SIGN	A/C Present Pitch rate
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word has the format defined for word 13 of block I09 of SNU-84-1 Rev. D Standard.

7.1.5.11 Word A5-14: Yaw Rate

Sheet 1 of 1

Word Name	: Yaw Rate		
Word ID	: A5/14	Max Value	: NA
Source(s)	: INU	Min Value	: NA
Comp Rate	: 200 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 2.0
Units	: Semicircles/sec	LSB	: 1.22070E-04
		Full scale	: 4.0

Field Name	Bit No	Description
A	00 SIGN	A/C Present Yaw rate
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word has the format defined for word 14 of block I09 of SNU-84-1 Rev. D Standard.

7.1.5.12 Word A5-15: Longitudinal Acceleration (nx)

Sheet 1 of 1

Word Name	: Longitudinal Acceleration (nx)		
Word ID	: A5/15	Max Value	: NA
Source(s)	: INU	Min Value	: NA
Comp Rate	: 200 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 512.0
Units	: Feet/sec ²	LSB	: 0.03125
		Full scale	: 1024.0

Field Name	Bit No	Description
A	00 SIGN	A/C Longitudinal Acceleration (nx)
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word has the format defined for word 15 of block I09 of SNU-84-1 Rev. D Standard.

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7.1.5.13 Word A5-16: Lateral Acceleration (ny)

Sheet 1 of 1

Word Name	: Lateral Acceleration (ny)		
Word ID	: A5/16	Max Value	: NA
Source(s)	: INU	Min Value	: NA
Comp Rate	: 200 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 512.0
Units	: Feet/sec ²	LSB	: 0.03125
		Full scale	: 1024.0

Field Name	Bit No	Description
A	00 SIGN	A/C Lateral Acceleration (ny)
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word has the format defined for word 16 of block I09 of SNU-84-1 Rev. D Standard.

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7.1.5.14 Word A5-17: Normal Acceleration (nz)

Sheet 1 of 1

Word Name	: Normal Acceleration (nz)		
Word ID	: A5/17	Max Value	: NA
Source(s)	: INU	Min Value	: NA
Comp Rate	: 200 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 512.0
Units	: Feet/sec ²	LSB	: 0.03125
		Full scale	: 1024.0

Field Name	Bit No	Description
A	00 SIGN	A/C Normal Acceleration (nz)
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word has the format defined for word 17 of block I09 of SNU-84-1 Rev. D Standard.

7.1.5.15 Word A5-18: Platform Azimuth Time Tag

Sheet 1 of 1

Word Name	: Platform Azimuth Time Tag	Max Value	: NA
Word ID	: A5/18	Min Value	: NA
Source(s)	: INU	Resolution	: NA
Comp Rate	: 200 Hz	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 2,097,152.0
Signal Type	: Unsigned numeric	LSB	: 64.0
Units	: μ sec	Full scale	: 4,194,240.0

Field Name	Bit No	Description
A	00-N MSB	Platform Azimuth Time Tag
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word has the format defined for word 18 of block I09 of SNU-84-1 Rev. D Standard.

7.1.5.16 Word A5-19: Roll Time Tag

Sheet 1 of 1

Word Name	: Roll Time Tag		
Word ID	: A5/19	Max Value	: NA
Source(s)	: INU	Min Value	: NA
Comp Rate	: 200 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: Unsigned numeric	MSB	: 2,097,152.0
Units	: μ sec	LSB	: 64.0
		Full scale	: 4,194,240.0

Field Name	Bit No	Description
A	00-N MSB	Roll Time Tag
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word has the format defined for word 19 of block I09 of SNU-84-1 Rev. D Standard.

7.1.5.17 Word A5-20: Pitch Time Tag

Sheet 1 of 1

Word Name	: Pitch Time Tag		
Word ID	: A5/20	Max Value	: NA
Source(s)	: INU	Min Value	: NA
Comp Rate	: 200 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: Unsigned numeric	MSB	: 2,097,152.0
Units	: μ sec	LSB	: 64.0
		Full scale	: 4,194,240.0

Field Name	Bit No	Description
A	00-N MSB	Pitch Time Tag
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word has the format defined for word 20 of block I09 of SNU-84-1 Rev. D Standard.

7.1.5.18 Word A5-21: Roll Axis Angular Acceleration

Sheet 1 of 1

Word Name	: Roll Axis Angular Acceleration		
Word ID	: A5/21	Max Value	: NA
Source(s)	: INU	Min Value	: NA
Comp Rate	: 200 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 4.0
Units	: Semicircles/sec ²	LSB	: 2.44141E-04
		Full scale	: 8.0

Field Name	Bit No	Description
A	00 SIGN	A/C Roll Axis Angular Acceleration
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word has the format defined for word 21 of block I09 of SNU-84-1 Rev. D Standard.

7.1.5.19 Word A5-22: Pitch Axis Angular Acceleration

Sheet 1 of 1

Word Name	: Pitch Axis Angular Acceleration		
Word ID	: A5/22	Max Value	: NA
Source(s)	: INU	Min Value	: NA
Comp Rate	: 200 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 4.0
Units	: Semicircles/sec ²	LSB	: 2.44141E-04
		Full scale	: 8.0

Field Name	Bit No	Description
A	00 SIGN	A/C Pitch Axis Angular Acceleration
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word has the format defined for word 22 of block I09 of SNU-84-1 Rev. D Standard.

7.1.5.20 Word A5-23: Yaw Axis Angular Acceleration

Sheet 1 of 1

Word Name	: Yaw Axis Angular Acceleration		
Word ID	: A5/23	Max Value	: NA
Source(s)	: INU	Min Value	: NA
Comp Rate	: 200 Hz	Resolution	: NA
Xmit Rate	: 50 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 4.0
Units	: Semicircles/sec ²	LSB	: 2.44141E-04
		Full scale	: 8.0

Field Name	Bit No	Description
A	00 SIGN	A/C Yaw Axis Angular Acceleration
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

Remark:

1. This word has the format defined for word 23 of block I09 of SNU-84-1 Rev. D Standard.

7.1.6 Message A6: Not Applicable**Message Name** : Not Applicable**Message ID** : A6**Source** : MC**Destination** : RDR**Transfer Type** : BC-to-RT**Word Count** : N/A**Xmit Rate** : N/A

This Message is not applicable to the current implementation

7.1.7 Message A7: Data Link Targets (Message#1)

This message is not managed by the current configuration of the MC. The description reported in this section is provisional.

Message Name	: Data Link Targets (Message#1)	Transfer Type	: BC-to-RT
Message ID	: A7	Word Count	: 31
Source	: MC	Xmit Rate	: 10 Hz
Destination	: RDR		

Word Name	Word No	Description	Section
Receive Command Word	CW	To RDR, subaddress 00111 (07)	
Targets Validity	01		7.1.7.1
Target 01 Position X	02		7.1.7.2
Target 01 Position Y	03		7.1.7.3
Target 01 Ground Track Angle	04		7.1.7.4
Target 01 Presentation Data	05		7.1.7.5
Target 01 Call Sign (MSW)	06		7.1.7.6
Target 01 Call Sign (LSW)	07		
Target 02 Position X	08		7.1.7.2
Target 02 Position Y	09		7.1.7.3
Target 02 Ground Track Angle	10		7.1.7.4
Target 02 Presentation Data	11		7.1.7.5
Target 02 Call Sign (MSW)	12		7.1.7.6
Target 02 Call Sign (LSW)	13		
Target 03 Position X	14		7.1.7.2
Target 03 Position Y	15		7.1.7.3
Target 03 Ground Track Angle	16		7.1.7.4
Target 03 Presentation Data	17		7.1.7.5
Target 03 Call Sign (MSW)	18		7.1.7.6
Target 03 Call Sign (LSW)	19		
Target 04 Position X	20		7.1.7.2
Target 04 Position Y	21		7.1.7.3
Target 04 Ground Track Angle	22		7.1.7.4
Target 04 Presentation Data	23		7.1.7.5
Target 04 Call Sign (MSW)	24		7.1.7.6
Target 04 Call Sign (LSW)	25		
Target 05 Position X	26		7.1.7.2
Target 05 Position Y	27		7.1.7.3
Target 05 Ground Track Angle	28		7.1.7.4
Target 05 Presentation Data	29		7.1.7.5
Target 05 Call Sign (MSW)	30		7.1.7.6
Target 05 Call Sign (LSW)	31		
Status Word	ST	From RDR	

7.1.7.1 Word A7-01: DL Targets Validity

Sheet 1 of 2

Word Name	: DL Targets Validity		
Word ID	: A7/01	Max Value	: NA
Source(s)	: MC	Min Value	: NA
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Coded	MSB	: NA
Units	: NA	LSB	: NA
		Full scale	: NA

Field Name	Bit No	Description	
A	00-C	DL Target 01 Validity	(Note 1)
	01-C	DL Target 02 Validity	(Note 1)
	02-C	DL Target 03 Validity	(Note 1)
	03-C	DL Target 04 Validity	(Note 1)
	04-C	DL Target 05 Validity	(Note 1)
	05-C	DL Target 06 Validity	(Note 1)
	06-C	DL Target 07 Validity	(Note 1)
	07-C	DL Target 08 Validity	(Note 1)
	08-C	DL Target 09 Validity	(Note 1)
	09-C	DL Target 10 Validity	(Note 1)
B	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

NOTE 1: Bit 00 through bit 09 control the Validity of the data of DL targets from 01 to 10 respectively, as indicated in Tab. A7/01-A.

Tab. A7/01-A - Field A Description

(i+1)-th DL Target Validity	Bit i	Decimal Value	Remarks
NOT ACTIVE	0	00	
ACTIVE	1	01	

7.1.7.2 **Word A7-02: Target 01 Position X**
Word A7-08: Target 02 Position X
Word A7-14: Target 03 Position X
Word A7-20: Target 04 Position X
Word A7-26: Target 05 Position X

Sheet 1 of 1

Word Name	: Target 01/02/03/04/05 Position X	Max Value	: 517,000
Word ID	: A7/02;/08;/14;/20;/26	Min Value	: -517,000
Source(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 262,144
Signal Type	: 2's complement	LSB	: 16
Units	: feet	Full scale	: 524,280

Field Name	Bit No	Description	
A	00 SIGN	X component of target 01/02/03/04/05 position	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the DL tgt position along the X axis of the XYZ Navigation frame.

NOTE 2: Word 02 is not significant if target 01 is not active (bit 00 of word A7/01 set to "NOT ACTIVE").
 Word 08 is not significant if target 02 is not active (bit 01 of word A7/01 set to "NOT ACTIVE").
 Word 14 is not significant if target 03 is not active (bit 02 of word A7/01 set to "NOT ACTIVE").
 Word 20 is not significant if target 04 is not active (bit 03 of word A7/01 set to "NOT ACTIVE").
 Word 26 is not significant if target 05 is not active (bit 04 of word A7/01 set to "NOT ACTIVE").

7.1.7.3 **Word A7-03: Target 01 Position Y**
Word A7-09: Target 02 Position Y
Word A7-15: Target 03 Position Y
Word A7-21: Target 04 Position Y
Word A7-27: Target 05 Position Y

Sheet 1 of 1

Word Name	: Target 01/02/03/04/05 Position Y		
Word ID	: A7/03;/09;/15;/21;/27	Max Value	: 517,000
Source(s)	: MC	Min Value	: -517,000
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 262,144
Units	: feet	LSB	: 16
		Full scale	: 524,280

Field Name	Bit No	Description	
A	00 SIGN	Y component of target 01/02/03/04/05 position	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the DL tgt position along the Y axis of the XYZ Navigation frame.

NOTE 2: Word 03 is not significant if target 01 is not active (bit 00 of word A7/01 set to "NOT ACTIVE").
 Word 09 is not significant if target 02 is not active (bit 01 of word A7/01 set to "NOT ACTIVE").
 Word 15 is not significant if target 03 is not active (bit 02 of word A7/01 set to "NOT ACTIVE").
 Word 21 is not significant if target 04 is not active (bit 03 of word A7/01 set to "NOT ACTIVE").
 Word 27 is not significant if target 05 is not active (bit 04 of word A7/01 set to "NOT ACTIVE").

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7.1.7.4 **Word A7-04: Target 01 Ground Track Angle**
Word A7-10: Target 02 Ground Track Angle
Word A7-16: Target 03 Ground Track Angle
Word A7-22: Target 04 Ground Track Angle
Word A7-28: Target 05 Ground Track Angle

Sheet 1 of 2

Word Name	: Target 01/02/03/04/05 Ground Track Angle		
Word ID	: A7/04;/10;/16;/22;/28	Max Value	: 1.0
Source(s)	: MC	Min Value	: -1.0
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 0.5
Units	: Semicircles	LSB	: 3.05176E-05
		Full scale	: 1.0

Field Name	Bit No	Description	
A	00 SIGN	Ground Track Angle of target 01/02/03/04/05	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

- NOTE 1:** This word represents the Ground Track Angle of the DL target. It is referred to the Navigation Frame, and is positive counter-clockwise (i.e. it is 0 degrees when the target moves along the x axis of the Navigation frame, and is 90 degrees when the target moves along the y axis of the Navigation Frame).
- NOTE 2:** Word 04 is not significant if target 01 is not active (bit 00 of word A7/01 set to "NOT ACTIVE").
Word 10 is not significant if target 02 is not active (bit 01 of word A7/01 set to "NOT ACTIVE").
Word 16 is not significant if target 03 is not active (bit 02 of word A7/01 set to "NOT ACTIVE").
Word 22 is not significant if target 04 is not active (bit 03 of word A7/01 set to "NOT ACTIVE").
Word 28 is not significant if target 05 is not active (bit 04 of word A7/01 set to "NOT ACTIVE").

7.1.7.5 **Word A7-05: Target 01 Presentation Data**
Word A7-11: Target 02 Presentation Data
Word A7-17: Target 03 Presentation Data
Word A7-23: Target 04 Presentation Data
Word A7-29: Target 05 Presentation Data

Sheet 1 of 2

Word Name	: Target 01/02/03/04/05 Presentation Data		
Word ID	: A7/05;/11;/17;/23;/29	Max Value	: See Notes
Source(s)	: MC	Min Value	: See Notes
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Unsigned Numeric/Coded	MSB	: See Notes
Units	: See Notes	LSB	: See Notes
		Full scale	: See Notes

Field Name	Bit No	Description	
A	00-C MSB	Type of Target 01/02/03/04/05	(Note 1,2)
	01-C LSB		
B	02-N MSB	Velocity of Target 01/02/03/04/05	(Note 1,3)
	03-N		
	04-N LSB		
C	05-N MSB	Altitude of Target 01/02/03/04/05	(Note 1,4)
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
D	11-N LSB		
	12-C	Target 01/02/03/04/05 within Intercept Zone selector	(Note 1,5)
E	13	spare	
	14		
	15		

NOTE 1: Word 05 is not significant if target 01 is not active (bit 00 of word A7/01 set to “NOT ACTIVE”).
 Word 11 is not significant if target 02 is not active (bit 01 of word A7/01 set to “NOT ACTIVE”).
 Word 17 is not significant if target 03 is not active (bit 02 of word A7/01 set to “NOT ACTIVE”).
 Word 23 is not significant if target 04 is not active (bit 03 of word A7/01 set to “NOT ACTIVE”).
 Word 29 is not significant if target 05 is not active (bit 04 of word A7/01 set to “NOT ACTIVE”).

NOTE 2: Bit 00 and 01 compose a two bit binary coded word (MSB=BIT 00) defining the type of the DL target 01/02/03/04/05, as indicated in Tab. A7/05;/11;/17;/23;/29-A respectively.

Tab. A7/05;/11;/17;/23;/29-A - Field A Description

DL Target Type selector	Bit		Decimal Value	Remarks
	00	01		
DL Target	0	0	00	
DL High Priority Target (HPL)	0	1	01	
DL Member	1	0	02	
DL High Priority Member (HPM)	1	1	03	

NOTE 3: Bit 02 through bit 04 compose a three bit binary coded word (MSB = Bit 02) which defines the Velocity of the DL Target 01/02/03/04/05. The units are knots, the MAX value is 1,000, the MIN value is 0, the MSB is 572, the LSB is 143 and the full scale is 1,001.
 If the DL target is a DL Member or a DL HPM (field A set to decimal value 02 or to decimal value 03) the content of this field is not significant.

NOTE 4: Bit 05 through bit 11 compose a seven bit binary coded word (MSB = Bit 05) which defines the Altitude of the DL Target 01/02/03/04/05. The units are kfeet, the MAX value is 99, the MIN value is 0, the MSB is 64, the LSB is 1 and the full scale is 127.

NOTE 5: If this bit is set to “1”, the relevant DL target is within the Intercept Zone.
 If the DL target is a DL Member or a DL HPM (field A set to decimal value 02 or to decimal value 03) the content of this field is not significant.

7.1.7.6 **Word A7-06/07: Target 01 Call Sign**
Word A7-12/13: Target 02 Call Sign
Word A7-18/19: Target 03 Call Sign
Word A7-24/25: Target 04 Call Sign
Word A7-30/31: Target 05 Call Sign

Sheet 1 of 1

Word Name	: Target 01/02/03/04/05 Call Sign	Max Value	: NA
Word ID	: A7/06-07;/12-13;/18-19;/24-25;/30-31	Min Value	: NA
Source(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
MSW	A	00-C MSB	Character 1 (Note 1, 2, 3)
		01-C	
		02-C	
		03-C	
		04-C	
		05-C	
		06-C	
B	07-C LSB	08-C MSB	Character 2 (Note 1, 2, 3)
		09-C	
		10-C	
		11-C	
		12-C	
		13-C	
		14-C	
LSW	C	15-C LSB	Character 3 (Note 1, 2, 3)
		00-C MSB	
		01-C	
		02-C	
		03-C	
		04-C	
		05-C	
D	06-C	07-C LSB	Character 4 (Note 1, 2, 3)
		08-C MSB	
		09-C	
		10-C	
		11-C	
		12-C	
		13-C	
		14-C	
		15-C LSB	

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- NOTE 1:** Fields A, B, C and D contain the ASCII code relevant respectively to the first, second, third and fourth character of the Target 01/02/03/04/05 Call Sign.
- NOTE 2:** Words 06-07 are not significant if target 01 is not active (bit 00 of word A7/01 set to "NOT ACTIVE").
Words 12-13 are not significant if target 02 is not active (bit 01 of word A7/01 set to "NOT ACTIVE").
Words 18-19 are not significant if target 03 is not active (bit 02 of word A7/01 set to "NOT ACTIVE").
Words 24-25 are not significant if target 04 is not active (bit 03 of word A7/01 set to "NOT ACTIVE").
Words 30-31 are not significant if target 05 is not active (bit 04 of word A7/01 set to "NOT ACTIVE").
- NOTE 3:** Words 06-07 are not significant if target 01 is a DL Target or a DL High Priority Target (HPL) (field A of word A7/05 set to "DL Target" or to "DL High Priority Target (HPL)").
Words 12-13 are not significant if target 02 is a DL Target or a DL High Priority Target (HPL) (field A of word A7/11 set to "DL Target" or to "DL High Priority Target (HPL)").
Words 18-19 are not significant if target 03 is a DL Target or a DL High Priority Target (HPL) (field A of word A7/17 set to "DL Target" or to "DL High Priority Target (HPL)").
Words 24-25 are not significant if target 04 is a DL Target or a DL High Priority Target (HPL) (field A of word A7/23 set to "DL Target" or to "DL High Priority Target (HPL)").
Words 30-31 are not significant if target 05 is a DL Target or a DL High Priority Target (HPL) (field A of word A7/29 set to "DL Target" or to "DL High Priority Target (HPL)").

7.1.8 Message A8: Data Link Targets (Message#2)

This message is not managed by the current configuration of the MC. The description reported in this section is provisional

Message Name : Data Link Targets (Message#2)

Message ID : A8	Transfer Type : BC-to-RT
Source : MC	Word Count : 30
Destination : RDR	Xmit Rate : 10 Hz

Word Name	Word No	Description	Section
Receive Command Word	CW	To RDR, subaddress 01000 (08)	
Target 06 Position X	01		7.1.8.1
Target 06 Position Y	02		7.1.8.2
Target 06 Ground Track Angle	03		7.1.8.3
Target 06 Presentation Data	04		7.1.8.4
Target 06 Call Sign (MSW)	05		7.1.8.5
Target 06 Call Sign (LSW)	06		
Target 07 Position X	07		7.1.8.1
Target 07 Position Y	08		7.1.8.2
Target 07 Ground Track Angle	09		7.1.8.3
Target 07 Presentation Data	10		7.1.8.4
Target 07 Call Sign (MSW)	11		7.1.8.5
Target 07 Call Sign (LSW)	12		
Target 08 Position X	13		7.1.8.1
Target 08 Position Y	14		7.1.8.2
Target 08 Ground Track Angle	15		7.1.8.3
Target 08 Presentation Data	16		7.1.8.4
Target 08 Call Sign (MSW)	17		7.1.8.5
Target 08 Call Sign (LSW)	18		
Target 09 Position X	19		7.1.8.1
Target 09 Position Y	20		7.1.8.2
Target 09 Ground Track Angle	21		7.1.8.3
Target 09 Presentation Data	22		7.1.8.4
Target 09 Call Sign (MSW)	23		7.1.8.5
Target 09 Call Sign (LSW)	24		
Target 10 Position X	25		7.1.8.1
Target 10 Position Y	26		7.1.8.2
Target 10 Ground Track Angle	27		7.1.8.3
Target 10 Presentation Data	28		7.1.8.4
Target 10 Call Sign (MSW)	29		7.1.8.5
Target 10 Call Sign (LSW)	30		
Status Word	ST	From RDR	

7.1.8.1 **Word A8-01: Target 06 Position X**
Word A8-07: Target 07 Position X
Word A8-13: Target 08 Position X
Word A8-19: Target 09 Position X
Word A8-25: Target 10 Position X

Sheet 1 of 1

Word Name	: Target 06/07/08/09/10 Position X	Max Value	: 517,000
Word ID	: A8/01;/07;/13;/19;/25	Min Value	: -517,000
Source(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 262,144
Signal Type	: 2's complement	LSB	: 16
Units	: feet	Full scale	: 524,280

Field Name	Bit No	Description	
A	00 SIGN	X component of target 06/07/08/09/10 position	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the DL tgt position along the X axis of the XYZ Navigation frame.

NOTE 2: Word 01 is not significant if target 06 is not active (bit 05 of word A7/01 set to "NOT ACTIVE").
 Word 07 is not significant if target 07 is not active (bit 06 of word A7/01 set to "NOT ACTIVE").
 Word 13 is not significant if target 08 is not active (bit 07 of word A7/01 set to "NOT ACTIVE").
 Word 19 is not significant if target 09 is not active (bit 08 of word A7/01 set to "NOT ACTIVE").
 Word 25 is not significant if target 10 is not active (bit 09 of word A7/01 set to "NOT ACTIVE").

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7.1.8.2 **Word A8-02: Target 06 Position Y**
Word A8-08: Target 07 Position Y
Word A8-14: Target 08 Position Y
Word A8-20: Target 09 Position Y
Word A8-26: Target 10 Position Y

Sheet 1 of 1

Word Name	: Target 06/07/08/09/10 Position Y	Max Value	: 517,000
Word ID	: A8/02;/08;/14;/20;/26	Min Value	: -517,000
Source(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 262,144
Signal Type	: 2's complement	LSB	: 16
Units	: feet	Full scale	: 524,280

Field Name	Bit No	Description	
A	00 SIGN	Y component of target 06/07/08/09/10 position	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the DL tgt position along the Y axis of the XYZ Navigation frame.

NOTE 2: Word 02 is not significant if target 06 is not active (bit 05 of word A7/01 set to "NOT ACTIVE").
Word 08 is not significant if target 07 is not active (bit 06 of word A7/01 set to "NOT ACTIVE").
Word 14 is not significant if target 08 is not active (bit 07 of word A7/01 set to "NOT ACTIVE").
Word 20 is not significant if target 09 is not active (bit 08 of word A7/01 set to "NOT ACTIVE").
Word 26 is not significant if target 10 is not active (bit 09 of word A7/01 set to "NOT ACTIVE").

7.1.8.3 **Word A8-03: Target 06 Ground Track Angle**
Word A8-09: Target 07 Ground Track Angle
Word A8-15: Target 08 Ground Track Angle
Word A8-21: Target 09 Ground Track Angle
Word A8-27: Target 10 Ground Track Angle

Sheet 1 of 2

Word Name	: Target 06/07/08/09/10 Ground Track Angle		
Word ID	: A8/03;/09;/15;/21;/27	Max Value	: 1.0
Source(s)	: MC	Min Value	: -1.0
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: 2's complement	MSB	: 0.5
Units	: Semicircles	LSB	: 3.05176E-05
		Full scale	: 1.0

Field Name	Bit No	Description	
A	00 SIGN	Ground Track Angle of target 06/07/08/09/10	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

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- NOTE 1:** This word represents the Ground Track Angle of the DL target. It is referred to the Navigation Frame, and is positive counter-clockwise (i.e. it is 0 degrees when the target moves along the x axis of the Navigation frame, and is 90 degrees when the target moves along the y axis of the Navigation Frame).
- NOTE 2:** Word 03 is not significant if target 06 is not active (bit 05 of word A7/01 set to "NOT ACTIVE").
Word 09 is not significant if target 07 is not active (bit 06 of word A7/01 set to "NOT ACTIVE").
Word 15 is not significant if target 08 is not active (bit 07 of word A7/01 set to "NOT ACTIVE").
Word 21 is not significant if target 09 is not active (bit 08 of word A7/01 set to "NOT ACTIVE").
Word 27 is not significant if target 10 is not active (bit 09 of word A7/01 set to "NOT ACTIVE").

7.1.8.4 **Word A8-04: Target 06 Presentation Data**
Word A8-10: Target 07 Presentation Data
Word A8-16: Target 08 Presentation Data
Word A8-22: Target 09 Presentation Data
Word A8-28: Target 10 Presentation Data

Sheet 1 of 2

Word Name	: Target 06/07/08/09/10 Presentation Data		
Word ID	: A8/04;/10;/16;/22;/28	Max Value	: See Notes
Source(s)	: MC	Min Value	: See Notes
Comp Rate	: NA	Resolution	: NA
Xmit Rate	: 10 Hz	Accuracy	: NA
Signal Type	: Unsigned Numeric/Coded	MSB	: See Notes
Units	: See Notes	LSB	: See Notes
		Full scale	: See Notes

Field Name	Bit No	Description	
A	00-C MSB	Type of Target 06/07/08/09/10	(Note 1,2)
	01-C LSB		
B	02-N MSB	Velocity of Target 06/07/08/09/10	(Note 1,3)
	03-N		
	04-N LSB		
C	05-N MSB	Altitude of Target 06/07/08/09/10	(Note 1,4)
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
D	11-N LSB		
	12-C	Target 06/07/08/09/10 within Intercept Zone selector	(Note 1,5)
E	13	spare	
	14		
	15		

NOTE 1: Word 04 is not significant if target 06 is not active (bit 05 of word A7/01 set to “NOT ACTIVE”).
 Word 10 is not significant if target 07 is not active (bit 06 of word A7/01 set to “NOT ACTIVE”).
 Word 16 is not significant if target 08 is not active (bit 07 of word A7/01 set to “NOT ACTIVE”).
 Word 22 is not significant if target 09 is not active (bit 08 of word A7/01 set to “NOT ACTIVE”).
 Word 28 is not significant if target 10 is not active (bit 09 of word A7/01 set to “NOT ACTIVE”).

NOTE 2: Bit 00 and 01 compose a two bit binary coded word (MSB=BIT 00) defining the type of the DL target 06/07/08/09/10, as indicated in Tab. A8/04; /10;/16; /22; /28-A respectively.

Tab. A8/04;/10;/16;/22;/28-A - Field A Description

DL Target Type selector	Bit		Decimal Value	Remarks
	00	01		
DL Target	0	0	00	
DL High Priority Target (HPL)	0	1	01	
DL Member	1	0	02	
DL High Priority Member (HPM)	1	1	03	

NOTE 3: Bit 02 through bit 04 compose a three bit binary coded word (MSB = Bit 02) which defines the Velocity of the DL Target 06/07/08/09/10. The units are knots, the MAX value is 1,000, the MIN value is 0, the MSB is 572, the LSB is 143 and the full scale is 1,001.
 If the DL target is a DL Member or a DL HPM (field A set to decimal value 02 or to decimal value 03) the content of this field is not significant.

NOTE 4: Bit 05 through bit 11 compose a seven bit binary coded word (MSB = Bit 05) which defines the Altitude of the DL Target 06/07/08/09/10. The units are kfeet, the MAX value is 99, the MIN value is 0, the MSB is 64, the LSB is 1 and the full scale is 127.

NOTE 5: If this bit is set to “1”, the relevant DL target is within the Intercept Zone.
 If the DL target is a DL Member or a DL HPM (field A set to decimal value 02 or to decimal value 03) the content of this field is not significant.

7.1.8.5 **Word A8-05/06: Target 06 Call Sign**
Word A8-11/12: Target 07 Call Sign
Word A8-17/18: Target 08 Call Sign
Word A8-23/24: Target 09 Call Sign
Word A8-29/30: Target 10 Call Sign

Sheet 1 of 2

Word Name	: Target 06/07/08/09/10 Call Sign	Max Value	: NA
Word ID	: A8/05-06;/11-12;/17-18;/23-24;/29-30	Min Value	: NA
Source(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description		
MSW	A	00-C MSB	Character 1	(Note 1, 2, 3)
		01-C		
		02-C		
		03-C		
		04-C		
		05-C		
		06-C		
	B	07-C LSB	Character 2	(Note 1, 2, 3)
		08-C MSB		
		09-C		
		10-C		
		11-C		
		12-C		
		13-C		
		14-C		
LSW	C	00-C MSB	Character 3	(Note 1, 2, 3)
		01-C		
		02-C		
		03-C		
		04-C		
		05-C		
		06-C		
	D	07-C LSB	Character 4	(Note 1, 2, 3)
		08-C MSB		
		09-C		
		10-C		
		11-C		
		12-C		
		13-C		
		14-C		
15-C LSB				

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- NOTE 1:** Fields A, B, C and D contain the ASCII code relevant respectively to the first, second, third and fourth character of the Target 06/07/08/09/10 Call Sign.
- NOTE 2:** Words 05-06 are not significant if target 06 is not active (bit 00 of word A7/01 set to "NOT ACTIVE").
Words 11-12 are not significant if target 07 is not active (bit 01 of word A7/01 set to "NOT ACTIVE").
Words 17-18 are not significant if target 08 is not active (bit 02 of word A7/01 set to "NOT ACTIVE").
Words 23-24 are not significant if target 09 is not active (bit 03 of word A7/01 set to "NOT ACTIVE").
Words 29-30 are not significant if target 10 is not active (bit 04 of word A7/01 set to "NOT ACTIVE").
- NOTE 3:** Words 05-06 are not significant if target 06 is a DL Target or a DL High Priority Target (HPL) (field A of word A8/04 set to "DL Target" or to "DL High Priority Target (HPL)").
Words 11-12 are not significant if target 07 is a DL Target or a DL High Priority Target (HPL) (field A of word A8/10 set to "DL Target" or to "DL High Priority Target (HPL)").
Words 17-18 are not significant if target 08 is a DL Target or a DL High Priority Target (HPL) (field A of word A8/16 set to "DL Target" or to "DL High Priority Target (HPL)").
Words 23-24 are not significant if target 09 is a DL Target or a DL High Priority Target (HPL) (field A of word A8/22 set to "DL Target" or to "DL High Priority Target (HPL)").
Words 29-30 are not significant if target 10 is a DL Target or a DL High Priority Target (HPL) (field A of word A8/28 set to "DL Target" or to "DL High Priority Target (HPL)").

7.1.9 Message A9: Reserved RX Message

This message is reserved for Leonardo and shall be not managed by the configuration of the MC. The description reported in this section is provisional.

Message Name : Reserved RX Message

Message ID : A9

Source : MC

Destination : RDR

Transfer Type : BC-to-RT

Word Count : from 1 to 32

Xmit Rate : 50 Hz

Word Name	Word No	Description	Section
Receive Command Word	CW	To RDR, subaddress 01001 (09)	
Word#01	01	Reserved	N/A
...	N/A
...	N/A
Word#32	32	Reserved	N/A
Status Word	ST	From RDR	

7.1.9.1 Word A9-01÷32: Reserved word

Sheet 1 of 1

Word Name	: Reserved word #1÷#32		
Word ID	: A9/01÷32	Max Value	: Any
Source(s)	: MC	Min Value	: Any
Destination(s)	: RDR	Resolution	: NA
Comp Rate	: Any	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: Any
Signal Type	: Any	LSB	: Any
Units	: Any	Full scale	: Any

Field Name	Bit No	Description
A	00 MSB	Reserved word #1÷#32
	01	
	02	
	03	
	04	
	05	
	06	
	07	
	08	
	09	
	10	
	11	
	12	
	13	
	14	
	15 LSB	

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7.2 Transmit Messages

The following sections describe the content and the structure of the messages transferred from the radar to the avionics and containing command tell-backs, track data, diagnostic data from the radar.

7.2.1 Message B1: TWS Status and Targets 1 and 2

Message Name	: TWS Status and Targets 1 and 2		
Message ID	: B1	Transfer Type	: RT-to-BC
Source	: RDR	Word Count	: 29
Destination	: MC	Xmit Rate	: 10 Hz

Word Name	Word No	Description	Section
Transmit Command Word	CW	To RDR, subaddress 01011 (11)	
Status Word	ST		
Track Validity and HPT Identifier	01		7.2.1.1
Track Priority (Targets 01 to 04)	02		7.2.1.2
Track Priority (Targets 05 to 08)	03		7.2.1.3
Track Accuracy (Targets 01 to 04)	04		7.2.1.4
Track Accuracy (Targets 05 to 08)	05		7.2.1.5
Track Id of Targets 01 and 02	06		7.2.1.6
Track Id of Targets 03 and 04	07		7.2.1.7
Track Id of Targets 05 and 06	08		7.2.1.8
Track Id of Targets 07 and 08	09		7.2.1.9
HPT X Display Coordinate	10		7.2.1.10
HPT Y Display Coordinate	11		7.2.1.11
Target 01 Time Tag	12		7.2.1.12
Target 01 Range	13		7.2.1.13
Target 01 Position X	14		7.2.1.14
Target 01 Position Y	15		7.2.1.15
Target 01 Position Z	16		7.2.1.16
Target 01 Velocity (Magnitude)	17		7.2.1.17
Target 01 Velocity X	18		7.2.1.18
Target 01 Velocity Y	19		7.2.1.19
Target 01 Velocity Z	20		7.2.1.20
Target 02 Time Tag	21		7.2.1.12
Target 02 Range	22		7.2.1.13
Target 02 Position X	23		7.2.1.14
Target 02 Position Y	24		7.2.1.15
Target 02 Position Z	25		7.2.1.16
Target 02 Velocity (Magnitude)	26		7.2.1.17
Target 02 Velocity X	27		7.2.1.18
Target 02 Velocity Y	28		7.2.1.19
Target 02 Velocity Z	29		7.2.1.20

Remark:

1. The content of this message is significant only when the Radar is performing TWS Mode.

7.2.1.1 Word B1-01: Validity Word and HPT Identifier

Sheet 1 of 3

Word Name	: Validity Word and HPT Identifier		
Word ID	: B1/01	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded and Unsigned Numeric	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00-C	Track 01 Validity	(Note 1)
	01-C	Track 02 Validity	(Note 1)
	02-C	Track 03 Validity	(Note 1)
	03-C	Track 04 Validity	(Note 1)
	04-C	Track 05 Validity	(Note 1)
	05-C	Track 06 Validity	(Note 1)
	06-C	Track 07 Validity	(Note 1)
	07-C	Track 08 Validity	(Note 1)
B	08-N MSB	HPT Selector	(Note 2)
	09-N		
	10-N		
	11-N LSB		
C	12	spare	
	13	spare	
	14	spare	
	15	spare	

NOTE 1: Bit 00 through bit 07 control the Validity of the data of TWS targets from 01 to 08 respectively, as indicated in Tab. B1/01-A.

Tab. B1/01-A - Field A Description

Track (i+1) Validity	Bit i	Decimal Value	Remarks
NOT ACTIVE	0	00	
ACTIVE	1	01	

NOTE 2: Bit 08 through bit 11 compose a four bit binary coded word (MSB = BIT 08) indicating the track that is HPT, as indicated in Tab. B1/01-B.

Tab. B1/01-B - Field B Description

HPT Selector	Bit				Decimal Value	Remarks
	08	09	10	11		
Target 01 HPT	0	0	0	0	00	
Target 02 HPT	0	0	0	1	01	
Target 03 HPT	0	0	1	0	02	
Target 04 HPT	0	0	1	1	03	
Target 05 HPT	0	1	0	0	04	
Target 06 HPT	0	1	0	1	05	
Target 07 HPT	0	1	1	0	06	
Target 08 HPT	0	1	1	1	07	
No HPT Present	1	1	1	1	15	

7.2.1.2 Word B1-02: Track Priority (Targets 01 to 04)

Sheet 1 of 2

Word Name	: Track Priority (Targets 01 to 04)	Max Value	: NA
Word ID	: B1/02	Min Value	: NA
Source(s)	: RDR	Resolution	: NA
Destination(s)	: MC	Accuracy	: NA
Comp Rate	: 25 Hz	MSB	: NA
Xmit Rate	: 10 Hz	LSB	: NA
Signal Type	: Coded	Full scale	: NA
Units	: NA		

Field Name	Bit No	Description	
A	00-C MSB	Track 01 Priority	(Note 1)
	01-C		
	02-C LSB		
B	03-C MSB	Track 02 Priority	(Note 1)
	04-C		
	05-C LSB		
C	06-C MSB	Track 03 Priority	(Note 1)
	07-C		
	08-C LSB		
D	09-C MSB	Track 04 Priority	(Note 1)
	10-C		
	11-C LSB		
E	12	spare	
	13	spare	
	14	spare	
	15	spare	

NOTE 1: Fields A, B, C and D provide the priority level of target 01 (bit 00, 01, 02), target 02 (bit 03, 04, 05), target 03 (bit 06, 07, 08) and target 04 (bit 9, 10, 11), as indicated in Tab. B1/02-A/B/C/D.

The value "Level 1" indicates the highest priority level, and the value "Level 8" indicates the lowest.

Tab. B1/02-A/B/C/D - Field A/B/C/D Description

Track Priority	Bit			Decimal Value	Remarks
	00	01	02		
Target 01	00	01	02		
Target 02	03	04	05		
Target 03	06	07	08		
Target 04	09	10	11		
Level 1	0	0	0	00	
Level 2	0	0	1	01	
Level 3	0	1	0	02	
Level 4	0	1	1	03	
Level 5	1	0	0	04	
Level 6	1	0	1	05	
Level 7	1	1	0	06	
Level 8	1	1	1	07	

7.2.1.3 Word B1-03: Track Priority (Targets 05 to 08)

Sheet 1 of 2

Word Name	: Track Priority (Targets 05 to 08)	Max Value	: NA
Word ID	: B1/03	Min Value	: NA
Source(s)	: RDR	Resolution	: NA
Destination(s)	: MC	Accuracy	: NA
Comp Rate	: 25 Hz	MSB	: NA
Xmit Rate	: 10 Hz	LSB	: NA
Signal Type	: Coded	Full scale	: NA
Units	: NA		

Field Name	Bit No	Description	
A	00-C MSB	Track 05 Priority	(Note 1)
	01-C		
	02-C LSB		
B	03-C MSB	Track 06 Priority	(Note 1)
	04-C		
	05-C LSB		
C	06-C MSB	Track 07 Priority	(Note 1)
	07-C		
	08-C LSB		
D	09-C MSB	Track 08 Priority	(Note 1)
	10-C		
	11-C LSB		
E	12	spare	
	13	spare	
	14	spare	
	15	spare	

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NOTE 1: Fields A, B, C and D provide the priority level of target 05 (bit 00, 01, 02), target 06 (bit 03, 04, 05), target 07 (bit 06, 07, 08) and target 08 (bit 9, 10, 11), as indicated in Tab. B1/03-A/B/C/D.

The value "Level 1" indicates the highest priority level, and the value "Level 8" indicates the lowest.

Tab. B1/03-A/B/C/D - Field A/B/C/D Description

Track Priority	Bit			Decimal Value	Remarks
	00	01	02		
Target 05	00	01	02		
Target 06	03	04	05		
Target 07	06	07	08		
Target 08	09	10	11		
Level 1	0	0	0	00	
Level 2	0	0	1	01	
Level 3	0	1	0	02	
Level 4	0	1	1	03	
Level 5	1	0	0	04	
Level 6	1	0	1	05	
Level 7	1	1	0	06	
Level 8	1	1	1	07	

7.2.1.4 Word B1-04: Track Accuracy (Targets 01 to 04)

Sheet 1 of 3

Word Name	: Track Accuracy (Targets 01 to 04)		
Word ID	: B1/04	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00-C MSB	Position Accuracy Target 01	(Note 1)
	01-C LSB		
B	02-C MSB	Velocity Accuracy Target 01	(Note 2)
	03-C LSB		
C	04-C MSB	Position Accuracy Target 02	(Note 1)
	05-C LSB		
D	06-C MSB	Velocity Accuracy Target 02	(Note 2)
	07-C LSB		
E	08-C MSB	Position Accuracy Target 03	(Note 1)
	09-C LSB		
F	10-C MSB	Velocity Accuracy Target 03	(Note 2)
	11-C LSB		
G	12-C MSB	Position Accuracy Target 04	(Note 1)
	13-C LSB		
H	14-C MSB	Velocity Accuracy Target 04	(Note 2)
	15-C LSB		

NOTE 1: Fields A, C, E and G provide the accuracy of the Position for target 01 (bit 00, 01), for target 02 (bit 04, 05), for target 03 (bit 08, 09), and for target 04 (bit 12, 13), as indicated in Tab. B1/04-A/C/E/G.

Tab. B1/04-A/C/E/G - Field A/C/E/G Description

Position Accuracy	Bit		Decimal Value	Remarks
	00	01		
Target 01	00	01		
Target 02	04	05		
Target 03	08	09		
Target 04	12	13		
Level 0	0	0	00	
Level 1	0	1	01	
Level 2	1	0	02	
Level 3	1	1	03	

NOTE 2: Fields B, D, F and H provide the accuracy of the Velocity for target 01 (bit 00, 01), for target 02 (bit 04, 05), for target 03 (bit 08, 09), and for target 04 (bit 12, 13), as indicated in Tab. B1/04-B/D/F/H.

Tab. B1/04-B/D/F/H - Field B/D/F/H Description

Velocity Accuracy	Bit		Decimal Value	Remarks
	00	01		
Target 01	00	01		
Target 02	04	05		
Target 03	08	09		
Target 04	12	13		
Level 0	0	0	00	
Level 1	0	1	01	
Level 2	1	0	02	
Level 3	1	1	03	

7.2.1.5 Word B1-05: Track Accuracy (Targets 05 to 08)

Sheet 1 of 3

Word Name : Track Accuracy (Targets 05 to 08)

Word ID : B1/05

Max Value : NA

Source(s) : RDR

Min Value : NA

Destination(s) : MC

Resolution : NA

Comp Rate : 25 Hz

Accuracy : NA

Xmit Rate : 10 Hz

MSB : NA

Signal Type : Coded

LSB : NA

Units : NA

Full scale : NA

Field Name	Bit No	Description	
A	00-C MSB	Position Accuracy Target 05	(Note 1)
	01-C LSB		
B	02-C MSB	Velocity Accuracy Target 05	(Note 2)
	03-C LSB		
C	04-C MSB	Position Accuracy Target 06	(Note 1)
	05-C LSB		
D	06-C MSB	Velocity Accuracy Target 06	(Note 2)
	07-C LSB		
E	08-C MSB	Position Accuracy Target 07	(Note 1)
	09-C LSB		
F	10-C MSB	Velocity Accuracy Target 07	(Note 2)
	11-C LSB		
G	12-C MSB	Position Accuracy Target 08	(Note 1)
	13-C LSB		
H	14-C MSB	Velocity Accuracy Target 08	(Note 2)
	15-C LSB		

NOTE 1: Fields A, C, E and G provide the accuracy of the Position for target 05 (bit 00, 01), for target 06 (bit 04, 05), for target 07 (bit 08, 09), and for target 08 (bit 12, 13), as indicated in Tab. B1/05-A/C/E/G.

Tab. B1/05-A/C/E/G - Field A/C/E/G Description

Position Accuracy	Bit		Decimal Value	Remarks
	00	01		
Target 05	00	01		
Target 06	04	05		
Target 07	08	09		
Target 08	12	13		
Level 0	0	0	00	
Level 1	0	1	01	
Level 2	1	0	02	
Level 3	1	1	03	

NOTE 2: Fields B, D, F and H provide the accuracy of the Velocity for target 05 (bit 00, 01), for target 06 (bit 04, 05), for target 07 (bit 08, 09), and for target 08 (bit 12, 13), as indicated in Tab. B1/05- B/D/F/H.

Tab. B1/05- B/D/F/H - Field B/D/F/H Description

Velocity Accuracy	Bit		Decimal Value	Remarks
	00	01		
Target 05	00	01		
Target 06	04	05		
Target 07	08	09		
Target 08	12	13		
Level 0	0	0	00	
Level 1	0	1	01	
Level 2	1	0	02	
Level 3	1	1	03	

7.2.1.6 Word B1-06: Track Id of TWS Tracked targets 01 and 02

Sheet 1 of 1

Word Name	: Track Id of TWS Tracked targets 01 and 02		
Word ID	: B1/06	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Unsigned numeric	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00-N MSB	Track Id. of TWS Tracked tgt 1	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
B	07-N LSB	Track Id. of TWS Tracked tgt 2	(Note 1,2)
	08-N MSB		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
15-N LSB			

NOTE 1: The content of field A is not significant if target 01 is not active (bit 00 of word B1/01 set to "NOT ACTIVE").
 The content of field B is not significant if target 02 is not active (bit 01 of word B1/01 set to "NOT ACTIVE").

NOTE 2: The content of field A represents the Track identifier associated to the Tracked target number 01.
 The content of field B represents the Track identifier associated to the Tracked target number 02.

7.2.1.7 Word B1-07: Track Id of TWS Tracked targets 03 and 04

Sheet 1 of 1

Word Name	: Track Id of TWS Tracked targets 03 and 04		
Word ID	: B1/07	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Unsigned Numeric	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00-N MSB	Track Id. of TWS Tracked tgt 3	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
B	07-N LSB	Track Id. of TWS Tracked tgt 4	(Note 1,2)
	08-N MSB		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
15-N LSB			

NOTE 1: The content of field A is not significant if target 03 is not active (bit 02 of word B1/01 set to "NOT ACTIVE").
 The content of field B is not significant if target 04 is not active (bit 03 of word B1/01 set to "NOT ACTIVE").

NOTE 2: The content of field A represents the Track identifier associated to the Tracked target number 03.
 The content of field B represents the Track identifier associated to the Tracked target number 04.

7.2.1.8 Word B1-08: Track Id of TWS Tracked targets 05 and 06

Sheet 1 of 1

Word Name	: Track Id of TWS Tracked targets 05 and 06		
Word ID	: B1/08	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Unsigned Numeric	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00-N MSB	Track Id. of TWS Tracked tgt 5	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
B	07-N LSB	Track Id. of TWS Tracked tgt 6	(Note 1,2)
	08-N MSB		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
15-N LSB			

NOTE 1: The content of field A is not significant if target 05 is not active (bit 04 of word B1/01 set to "NOT ACTIVE").
 The content of field B is not significant if target 06 is not active (bit 05 of word B1/01 set to "NOT ACTIVE").

NOTE 2: The content of field A represents the Track identifier associated to the Tracked target number 05.
 The content of field B represents the Track identifier associated to the Tracked target number 06.

7.2.1.9 Word B1-09: Track Id of TWS Tracked targets 07 and 08

Sheet 1 of 1

Word Name	: Track Id of TWS Tracked targets 07 and 08		
Word ID	: B1/09	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Unsigned Numeric	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00-N MSB	Track Id. of TWS Tracked tgt 7	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
B	07-N LSB	Track Id. of TWS Tracked tgt 8	(Note 1,2)
	08-N MSB		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
15-N LSB			

NOTE 1: The content of field A is not significant if target 07 is not active (bit 06 of word B1/01 set to "NOT ACTIVE").
 The content of field B is not significant if target 08 is not active (bit 07 of word B1/01 set to "NOT ACTIVE").

NOTE 2: The content of field A represents the Track identifier associated to the Tracked target number 07.
 The content of field B represents the Track identifier associated to the Tracked target number 08.

7.2.1.10 Word B1-10: HPT X Display Coordinate

Sheet 1 of 1

Word Name	: HPT X Display Coordinate		
Word ID	: B1/10	Max Value	: 483
Source(s)	: RDR	Min Value	: 0
Destination(s)	: MC	Resolution	: 1
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 1010 Hz	MSB	: 256
Signal Type	: Unsigned Numeric	LSB	: 1
Units	: Pixels	Full scale	: 511

Field Name	Bit No	Description	
A	00 N MSB	X-Display coordinate of the HPT target	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
B	09	spare	
	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

NOTE 1: Bit 00 through bit 08 compose a binary coded word defining the current X-display coordinate of the HPT symbol.

NOTE 2: The content of this word is not significant if the HPT is not present (Field B of B1/01 set to "No HPT Present").

7.2.1.11 Word B1-11: HPT Y Display Coordinate

Sheet 1 of 1

Word Name	: HPT Y Display Coordinate		
Word ID	: B1/11	Max Value	: 483
Source(s)	: RDR	Min Value	: 0
Destination(s)	: MC	Resolution	: 1
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 1010 Hz	MSB	: 256
Signal Type	: Unsigned Numeric	LSB	: 1
Units	: Pixels	Full scale	: 511

Field Name	Bit No	Description	
A	00 N MSB	Y-Display coordinate of the HPT target	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
B	09	spare	
	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

NOTE 1: Bit 00 through bit 08 compose a binary coded word defining the current Y-display coordinate of the HPT symbol.

NOTE 2: The content of this word is not significant if the HPT is not present (Field B of B1/01 set to "No HPT Present").

**7.2.1.12 Word B1-12: Target 01 Time Tag
 Word B1-21: Target 02 Time Tag**

Sheet 1 of 1

Word Name	: Target 01/02 Time Tag		
Word ID	: B1/12;/21	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 2,097,152.0
Signal Type	: Unsigned Numeric	LSB	: 64.0
Units	: μ sec	Full scale	: 4,194,240.0

Field Name	Bit No	Description	
A	00-N MSB	Time Tag of Tracked target 01/02 data	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: Word 12 is not significant if target 01 is not active (bit 00 of word B1/01 set to "NOT ACTIVE").
 Word 21 is not significant if target 02 is not active (bit 01 of word B1/01 set to "NOT ACTIVE").

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7.2.1.13 Word B1-13: Target 01 Range
Word B1-22: Target 02 Range

Sheet 1 of 1

Word Name	: Target 01/02 Range		
Word ID	: B1/13;/22	Max Value	: 517,000
Source(s)	: RDR	Min Value	: 0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 262,144
Signal Type	: Unsigned Numeric	LSB	: 8
Units	: feet	Full scale	: 524,280

Field Name	Bit No	Description	
A	00-N MSB	Range of Tracked target 01/02	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: Word 13 is not significant if target 01 is not active (bit 00 of word B1/01 set to "NOT ACTIVE").
 Word 22 is not significant if target 02 is not active (bit 01 of word B1/01 set to "NOT ACTIVE").

**7.2.1.14 Word B1-14: Target 01 Position X
 Word B1-23: Target 02 Position X**

Sheet 1 of 1

Word Name	: Target 01/02 Position X		
Word ID	: B1/14:/23	Max Value	: 517,000
Source(s)	: RDR	Min Value	: -517,000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 262,144
Signal Type	: 2's complement	LSB	: 16
Units	: feet	Full scale	: 524,280

Field Name	Bit No	Description	
A	00 SIGN	X component of Tracked target 01/02 position	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target position along the X axis of the XYZ Navigation frame.

NOTE 2: Word 14 is not significant if target 01 is not active (bit 00 of word B1/01 set to "NOT ACTIVE").
 Word 23 is not significant if target 02 is not active (bit 01 of word B1/01 set to "NOT ACTIVE").

7.2.1.15 Word B1-15: Target 01 Position Y
Word B1-24: Target 02 Position Y

Sheet 1 of 1

Word Name	: Target 01/02 Position Y		
Word ID	: B1/15;/24	Max Value	: 517,000
Source(s)	: RDR	Min Value	: -517,000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 262,144
Signal Type	: 2's complement	LSB	: 16
Units	: feet	Full scale	: 524,280

Field Name	Bit No	Description	
A	00 SIGN	Y component of Tracked target 01/02 position	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target position along the Y axis of the XYZ Navigation frame.

NOTE 2: Word 15 is not significant if target 01 is not active (bit 00 of word B1/01 set to "NOT ACTIVE").
 Word 24 is not significant if target 02 is not active (bit 01 of word B1/01 set to "NOT ACTIVE").

7.2.1.16 Word B1-16: Target 01 Position Z
Word B1-25: Target 02 Position Z

Sheet 1 of 1

Word Name	: Target 01/02 Position Z		
Word ID	: B1/16;/25	Max Value	: 80,000
Source(s)	: RDR	Min Value	: -80,000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 40,960
Signal Type	: 2's complement	LSB	: 2.5
Units	: feet	Full scale	: 81,920

Field Name	Bit No	Description	
A	00 SIGN	Z component of Tracked target 01/02 position	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target position along the Z axis of the XYZ Navigation frame.

NOTE 2: Word 16 is not significant if target 01 is not active (bit 00 of word B1/01 set to "NOT ACTIVE").
 Word 25 is not significant if target 02 is not active (bit 01 of word B1/01 set to "NOT ACTIVE").

**7.2.1.17 Word B1-17: Target 01 Velocity (magnitude)
 Word B1-26: Target 02 Velocity (magnitude)**

Sheet 1 of 1

Word Name	: Target 01/02 Velocity (Magnitude)		
Word ID	: B1/17;/26	Max Value	: 4,000.0
Source(s)	: RDR	Min Value	: 0.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 2,048.00
Signal Type	: Unsigned Numeric	LSB	: 0.0625
Units	: feet/sec	Full scale	: 4,095.94

Field Name	Bit No	Description	
A	00-N MSB	Magnitude of target 01/02 absolute velocity	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the magnitude of the estimated absolute velocity of the target.

NOTE 2: Word 17 is not significant if target 01 is not active (bit 00 of word B1/01 set to "NOT ACTIVE").
 Word 26 is not significant if target 02 is not active (bit 01 of word B1/01 set to "NOT ACTIVE").

**7.2.1.18 Word B1-18: Target 01 Velocity X
 Word B1-27: Target 02 Velocity X**

Sheet 1 of 1

Word Name	: Target 01/02 Velocity X		
Word ID	: B1/18;/27	Max Value	: 4,000.0
Source(s)	: RDR	Min Value	: -4,000.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 2,048.00
Signal Type	: 2's complement	LSB	: 0.125
Units	: feet/sec	Full scale	: 4,095.87

Field Name	Bit No	Description	
A	00 SIGN	X component of target 01/02 absolute velocity	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target absolute velocity along the X axis of the XYZ Navigation frame.

NOTE 2: Word 18 is not significant if target 01 is not active (bit 00 of word B1/01 set to "NOT ACTIVE").
 Word 27 is not significant if target 02 is not active (bit 01 of word B1/01 set to "NOT ACTIVE").

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7.2.1.19 Word B1-19: Target 01 Velocity Y
Word B1-28: Target 02 Velocity Y

Sheet 1 of 1

Word Name	: Target 01/02 Velocity Y		
Word ID	: B1/19;/28	Max Value	: 4,000.0
Source(s)	: RDR	Min Value	: -4,000.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 2,048.00
Signal Type	: 2's complement	LSB	: 0.125
Units	: feet/sec	Full scale	: 4,095.87

Field Name	Bit No	Description	
A	00 SIGN	Y component of target 01/02 absolute velocity	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target absolute velocity along the Y axis of the XYZ Navigation frame.

NOTE 2: Word 19 is not significant if target 01 is not active (bit 00 of word B1/01 set to "NOT ACTIVE").
 Word 28 is not significant if target 02 is not active (bit 01 of word B1/01 set to "NOT ACTIVE").

7.2.1.20 Word B1-20: Target 01 Velocity Z
Word B1-29: Target 02 Velocity Z

Sheet 1 of 1

Word Name	: Target 01/02 Velocity Z		
Word ID	: B1/20;/29	Max Value	: 4,000.0
Source(s)	: RDR	Min Value	: -4,000.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 2,048.00
Signal Type	: 2's complement	LSB	: 0.125
Units	: feet/sec	Full scale	: 4,095.87

Field Name	Bit No	Description	
A	00 SIGN	Z component of target 01/02 absolute velocity	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

- NOTE 1:** This word represents the component of the tracked target absolute velocity along the Z axis of the XYZ Navigation frame.
- NOTE 2:** Word 20 is not significant if target 01 is not active (bit 00 of word B1/01 set to "NOT ACTIVE").
Word 29 is not significant if target 02 is not active (bit 01 of word B1/01 set to "NOT ACTIVE").

7.2.2 Message B2: TWS Targets 3, 4, 5
Message Name : TWS Targets 3, 4, 5

Message ID : B2

Transfer Type : RT-to-BC

Source : RDR

Word Count : 27

Destination : MC

Xmit Rate : 10 Hz

Word Name	Word No	Description	Section
Transmit Command Word	CW	To RDR, subaddress 01100 (12)	
Status Word	ST		
Target 03 Time Tag	01		7.2.2.1
Target 03 Range	02		7.2.2.2
Target 03 Position X	03		7.2.2.3
Target 03 Position Y	04		7.2.2.4
Target 03 Position Z	05		7.2.2.5
Target 03 Velocity (Magnitude)	06		7.2.2.6
Target 03 Velocity X	07		7.2.2.7
Target 03 Velocity Y	08		7.2.2.8
Target 03 Velocity Z	09		7.2.2.9
Target 04 Time Tag	10		7.2.2.1
Target 04 Range	11		7.2.2.2
Target 04 Position X	12		7.2.2.3
Target 04 Position Y	13		7.2.2.4
Target 04 Position Z	14		7.2.2.5
Target 04 Velocity (Magnitude)	15		7.2.2.6
Target 04 Velocity X	16		7.2.2.7
Target 04 Velocity Y	17		7.2.2.8
Target 04 Velocity Z	18		7.2.2.9
Target 05 Time Tag	19		7.2.2.1
Target 05 Range	20		7.2.2.2
Target 05 Position X	21		7.2.2.3
Target 05 Position Y	22		7.2.2.4
Target 05 Position Z	23		7.2.2.5
Target 05 Velocity (Magnitude)	24		7.2.2.6
Target 05 Velocity X	25		7.2.2.7
Target 05 Velocity Y	26		7.2.2.8
Target 05 Velocity Z	27		7.2.2.9

Remark:

- The content of this message is significant only when the Radar is performing TWS Mode.

7.2.2.1 **Word B2-01: Target 03 Time Tag**
Word B2-10: Target 04 Time Tag
Word B2-19: Target 05 Time Tag

Sheet 1 of 1

Word Name	: Target 03/04/05 Time Tag	Max Value	: NA
Word ID	: B2/01;/10;/19	Min Value	: NA
Source(s)	: RDR	Resolution	: NA
Destination(s)	: MC	Accuracy	: NA
Comp Rate	: 25 Hz	MSB	: 2,097,152.0
Xmit Rate	: 10 Hz	LSB	: 64.0
Signal Type	: Unsigned Numeric	Full scale	: 4,194,240.0
Units	: μ sec		

Field Name	Bit No	Description	
A	00-N MSB	Time Tag of Tracked target 03/04/05 data	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: Word 01 is not significant if target 03 is not active (bit 02 of word B1/01 set to "NOT ACTIVE").
 Word 10 is not significant if target 04 is not active (bit 03 of word B1/01 set to "NOT ACTIVE").
 Word 19 is not significant if target 05 is not active (bit 04 of word B1/01 set to "NOT ACTIVE").

7.2.2.2 **Word B2-02: Target 03 Range**
Word B2-11: Target 04 Range
Word B2-20: Target 05 Range

Sheet 1 of 1

Word Name	: Target 03/04/05 Range	Max Value	: 517,000
Word ID	: B2/02;11;20	Min Value	: 0
Source(s)	: RDR	Resolution	: NA
Destination(s)	: MC	Accuracy	: NA
Comp Rate	: 25 Hz	MSB	: 262,144
Xmit Rate	: 10 Hz	LSB	: 8
Signal Type	: Unsigned Numeric	Full scale	: 524,280
Units	: feet		

Field Name	Bit No	Description	
A	00-N MSB	Range of Tracked target 03/04/05	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: Word 02 is not significant if target 03 is not active (bit 02 of word B1/01 set to "NOT ACTIVE").
 Word 11 is not significant if target 04 is not active (bit 03 of word B1/01 set to "NOT ACTIVE").
 Word 20 is not significant if target 05 is not active (bit 04 of word B1/01 set to "NOT ACTIVE").

7.2.2.3 **Word B2-03: Target 03 Position X**
Word B2-12: Target 04 Position X
Word B2-21: Target 05 Position X

Sheet 1 of 1

Word Name	: Target 03/04/05 Position X		
Word ID	: B2/03;/12;/21	Max Value	: 517,000
Source(s)	: RDR	Min Value	: -517,000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 262,144
Signal Type	: 2's complement	LSB	: 16
Units	: feet	Full scale	: 524,280

Field Name	Bit No	Description	
A	00 SIGN	X component of Tracked target 03/04/05 position	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target position along the X axis of the XYZ Navigation frame.

NOTE 2: Word 03 is not significant if target 03 is not active (bit 02 of word B1/01 set to "NOT ACTIVE").
 Word 12 is not significant if target 04 is not active (bit 03 of word B1/01 set to "NOT ACTIVE").
 Word 21 is not significant if target 05 is not active (bit 04 of word B1/01 set to "NOT ACTIVE").

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7.2.2.4 **Word B2-04: Target 03 Position Y**
Word B2-13: Target 04 Position Y
Word B2-22: Target 05 Position Y

Sheet 1 of 1

Word Name	: Target 03/04/05 Position Y		
Word ID	: B2/04;/13;/22	Max Value	: 517,000
Source(s)	: RDR	Min Value	: -517,000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 262,144
Signal Type	: 2's complement	LSB	: 16
Units	: feet	Full scale	: 524,280

Field Name	Bit No	Description	
A	00 SIGN	Y component of Tracked target 03/04/05 position	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target position along the Y axis of the XYZ Navigation frame.

NOTE 2: Word 04 is not significant if target 03 is not active (bit 02 of word B1/01 set to "NOT ACTIVE").
 Word 13 is not significant if target 04 is not active (bit 03 of word B1/01 set to "NOT ACTIVE").
 Word 22 is not significant if target 05 is not active (bit 04 of word B1/01 set to "NOT ACTIVE").

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7.2.2.5 **Word B2-05: Target 03 Position Z**
Word B2-14: Target 04 Position Z
Word B2-23: Target 05 Position Z

Sheet 1 of 1

Word Name	: Target 03/04/05 Position Z		
Word ID	: B2/05;/14;/23	Max Value	: 80,000
Source(s)	: RDR	Min Value	: -80,000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 40,960
Signal Type	: 2's complement	LSB	: 2.5
Units	: feet	Full scale	: 81,920

Field Name	Bit No	Description	
A	00 SIGN	Z component of Tracked target 03/04/05 position	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target position along the Z axis of the XYZ Navigation frame.

NOTE 2: Word 05 is not significant if target 03 is not active (bit 02 of word B1/01 set to "NOT ACTIVE").
 Word 14 is not significant if target 04 is not active (bit 03 of word B1/01 set to "NOT ACTIVE").
 Word 23 is not significant if target 05 is not active (bit 04 of word B1/01 set to "NOT ACTIVE").

7.2.2.6 **Word B2-06: Target 03 Velocity (magnitude)**
Word B2-15: Target 04 Velocity (magnitude)
Word B2-24: Target 05 Velocity (magnitude)

Sheet 1 of 1

Word Name	: Target 03/04/05 Velocity (Magnitude)		
Word ID	: B2/06;/15;/24	Max Value	: 4,000.0
Source(s)	: RDR	Min Value	: 0.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 2,048.00
Signal Type	: Unsigned Numeric	LSB	: 0.0625
Units	: feet/sec	Full scale	: 4,095.94

Field Name	Bit No	Description	
A	00-N MSB	Magnitude of target 03/04/05 absolute velocity	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

- NOTE 1:** This word represents the magnitude of the estimated absolute velocity of the target.
NOTE 2: Word 06 is not significant if target 03 is not active (bit 02 of word B1/01 set to "NOT ACTIVE").
 Word 15 is not significant if target 04 is not active (bit 03 of word B1/01 set to "NOT ACTIVE").
 Word 24 is not significant if target 05 is not active (bit 04 of word B1/01 set to "NOT ACTIVE").

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7.2.2.7 **Word B2-07: Target 03 Velocity X**
Word B2-16: Target 04 Velocity X
Word B2-25: Target 05 Velocity X

Sheet 1 of 1

Word Name	: Target 03/04/05 Velocity X	Max Value	: 4,000.0
Word ID	: B2/07;/16;/25	Min Value	: -4,000.0
Source(s)	: RDR	Resolution	: NA
Destination(s)	: MC	Accuracy	: NA
Comp Rate	: 25 Hz	MSB	: 2,048.00
Xmit Rate	: 10 Hz	LSB	: 0.125
Signal Type	: 2's complement	Full scale	: 4,095.87
Units	: feet/sec		

Field Name	Bit No	Description	
A	00 SIGN	X component of target 03/04/05 absolute velocity	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target absolute velocity along the X axis of the XYZ Navigation frame.

NOTE 2: Word 07 is not significant if target 03 is not active (bit 02 of word B1/01 set to "NOT ACTIVE").
Word 16 is not significant if target 04 is not active (bit 03 of word B1/01 set to "NOT ACTIVE").
Word 25 is not significant if target 05 is not active (bit 04 of word B1/01 set to "NOT ACTIVE").

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7.2.2.8 **Word B2-08: Target 03 Velocity Y**
 Word B2-17: Target 04 Velocity Y
 Word B2-26: Target 05 Velocity Y

Sheet 1 of 1

Word Name	: Target 03/04/05 Velocity Y	Max Value	: 4,000.0
Word ID	: B2/08;/17;/26	Min Value	: -4,000.0
Source(s)	: RDR	Resolution	: NA
Destination(s)	: MC	Accuracy	: NA
Comp Rate	: 25 Hz	MSB	: 2,048.00
Xmit Rate	: 10 Hz	LSB	: 0.125
Signal Type	: 2's complement	Full scale	: 4,095.87
Units	: feet/sec		

Field Name	Bit No	Description	
A	00 SIGN	Y component of target 03/04/05 absolute velocity	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target absolute velocity along the Y axis of the XYZ Navigation frame.

NOTE 2: Word 08 is not significant if target 03 is not active (bit 02 of word B1/01 set to "NOT ACTIVE").
 Word 17 is not significant if target 04 is not active (bit 03 of word B1/01 set to "NOT ACTIVE").
 Word 26 is not significant if target 05 is not active (bit 04 of word B1/01 set to "NOT ACTIVE").

7.2.2.9 **Word B2-09: Target 03 Velocity Z**
 Word B2-18: Target 04 Velocity Z
 Word B2-27: Target 05 Velocity Z

Sheet 1 of 1

Word Name	: Target 03/04/05 Velocity Z	Max Value	: 4,000.0
Word ID	: B2/09;/18;/27	Min Value	: -4,000.0
Source(s)	: RDR	Resolution	: NA
Destination(s)	: MC	Accuracy	: NA
Comp Rate	: 25 Hz	MSB	: 2,048.00
Xmit Rate	: 10 Hz	LSB	: 0.125
Signal Type	: 2's complement	Full scale	: 4,095.87
Units	: feet/sec		

Field Name	Bit No	Description	
A	00 SIGN	Z component of target 03/04/05 absolute velocity	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target absolute velocity along the Z axis of the XYZ Navigation frame.

NOTE 2: Word 09 is not significant if target 03 is not active (bit 02 of word B1/01 set to "NOT ACTIVE").
 Word 18 is not significant if target 04 is not active (bit 03 of word B1/01 set to "NOT ACTIVE").
 Word 27 is not significant if target 05 is not active (bit 04 of word B1/01 set to "NOT ACTIVE").

7.2.3 Message B3: TWS Targets 6, 7, 8
Message Name : TWS Targets 6, 7, 8

Message ID : B3

Transfer Type : RT-to-BC

Source : RDR

Word Count : 27

Destination : MC

Xmit Rate : 10 Hz

Word Name	Word No	Description	Section
Transmit Command Word	CW	To RDR, subaddress 01101 (13)	
Status Word	ST		
Target 06 Time Tag	01		7.2.3.1
Target 06 Range	02		7.2.3.2
Target 06 Position X	03		7.2.3.3
Target 06 Position Y	04		7.2.3.4
Target 06 Position Z	05		7.2.3.5
Target 06 Velocity (Magnitude)	06		7.2.3.6
Target 06 Velocity X	07		7.2.3.7
Target 06 Velocity Y	08		7.2.3.8
Target 06 Velocity Z	09		7.2.3.9
Target 07 Time Tag	10		7.2.3.1
Target 07 Range	11		7.2.3.2
Target 07 Position X	12		7.2.3.3
Target 07 Position Y	13		7.2.3.4
Target 07 Position Z	14		7.2.3.5
Target 07 Velocity (Magnitude)	15		7.2.3.6
Target 07 Velocity X	16		7.2.3.7
Target 07 Velocity Y	17		7.2.3.8
Target 07 Velocity Z	18		7.2.3.9
Target 08 Time Tag	19		7.2.3.1
Target 08 Range	20		7.2.3.2
Target 08 Position X	21		7.2.3.3
Target 08 Position Y	22		7.2.3.4
Target 08 Position Z	23		7.2.3.5
Target 08 Velocity (Magnitude)	24		7.2.3.6
Target 08 Velocity X	25		7.2.3.7
Target 08 Velocity Y	26		7.2.3.8
Target 08 Velocity Z	27		7.2.3.9

Remark:

- The content of this message is significant only when the Radar is performing TWS Mode.

7.2.3.1 **Word B3-01: Target 06 Time Tag**
Word B3-10: Target 07 Time Tag
Word B3-19: Target 08 Time Tag

Sheet 1 of 1

Word Name	: Target 06/07/08 Time Tag		
Word ID	: B3/01;/10;/19	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 2,097,152.0
Signal Type	: Unsigned Numeric	LSB	: 64.0
Units	: μ sec	Full scale	: 4,194,240.0

Field Name	Bit No	Description	
A	00-N MSB	Time Tag of Tracked target 06/07/08 data	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: Word 01 is not significant if target 06 is not active (bit 05 of word B1/01 set to "NOT ACTIVE").
 Word 10 is not significant if target 07 is not active (bit 06 of word B1/01 set to "NOT ACTIVE").
 Word 19 is not significant if target 08 is not active (bit 07 of word B1/01 set to "NOT ACTIVE").

7.2.3.2 **Word B3-02: Target 06 Range**
Word B3-11: Target 07 Range
Word B3-20: Target 08 Range

Sheet 1 of 1

Word Name	: Target 06/07/08 Range		
Word ID	: B3/02;/11;/20	Max Value	: 517,000
Source(s)	: RDR	Min Value	: 0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 262,144
Signal Type	: Unsigned Numeric	LSB	: 8
Units	: feet	Full scale	: 524,280

Field Name	Bit No	Description	
A	00-N MSB	Range of Tracked target 06/07/08	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: Word 02 is not significant if target 06 is not active (bit 05 of word B1/01 set to "NOT ACTIVE").
Word 11 is not significant if target 07 is not active (bit 06 of word B1/01 set to "NOT ACTIVE").
Word 20 is not significant if target 08 is not active (bit 07 of word B1/01 set to "NOT ACTIVE").

7.2.3.3 **Word B3-03: Target 06 Position X**
Word B3-12: Target 07 Position X
Word B3-21: Target 08 Position X

Sheet 1 of 1

Word Name	: Target 06/07/08 Position X		
Word ID	: B3/03;/12;/21	Max Value	: 517,000
Source(s)	: RDR	Min Value	: -517,000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 262,144
Signal Type	: 2's complement	LSB	: 16
Units	: feet	Full scale	: 524,280

Field Name	Bit No	Description	
A	00 SIGN	X component of Tracked target 06/07/08 position	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target position along the X axis of the XYZ Navigation frame.

NOTE 2: Word 03 is not significant if target 06 is not active (bit 05 of word B1/01 set to "NOT ACTIVE").
 Word 12 is not significant if target 07 is not active (bit 06 of word B1/01 set to "NOT ACTIVE").
 Word 21 is not significant if target 08 is not active (bit 07 of word B1/01 set to "NOT ACTIVE").

7.2.3.4 **Word B3-04: Target 06 Position Y**
Word B3-13: Target 07 Position Y
Word B3-22: Target 08 Position Y

Sheet 1 of 1

Word Name	: Target 06/07/08 Position Y		
Word ID	: B3/04;/13;/22	Max Value	: 517,000
Source(s)	: RDR	Min Value	: -517,000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 262,144
Signal Type	: 2's complement	LSB	: 16
Units	: feet	Full scale	: 524,280

Field Name	Bit No	Description	
A	00 SIGN	Y component of Tracked target 06/07/08 position	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target position along the Y axis of the XYZ Navigation frame.

NOTE 2: Word 04 is not significant if target 06 is not active (bit 05 of word B1/01 set to "NOT ACTIVE").
 Word 13 is not significant if target 07 is not active (bit 06 of word B1/01 set to "NOT ACTIVE").
 Word 22 is not significant if target 08 is not active (bit 07 of word B1/01 set to "NOT ACTIVE").

7.2.3.5 **Word B3-05: Target 06 Position Z**
Word B3-14: Target 07 Position Z
Word B3-23: Target 08 Position Z

Sheet 1 of 1

Word Name	: Target 06/07/08 Position Z		
Word ID	: B3/05;14;23	Max Value	: 80,000
Source(s)	: RDR	Min Value	: -80,000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 40,960
Signal Type	: 2's complement	LSB	: 2.5
Units	: feet	Full scale	: 81,920

Field Name	Bit No	Description	
A	00 SIGN	Z component of Tracked target 06/07/08 position	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	08-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target position along the Z axis of the XYZ Navigation frame.

NOTE 2: Word 05 is not significant if target 06 is not active (bit 05 of word B1/01 set to "NOT ACTIVE").
Word 14 is not significant if target 07 is not active (bit 06 of word B1/01 set to "NOT ACTIVE").
Word 23 is not significant if target 08 is not active (bit 07 of word B1/01 set to "NOT ACTIVE").

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7.2.3.6 **Word B3-06: Target 06 Velocity (magnitude)**
Word B3-15: Target 07 Velocity (magnitude)
Word B3-24: Target 08 Velocity (magnitude)

Sheet 1 of 1

Word Name	: Target 06/07/08 Velocity (Magnitude)		
Word ID	: B3/06;/15;/24	Max Value	: 4,000.0
Source(s)	: RDR	Min Value	: 0.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 2,048.00
Signal Type	: Unsigned Numeric	LSB	: 0.0625
Units	: feet/sec	Full scale	: 4,095.94

Field Name	Bit No	Description	
A	00-N MSB	Magnitude of target 06/07/08 absolute velocity	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

- NOTE 1:** This word represents the magnitude of the estimated absolute velocity of the target.
NOTE 2: Word 06 is not significant if target 06 is not active (bit 05 of word B1/01 set to "NOT ACTIVE").
 Word 15 is not significant if target 07 is not active (bit 06 of word B1/01 set to "NOT ACTIVE").
 Word 24 is not significant if target 08 is not active (bit 07 of word B1/01 set to "NOT ACTIVE").

7.2.3.7 **Word B3-07: Target 06 Velocity X**
Word B3-16: Target 07 Velocity X
Word B3-25: Target 08 Velocity X

Sheet 1 of 1

Word Name	: Target 06/07/08 Velocity X	Max Value	: 4,000.0
Word ID	: B3/07;/16;/25	Min Value	: -4,000.0
Source(s)	: RDR	Resolution	: NA
Destination(s)	: MC	Accuracy	: NA
Comp Rate	: 25 Hz	MSB	: 2,048.00
Xmit Rate	: 10 Hz	LSB	: 0.125
Signal Type	: 2's complement	Full scale	: 4,095.87
Units	: feet/sec		

Field Name	Bit No	Description	
A	00 SIGN	X component of target 06/07/08 absolute velocity	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target absolute velocity along the X axis of the XYZ Navigation frame.

NOTE 2: Word 07 is not significant if target 06 is not active (bit 05 of word B1/01 set to "NOT ACTIVE").
 Word 16 is not significant if target 07 is not active (bit 06 of word B1/01 set to "NOT ACTIVE").
 Word 25 is not significant if target 08 is not active (bit 07 of word B1/01 set to "NOT ACTIVE").

7.2.3.8 **Word B3-08: Target 06 Velocity Y**
Word B3-17: Target 07 Velocity Y
Word B3-26: Target 08 Velocity Y

Sheet 1 of 1

Word Name	: Target 06/07/08 Velocity Y	Max Value	: 4,000.0
Word ID	: B3/08;/17;/26	Min Value	: -4,000.0
Source(s)	: RDR	Resolution	: NA
Destination(s)	: MC	Accuracy	: NA
Comp Rate	: 25 Hz	MSB	: 2,048.00
Xmit Rate	: 10 Hz	LSB	: 0.125
Signal Type	: 2's complement	Full scale	: 4,095.87
Units	: feet/sec		

Field Name	Bit No	Description	
A	00 SIGN	Y component of target 06/07/08 absolute velocity	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target absolute velocity along the Y axis of the XYZ Navigation frame.

NOTE 2: Word 08 is not significant if target 06 is not active (bit 05 of word B1/01 set to "NOT ACTIVE").
Word 17 is not significant if target 07 is not active (bit 06 of word B1/01 set to "NOT ACTIVE").
Word 26 is not significant if target 08 is not active (bit 07 of word B1/01 set to "NOT ACTIVE").

7.2.3.9 **Word B3-09: Target 06 Velocity Z**
 Word B3-18: Target 07 Velocity Z
 Word B3-27: Target 08 Velocity Z

Sheet 1 of 1

Word Name	: Target 06/07/08 Velocity Z	Max Value	: 4,000.0
Word ID	: B3/09;/18;/27	Min Value	: -4,000.0
Source(s)	: RDR	Resolution	: NA
Destination(s)	: MC	Accuracy	: NA
Comp Rate	: 25 Hz	MSB	: 2,048.00
Xmit Rate	: 10 Hz	LSB	: 0.125
Signal Type	: 2's complement	Full scale	: 4,095.87
Units	: feet/sec		

Field Name	Bit No	Description	
A	00 SIGN	Z component of target 06/07/08 absolute velocity	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target absolute velocity along the Z axis of the XYZ Navigation frame.

NOTE 2: Word 09 is not significant if target 06 is not active (bit 05 of word B1/01 set to "NOT ACTIVE").
 Word 18 is not significant if target 07 is not active (bit 06 of word B1/01 set to "NOT ACTIVE").
 Word 27 is not significant if target 08 is not active (bit 07 of word B1/01 set to "NOT ACTIVE").

7.2.4 Message B4: SPT Target Message

Message Name : SPT Target Message

Message ID : B4

Source : RDR

Destination : MC

Transfer Type : RT-to-BC

Word Count : 24

Xmit Rate : 50 Hz

Word Name	Word No	Description	Section
Transmit Command Word	CW	To RDR, subaddress 01110 (14)	
Status Word	ST		
Track Validity and Status Word #1	01		7.2.4.1
Track Validity and Status Word #2	02		7.2.4.2
Time Tag	03		7.2.4.3
Target Range	04		7.2.4.4
Normalized Target Position X	05		7.2.4.5
Normalized Target Position Y	06		7.2.4.6
Normalized Target Position Z	07		7.2.4.7
Target Range Rate	08		7.2.4.8
Target Velocity (Magnitude)	09		7.2.4.9
Target Velocity X	10		7.2.4.10
Target Velocity Y	11		7.2.4.11
Target Velocity Z	12		7.2.4.12
Target Acceleration (Magnitude)	13		7.2.4.13
Target Acceleration X	14		7.2.4.14
Target Acceleration Y	15		7.2.4.15
Target Acceleration Z	16		7.2.4.16
Target Aspect Angle	17		7.2.4.17
Target CAS	18		7.2.4.18
Target Mach number	19		7.2.4.19
Target X Display Coordinate	20		7.2.4.20
Target Y Display Coordinate	21		7.2.4.21
Standard Deviation of Position X estimate	22		7.2.4.22
Standard Deviation of Position Y estimate	23		7.2.4.23
Standard Deviation of Position Z estimate	24		7.2.4.24

Remarks:

1. The content of this message is significant only when the Radar is performing DTT mode.

7.2.4.1 Word B4-01: Track Validity and Status Word #1

Sheet 1 of 3

Word Name	: Track Validity and Status Word #1		
Word ID	: B4/01	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00-C	Range Validity	(Note 1)
B	01-C	Position X-Y-Z Validity	(Note 2)
C	02-C	Range Rate Validity	(Note 3)
D	03-C	Velocity Data Validity	(Note 4)
E	04-C	Acceleration Data Validity	(Note 5)
F	05-C	Aspect Angle Validity	(Note 6)
G	06-C	CAS and Mach Number Validity	(Note 7)
H	07	spare	
I	08-C	Display Coordinates Validity	(Note 8)
J	09-C MSB	Position Accuracy	(Note 9, 11)
	10-C LSB		
K	11-C MSB	Velocity Accuracy	(Note 10, 11)
	12-C LSB		
L	13-C MSB	Acceleration Accuracy	(Note 10, 11)
	14-C LSB		
M	15	spare	

- NOTE 1:** If this field is set to 1, the content of word 04 of B4 is valid and is available to the MC.
- NOTE 2:** If this field is set to 1, the content of words 05, 06 and 07 of B4, and of word 22, 23 and 24 of B4 is valid and is available to the MC.
- NOTE 3:** If this field is set to 1, the content of word 08 of B4 is valid and is available to the MC.
- NOTE 4:** If this field is set to 1, the content of words 09, 10, 11 and 12 of B4 is valid and is available to the MC.
- NOTE 5:** If this field is set to 1, the content of words 13, 14, 15 and 16 of B4 is valid and is available to the MC.
- NOTE 6:** If this field is set to 1, the content of word 17 of B4 is valid and is available to the MC.
- NOTE 7:** If this field is set to 1, the content of words 18 and 19 of B4 is valid and is available to the MC.
- NOTE 8:** If this field is set to 1, the content of words 20 and 21 of B4 is valid and is available to the MC.
- NOTE 9:** If AOJ is being performed on the tracked target, the content of this field refers only to the accuracy of the angular estimates.
- NOTE 10:** The content of this field is not significant when the Radar is performing AOJ.

NOTE 11: Fields J, K and L provide the accuracy of the Position (bit 09, 10), of the Velocity (bit 11, 12) and of the Acceleration (bit 13, 14) of the target under track, as indicated in Tab. B4/01-J/K/L.

Tab. B4/01-J/K/L - Field J/K/L Description

Accuracy	Bit		Decimal Value	Remarks
	09	10		
	11	12		
	13	14		
Level 0	0	0	00	
Level 1	0	1	01	
Level 2	1	0	02	
Level 3	1	1	03	

7.2.4.2 Word B4-02: Track Validity and Status Word #2

Sheet 1 of 4

Word Name	: Track Validity and Status Word #2	Max Value	: NA
Word ID	: B4/02	Min Value	: NA
Source(s)	: RDR	Resolution	: NA
Destination(s)	: MC	Accuracy	: NA
Comp Rate	: NA	MSB	: NA
Xmit Rate	: 50 Hz	LSB	: NA
Signal Type	: Coded	Full scale	: NA
Units	: NA		

Field Name	Bit No	Description	
A	00-C	Reacquisition	(Note 1)
B	01-C	Target in COAST	(Note 2)
C	02-C	HOJ	(Note 3)
D	03-C	AOJ	(Note 4)
E	04-C MSB	Normalization factor for target position X	(Note 5)
	05-C		
	06-C LSB		
F	07-C MSB	Normalization factor for target position Y	(Note 5)
	08-C		
	09-C LSB		
G	10-C MSB	Normalization factor for target position Z	(Note 6)
	11-C LSB		
H	12	spare	
	13	spare	
	14	spare	
	15	spare	

- NOTE 1:** If this field is set to 1, a Reacquisition Process is in progress on the tracked target.
- NOTE 2:** If this field is set to 1, the tracked target is declared to be in COAST.
- NOTE 3:** If this field is set to 1, the Radar is performing HOJ on the tracked target.
- NOTE 4:** If this field is set to 1, the Radar is performing AOJ on the tracked target.

NOTE 5: Fields E and F provide the normalization factor for the data of position X (bit 04, 05 and 06) contained in word 05 and position Y (bit 07, 08 and 09) contained in word 06, as indicated in Tab. B4/02-E/F.

Tab. B4/02-E/F - Field E/F Description

Normalization Factor	Bit			Decimal Value	Remarks
	04	05	06		
	07	08	09		
Factor 0	0	0	0	00	a)
Factor 1	0	0	1	01	b)
Factor 2	0	1	0	02	c)
Factor 3	0	1	1	03	d)
Factor 4	1	0	0	04	e)
Factor 5	1	0	1	05	f)

- Remark a) If field E/F assumes the value "Factor 0", the absolute value of the Target Position X/Y is in the range (0, 2.5 NM) and the actual value is the normalized value of word B4/05/06 multiplied by 0.5 ft.
- Remark b) If field E/F assumes the value "Factor 1", the absolute value of the Target Position X/Y is in the range (2.5, 5 NM) and the actual value is the normalized value of word B4/05/06 multiplied by 1 ft.
- Remark c) If field E/F assumes the value "Factor 2", the absolute value of the Target Position X/Y is in the range (5, 10 NM) and the actual value is the normalized value of word B4/05/06 multiplied by 2 ft.
- Remark d) If field E/F assumes the value "Factor 3", the absolute value of the Target Position X/Y is in the range (10, 20 NM) and the actual value is the normalized value of word B4/05/06 multiplied by 4 ft.
- Remark e) If field E/F assumes the value "Factor 4", the absolute value of the Target Position X/Y is in the range (20, 40 NM) and the actual value is the normalized value of word B4/05/06 multiplied by 8 ft.
- Remark f) If field E/F assumes the value "Factor 5", the absolute value of the Target Position X/Y is in the range (40, 80 NM) and the actual value is the normalized value of word B4/05/06 multiplied by 16 ft.

NOTE 6: Field G provides the normalization factor for the data of position Z (bit 10 and 11) contained in word 07, as indicated in Tab. B4/02-G.

Tab. B4/02-G - Field G Description

Normalization Factor	Bit		Decimal Value	Remarks
	10	11		
Factor 0	0	0	00	a)
Factor 1	0	1	01	b)
Factor 2	1	0	02	c)
Factor 3	1	1	03	d)

Remark a) If field G assumes the value "Factor 0", the absolute value of the Target Position Z is in the range (0, 2.5 NM) and the actual value is the normalized value of word B4/07 multiplied by 0.5 ft.

Remark b) If field G assumes the value "Factor 1", the absolute value of the Target Position Z is in the range (2.5, 5 NM) and the actual value is the normalized value of word B4/07 multiplied by 1 ft.

Remark c) If field G assumes the value "Factor 2", the absolute value of the Target Position Z is in the range (5, 10 NM) and the actual value is the normalized value of word B4/07 multiplied by 2 ft.

Remark d) If field G assumes the value "Factor 3", the absolute value of the Target Position Z is in the range (10, 20 NM) and the actual value is the normalized value of word B4/07 multiplied by 4 ft.

7.2.4.3 Word B4-03: Time Tag

Sheet 1 of 1

Word Name	: Time Tag		
Word ID	: B4/03	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 2,097,152.0
Signal Type	: Unsigned Numeric	LSB	: 64.0
Units	: μ sec	Full scale	: 4,194,240.0

Field Name	Bit No	Description
A	00-N MSB	Time Tag of Tracked target data
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

7.2.4.4 Word B4-04: Target Range

Sheet 1 of 1

Word Name	: Target Range		
Word ID	: B4/04	Max Value	: 517,000
Source(s)	: RDR	Min Value	: 0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 262,144
Signal Type	: Unsigned Numeric	LSB	: 8
Units	: feet	Full scale	: 524,280

Field Name	Bit No	Description	
A	00-N MSB	Range of Tracked target	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.4.5 Word B4-05: Normalized Target Position X

Sheet 1 of 2

Word Name	: Normalized Target Position X		
Word ID	: B4/05	Max Value	: 32,000
Source(s)	: RDR	Min Value	: -32,000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 16,384
Signal Type	: 2's complement	LSB	: 1
Units	: NA	Full scale	: 32,767

Field Name	Bit No	Description	
A	00 SIGN	Normalized X component of Tracked target position	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the Normalized component of the tracked target position along the X axis of the XYZ Navigation frame. If the Radar is performing AOJ on the tracked target, it represents the director cosine of the tracked jammer direction along the same axis, multiplied by the fixed value 32,000.

NOTE 2: The value of the component can be obtained by multiplying the Normalized value contained in this word by an appropriate factor, which is obtained from the Normalization factor defined by field E of word B4/02, as indicated in the following table:

Normalization Factor	Multiplying Factor (ft)
Factor 0	0.5
Factor 1	1
Factor 2	2
Factor 3	4
Factor 4	8
Factor 5	16

7.2.4.6 Word B4-06: Normalized Target Position Y

Sheet 1 of 2

Word Name	: Normalized Target Position Y		
Word ID	: B4/06	Max Value	: 32,000
Source(s)	: RDR	Min Value	: -32,000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 16,384
Signal Type	: 2's complement	LSB	: 1
Units	: NA	Full scale	: 32,767

Field Name	Bit No	Description	
A	00 SIGN	Normalized Y component of Tracked target position	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the Normalized component of the tracked target position along the Y axis of the XYZ Navigation frame. If the Radar is performing AOJ on the tracked target, it represents the director cosine of the tracked jammer direction along the same axis, multiplied by the fixed value 32,000.

NOTE 2: The value of the component can be obtained by multiplying the Normalized value contained in this word by an appropriate factor, which is obtained from the Normalization factor defined by field F of word B4/02, as indicated in the following table:

Normalization Factor	Multiplying Factor (ft)
Factor 0	0.5
Factor 1	1
Factor 2	2
Factor 3	4
Factor 4	8
Factor 5	16

7.2.4.7 Word B4-07: Normalized Target Position Z

Sheet 1 of 2

Word Name	: Normalized Target Position Z		
Word ID	: B4/07	Max Value	: 32,000
Source(s)	: RDR	Min Value	: -32,000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 16,384
Signal Type	: 2's complement	LSB	: 1
Units	: NA	Full scale	: 32,767

Field Name	Bit No	Description	
A	00 SIGN	Normalized Z component of Tracked target position	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the Normalized component of the tracked target position along the Z axis of the XYZ Navigation frame. If the Radar is performing AOJ on the tracked target, it represents the director cosine of the tracked jammer direction along the same axis, multiplied by the fixed value 32,000.

NOTE 2: The value of the component can be obtained by multiplying the Normalized value contained in this word by an appropriate factor, which is obtained from the Normalization factor defined by field G of word B4/02, as indicated in the following table:

Normalization Factor	Multiplying Factor (ft)
Factor 0	0.5
Factor 1	1
Factor 2	2
Factor 3	4

7.2.4.8 Word B4-08: Target Range Rate

Sheet 1 of 1

Word Name	: Target Range Rate		
Word ID	: B4/08	Max Value	: 32,767
Source(s)	: RDR	Min Value	: -32,768
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 16,384
Signal Type	: 2's complement	LSB	: 1.0
Units	: feet/sec	Full scale	: 32,768

Field Name	Bit No	Description	
A	00 SIGN	Range Rate of the tracked target	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

- NOTE 1:** The value of the range rate contained in this word is positive for increasing range.
NOTE 2: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

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7.2.4.9 Word B4-09: Target Velocity (Magnitude)

Sheet 1 of 1

Word Name	: Target Velocity (Magnitude)		
Word ID	: B4/09	Max Value	: 4,000.0
Source(s)	: RDR	Min Value	: 0.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 2,048.00
Signal Type	: Unsigned Numeric	LSB	: 0.0625
Units	: feet/sec	Full scale	: 4,095.94

Field Name	Bit No	Description	
A	00-N MSB	Magnitude of target absolute velocity	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

- NOTE 1:** This word represents the magnitude of the estimated absolute velocity of the target.
NOTE 2: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

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7.2.4.10 Word B4-10: Target Velocity X

Sheet 1 of 1

Word Name	: Target Velocity X		
Word ID	: B4/10	Max Value	: 4,000.0
Source(s)	: RDR	Min Value	: -4,000.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 2,048.00
Signal Type	: 2's complement	LSB	: 0.125
Units	: feet/sec	Full scale	: 4,095.87

Field Name	Bit No	Description	
A	00 SIGN	X component of the target absolute velocity	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target absolute velocity along the X axis of the XYZ Navigation frame.

NOTE 2: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.4.11 Word B4-11: Target Velocity Y

Sheet 1 of 1

Word Name	: Target Velocity Y		
Word ID	: B4/11	Max Value	: 4,000.0
Source(s)	: RDR	Min Value	: -4,000.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 2,048.00
Signal Type	: 2's complement	LSB	: 0.125
Units	: feet/sec	Full scale	: 4,095.87

Field Name	Bit No	Description	
A	00 SIGN	Y component of the target absolute velocity	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target absolute velocity along the Y axis of the XYZ Navigation frame.

NOTE 2: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.4.12 Word B4-12: Target Velocity Z

Sheet 1 of 1

Word Name	: Target Velocity Z		
Word ID	: B4/12	Max Value	: 4,000.0
Source(s)	: RDR	Min Value	: -4,000.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 2,048.00
Signal Type	: 2's complement	LSB	: 0.125
Units	: feet/sec	Full scale	: 4,095.87

Field Name	Bit No	Description	
A	00 SIGN	Z component of the target absolute velocity	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target absolute velocity along the Z axis of the XYZ Navigation frame.

NOTE 2: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.4.13 Word B4-13: Target Acceleration (Magnitude)

Sheet 1 of 1

Word Name	: Target Acceleration (Magnitude)		
Word ID	: B4/13	Max Value	: 1,000.0
Source(s)	: RDR	Min Value	: 0.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 512.00
Signal Type	: Unsigned Numeric	LSB	: 0.015625
Units	: feet/sec ²	Full scale	: 1,023.98

Field Name	Bit No	Description	
A	00-N MSB	Magnitude of target absolute acceleration	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the magnitude of the estimated absolute acceleration of the target.

NOTE 2: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.4.14 Word B4-14: Target Acceleration X

Sheet 1 of 1

Word Name	: Target Acceleration X		
Word ID	: B4/14	Max Value	: 1,000.0
Source(s)	: RDR	Min Value	: -1,000.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 512.00
Signal Type	: 2's complement	LSB	: 0.03125
Units	: feet/sec ²	Full scale	: 1,023.97

Field Name	Bit No	Description	
A	00 SIGN	X component of the target absolute acceleration	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target absolute acceleration along the X axis of the XYZ Navigation frame.

NOTE 2: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

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7.2.4.15 Word B4-15: Target Acceleration Y

Sheet 1 of 1

Word Name	: Target Acceleration Y		
Word ID	: B4/15	Max Value	: 1,000.0
Source(s)	: RDR	Min Value	: -1,000.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 512.00
Signal Type	: 2's complement	LSB	: 0.03125
Units	: feet/sec ²	Full scale	: 1,023.97

Field Name	Bit No	Description	
A	00 SIGN	Y component of the target absolute acceleration	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target absolute acceleration along the Y axis of the XYZ Navigation frame.

NOTE 2: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.4.16 Word B4-16: Target Acceleration Z

Sheet 1 of 1

Word Name	: Target Acceleration Z		
Word ID	: B4/16	Max Value	: 1,000.0
Source(s)	: RDR	Min Value	: -1,000.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 512.00
Signal Type	: 2's complement	LSB	: 0.03125
Units	: feet/sec ²	Full scale	: 1,023.97

Field Name	Bit No	Description	
A	00 SIGN	Z component of the target absolute acceleration	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target absolute acceleration along the Z axis of the XYZ Navigation frame.

NOTE 2: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.4.17 Word B4-17: Target Aspect Angle

Sheet 1 of 1

Word Name	: Target Aspect Angle		
Word ID	: B4/17	Max Value	: 1.0
Source(s)	: RDR	Min Value	: -1.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 0.5
Signal Type	: 2's complement	LSB	: 3.05176E-05
Units	: Semicircles	Full scale	: 1.0

Field Name	Bit No	Description	
A	00 SIGN	Target Aspect Angle	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the estimated aspect angle of the tracked target (+180° is for head-on target). The sign of the aspect angle is positive clockwise. This corresponds (in condition of zero roll for both interceptor and target) to a value positive when the interceptor faces the right side of the target, and to a value negative when the interceptor faces the left side of the target.

NOTE 2: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.4.18 Word B4-18: Target CAS

Sheet 1 of 1

Word Name	: Target CAS		
Word ID	: B4/18	Max Value	: 1,000
Source(s)	: RDR	Min Value	: 0.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 1,000.0
Signal Type	: Unsigned Numeric	LSB	: 3.0518 E-02
Units	: knots	Full scale	: 2,000.0

Field Name	Bit No	Description	
A	00-N MSB	Target CAS	(Note 1, 2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the Calibrated Air Speed of the tracked target.

NOTE 2: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.4.19 Word B4-19: Target Mach Number

Sheet 1 of 1

Word Name	: Target Mach Number		
Word ID	: B4/19	Max Value	: 10.00
Source(s)	: RDR	Min Value	: 0.00
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 8.00
Signal Type	: Unsigned Numeric	LSB	: 2.4414 E-04
Units	: Mach	Full scale	: 16.00

Field Name	Bit No	Description	
A	00-N MSB	Target Mach Number	(Note 1, 2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the Mach Number of the tracked target.

NOTE 2: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.4.20 Word B4-20: Target X Display Coordinate

Sheet 1 of 1

Word Name	: Target X Display Coordinate		
Word ID	: B4/20	Max Value	: 483
Source(s)	: RDR	Min Value	: 0
Destination(s)	: MC	Resolution	: 1
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 256
Signal Type	: Unsigned Numeric	LSB	: 1
Units	: Pixels	Full scale	: 511

Field Name	Bit No	Description	
A	00 N MSB	X-Display coordinate of the tracked target	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
B	09	spare	
	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

NOTE 1: Bit 00 through bit 08 compose a binary coded word defining the current X-display coordinate of the tracked target symbol.

7.2.4.21 Word B4-21: Target Y Display Coordinate

Sheet 1 of 1

Word Name	: Target Y Display Coordinate		
Word ID	: B4/21	Max Value	: 483
Source(s)	: RDR	Min Value	: 0
Destination(s)	: MC	Resolution	: 1
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 256
Signal Type	: Unsigned Numeric	LSB	: 1
Units	: Pixels	Full scale	: 511

Field Name	Bit No	Description	
A	00 N MSB	Y-Display coordinate of the tracked target	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
B	09	spare	
	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

NOTE 1: Bit 00 through bit 08 compose a binary coded word defining the current Y-display coordinate of the tracked target symbol.

7.2.4.22 Word B4-22: Standard Deviation of Position X estimate

Sheet 1 of 1

Word Name	: Standard Deviation of Position X estimate		
Word ID	: B4/22	Max Value	: 28,000
Source(s)	: RDR	Min Value	: 0.000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 14,000
Signal Type	: Unsigned Numeric	LSB	: 0.42725
Units	: feet	Full scale	: 28,000

Field Name	Bit No	Description	
A	00-N MSB	Standard Deviation of Position X estimate	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the Standard Deviation of the estimate of the tracked target position along the X axis of the XYZ Navigation frame.

NOTE 2: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

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7.2.4.23 Word B4-23: Standard Deviation of Position Y estimate

Sheet 1 of 1

Word Name	: Standard Deviation of Position Y estimate		
Word ID	: B4/23	Max Value	: 28,000
Source(s)	: RDR	Min Value	: 0.000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 14,000
Signal Type	: Unsigned Numeric	LSB	: 0.42725
Units	: feet	Full scale	: 28,000

Field Name	Bit No	Description	
A	00-N MSB	Standard Deviation of Position Y estimate	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the Standard Deviation of the estimate of the tracked target position along the Y axis of the XYZ Navigation frame.

NOTE 2: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.4.24 Word B4-24: Standard Deviation of Position Z estimate

Sheet 1 of 1

Word Name	: Standard Deviation of Position Z estimate		
Word ID	: B4/24	Max Value	: 28,000
Source(s)	: RDR	Min Value	: 0.000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 14,000
Signal Type	: Unsigned Numeric	LSB	: 0.42725
Units	: feet	Full scale	: 28,000

Field Name	Bit No	Description	
A	00-N MSB	Standard Deviation of Position Z estimate	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the Standard Deviation of the estimate of the tracked target position along the Z axis of the XYZ Navigation frame.

NOTE 2: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.5 Message B5: Tracked Target Message

Message Name	: Tracked Target Message		
Message ID	: B5	Transfer Type	: RT-to-BC
Source	: RDR	Word Count	: 26
Destination	: MC	Xmit Rate	: 50 Hz

Word Name	Word No	Description	Section
Transmit Command Word	CW	To RDR, subaddress 01111 (15)	
Status Word	ST		
Track Validity and Status Word #1	01		7.2.5.1
Track Validity and Status Word #2	02		7.2.5.2
Time Tag	03		7.2.5.3
Target Range	04		7.2.5.4
Normalized Target Position X	05		7.2.5.5
Normalized Target Position Y	06		7.2.5.6
Normalized Target Position Z	07		7.2.5.7
Target Range Rate	08		7.2.5.8
Target Velocity (Magnitude)	09		7.2.5.9
Target Velocity X	10		7.2.5.10
Target Velocity Y	11		7.2.5.11
Target Velocity Z	12		7.2.5.12
Target Acceleration (Magnitude)	13		7.2.5.13
Target Acceleration X	14		7.2.5.14
Target Acceleration Y	15		7.2.5.15
Target Acceleration Z	16		7.2.5.16
Tgt Aspect Angle and Ground Track Angle	17		7.2.5.17
Target CAS	18		7.2.5.18
Target Mach number	19		7.2.5.19
Target X Display Coordinate	20		7.2.5.20
Target Y Display Coordinate	21		7.2.5.21
Standard Deviation of Position X estimate	22		7.2.5.22
Standard Deviation of Position Y estimate	23		7.2.5.23
Standard Deviation of Position Z estimate	24		7.2.5.24
Antenna Azimuth Position	25		7.2.5.25
Antenna Elevation Position	26		7.2.5.26

Remarks:

- The content of this message is significant only when the Radar is performing one of the following modes: STT, SAM, DTT, TWS, AGR, SSTT, SMTT, GMTT, FTT.
- If the Radar is operating in STT, SAM, DTT or TWS, the data contained in this message are relevant to the HPT.
- If the Radar is operating in TWS, the data contained in this message are provided also in Messages B1, B2 and B3. However, due to the different rates, the content of the different messages is not synchronous.

7.2.5.1 Word B5-01: Track Validity and Status Word #1

Sheet 1 of 3

Word Name	: Track Validity and Status Word #1		
Word ID	: B5/01	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00-C	Range Validity	(Note 1)
B	01-C	Position X-Y-Z Validity	(Note 2)
C	02-C	Range Rate Validity	(Note 3)
D	03-C	Velocity Data Validity	(Note 4)
E	04-C	Acceleration Data Validity	(Note 5)
F	05-C	Aspect Angle and Ground Track Angle Validity	(Note 6)
G	06-C	CAS and Mach Number Validity	(Note 7)
H	07-C	Antenna Position Validity	(Note 8)
I	08-C	Display Coordinates Validity	(Note 9)
J	09-C MSB	Position Accuracy	(Note 10, 11, 12)
	10-C LSB		
K	11-C MSB	Velocity Accuracy	(Note 10, 11, 13)
	12-C LSB		
L	13-C MSB	Acceleration Accuracy	(Note 10, 11, 13, 14)
	14-C LSB		
M	15	spare	

- NOTE 1:** If this field is set to 1, the content of word 04 of B5 is valid and is available to the MC.
- NOTE 2:** If this field is set to 1, the content of words 05, 06 and 07 of B5, and of word 22, 23 and 24 of B5 (if the Radar is performing STT, SAM, DTT, TWS, SSTT, SMTT, GMTT, FTT) or the content of word 07 of B5 (if the Radar is performing AGR) is valid and is available to the MC.
- NOTE 3:** If this field is set to 1, the content of word 08 of B5 is valid and is available to the MC.
- NOTE 4:** If this field is set to 1, the content of words 09, 10, 11 and 12 of B5 is valid and is available to the MC.
- NOTE 5:** If this field is set to 1, the content of words 13, 14, 15 and 16 of B5 is valid and is available to the MC.
- NOTE 6:** If this field is set to 1, the content of word 17 of B5 is valid and is available to the MC.
- NOTE 7:** If this field is set to 1, the content of words 18 and 19 of B5 is valid and is available to the MC.
- NOTE 8:** If this field is set to 1, the content of words 25 and 26 of B5 is valid and is available to the MC.
- NOTE 9:** If this field is set to 1, the content of words 20 and 21 of B5 is valid and is available to the MC.
- NOTE 10:** This field is not significant when the Radar is performing AGR.

NOTE 11: Fields J, K and L provide the accuracy of the Position (bit 09, 10), of the Velocity (bit 11, 12) and of the Acceleration (bit 13, 14) of the target under track, as indicated in Tab. B5/01-J/K/L.

Tab. B5/01-J/K/L - Field J/K/L Description

Accuracy	Bit		Decimal Value	Remarks
	09	10		
	11	12		
	13	14		
Level 0	0	0	00	
Level 1	0	1	01	
Level 2	1	0	02	
Level 3	1	1	03	

NOTE 12: If AOJ is being performed on the tracked target, the content of this field refers only to the accuracy of the angular estimates.

NOTE 13: The content of this field is not significant when the Radar is performing AOJ or is operating in FTT.

NOTE 14: The content of this field is not significant when the Radar is operating in TWS, SSTT, SMTT, GMTT, FTT.

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7.2.5.2 Word B5-02: Track Validity and Status Word #2

Sheet 1 of 5

Word Name	: Track Validity and Status Word #2	Max Value	: NA
Word ID	: B5/02	Min Value	: NA
Source(s)	: RDR	Resolution	: NA
Destination(s)	: MC	Accuracy	: NA
Comp Rate	: NA	MSB	: NA
Xmit Rate	: 50 Hz	LSB	: NA
Signal Type	: Coded	Full scale	: NA
Units	: NA		

Field Name	Bit No	Description	
A	00-C	Reacquisition	(Note 1, 2, 6)
B	01-C	Target in COAST	(Note 1, 2, 3, 4, 7)
C	02-C	HOJ	(Note 1, 2, 3, 8)
D	03-C	AOJ	(Note 1, 2, 3, 9)
E	04-C MSB	Normalization factor for target position X	(Note 1, 10)
	05-C		
	06-C LSB		
F	07-C MSB	Normalization factor for target position Y	(Note 1, 10)
	08-C		
	09-C LSB		
G	10-C MSB	Normalization factor for target position Z	(Note 11)
	11-C LSB		
H	12-C	Target moving in FTT	(Note 5, 12)
I	13-C	Swap HPT flag	(Note 1, 3, 4, 13)
J	14-C	Single PT rejected	(Note 1, 3, 4, 14)
	15	spare	

- NOTE 1:** This field is not significant when the Radar is performing AGR.
- NOTE 2:** This field is not significant when the Radar is performing TWS.
- NOTE 3:** This field is not significant when the Radar is performing SSTT, FTT.
- NOTE 4:** This field is not significant when the Radar is performing SMTT, GMTT.
- NOTE 5:** This field is significant only when the Radar is performing FTT.
- NOTE 6:** If this field is set to 1, a Reacquisition Process is in progress on the tracked target.
- NOTE 7:** If this field is set to 1, the tracked target is declared to be in COAST.
- NOTE 8:** If this field is set to 1, the Radar is performing HOJ on the tracked target.
- NOTE 9:** If this field is set to 1, the Radar is performing AOJ on the tracked target.

NOTE 10: Fields E and F provide the normalization factor for the data of position X (bit 04, 05 and 06) contained in word 05 and position Y (bit 07, 08 and 09) contained in word 06, as indicated in Tab. B5/02-E/F.

Tab. B5/02-E/F - Field E/F Description

Normalization Factor	Bit			Decimal Value	Remarks
	04	05	06		
	07	08	09		
Factor 0	0	0	0	00	a)
Factor 1	0	0	1	01	b)
Factor 2	0	1	0	02	c)
Factor 3	0	1	1	03	d)
Factor 4	1	0	0	04	e)
Factor 5	1	0	1	05	f)

Remark a) If field E/F assumes the value "Factor 0", the absolute value of the Target Position X/Y is in the range (0, 2.5 NM) and the actual value is the normalized value of word B5/05/06 multiplied by 0.5 ft.

Remark b) If field E/F assumes the value "Factor 1", the absolute value of the Target Position X/Y is in the range (2.5, 5 NM) and the actual value is the normalized value of word B5/05/06 multiplied by 1 ft.

Remark c) If field E/F assumes the value "Factor 2", the absolute value of the Target Position X/Y is in the range (5, 10 NM) and the actual value is the normalized value of word B5/05/06 multiplied by 2 ft.

Remark d) If field E/F assumes the value "Factor 3", the absolute value of the Target Position X/Y is in the range (10, 20 NM) and the actual value is the normalized value of word B5/05/06 multiplied by 4 ft.

Remark e) If field E/F assumes the value "Factor 4", the absolute value of the Target Position X/Y is in the range (20, 40 NM) and the actual value is the normalized value of word B5/05/06 multiplied by 8 ft.

Remark f) If field E/F assumes the value "Factor 5", the absolute value of the Target Position X/Y is in the range (40, 80 NM) and the actual value is the normalized value of word B5/05/06 multiplied by 16 ft.

NOTE 11: Field G provides the normalization factor for the data of position Z (bit 10 and 11) contained in word 07, as indicated in Tab. B5/02-G.

Tab. B5/02-G - Field G Description

Normalization Factor	Bit		Decimal Value	Remarks
	10	11		
Factor 0	0	0	00	a)
Factor 1	0	1	01	b)
Factor 2	1	0	02	c)
Factor 3	1	1	03	d)

- Remark a) If field G assumes the value "Factor 0", the absolute value of the Target Position Z is in the range (0, 2.5 NM) and the actual value is the normalized value of word B5/07 multiplied by 0.5 ft.
- Remark b) If field G assumes the value "Factor 1", the absolute value of the Target Position Z is in the range (2.5, 5 NM) and the actual value is the normalized value of word B5/07 multiplied by 1 ft.
- Remark c) If field G assumes the value "Factor 2", the absolute value of the Target Position Z is in the range (5, 10 NM) and the actual value is the normalized value of word B5/07 multiplied by 2 ft.
- Remark d) If field G assumes the value "Factor 3", the absolute value of the Target Position Z is in the range (10, 20 NM) and the actual value is the normalized value of word B5/07 multiplied by 4 ft.

NOTE 12: This field is significant only when the Radar is performing FTT. This field is set to 1 when the Radar detects that the tracked target is moving.

NOTE 13: This field is set to 1 whenever a change of HPT is performed, either upon manual command by the pilot, or automatically by the radar. In particular, the field is set to 1 when:

- In TWS a new HPT is selected by the pilot (via Lock-On or Transfer of HPT bug)
- In TWS a new HPT is selected by the radar (because of change of priority, or loss of the previous HPT)
- In DTT the HPT bug is transferred to the SPT by the pilot (via Transfer of HPT Bug)
- In DTT, the HPT is lost, and the SPT becomes the new HPT (and the SAM is entered)
- In SAM, a new HPT is acquired via pilot designation

The setting to 1 in this field has to be held for at least 2 cycles (40 ms) and then reset to the value 0. The Radar shall not serve any further transition in this field until the field is reset to 0 for at least 2 cycles (40 ms).

NOTE 14: This field is set to 1 whenever a rejection of SPT is performed, upon manual command by the pilot. In particular, the field is set to 1 when:

- In TWS a SPT is selected by the pilot (via "Single PT Reject")

The setting to 1 in this field has to be held for at least 2 cycles (40 ms) and then reset to the value 0. The Radar shall not serve any further transition in this field until the field is reset to 0 for at least 2 cycles (40 ms).

7.2.5.3 Word B5-03: Time Tag

Sheet 1 of 1

Word Name	: Time Tag		
Word ID	: B5/03	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 2,097,152.0
Signal Type	: Unsigned Numeric	LSB	: 64.0
Units	: μ sec	Full scale	: 4,194,240.0

Field Name	Bit No	Description
A	00-N MSB	Time Tag of Tracked target data
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

7.2.5.4 Word B5-04: Target Range

Sheet 1 of 1

Word Name	: Target Range		
Word ID	: B5/04	Max Value	: 517,000
Source(s)	: RDR	Min Value	: 0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 262,144
Signal Type	: Unsigned Numeric	LSB	: 8
Units	: feet	Full scale	: 524,280

Field Name	Bit No	Description	
A	00-N MSB	Range of Tracked target	(Note 1, 2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: If the Radar is operating in AGR, this word contains the Range of the ground measured along the line-of-sight.

NOTE 2: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.5.5 Word B5-05: Normalized Target Position X

Sheet 1 of 2

Word Name	: Normalized Target Position X		
Word ID	: B5/05	Max Value	: 32,000
Source(s)	: RDR	Min Value	: -32,000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 16,384
Signal Type	: 2's complement	LSB	: 1
Units	: NA	Full scale	: 32,767

Field Name	Bit No	Description	
A	00 SIGN	Normalized X component of Tracked target position	(Note 1,2,3)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the Normalized component of the tracked target position along the X axis of the XYZ Navigation frame. If the Radar is performing AOJ on the tracked target, it represents the director cosine of the tracked jammer direction along the same axis, multiplied by the fixed value 32,000.

NOTE 2: The content of this word is not significant if the Radar is operating in AGR.

NOTE 3: The value of the component can be obtained by multiplying the Normalized value contained in this word by an appropriate factor, which is obtained from the Normalization factor defined by field E of word B5/02, as indicated in the following table:

Normalization Factor	Multiplying Factor (ft)
Factor 0	0.5
Factor 1	1
Factor 2	2
Factor 3	4
Factor 4	8
Factor 5	16

7.2.5.6 Word B5-06: Normalized Target Position Y

Sheet 1 of 2

Word Name	: Normalized Target Position Y		
Word ID	: B5/06	Max Value	: 32,000
Source(s)	: RDR	Min Value	: -32,000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 16,384
Signal Type	: 2's complement	LSB	: 1
Units	: NA	Full scale	: 32,767

Field Name	Bit No	Description	
A	00 SIGN	Normalized Y component of Tracked target position	(Note 1,2,3)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the Normalized component of the tracked target position along the Y axis of the XYZ Navigation frame. If the Radar is performing AOJ on the tracked target, it represents the director cosine of the tracked jammer direction along the same axis, multiplied by the fixed value 32,000.

NOTE 2: The content of this word is not significant if the Radar is operating in AGR.

NOTE 3: The value of the component can be obtained by multiplying the Normalized value contained in this word by an appropriate factor, which is obtained from the Normalization factor defined by field F of word B5/02, as indicated in the following table:

Normalization Factor	Multiplying Factor (ft)
Factor 0	0.5
Factor 1	1
Factor 2	2
Factor 3	4
Factor 4	8
Factor 5	16

7.2.5.7 Word B5-07: Normalized Target Position Z

Sheet 1 of 2

Word Name	: Normalized Target Position Z		
Word ID	: B5/07	Max Value	: 32,000
Source(s)	: RDR	Min Value	: -32,000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 16,384
Signal Type	: 2's complement	LSB	: 1
Units	: NA	Full scale	: 32,767

Field Name	Bit No	Description	
A	00 SIGN	Normalized Z component of Tracked target position	(Note 1,2,3)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: If the Radar operates in STT, SAM, DTT, TWS, SSTT, SMTT, GMTT, FTT, this word represents the Normalized component of the tracked target position along the Z axis of the XYZ Navigation frame. If the Radar is performing AOJ on the tracked target, it represents the director cosine of the tracked jammer direction along the same axis, multiplied by the fixed value 32,000.

NOTE 2: If the Radar operates in AGR, this word represents the estimated normalized height above ground.

NOTE 3: The value of the component can be obtained by multiplying the Normalized value contained in this word by an appropriate factor, which is obtained from the Normalization factor defined by field G of word B5/02, as indicated in the following table:

Normalization Factor	Multiplying Factor (ft)
Factor 0	0.5
Factor 1	1
Factor 2	2
Factor 3	4

7.2.5.8 Word B5-08: Target Range Rate

Sheet 1 of 1

Word Name	: Target Range Rate		
Word ID	: B5/08	Max Value	: 32,767
Source(s)	: RDR	Min Value	: -32,768
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 16,384
Signal Type	: 2's complement	LSB	: 1.0
Units	: feet/sec	Full scale	: 32,768

Field Name	Bit No	Description	
A	00 SIGN	Range Rate of the tracked target	(Note 1,2,3,4)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

- NOTE 1:** The value of the range rate contained in this word is positive for increasing range.
- NOTE 2:** If the Radar is operating in AGR, this word contains the Range rate of the ground measured along the line-of-sight.
- NOTE 3:** The content of this word is not significant if the Radar is operating in FTT.
- NOTE 4:** The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.5.9 Word B5-09: Target Velocity (Magnitude)

Sheet 1 of 1

Word Name	: Target Velocity (Magnitude)		
Word ID	: B5/09	Max Value	: 4,000.0
Source(s)	: RDR	Min Value	: 0.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 2,048.00
Signal Type	: Unsigned Numeric	LSB	: 0.0625
Units	: feet/sec	Full scale	: 4,095.94

Field Name	Bit No	Description	
A	00-N MSB	Magnitude of target absolute velocity	(Note 1,2,3)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

- NOTE 1:** This word represents the magnitude of the estimated absolute velocity of the target.
NOTE 2: The content of this word is not significant if the Radar is operating in AGR or in FTT.
NOTE 3: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.5.10 Word B5-10: Target Velocity X

Sheet 1 of 1

Word Name	: Target Velocity X		
Word ID	: B5/10	Max Value	: 4,000.0
Source(s)	: RDR	Min Value	: -4,000.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 2,048.00
Signal Type	: 2's complement	LSB	: 0.125
Units	: feet/sec	Full scale	: 4,095.87

Field Name	Bit No	Description	
A	00 SIGN	X component of the target absolute velocity	(Note 1,2,3)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target absolute velocity along the X axis of the XYZ Navigation frame.

NOTE 2: The content of this word is not significant if the Radar is operating in AGR or in FTT.

NOTE 3: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.5.11 Word B5-11: Target Velocity Y

Sheet 1 of 1

Word Name	: Target Velocity Y		
Word ID	: B5/11	Max Value	: 4,000.0
Source(s)	: RDR	Min Value	: -4,000.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 2,048.00
Signal Type	: 2's complement	LSB	: 0.125
Units	: feet/sec	Full scale	: 4,095.87

Field Name	Bit No	Description	
A	00 SIGN	Y component of the target absolute velocity	(Note 1,2,3)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target absolute velocity along the Y axis of the XYZ Navigation frame.

NOTE 2: The content of this word is not significant if the Radar is operating in AGR or in FTT.

NOTE 3: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.5.12 Word B5-12: Target Velocity Z

Sheet 1 of 1

Word Name	: Target Velocity Z		
Word ID	: B5/12	Max Value	: 4,000.0
Source(s)	: RDR	Min Value	: -4,000.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 2,048.00
Signal Type	: 2's complement	LSB	: 0.125
Units	: feet/sec	Full scale	: 4,095.87

Field Name	Bit No	Description	
A	00 SIGN	Z component of the target absolute velocity	(Note 1,2,3)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target absolute velocity along the Z axis of the XYZ Navigation frame.

NOTE 2: The content of this word is not significant if the Radar is operating in AGR or in FTT.

NOTE 3: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.5.13 Word B5-13: Target Acceleration (Magnitude)

Sheet 1 of 1

Word Name	: Target Acceleration (Magnitude)		
Word ID	: B5/13	Max Value	: 1,000.0
Source(s)	: RDR	Min Value	: 0.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 512.00
Signal Type	: Unsigned Numeric	LSB	: 0.015625
Units	: feet/sec ²	Full scale	: 1,023.98

Field Name	Bit No	Description	
A	00-N MSB	Magnitude of target absolute acceleration	(Note 1,2,3)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the magnitude of the estimated absolute acceleration of the target.

NOTE 2: The content of this word is not significant if the Radar is operating in TWS, AGR, SSTT, SMTT, GMITT or FTT.

NOTE 3: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.5.14 Word B5-14: Target Acceleration X

Sheet 1 of 1

Word Name	: Target Acceleration X		
Word ID	: B5/14	Max Value	: 1,000.0
Source(s)	: RDR	Min Value	: -1,000.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 512.00
Signal Type	: 2's complement	LSB	: 0.03125
Units	: feet/sec ²	Full scale	: 1,023.97

Field Name	Bit No	Description	
A	00 SIGN	X component of the target absolute acceleration	(Note 1,2,3)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target absolute acceleration along the X axis of the XYZ Navigation frame.

NOTE 2: The content of this word is not significant if the Radar is operating in TWS, AGR, SSTT, SMTT, GMTT or FTT.

NOTE 3: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.5.15 Word B5-15: Target Acceleration Y

Sheet 1 of 1

Word Name	: Target Acceleration Y		
Word ID	: B5/15	Max Value	: 1,000.0
Source(s)	: RDR	Min Value	: -1,000.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 512.00
Signal Type	: 2's complement	LSB	: 0.03125
Units	: feet/sec ²	Full scale	: 1,023.97

Field Name	Bit No	Description	
A	00 SIGN	Y component of the target absolute acceleration	(Note 1,2,3)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target absolute acceleration along the Y axis of the XYZ Navigation frame.

NOTE 2: The content of this word is not significant if the Radar is operating in TWS, AGR, SSTT, SMTT, GMTT or FTT.

NOTE 3: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.5.16 Word B5-16: Target Acceleration Z

Sheet 1 of 1

Word Name	: Target Acceleration Z		
Word ID	: B5/16	Max Value	: 1,000.0
Source(s)	: RDR	Min Value	: -1,000.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 512.00
Signal Type	: 2's complement	LSB	: 0.03125
Units	: feet/sec ²	Full scale	: 1,023.97

Field Name	Bit No	Description	
A	00 SIGN	Z component of the target absolute acceleration	(Note 1,2,3)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the component of the tracked target absolute acceleration along the Z axis of the XYZ Navigation frame.

NOTE 2: The content of this word is not significant if the Radar is operating in TWS, AGR, SSTT, SMTT, GMTT or FTT.

NOTE 3: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.5.17 Word B5-17: Target Aspect Angle and Target Ground Track Angle

Sheet 1 of 1

Word Name	: Target Aspect Angle and Target Ground Track Angle		
Word ID	: B5/17	Max Value	: 1.0
Source(s)	: RDR	Min Value	: -1.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 0.5
Signal Type	: 2's complement	LSB	: 3.05176E-05
Units	: Semicircles	Full scale	: 1.0

Field Name	Bit No	Description	
A	00 SIGN	Target Aspect Angle and Target Ground Track Angle	(Note 1,2,3,4)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents (in SAM, A/A STT and TWS modes) the estimated aspect angle of the tracked target (+180° is for head-on target). The sign of the aspect angle is positive clockwise. This corresponds (in condition of zero roll for both interceptor and target) to a value positive when the interceptor faces the right side of the target, and to a value negative when the interceptor faces the left side of the target.

NOTE 2: This word represents (in SSTT, SMTT and GMTT modes) the estimated Ground Track Angle of the tracked target. It is referred to the Navigation Frame, and is positive counter-clockwise (i.e. it is 0 degrees when the target moves along the x axis of the Navigation frame, and is 90 degrees when the target moves along the y axis of the Navigation Frame).

NOTE 3: The content of this word is not significant if the Radar is operating in AGR or FTT.

NOTE 4: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.5.18 Word B5-18: Target CAS

Sheet 1 of 1

Word Name	: Target CAS		
Word ID	: B5/18	Max Value	: 1,000
Source(s)	: RDR	Min Value	: 0.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 1,000.0
Signal Type	: Unsigned Numeric	LSB	: 3.0518 E-02
Units	: knots	Full scale	: 2,000.0

Field Name	Bit No	Description	
A	00-N MSB	Target CAS	(Note 1, 2, 3)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the Calibrated Air Speed of the tracked target.

NOTE 2: The content of this word is not significant if the Radar is operating in AGR, SSTT, SMTT, GMTT or FTT.

NOTE 3: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.5.19 Word B5-19: Target Mach Number

Sheet 1 of 1

Word Name	: Target Mach Number		
Word ID	: B5/19	Max Value	: 10.00
Source(s)	: RDR	Min Value	: 0.00
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 8.00
Signal Type	: Unsigned Numeric	LSB	: 2.4414 E-04
Units	: Mach	Full scale	: 16.00

Field Name	Bit No	Description	
A	00-N MSB	Target Mach Number	(Note 1, 2, 3)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the Mach Number of the tracked target.

NOTE 2: The content of this word is not significant if the Radar is operating in AGR, SSTT, SMTT, GMTT or FTT.

NOTE 3: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

7.2.5.20 Word B5-20: Target X Display Coordinate

Sheet 1 of 1

Word Name	: Target X Display Coordinate		
Word ID	: B5/20	Max Value	: 483
Source(s)	: RDR	Min Value	: 0
Destination(s)	: MC	Resolution	: 1
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 256
Signal Type	: Unsigned Numeric	LSB	: 1
Units	: Pixels	Full scale	: 511

Field Name	Bit No	Description	
A	00 N MSB	X-Display coordinate of the tracked target	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
B	09	spare	
	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

NOTE 1: Bit 00 through bit 08 compose a binary coded word defining the current X-display coordinate of the tracked target symbol.

NOTE 2: The content of this word is not significant if the Radar is operating in AGR.

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7.2.5.21 Word B5-21: Target Y Display Coordinate

Sheet 1 of 1

Word Name	: Target Y Display Coordinate		
Word ID	: B5/21	Max Value	: 483
Source(s)	: RDR	Min Value	: 0
Destination(s)	: MC	Resolution	: 1
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 256
Signal Type	: Unsigned Numeric	LSB	: 1
Units	: Pixels	Full scale	: 511

Field Name	Bit No	Description	
A	00 N MSB	Y-Display coordinate of the tracked target	(Note 1,2)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
B	09	spare	
	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

NOTE 1: Bit 00 through bit 08 compose a binary coded word defining the current Y-display coordinate of the tracked target symbol.

NOTE 2: The content of this word is not significant if the Radar is operating in AGR.

7.2.5.22 Word B5-22: Standard Deviation of Position X estimate

Sheet 1 of 1

Word Name	: Standard Deviation of Position X estimate		
Word ID	: B5/22	Max Value	: 28,000
Source(s)	: RDR	Min Value	: 0.000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 14,000
Signal Type	: Unsigned Numeric	LSB	: 0.42725
Units	: feet	Full scale	: 28,000

Field Name	Bit No	Description	
A	00-N MSB	Standard Deviation of Position X estimate	(Note 1,2,3)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the Standard Deviation of the estimate of the tracked target position along the X axis of the XYZ Navigation frame.

NOTE 2: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

NOTE 3: The content of this word is not significant if the Radar is operating in AGR, FTT, SSTT, GMTT, SMTT.

7.2.5.23 Word B5-23: Standard Deviation of Position Y estimate

Sheet 1 of 1

Word Name	: Standard Deviation of Position Y estimate		
Word ID	: B5/23	Max Value	: 28,000
Source(s)	: RDR	Min Value	: 0.000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 14,000
Signal Type	: Unsigned Numeric	LSB	: 0.42725
Units	: feet	Full scale	: 28,000

Field Name	Bit No	Description	
A	00-N MSB	Standard Deviation of Position Y estimate	(Note 1,2,3)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the Standard Deviation of the estimate of the tracked target position along the Y axis of the XYZ Navigation frame.

NOTE 2: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

NOTE 3: The content of this word is not significant if the Radar is operating in AGR, FTT, SSTT, GMTT, SMTT.

7.2.5.24 Word B5-24: Standard Deviation of Position Z estimate

Sheet 1 of 1

Word Name	: Standard Deviation of Position Z estimate		
Word ID	: B5/24	Max Value	: 28,000
Source(s)	: RDR	Min Value	: 0.000
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 14,000
Signal Type	: Unsigned Numeric	LSB	: 0.42725
Units	: feet	Full scale	: 28,000

Field Name	Bit No	Description	
A	00-N MSB	Standard Deviation of Position Z estimate	(Note 1,2,3)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word represents the Standard Deviation of the estimate of the tracked target position along the Z axis of the XYZ Navigation frame.

NOTE 2: The content of this word is not significant if the Radar is performing AOJ on the tracked target.

NOTE 3: The content of this word is not significant if the Radar is operating in AGR, FTT, SSTT, GMTT, SMTT.

7.2.5.25 Word B5-25: Antenna Azimuth Position

Sheet 1 of 1

Word Name	: Antenna Azimuth Position		
Word ID	: B5/25	Max Value	: 0.5
Source(s)	: RDR	Min Value	: -0.5
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 0.5
Signal Type	: 2's complement	LSB	: 3.05176E-05
Units	: Semicircles	Full scale	: 1.0

Field Name	Bit No	Description	
A	00 SIGN	Azimuth of the antenna in Body frame	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

- NOTE 1:** This word represents the azimuth of the antenna in the Body frame.
NOTE 2: The content of this word is significant only if the Radar is operating in AGR.

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7.2.5.26 Word B5-26: Antenna Elevation Position

Sheet 1 of 1

Word Name	: Antenna Elevation Position		
Word ID	: B5/26	Max Value	: 0.5
Source(s)	: RDR	Min Value	: -0.5
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 0.5
Signal Type	: 2's complement	LSB	: 3.05176E-05
Units	: Semicircles	Full scale	: 1.0

Field Name	Bit No	Description	
A	00 SIGN	Elevation of the antenna in Body frame	(Note 1,2)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

- NOTE 1:** This word represents the elevation of the antenna in the Body frame.
NOTE 2: The content of this word is significant only if the Radar is operating in AGR.

7.2.6 Message B6: Radar Operational Setting and Parameter Transfer Tell-Back

Message Name	: Radar Operational Setting and Parameter Transfer Tell-back		
Message ID	: B6	Transfer Type	: RT-to-BC
Source	: RDR	Word Count	: 23
Destination	: MC	Xmit Rate	: 10 Hz

Word Name	Word No	Description	Section
Transmit Command Word	CW	To RDR, subaddress 10000 (16)	
Status Word	ST		
Radar Setting Tell-back	01	Current Radar setting	7.2.6.1
Freq. Agil. Setting and Interl. Sel. Tell-back	02	Current Frequency agility and WF interleaving param	7.2.6.2
Beacon delay and code Tell-back	03	Current beacon delay and beacon code	7.2.6.3
Radar gains and RF Chan. Grouping T-B	04	Current IF and Moving Target Gain and Chan Group Sel	7.2.6.4
Radar Health status and BIT report valid.	05	Current operational status of the Radar	7.2.6.5
SW Release 1	06	Id. of Installed SW release (Main Comp. / Graph Comp.)	7.2.6.6
SW Release 2	07	Id. of Installed SW release (Antenna Comp.)	7.2.6.7
AZ Scan Centre	08	Azimuth of the scan centre implemented by the Radar	7.2.6.8
EL Scan Centre	09	Elevation of the scan centre implemented by the Radar	7.2.6.9
Clearance Plane Distance Tell-Back	10	Clearance plane distance implemented by the Radar	7.2.6.10
Terrain Avoidance data (word#1)	11	Data computed by the Terrain Avoidance mode	7.2.6.11
Terrain Avoidance data (word#2)	12	Data computed by the Terrain Avoidance mode	7.2.6.12
Parameter Identifier Tell-Back	13	Tell-Back of the Parameter Request	7.2.6.13
Parameter Value (Word 1)	14	Value of the parameter received/transm. by the Radar	7.2.6.14
Parameter Value (Word 2)	15		
Cursor X-display coordinate / Qualifiers	16	Current X-Display coord. of the Acq. curs. and qualifiers	7.2.6.15
Cursor Y-display coordinate	17	Current Y-Display coordinate of the Acquisition cursor	7.2.6.16
Cursor world position (Range)	18	Current Range of the acquisition cursor	7.2.6.17
Cursor world position (Azimuth)	19	Current Azimuth of the acquisition cursor	7.2.6.18
Cursor position latitude (MSW)	20	Current Latitude of the acquisition cursor	7.2.6.19
Cursor position latitude (LSW)	21		
Cursor position longitude (MSW)	22	Current Longitude of the acquisition cursor	7.2.6.20
Cursor position longitude (LSW)	23		

7.2.6.1 Word B6-01: Radar Setting Tell-Back

Sheet 1 of 4

Word Name	: Radar Setting Tell-Back		
Word ID	: B6/01	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 10 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded and Numeric	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00-C MSB	Target History Tell-back	(Note 1)
	01-C LSB		
B	02-N MSB	Radar Symbology Intensity Tell-back	(Note 2)
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
C	09-C	Ground Target Rejected radial Velocity Tell-back	(Note 3)
D	10-C	Min Detectable ground target radial velocity Tell-back	(Note 4)
E	11-C	ALE Blanking Enable/Disable Tell-back	(Note 5)
F	12-C MSB	Altitude Block Selection Tell-back	(Note 6)
	13-C LSB		
G	14-C	LPRF/MPRF Look-Up Selection Tell-back	(Note 7)
H	15	spare	

NOTE 1: Bit 00 and 01 compose a two bit binary coded word (MSB = Bit 00) defining the displayed target history, as indicated in Tab. B6/01-A.

The content of this field is significant only when the Radar is operating in one of the following Master Modes: RWS, TWS, VS, as shown in field A of B7/01.

Tab. B6/01-A - Field A Description

Target History Tell-back	Bit		Decimal Value	Remarks
	00	01		
Level 1	0	0	00	
Level 2	0	1	01	
Level 3	1	0	02	
Level 4	1	1	03	

NOTE 2: Bit 02 through bit 08 compose a seven bit binary coded word (MSB = Bit 02) which defines the max reference intensity level being used by the Radar to display the symbology (alphanumeric messages and symbols).

NOTE 3: Bit 09 indicates the Decluttering level used by the Radar in Air-to-Air modes, as indicated in Tab. B6/01-C.

The content of his field is significant only when the Radar is operating in one of the following Modes: RWS, SAM, TWS, ACM, VS, as shown in fields A and B of B7/01.

Tab. B6/01-C - Field C Description

Ground Target Rejected Radial Vel. Tell-back	Bit 09	Decimal Value	Remarks
LOW	0	00	
HIGH	1	01	

NOTE 4: Bit 10 indicates the minimum detectable radial velocity used by the Radar in Air-to-Surface modes, as indicated in Tab. B6/01-D.

The content of this field is significant only when the Radar is operating in one of the following Modes: SEA-2, GMTI, as shown in fields A and B of B7/01.

Tab. B6/01-D - Field D Description

Min Detect. Ground Tgt Radial Vel. Tell-back	Bit 10	Decimal Value	Remarks
LOW	0	00	
HIGH	1	01	

NOTE 5: Bit 11 indicates if the ALE Blanking Function is enabled by the Radar, as indicated in Tab. B6/01-E

The content of this field is significant only when the Radar is operating in one of the following Modes: RWS, SAM, TWS, as shown in fields A and B of B7/01.

Tab. B6/01-E - Field E Description

ALE Blanking Enable/Disable Tell-back	Bit 11	Decimal Value	Remarks
ALE Blanking enabled	0	00	
ALE Blanking disabled	1	01	

NOTE 6: Bit 12 and 13 compose a two bit binary coded word (MSB = Bit 12) defining the altitude block stabilization performed by the Radar, as indicated in Tab. B6/01-F.

The content of this field is significant only when the Radar is operating in one of the following Modes: RWS, SAM, TWS, VS, as shown in field A of B7/01.

Tab. B6/01-F - Field F Description

Altitude Block Selection Tell-back	Bit		Decimal Value	Remarks
	12	13		
BTBK	0	0	00	
TPBK	0	1	01	
NORMAL	1	0	02	
spare	1	1	03	

NOTE 7: Bit 14 indicates the selection between LPRF and MPRF Look-Up for Look-Up operation currently implemented by the Radar, as indicated in Tab. B6/01-G.

The content of this field is significant only if the Radar is operating in RWS, SAM modes.

Tab. B6/01-G - Field G Description

LPRF/MPRF Look-Up Selection Tell-back	Bit 14	Decimal Value	Remarks
LPRF	0	00	
MPRF Look-Up	1	01	

7.2.6.2 Word B6-02: Frequency Agility Setting and Interleave selection Tell-Back

Sheet 1 of 4

Word Name	: Frequency Agility Setting and Interleave selection Tell-back		
Word ID	: B6/02	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 10 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00-C MSB	Frequency Agility type Tell-back	(Note 1)
	01-C LSB		
B	02-C	Frequency Group 1 selector Tell-back	(Note 2)
	03-C	Frequency Group 2 selector Tell-back	(Note 2)
	04-C	Frequency Group 3 selector Tell-back	(Note 2)
	05-C	Frequency Group 4 selector Tell-back	(Note 2)
	06-C	Frequency Group 5 selector Tell-back	(Note 2)
C	07-C MSB	Frequency channel Tell-back	(Note 3)
	08-C		
	09-C		
	10-C		
	11-C		
	12-C LSB		
D	13-C MSB	Waveform Interleave Selection Tell-back	(Note 4)
	14-C LSB		
E	15-C	LPRF Threshold Tell-Back	(Note 5)

Remark:

- The content of this word is not significant when the Radar is operating in Beacon Mode.

NOTE 1: Bit 00 and 01 compose a two bit binary coded word (MSB = Bit 00) indicating the type of frequency agility scheme being used by the Radar, as indicated in Tab. B6/02-A.

Tab. B6/02-A - Field A Description

Frequency Agility Type Tell-back	Bit		Decimal Value	Remarks
	00	01		
FIXED	0	0	00	
RANDOM	0	1	01	
ADAPTIVE	1	0	02	
spare	1	1	03	

NOTE 2: Bits 02, 03, 04, 05 and 06 indicate the selection of the frequency groups 1, 2, 3, 4 and 5 respectively, as indicated in Tab. A1/02-B.

If the field A of B6/02 is set to "FIXED", the content of this field is not significant.

Tab. B6/02-B - Field B Description

Frequency Group Selector	Bit	Decimal Value	Remarks
Tell-back			
Group 1	02		
Group 2	03		
Group 3	04		
Group 4	05		
Group 5	06		
NOT ACTIVE	0	00	
ACTIVE	1	01	

NOTE 3: Bit 07 through bit 12 compose a six bit coded word (MSB = Bit 07) indicating the frequency channel being used by the Radar.

The decimal value corresponding to the six bit binary coded word is the number of the selected channel.

The valid range is from 1 to 26.

If the field A of B6/02 is set to "RANDOM" or to "ADAPTIVE", the content of this field is not significant.

NOTE 4: Bit 13 and 14 compose a two bit binary coded word (MSB = Bit 13) indicating the Waveform Interleave Scheme being currently performed automatically by the Radar, as Indicated in Tab. B6/02-D

The content of this field is significant only if the Radar is operating in RWS, SAM modes.

Tab. B6/02-D - Field D Description

Waveform Interleave Selection Tell-back	Bit		Decimal Value	Remarks
	13	14		
Spare	0	0	00	
Interleave 1	0	1	01	
Interleave 2	1	0	02	
Interleave 3	1	1	03	

NOTE 5: Bit 15 indicates the selection (Low/High) of the Threshold for Look-Up Operation currently implemented by the Radar, as indicated in Tab. B6/02-E.

The content of this field is significant only if the Radar is operating in RWS, SAM modes, and the LPRF/MPRF Look-Up Selection (field G of B6/01) assumes the value "LPRF".

Tab. B6/02-E - Field E Description

LPRF Threshold Selection Tell-back	Bit 15	Decimal Value	Remarks
THRESHOLD LOW	0	00	
THRESHOLD HIGH	1	01	

7.2.6.3 Word B6-03: Beacon Delay and Code Tell-Back

Sheet 1 of 2

Word Name	: Beacon Delay and Code Tell-back		
Word ID	: B6/03	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 10 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 20.48 (Field A)
Signal Type	: NUMERIC and Coded	LSB	: 0.01 (Field A)
Units	: μ sec (Field A)	Full scale	: 40.95 (Field A)

Field Name	Bit No	Description	
A	00-N MSB	Beacon Delay Tell-back	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
B	11-N LSB	Beacon Code Tell-back	(Note 2)
	12-C MSB		
	13-C		
	14-C		
	15-C LSB		

NOTE 1: Bit 00 through bit 11 represent a 12 bit binary coded word (MSB=Bit 00) indicating the beacon delay being used by the Radar for the beacon range computation.

The content of this field is significant only when the Radar is operating in Beacon Master Mode, as shown in field A of B7/01.

NOTE 2: Bit 12 through bit 15 represent a four bit binary coded word (MSB=Bit 12) indicating the beacon code which is decoded by the Radar.

The valid range is from 0 to 15.

The content of this field is significant only when the Radar is operating in Beacon Master Mode, as shown in field A of B7/01.

7.2.6.4 Word B6-04: Radar Gains and RF Channel Grouping Tell-Back

Sheet 1 of 3

Word Name	: Radar Gains and RF Channel Grouping Options Tell-back		
Word ID	: B6/04	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 10 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded and Numeric	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00-N MSB	IF (Map) Gain Command Tell-back	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
B	06-N LSB	Moving Target Gain Tell-back	(Note 2)
	07-N MSB		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
C	13-N LSB	Frequency Grouping Option Tell-back	(Note 3)
	14-C		
D	15	spare	

NOTE 1: Bit 00 through bit 06 represent a 7 bit binary coded word (MSB=Bit 00) indicating the IF Gain (Map Gain) used by the Radar.

The content of this field is significant only when the Radar is operating in one of the following modes, having a raw video map: GM, DBS, SEA-1, GMTI, WA as shown in fields A and B of B7/01.

The valid range is from 0 to 127.

NOTE 2: Bit 07 through bit 13 represent a 7 bit binary coded word (MSB=Bit 07) indicating the Moving Target Gain (MTG) used by the Radar.

Valid range is from 0 to 127.

The content of this field is significant only when the Radar is operating in SEA-2 and GMTI Modes (as shown in fields A and B of B7/01).

NOTE 3: Bit 14 indicates the option of grouping of the RF channels currently implemented by the Radar, as indicated in Tab. B6/04-C.

Tab. B6/04-C - Field C Description

Frequency Grouping Tell-Back	Bit 14	Decimal Value	Remarks
Option 1	0	00	
Option 2	1	01	

7.2.6.5 Word B6-05: Radar Health Status and BIT report validity

Sheet 1 of 8

Word Name	: Radar Health Status and BIT report validity		
Word ID	: B6/05	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 10 Hz	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00-C	Radar Fail status	(Note 1)
B	01-C	Array status	(Note 2)
	02-C	Pedestal status	(Note 2)
	03-C	Servoloop status	(Note 2)
	04-C	Rx Front-end status	(Note 2)
	05-C	Receiver status	(Note 2)
C	06-C	Transmitter status	(Note 2)
	07-C	Processor status	(Note 2)
	08-C	Transmitter Over Temperature alarm	(Note 3)
D	09-C	Processor Over Temperature alarm	(Note 4)
E	10-C	Servoloop Over Temperature alarm	(Note 5)
F	11-C	Pressurization status	(Note 6)
G	12-C	BIT Report Available	(Note 7)
	13	spare	
	14	spare	
H	15	spare	

NOTE 1: Bit 00 indicates the occurrence of a failure in the Radar, as indicated in Tab. B6/05-A.

Tab. B6/05-A - Field A Description

Radar fail status	Bit 00	Decimal Value	Remarks
RDR OK	0	00	
RDR FAILED	1	01	a)

Remark a) If this field assumes the value "RDR FAILED", the location of the detected failure is given by field B.

NOTE 2: Bits 01, 02, 03, 04, 05, 06, 07 indicate the occurrence of a failure in the corresponding LRU, as indicated in Tab. B6/05-B.

Tab. B6/05-B - Field B Description

LRU fail status	Bit 01÷07	Decimal Value	Remarks
LRU OK	0	00	
LRU FAILED	1	01	

NOTE 3: Bit 08 indicates the occurrence of an over-temperature condition in the Transmitter, as indicated in Tab. B6/05-C.

Tab. B6/05-C - Field C Description

Transmitter over-temperature alarm	Bit 08	Decimal Value	Remarks
NO OVERTEMP	0	00	
OVERTEMP	1	01	

NOTE 4: Bit 09 indicates the occurrence of an over-temperature condition in the Processor, as indicated in Tab. B6/05-D.

Tab. B6/05-D - Field D Description

Processor Over-temperature alarm	Bit 09	Decimal Value	Remarks
NO OVERTEMP	0	00	
OVERTEMP	1	01	

NOTE 5: Bit 10 indicates the occurrence of an over-temperature condition in the Servoloop, as indicated in Tab. B6/05-E.

Tab. B6/05-E - Field E Description

Servoloop Over-temperature alarm	Bit 10	Decimal Value	Remarks
NO OVERTEMP	0	00	
OVERTEMP	1	01	

NOTE 6: Bit 11 indicates the occurrence of a pressurization failure, as indicated in Tab. B6/05-F.

Tab. B6/05-F - Field F Description

Pressurization status	Bit 11	Decimal Value	Remarks
PRESSURIZATION OK	0	00	
PRESSURIZATION FAIL	1	01	

NOTE 7: Bit 12 indicates if a BIT Report is available, as indicated in Tab. B6/05-G.

Tab. B6/05-G - Field G Description

BIT Report Available	Bit 12	Decimal Value	Remarks
NOT AVAILABLE	0	00	a)
AVAILABLE	1	01	b)

Remark a) If this field is set to "NOT AVAILABLE", the content of message B8 is not significant.

Remark b) If this field is set to "AVAILABLE", the report relevant to the last BIT is available in message B8 and has to be read by the MC within 200 ms.

7.2.6.6 Word B6-06: SW Release 1

Sheet 1 of 2

Word Name	: SW Release 1		
Word ID	: B6/06	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: CODED	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00-C	Main Computer SW release	(Note 1)
	01-C		
	02-C		
	03-C LSB		
B	04-C MSB	Main Computer SW version	(Note 2)
	05-C		
	06-C		
	07-C LSB		
C	08-C MSB	Graphic Computer SW release	(Note 1)
	09-C		
	10-C		
	11-C LSB		
D	12-C MSB	Graphic Computer SW version	(Note 2)
	13-C		
	14-C		
	15-C LSB		

- NOTE 1:** Bit 00 through bit 03 and bit 08 through bit 11 represent two four bit binary coded words (MSB=Bit 00 and MSB=Bit 08) labelling the installed software release of the Main Computer CSCI and of the Graphic Computer CSCI respectively.
- NOTE 2:** Bit 04 through bit 07 and bit 12 through bit 15 represent two four bit binary coded words (MSB=Bit 04 and MSB=Bit 12) labelling the version of the installed software release of the Main Computer CSCI and of the Graphic Computer CSCI respectively.

7.2.6.7 Word B6-07: SW Release 2

Sheet 1 of 2

Word Name	: SW Release 2		
Word ID	: B6/07	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: CODED	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00-C MSB	Antenna Computer SW release	(Note 1)
	01-C		
	02-C		
	03-C LSB		
B	04-C MSB	Antenna Computer SW version	(Note 2)
	05-C		
	06-C		
	07-C LSB		
C	08	spare	
	09	spare	
	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

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- NOTE 1:** Bit 00 through bit 03 represent a four bit binary coded word (MSB=Bit 00) labelling the installed software release of the Antenna Computer CSCI.
- NOTE 2:** Bit 04 through bit 07 represent a four bit binary coded word (MSB=Bit 04) labelling the version of the installed software release of the Antenna Computer CSCI.

7.2.6.8 Word B6-08: AZ Scan Centre

Sheet 1 of 2

Word Name	: AZ Scan Centre		
Word ID	: B6/08	Max Value	: 1.0
Source(s)	: RDR	Min Value	: -1.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 0.5
Signal Type	: 2's complement	LSB	: 3.05176E-05
Units	: Semicircles	Full scale	: 1.0

Field Name	Bit No	Description	
A	00 SIGN	Implemented azimuth of the scan centre	(Note 1)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: The content of this word is not significant when the Radar is operating in one of the following modes: STT, DTT, SSTT, SMTT, GMTT, FTT, ACM-BORESIGHT, ACM-HUD, ACM-VERTICAL, as resulting from fields A and B of B7/01 and from field C of B7/02.

7.2.6.9 Word B6-09: EL Scan Centre

Sheet 1 of 2

Word Name	: EL Scan Centre		
Word ID	: B6/09	Max Value	: 0.5
Source(s)	: RDR	Min Value	: -0.5
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 0.5
Signal Type	: 2's complement	LSB	: 3.05176E-05
Units	: Semicircles	Full scale	: 1.0

Field Name	Bit No	Description	
A	00 SIGN	Implemented Elevation of the scan centre	(Note 1)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

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NOTE 1: The content of this word is not significant when the Radar is operating in one of the following modes: STT, DTT, SSTT, SMTT, GMITT, ACM-BORESIGHT, ACM-HUD, ACM-VERTICAL, as resulting from fields A and B of B7/01 and from field C of B7/02.

7.2.6.10 Word B6-10: Clearance Plane Distance Tell-Back

Sheet 1 of 1

Word Name	: Clearance Plane Distance Tell-Back		
Word ID	: B6/10	Max Value	: 5,000.0
Source(s)	: RDR	Min Value	: 0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 32,768.0
Signal Type	: Unsigned Numeric	LSB	: 2.0
Units	: Feet	Full scale	: 65,535.0

Field Name	Bit No	Description
A	00-N MSB	Distance of second clearance plane in TA Mode
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
	15-N LSB	

NOTE 1: The content of this word is significant only if the Radar is operating in TA.

7.2.6.11 Word B6-11: Terrain Avoidance Data (word#1)

Sheet 1 of 2

Word Name	: Terrain Avoidance data (word#1)		
Word ID	: B6/11	Max Value	: 18,525.0 (Field A)
Source(s)	: RDR	Min Value	: 0 (Field A)
Destination(s)	: MC	Resolution	: 74.9481 (Field A)
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 9,593.36 (Field A)
Signal Type	: Unsigned Numeric/Coded	LSB	: 4.68426 (Field A)
Units	: Meters (Field A)	Full scale	: 19,182.0 (Field A)

Field Name	Bit No	Description	
A	00-N MSB	Min Range of Protrusion (High Clearance Plane)	(Note 1,2,3)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N LSB		
B	12-C	No Signal Available	(Note 1,4)
C	13-C	Jammer within Corridor	(Note 1,5)
D	14	spare	
	15	spare	

- NOTE 1:** The content of this word is significant only if the Radar is operating in TA.
- NOTE 2:** Bit 00 through bit 11 compose a twelve bit binary coded word (MSB = Bit 00) which defines the minimum range of protrusion through the high clearance plane within the central corridor, measured along the local horizontal plane (i.e. ground measured range).
- NOTE 3:** The range of protrusion has to be considered not valid when the content of field A assumes the value 0.
- NOTE 4:** Bit 12 indicates the absence of significant signal, as indicated in Tab. B6/11-B.

Tab. B6/11-B - Field B Description

No Signal Available Indication	Bit 12	Decimal Value	Remarks
Signal Available	0	00	
No Signal Available	1	01	

- NOTE 5:** Bit 13 indicates the presence of a Jammer source in the central corridor, as indicated in Tab. B6/11-C.

Tab. B6/11-C - Field C Description

Jammer within Corridor Indication	Bit 13	Decimal Value	Remarks
No Jammer within Corridor	0	00	
Jammer present within Corridor	1	01	

7.2.6.12 Word B6-12: Terrain Avoidance Data (word#2)

Sheet 1 of 2

Word Name	: Terrain Avoidance data (word#2)		
Word ID	: B6/12	Max Value	: 18,525.0
Source(s)	: RDR	Min Value	: 0
Destination(s)	: MC	Resolution	: 74.9481
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 9,593.36
Signal Type	: Unsigned Numeric	LSB	: 4.68426
Units	: Meters	Full scale	: 19,182.0

Field Name	Bit No	Description	
A	00-N MSB	Min Range of Protrusion (Low Clearance Plane)	(Note 1,2,3)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N LSB		
B	12	spare	
	13	spare	
	14	spare	
	15	spare	

- NOTE 1:** The content of this word is significant only if the Radar is operating in TA.
- NOTE 2:** Bit 00 through bit 11 compose a twelve bit binary coded word (MSB = Bit 00) which defines the minimum range of protrusion through the low clearance plane within the central corridor, measured along the local horizontal plane (i.e. ground measured range).
- NOTE 3:** The range of protrusion has to be considered not valid when the content of field A assumes the value 0.

7.2.6.13 Word B6-13: Parameter Identifier Tell-Back

Sheet 1 of 3

Word Name	: Parameter Identifier Tell-back		
Word ID	: B6/13	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00-C	Parameter Transfer Enable	(Note 1)
B	01-C	Receive/Transmit Selector	(Note 2)
C	02-C MSB	Parameter Identifier	(Note 3)
	03-C		
	04-C		
	05-C		
	06-C		
	07-C		
	08-C		
	09-C LSB		
	D	10	spare
11		spare	
12		spare	
13		spare	
14		spare	
	15	spare	

NOTE 1: Bit 00 indicates if the request for transmit/receive a parameter is active, as indicated in Tab. B6/13-A.

Tab. B6/13-A - Field A Description

Parameter Transfer Enable	Bit 00	Decimal Value	Remarks
NOT ACTIVE	0	00	a)
ACTIVE	1	01	b)

Remark a) If this field is set to "NOT ACTIVE", no action of transmit/receive of parameters is in progress. Consequently, the content of fields B, C and D of this word and the content of words B6/14 and B6/15 are not significant.

Remark b) If this field is set to "ACTIVE", the Radar is managing the request of transmit/receive of the parameter indicated in field C.

NOTE 2: Bit 01 selects the operation done on the parameter, as indicated in Tab. B6/13-B.

Tab. B6/13-B - Field B Description

Receive/Transmit Selector	Bit 01	Decimal Value	Remarks
RECEIVED	0	00	a)
TRANSMITTED	1	01	b)

Remark a) If this field is set to "RECEIVED", the parameter identified in field C has been received from words A1/09 and A1/10, and is available, as tell-back, in words B6/14 and B6/15.

Remark b) If this field is set to "TRANSMITTED", the parameter identified in field C has been made available by the Radar in words B6/14 and B6/15.

NOTE 3: Bit 02 through bit 09 compose a eight bit binary coded word (MSB = Bit 02) which identifies the parameter which has been received/transmitted by the Radar.
The parameters received/transmitted by the Radar are listed in Note 3 to word 08 of message A1.

7.2.6.14 Word B6-14/15: Parameter Value (word 1 and 2)

Sheet 1 of 1

Word Name	: Parameter Value (word 1 and 2)		
Word ID	: B6/14-15	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
MSW	00-C MSB	Parameter value (Word 1)	(Note 1)
	01-C		
	02-C		
	03-C		
	04-C		
	05-C		
	06-C		
	07-C		
	08-C		
	09-C		
	10-C		
	11-C		
	12-C		
	13-C		
	14-C		
15-C			
LSW	00-C	Parameter value (Word 2)	
	01-C		
	02-C		
	03-C		
	04-C		
	05-C		
	06-C		
	07-C		
	08-C		
	09-C		
	10-C		
	11-C		
	12-C		
	13-C		
	14-C		
15-C LSB			

NOTE 1: These two words contain the value of the parameter, identified by the value in field C of word B6/13, which has to be received (in words A1/09 and A1/10) or transmitted by the Radar. The format for all the parameters, except those reserved for experimental purposes, is described in the description of words 09 and 10 of message A1.

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7.2.6.15 Word B6-16: Cursor X-Display coordinate and Qualifiers

Sheet 1 of 2

Word Name	: Cursor X-Display coordinate/Qualifiers		
Word ID	: B6/16	Max Value	: 483 (field A)
Source(s)	: RDR	Min Value	: 0 (field A)
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 256 (field A)
Signal Type	: Unsigned Numeric (field A)	LSB	: 1 (field A)
Units	: Pixels (field A)	Full scale	: 511 (field A)

Field Name	Bit No	Description	
A	00-N MSB	Current X-Display coord. of the Acquisition Cursor	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
B	09-C	Cursor Normal/Slave Selector Tell-Back	(Note 2)
C	10-C	Cursor Zero Tell-Back	(Note 3)
D	11-C	Cursor Snowplough Command Tell-Back	(Note 4)
E	12-C	SAR Enabled Tell-Back	(Note 5)
F	13	spare	
	14	spare	
	15	spare	

NOTE 1: Bit 00 through bit 08 compose a binary coded word defining the current X-display coordinate of the acquisition cursor symbol.

NOTE 2: Bit 09 provides the tell-back relevant to the selection of the Normal/Slave management of the Acquisition cursor, as indicated in Tab. B6/16-B.

Tab. B6/16-B - Field B Description

Normal/Slave Selector Tell-Back	Bit 09	Decimal Value	Remarks
NORMAL	0	00	
SLAVE	1	01	

NOTE 3: Bit 10 provides the tell-back of the Cursor Zero command. If this bit is set to "1", the Radar is implementing the "Cursor Zero" command.

NOTE 4: Bit 11 provides the tell-back relevant to the selection of the Snowplough management for the Acquisition cursor, as indicated in Tab. B6/16-D.

Tab. B6/16-D - Field D Description

Normal/Snowplough Selector Tell-Back	Bit 11	Decimal Value	Remarks
NORMAL	0	00	
SNOWPLOUGH	1	01	

NOTE 5: Bit 12 provides the tell-back relevant to the enable of the SAR Function, as indicated in Tab. B6/16-E.

Tab. B6/16-E - Field E Description

SAR Enabled Tell-Back	Bit 12	Decimal Value	Remarks
NORMAL	0	00	
SAR ENABLED	1	01	

7.2.6.16 Word B6-17: Cursor Y-Display coordinate

Sheet 1 of 1

Word Name	: Cursor Y-Display coordinate		
Word ID	: B6/17	Max Value	: 483
Source(s)	: RDR	Min Value	: 0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 256
Signal Type	: Unsigned Numeric	LSB	: 1
Units	: Pixels	Full scale	: 511

Field Name	Bit No	Description	
A	00-N MSB	Current Y-Display coord. of the Acquisition Cursor	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N LSB		
B	09	spare	
	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

NOTE 1: Bit 00 through bit 08 compose a binary coded word defining the current Y-display coordinate of the acquisition cursor symbol.

7.2.6.17 Word B6-18: Cursor Inertial position (range)

Sheet 1 of 1

Word Name	: Cursor Inertial position (Range)		
Word ID	: B6/18	Max Value	: 520,000
Source(s)	: RDR	Min Value	: 0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 262,144
Signal Type	: Unsigned Numeric	LSB	: 8
Units	: feet	Full scale	: 524,287

Field Name	Bit No	Description	
A	00-N MSB	Range of Acquisition Cursor	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This field represents the Range of the Acquisition Cursor as used by the Radar, expressed in the polar frame associated to the XYZ Navigation frame.

7.2.6.18 Word B6-19: Cursor Inertial position (Azimuth)

Sheet 1 of 1

Word Name	: Cursor Inertial Position (Azimuth)		
Word ID	: B6/19	Max Value	: 1.0
Source(s)	: RDR	Min Value	: -1.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 0.5
Signal Type	: 2's complement	LSB	: 3.05176E-05
Units	: Semicircles	Full scale	: 1.0

Field Name	Bit No	Description	
A	00 SIGN	Azimuth of Acquisition Cursor	(Note 1)
	01-N MSB		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This field represents the Azimuth of the Acquisition Cursor as used by the Radar, expressed in the polar frame associated to the XYZ Navigation frame.

7.2.6.19 Word B6-20/21: Cursor Position Latitude

Sheet 1 of 1

Word Name	: Cursor Position Latitude		
Word ID	: B6/20-21	Max Value	: 1.0
Source(s)	: RDR	Min Value	: -1.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 0.5
Signal Type	: 2's complement	LSB	: 4.65661E-10
Units	: Semicircles	Full scale	: 1.0

Field Name	Bit No	Description
MSW	00 SIGN	Cursor Position Latitude
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N		
LSW	00-N	
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N LSB		

7.2.6.20 Word B6-22/23: Cursor Position Longitude

Sheet 1 of 1

Word Name	: Cursor Position Longitude		
Word ID	: B6/22-23	Max Value	: 1.0
Source(s)	: RDR	Min Value	: -1.0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 0.5
Signal Type	: 2's complement	LSB	: 4.65661E-10
Units	: Semicircles	Full scale	: 1.0

Field Name	Bit No	Description
MSW	00 SIGN	Cursor Position Longitude
	01-N MSB	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N		
LSW	00-N	
	01-N	
	02-N	
	03-N	
	04-N	
	05-N	
	06-N	
	07-N	
	08-N	
	09-N	
	10-N	
	11-N	
	12-N	
	13-N	
	14-N	
15-N LSB		

7.2.7 Message B7: Radar Status Tell-Back**Message Name** : RDR Status Tell-back**Message ID** : B7**Source** : RDR**Destination** : MC**Transfer Type** : RT-to-BC**Word Count** : 3**Xmit Rate** : 25 Hz

Word Name	Word No	Description	Section
Transmit Command Word	CW	To RDR, subaddress 10001 (17)	
Status Word	ST		
Radar Mode Tell-back	01	Current Radar mode	7.2.7.1
Rdr functions and par. Tell-back (word#1)	02	Current Radar functions and parameters (word#1)	7.2.7.2
Rdr functions and par. Tell-back (word#2)	03	Current Radar functions and parameters (word#2)	7.2.7.3

7.2.7.1 Word B7-01: Radar Mode Tell-Back

Sheet 1 of 6

Word Name	: Radar Mode Tell-Back		
Word ID	: B7/01	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 25 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00-C MSB	Master Mode Tell-Back	(Note 1)
	01-C		
	02-C		
	03-C LSB		
B	04-C MSB	Radar Designation status	(Note 2)
	05-C		
	06-C LSB		
C	07-C	INT-BIT status	(Note 3)
D	08-C	STBY Tell-Back	(Note 4)
E	09-C	FREEZE Tell-Back	(Note 5)
F	10-C	Degraded Performance Status	(Note 6)
G	11-C	Reserved	(Note 7)
H	12-C	RF Radiation Status	(Note 8)
I	13-C	Transition Status	(Note 9)
J	14-C	Last Acquisition Result	(Note 10)
K	15-C	SAR Acquisition Type	(Note 11)

NOTE 1: Bit 00 through bit 03 compose a four bit binary coded word (MSB = Bit 00) indicating the Master Mode being performed by the Radar, as indicated in Tab. B7/01-A.

Tab. B7/01-A - Field A Description

Master Mode Tell-Back	Bit				Decimal Value	Remarks
	00	01	02	03		
RWS	0	0	0	0	00	
VS	0	0	0	1	01	
ACM	0	0	1	0	02	
TWS	0	0	1	1	03	
spare	0	1	0	0	04	
GM	0	1	0	1	05	
SEA-1	0	1	1	0	06	
SEA-2	0	1	1	1	07	
GMTI	1	0	0	0	08	
BCN	1	0	0	1	09	
AGR	1	0	1	0	10	
TA	1	0	1	1	11	
WA	1	1	0	0	12	
spare	1	1	0	1	13	
spare	1	1	1	0	14	
DLY	1	1	1	1	15	

NOTE 2: Bit 04 through bit 06 compose a three bit binary coded word defining the tracking status, as indicated in Tab. B7/01-B.

The content of this field represents the tracking status and the SAR status of the Radar under the Master Mode indicated in field A of B7/01.

Tab. B7/01-B - Field B Description

Radar Designation Status	Bit			Decimal Value	Remarks
	04	05	06		
STT	0	0	0	00	
DTT	0	0	1	01	
SAM	0	1	0	02	
TWS with HPT	0	1	1	03	
AGR Lock-On	1	0	0	04	
ACQUISITION in Progress	1	0	1	05	
SAR	1	1	0	06	
NOT VALID	1	1	1	07	

NOTE 3: Bit 07 shows the status of the Interruptive BIT sequence, as indicated in Tab. B7/01-C.

Tab. B7/01-C - Field C Description

INT-BIT Status	Bit 07	Decimal Value	Remarks
NORMAL	0	00	
INT-BIT In Progress	1	01	

NOTE 4: Bit 08 indicates the tell-back relevant to the Stand-by function, as indicated in Tab. B7/01-D.

Tab. B7/01-D - Field D Description

STBY Tell-Back	Bit 08	Decimal Value	Remarks
STBY OFF	0	00	
STBY ON	1	01	

NOTE 5: Bit 09 indicates the tell-back relevant to the FREEZE function, as indicated in Tab. B7/01-E.

Tab. B7/01-E - Field E Description

FREEZE Tell-Back	Bit 09	Decimal Value	Remarks
NORMAL	0	00	
FREEZE	1	01	

NOTE 6: Bit 10 indicates the Degraded performance status of the Radar, as indicated in Tab. B7/01-F.

Tab. B7/01-F - Field F Description

Degraded performance status	Bit 10	Decimal Value	Remarks
NORMAL	0	00	
DEGRADED	1	01	

NOTE 7: This field is reserved.

It is always set to decimal value "00" by the Radar.

NOTE 8: Bit 12 controls the RF Radiation status of the Radar, as indicated in Tab. B7/01-H.

Tab. B7/01-H - Field H Description

RF Radiation status	Bit 12	Decimal Value	Remarks
Radiation ON	0	00	
Radiation OFF	1	01	

NOTE 9: Bit 13 indicates if a transition is in progress, as a consequence of a command in message A2, as indicated in Tab. B7/01-I.

Tab. B7/01-I - Field I Description

Transition status	Bit 13	Decimal Value	Remarks
NO TRANSITION	0	00	
TRANSITION In Progress	1	01	a)

Remark a) Whenever this field is set to the value "TRANSITION In Progress", the Radar disregards messages A1 and A2.

NOTE 10: Bit 14 indicates the result of the last Acquisition or Reacquisition performed, as indicated in Tab. B7/01-J.

Tab. B7/01-J - Field J Description

Last Acquisition Result	Bit 14	Decimal Value	Remarks
Last Acquisition Unsuccessful	0	00	
Last Acquisition Successful	1	01	

NOTE 11: Bit 15 indicates the "type" of SAR performed, as indicated in Tab. B7/01-K.

Tab. B7/01-K - Field K Description

Last Acquisition Result	Bit 15	Decimal Value	Remarks
SAR on Cursor	0	00	
SAR on SPOI	1	01	

7.2.7.2 Word B7-02: Radar Functions and Parameters Tell-Back (word#1)

Sheet 1 of 9

Word Name	: RDR Functions and Parameters Tell-Back (word#1)		
Word ID	: B7/02	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 25 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00-C	RWS Submode Tell-Back	(Note 1)
B	01-C	SPOT function Tell-Back	(Note 2)
C	02-C MSB	ACM Submode Tell-Back	(Note 3)
	03-C		
	04-C LSB		
D	05-C	GM Submode Tell-Back	(Note 4)
E	06-C MSB	EXPAND Tell-Back	(Note 5)
	07-C LSB		
F	08-C MSB	Range Scale Tell-Back	(Note 6)
	09-C LSB		
G	10-C MSB	Number of bars Tell-Back	(Note 7)
	11-C LSB		
H	12-C MSB	Azimuth Scan width Tell-Back	(Note 8)
	13-C		
	14-C		
	15-C LSB		

NOTE 1: Bit 00 indicates the selected RWS submode, as indicated in Tab. B7/02-A.

The content of this field is significant only when the Radar is in the Search status or in SAM status under RWS Master Mode, as indicated in fields A and B of B7/01.

Tab. B7/02-A - Field A Description

RWS Submode Tell-Back	Bit 00	Decimal Value	Remarks
RWS NAM	0	00	
RWS ASM	1	01	

NOTE 2: Bit 01 contains the tell-back relevant to the SPOT selection, as indicated in Tab. B7/02-B.

The content of this field is significant only when the Radar is either in the search status or in SAM status under RWS Master Mode, or in TWS (with or without HPT) under TWS Master Mode, as indicated in fields A and B of B7/01.

Tab. B7/02-B - Field B Description

SPOT Function Tell-Back	Bit 01	Decimal Value	Remarks
NORMAL	0	00	
SPOT	1	01	

NOTE 3: Bit 02 through bit 04 compose a three bit binary coded word (MSB=BIT 02) indicating the ACM submode performed by the Radar, as indicated in Tab. B7/02-C.

The content of this field is significant only when the Radar is performing the ACM mode, as resulting from field A of B7/01.

Tab. B7/02-C - Field C Description

ACM submode Tell-Back	Bit			Decimal Value	Remarks
	02	03	04		
BORESIGHT	0	0	0	00	
NARROW	0	0	1	01	
HUD	0	1	0	02	
WIDE	0	1	1	03	
VERTICAL	1	0	0	04	
SLEWABLE	1	0	1	05	
spare	1	1	0	06	
spare	1	1	1	07	

NOTE 4: Bit 05 indicates the GM submode being performed by the Radar, as indicated in Tab. B7/02-D.

The content of this field is significant only when the Radar is performing the GM mode, as resulting from field A of B7/01.

Tab. B7/02-D - Field D Description

GM Submode Tell-Back	Bit 05	Decimal Value	Remarks
RBM	0	00	
DBS	1	01	

NOTE 5: Bit 06 indicates the tell-back of the EXPAND function selection, as indicated in Tab. B7/02-E.

This field is significant only when the Radar is performing SAM, TWS (with HPT), BCN (with one scan bar), GM, SEA-1, SEA-2, GMTI, as resulting from fields A and B of B7/01.

Tab. B7/02-E - Field E Description

EXPAND Tell-Back	Bit 06	Decimal Value	Remarks
NORMAL	0	00	
EXPAND	1	01	

NOTE 6: Bit 08 and bit 09 compose a two bit binary coded word (MSB=BIT 08) indicating the range or the radial closing velocity full scale being used by the Radar, as indicated in Tab. B7/02-F.

Tab. B7/02-F - Field F Description

Range Scale (Radial closing velocity) Tell-Back	Bit		Decimal	Remarks
	08	09	Value	
80 NM	0	0	00	
40 NM	0	1	01	
20 NM (2400 Kts)	1	0	02	a)
10 NM (1200 Kts)	1	1	03	a)

Remark a) When the Radar is operating in VS (as indicated by field A of B7/01) the value "20 NM" refers to 2400 Knots full scale radial closing velocity and the value "10 NM" refers to 1200 Knots full scale radial closing velocity.

NOTE 7: Bit 10 and bit 11 compose a three bit binary coded word (MSB=BIT 10) defining the number of bars actually scanned by the Radar, as indicated in Tab. B7/02-G.

This field is not significant when the Radar is operating under ACM, AGR, GM, SEA-1, SEA-2, GMTI, WA, TA Master Modes, as resulting from fields A of B7/01.

Tab. B7/02-G - Field G Description

Number of Bars Tell-Back	Bit		Decimal Value	Remarks
	10	11		
1 bar	0	0	00	
2 bars	0	1	01	
3 bars	1	0	02	
4 bars	1	1	03	

NOTE 8: Bit 12 through bit 15 compose a four bit binary coded word (MSB=BIT 12) defining the Azimuth scan width actually scanned or preselected (if in Stand-by) by the Radar, as indicated in Tab. B7/02-H.

The content of this field is not significant when the Radar is operating under either ACM or AGR Master Modes (as resulting from field A of B7/01).

Tab. B7/02-H - Field H Description

Azimuth Scan width Tell-Back	Bit				Decimal Value	Remarks
	12	13	14	15		
±60°	0	0	0	0	00	
±55°	0	0	0	1	01	
±50°	0	0	1	0	02	
±45°	0	0	1	1	03	
±40°	0	1	0	0	04	
±35°	0	1	0	1	05	
±30°	0	1	1	0	06	
±25°	0	1	1	1	07	
±20°	1	0	0	0	08	
±15°	1	0	0	1	09	
±10°	1	0	1	0	10	
±05°	1	0	1	1	11	
±00°	1	1	0	0	12	
spare	1	1	0	1	13	
spare	1	1	1	0	14	
spare	1	1	1	1	15	

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7.2.7.3 Word B7-03: Radar Functions and Parameters Tell-Back (word#2)

Sheet 1 of 2

Word Name	: RDR Functions and Parameters Tell-Back (word#2)		
Word ID	: B7/03	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: 25 Hz	Accuracy	: NA
Xmit Rate	: 25 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00	spare	(Note 1)
	01	spare	
	02	spare	
	03	spare	
B	04-C MSB	Zoom command Tell-Back	(Note 2)
	05-C LSB		
C	06-C MSB	SAR Map Orientation Tell-Back	(Note 3)
	07-C LSB		
D	08-C	SAR Feasibility for Cursor	(Note 4)
E	09-C	SAE Feasibility for SPOI	(Note 5)
	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

NOTE 1: Not applicable

NOTE 2: Bit 04 and 05 compose a two bit binary coded word (MSB=BIT 04) indicating the tell-back of the Zoom command, as indicated in Tab. B7/03-B.

This field is significant only when the Radar is performing either SSAR or ISAR, as resulting from fields A and B of B7/01.

Tab. B7/03-B - Field B Description

Zoom Command Tell-Back	Bit		Decimal Value	Remarks
	04	05		
NOT ACTIVE	0	0	00	
ZOOM-IN	0	1	01	
ZOOM-OUT	1	0	02	
spare	1	1	03	

NOTE 3: Bit 06 and 07 compose a two bit binary coded word (MSB = Bit 06) indicating the tell-back of the Map Orientation selected for the representation of SAR images, as indicated in Tab. B7/03-C.

Tab. B7/03-C - Field C Description

SAR Map Orientation Tell-Back	Bit		Decimal Value	Remarks
	06	07		
A/C Nose Reference	0	0	00	
Slant/Cross Range	0	1	01	
Not Used	1	0	02	
Not Used	1	1	03	

NOTE 4: Bit 08 indicates if the point on ground indicated by the Cursor is feasible for SAR execution, as indicated in Tab. B7/03-D

Tab. B7/03-D - Field D Description

SAR Feasibility for Cursor	Bit 08	Decimal Value	Remarks
SAR Not Feasible	0	00	
SAR Feasible	1	01	

NOTE 5: Bit 09 indicates if the SPOI indicated in A4-01, A4-13, A4-28/29 and A4-30/31 is feasible for SAR execution, as indicated in Tab. B7/03-E.

Tab. B7/03-E - Field E Description

SAR Feasibility for SPOI	Bit 09	Decimal Value	Remarks
SAR Not Feasible on SPOI	0	00	
SAR Feasible on SPOI	1	01	

7.2.8 Message B8: BIT Report Message
Message Name : BIT Report Message

Message ID : B8	Transfer Type : RT-to-BC
Source : RDR	Word Count : 22
Destination : MC	Xmit Rate : 10 Hz

Word Name	Word No	Description	Section
Transmit Command Word	CW	To RDR, subaddress 10010 (18)	
Status Word	ST		
BIT Report Label	01		7.2.8.1
Bit Report Date	02		7.2.8.2
Bit Report Time Tag	03		7.2.8.3
Degradation Conditions (word 1)	04		7.2.8.4
Degradation Conditions (word 2)	05		7.2.8.5
Failure Location (Pedestal)	06		7.2.8.6
Failure Location (Servoloop)	07		7.2.8.7
Failure Location (RX Front-End)	08		7.2.8.8
Failure Location (Receiver)	09		7.2.8.9
Failure Location (Transmitter)	10		7.2.8.10
Failure Location (Processor)	11		7.2.8.11
Signal Processor Test Results	12		7.2.8.12
Rx Module Test Results	13		7.2.8.13
Data Processor Test Results	14		7.2.8.14
Post Processor Test Results	15		7.2.8.15
AGC Test Results	16		7.2.8.16
Power Supply Test Results	17		7.2.8.17
Servoloop Test Results	18		7.2.8.18
Transmitter Test Results (Word 1)	19		7.2.8.19
Transmitter Test Results (Word 2)	20		7.2.8.20
Receiver and Rx Front-end Test Results	21		7.2.8.21
Integrated System Test Results	22		7.2.8.22

Remarks:

- The transmit rate for this message is nominal, because it can be inserted in the frame only when needed.

7.2.8.1 Word B8-01: BIT Report Label

Sheet 1 of 2

Word Name	: BIT Report Label		
Word ID	: B8/01	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00-C MSB	BIT Report Label	(Note 1)
	01-C		
	02-C LSB		
B	03	spare	
	04	spare	
	05	spare	
	06	spare	
	07	spare	
	08	spare	
	09	spare	
	10	spare	
	11	spare	
	12	spare	
	13	spare	
	14	spare	
	15	spare	

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NOTE 1: Bit 00 through bit 02 compose a three bit binary coded word identifying the event which generated the BIT report, as indicated in Tab. B8/01-A.

Tab. B8/01-A - Field A Description

BIT Report Label	Bit			Decimal Value	Remarks
	00	01	02		
Power-Up BIT	0	0	0	00	
Fast Power-Up BIT	0	0	1	01	
Int BIT	0	1	0	02	
Switch Off	0	1	1	03	
Fail Onset	1	0	0	04	
Fail Stop	1	0	1	05	
spare	1	1	0	06	
spare	1	1	1	07	

7.2.8.2 Word B8-02: BIT Report Date

Sheet 1 of 1

Word Name	: BIT Report Date		
Word ID	: B8/02	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Numeric	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description	
A	00-N MSB	Year	(Note 1, 2)
	01-N		
	02-N		
	03-N		
	04-N		
B	05-N LSB	Month	(Note 1)
	06-N MSB		
	07-N		
	08-N		
C	09-N LSB	Day	(Note 1)
	10-N MSB		
	11-N		
	12-N		
D	13-N	spare	
	14-N LSB		
	15		

NOTE 1: The format of each field in this word is the same as that of the word A1/06.

NOTE 2: This word contains the Date of Validity of the BIT report available in words 04 through 22. This date is based on the MC Date of mission, provided to the Radar in message A1, word 06.

7.2.8.3 Word B8-03: BIT Report Time Tag

Sheet 1 of 1

Word Name	: BIT Report Time Tag		
Word ID	: B8/03	Max Value	: 86398
Source(s)	: RDR	Min Value	: 0
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: 65536
Signal Type	: Numeric	LSB	: 2
Units	: sec	Full scale	: 131070

Field Name	Bit No	Description	
A	00-N MSB	BIT report time tag	(Note 1)
	01-N		
	02-N		
	03-N		
	04-N		
	05-N		
	06-N		
	07-N		
	08-N		
	09-N		
	10-N		
	11-N		
	12-N		
	13-N		
	14-N		
	15-N LSB		

NOTE 1: This word contains the Time of Validity of the BIT report available in words 04 through 22. This Time tag is based on the MC Time of mission (time of the day), provided to the Radar in Msg A1, word 07.

7.2.8.4 Word B8-04: Degradation Conditions (word 1)

Sheet 1 of 1

Word Name	: Degradation Conditions (word 1)		
Word ID	: B8/04	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description
A	00-C	Group#1 Fail
B	01-C	Group#2 Fail
C	02-C	Group#3 Fail
D	03-C	Group#4 Fail
E	04-C	Group#5 Fail
F	05-C	Spare
G	06-C	Spare
H	07-C	Spare
I	08-C	GM-RBM, SEA-1, TA, WA Fail
J	09-C	BCN Fail
K	10-C	No RDR Symbology
L	11-C	Total RDR Fail
M	12-C	Not identified RDR Fail
N	13-C	HR modes and GM-DBS Fail
O	14-C	Spare
P	15-C	Selected channel Fail

Remark:

1. The setting to logic "1" of any field (from A to P) indicates that the corresponding Degradation message has to be displayed by the MC.
2. The detailed description of each degradation condition is described in ICD7033161 GRIFO-346FA, Logic of Operation for

7.2.8.5 Word B8-05: Degradation Conditions (word 2)

Sheet 1 of 1

Word Name : Degradation Conditions (word 2)

Word ID : B8/05

Source(s) : RDR

Destination(s) : MC

Comp Rate : NA

Xmit Rate : 10 Hz

Signal Type : Coded

Units : NA

Max Value : NA

Min Value : NA

Resolution : NA

Accuracy : NA

MSB : NA

LSB : NA

Full scale : NA

Field Name	Bit No	Description
A	00	spare
	01	spare
	02	spare
	03	spare
	04	spare
	05	spare
	06	spare
	07	spare
	08	spare
	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
15	spare	

7.2.8.6 Word B8-06: Failure Location (Pedestal)

Sheet 1 of 1

Word Name	: Failure Location (Pedestal)		
Word ID	: B8/06	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description
A	00-C	SRU 1: Gimbal
B	01-C	SRU 2: Waveguide
C	02-C	SRU 3: Waveguide
D	03-C	SRU 4: Delta/Guard LNA Switch
E	04-C	SRU 5: Waveguide switch
F	05	spare
	06	spare
	07	spare
	08	spare
	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
	15	spare

Remark:

- The setting to logic "1" of any field (from A to E) indicates that the failure is located by the Radar BIT to the corresponding SRU.

7.2.8.7 Word B8-07: Failure Location (Servoloop)

Sheet 1 of 1

Word Name	: Failure Location (Servoloop)		
Word ID	: B8/07	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description
A	00-C	SRU 1: Chassis
B	01-C	SRU 2: Power Supply
C	02-C	SRU 3: Digital Controller
D	03	spare
	04	spare
	05	spare
	06	spare
	07	spare
	08	spare
	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
	15	spare

Remark:

1. The setting to logic "1" of any field (from A to C) indicates that the failure is located by the Radar BIT to the corresponding SRU.

7.2.8.8 Word B8-08: Failure Location (RX Front-End)

Sheet 1 of 1

Word Name	: Failure Location (RX Front-End)		
Word ID	: B8/08	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description
A	00-C	SRU 1: Chassis
B	01-C	SRU 2: Delta/Guard LNA
C	02-C	SRU 3: Sum Act. Prot. and LNA
D	03-C	SRU 4: 4 port circulator
E	04-C	SRU 5: STC attenuators (Delta/Guard)
F	05-C	SRU 5: STC attenuators (Sum)
G	06	spare
	07	spare
	08	spare
	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
	15	spare

Remark:

- The setting to logic "1" of any field (from A to F) indicates that the failure is located by the Radar BIT to the corresponding SRU.

7.2.8.9 Word B8-09: Failure Location (Receiver)

Sheet 1 of 1

Word Name	: Failure Location (Receiver)		
Word ID	: B8/09	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description
A	00-C	SRU 1: Chassis
B	01-C	SRU 2: UHF Assy
C	02-C	SRU 3: Synthesizer
D	03-C	SRU 4: Delta/Guard Down converter
E	04-C	SRU 5: Sum Down Converter
F	05-C	SRU 6: L.O. Distributor
G	06-C	SRU 7: Up Converter
H	07	spare
	08	spare
	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
	15	spare

Remark:

- The setting to logic "1" of any field (from A to G) indicates that the failure is located by the Radar BIT to the corresponding SRU.

7.2.8.10 Word B8-10: Failure Location (Transmitter)

Sheet 1 of 1

Word Name : Failure Location (Transmitter)

Word ID : B8/10

Max Value : NA

Source(s) : RDR

Min Value : NA

Destination(s) : MC

Resolution : NA

Comp Rate : NA

Accuracy : NA

Xmit Rate : 10 Hz

MSB : NA

Signal Type : Coded

LSB : NA

Units : NA

Full scale : NA

Field Name	Bit No	Description
A	00-C	SRU 1: Chassis
B	01-C	SRU 2: Rex F. Tx
C	02-C	SRU 3: Power Supply
D	03-C	SRU 4: Valve El. TWT TX
E	04-C	SRU 5: RF Driver
F	05-C	SRU 6: Controller TX
G	06-C	SRU 7: H.V. Power Supply
H	07-C	SRU 8: EHT Power Supply
I	08	spare
	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
	15	spare

Remark:

- The setting to logic "1" of any field (from A to H) indicates that the failure is located by the Radar BIT to the corresponding SRU.

7.2.8.11 Word B8-11: Failure Location (Processor)

Sheet 1 of 1

Word Name	: Failure Location (Processor)		
Word ID	: B8/11	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description
A	00-C	SRU 1, Motherboard and Chassis, 1=fail
B	01-C	SRU 2, MTI-FFT, 1=fail
C	02-C	SRU 3, DSP0, 1=fail
D	03-C	SRU 4, DSP1, 1=fail
E	04-C	SRU 5, CFAR/PX-CTRL, 1=fail
F	05-C	SRU 6, Timer, 1=fail
G	06-C	SRU 7, Post Processor, 1=fail
H	07-C	SRU 8, AGC, 1=fail
I	08-C	SRU 9, ESA IF, 1=fail
J	09-C	SRU 10, Main Computer, 1=fail
K	10-C	SRU 11, Graphic Computer, 1=fail
L	11-C	SRU 12, Power Supply, 1=fail
M	12-C	SRU 13, Det_Exp, 1=fail
N	13-C	SRU 14, Rx-Module, 1=fail
O	14	spare
	15	spare

Remark:

1. The setting to logic "1" of any field (from A to N) indicates that the failure is located by the Radar BIT to the corresponding SRU.

7.2.8.12 Word B8-12: Signal Processor Test Results

Sheet 1 of 1

Word Name	: Signal Processor Test Results		
Word ID	: B8/12	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description
A	00-C	Test SP1: Timer1 uP
B	01-C	Test SP2: Timer DMA and PXC I/F
C	02-C	Test SP3: Timer Internal timing
D	03-C	Test SP4: Px-Ctrl Communication Tests
E	04-C	Test SP5: Video 1 Test without A/D
F	05-C	Test SP6: Video 1 Test with A/D
G	06-C	Test SP7: Video 2 Test with A/D synchronism
H	07-C	Test SP8: Video 2 Test with Timer synchronism
I	08-C	Test SP9: A/D and D/A Test
J	09-C	Test SP9-B: Wide Band Expander Test
K	10-C	Test SP10: Board Overall Status test
L	11-C	Test SP11: Attenuatori e antenna
M	12-C	spare
N	13-C	Test SP14: External SP interfaces
O	14-C	spare
P	15-C	Test SP16: BCN

Remark:

- The setting to logic "1" of any field (from A to P) indicates that a failure has been detected during the execution of the corresponding test.

7.2.8.13 Word B8-13: Rx Module Test Results

Sheet 1 of 1

Word Name	: Rx Module Test Results		
Word ID	: B8/13	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description
A	00-C	Test RM1: Master Clock Level
B	01-C	Test RM2: Expander Level
C	02-C	Test RM3: Sum Channel Down Converter
D	03-C	Test RM4: D/G Channel Down Converter
E	04-C	Test RM5: Noise Attenuators
F	05	spare
	06	spare
	07	spare
	08	spare
	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
G	15-C	Test RM16: Calibration: Sum channel fail

Remark:

- The setting to logic "1" of any field (from A to E) indicates that a failure has been detected during the execution of the corresponding test.
 The setting to logic "1" of field G indicates that the last performed cal. (Power-Up or Run Time) failed on Sum channel.

7.2.8.14 Word B8-14: Data Processor Test Results

Sheet 1 of 1

Word Name	: Data Processor Test Results		
Word ID	: B8/14	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description
A	00-C	Test DP1: 486 CPU tests
B	01-C	Test DP2: 486 interfaces with R3000 and GC
C	02-C	Test DP3: 486 interface with SLC
D	03-C	Test DP4: SLC Communications
E	04-C	Test DP5: R3000 CPU tests
F	05-C	Test DP6: R3000 interfaces
G	06-C	Test DP7: 1553 and discretes
H	07-C	Test DP8: Graphic CPU
I	08-C	Test DP9: Graphic Processors
J	09-C	Test DP10: Video Memory
K	10-C	Test DP11: Video Unit
L	11-C	Test DP12: Transputer Unit
M	12-C	Test DP13: Scan Converter Polar Memory
N	13-C	Test DP14: Scan Converter format converter
O	14	spare
	15	spare

Remark:

- The setting to logic "1" of any field (from A to N) indicates that a failure has been detected during the execution of the corresponding test.

7.2.8.15 Word B8-15: Post Processor Test Results

Sheet 1 of 1

Word Name	: Post Processor Test Results		
Word ID	: B8/15	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description
A	00-C	Test PP1: Master DSP
B	01-C	Test PP2: Interface Card
C	02-C	Test PP3: CPU cards
D	03-C	Test PP4: DMA Bus
E	04-C	Test PP5: SP Interface
F	05-C	Test PP6: DP Interface
G	06-C	Test PP7: Scan Converter Interface
H	07-C	Test PP8: AGC Interface
I	08	spare
	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
	15	spare

Remark:

- The setting to logic "1" of any field (from A to H) indicates that a failure has been detected during the execution of the corresponding test.

7.2.8.16 Word B8-16: AGC Test Results

Sheet 1 of 1

Word Name : AGC Test Results

Word ID : B8/16

Max Value : NA

Source(s) : RDR

Min Value : NA

Destination(s) : MC

Resolution : NA

Comp Rate : NA

Accuracy : NA

Xmit Rate : 10 Hz

MSB : NA

Signal Type : Coded

LSB : NA

Units : NA

Full scale : NA

Field Name	Bit No	Description
A	00-C	Test AGC1: Non destr. internal XYP RAM
B	01-C	Test AGC2: Non destr. external XYP RAM
C	02-C	spare
D	03-C	spare
E	04-C	Test AGC5: Dual Port RAM
F	05-C	Test AGC6: AGC Machine
G	06-C	Test AGC7: Sat. Machine
H	07-C	spare
I	08-C	Test AGC9: C RAM & XY Data Checksum
J	09-C	Test AGC10: Pulse Compressor Interface
K	10-C	Test AGC11: DP Interface
L	11	spare
M	12-C	Test AGC13: Taxi Running
N	13-C	Test AGC14: Non destr. ext. XYP RAM
O	14-C	Test AGC15: Servoloop Interface
P	15	spare

Remark:

- The setting to logic "1" of any field (from A to K and from M to O) indicates that a failure has been detected during the execution of the corresponding test.

7.2.8.17 Word B8-17: Power Supply Test Results

Sheet 1 of 1

Word Name : Power Supply Test Results

Word ID : B8/17

Source(s) : RDR

Destination(s) : MC

Comp Rate : NA

Xmit Rate : 10 Hz

Signal Type : Coded

Units : NA

Max Value : NA

Min Value : NA

Resolution : NA

Accuracy : NA

MSB : NA

LSB : NA

Full scale : NA

Field Name	Bit No	Description
A	00-C	Test PS1: Power Supply
B	01-C	Test PS2: Over-temperature
C	02-C	spare
D	03	spare
	04	spare
	05	spare
	06	spare
	07	spare
	08	spare
	09	spare
	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
	15	spare

Remark:

- The setting to logic "1" of any field (from A to C) indicates that a failure has been detected during the execution of the corresponding test.

7.2.8.18 Word B8-18: Servoloop Test Results

Sheet 1 of 1

Word Name	: Servoloop Test Results		
Word ID	: B8/18	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description
A	00-C	Test SL1: Low Voltage Power Supply
B	01-C	Test SL2: High Voltage power Supply
C	02-C	Test SL3: Motor Drivers
D	03-C	Test SL4: Resolvers Power Supply
E	04-C	Test SL5: Waveguide switch
F	05-C	Test SL6: Over-temperature
G	06-C	Test SL7: Resolver to Digital Conv.
H	07-C	Test SL8: Position Loop Error
I	08-C	Test SL9: Microprocessor
J	09-C	Test SL10: AGC Control
K	10-C	Test SL11: A/D
L	11-C	Test SL12: D/A's
M	12-C	Test SL13: Serial Communications
N	13-C	Test SL14: TAXI Interface
O	14-C	Test SL15: Pedestal Centre Scan Location
P	15	spare

Remark:

- The setting to logic "1" of any field (from A to O) indicates that a failure has been detected during the execution of the corresponding test.

7.2.8.19 Word B8-19: Transmitter Test Results (word 1)

Sheet 1 of 1

Word Name	: Transmitter Test Results (word 1)		
Word ID	: B8/19	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description
A	00-C	Test TX1: Microprocessors
B	01-C	Test TX2: TX RF Input
C	02-C	Test TX3: TWT RF Input
D	03-C	Test TX4: TWT RF Output
E	04-C	Test TX5: TX RF Output Level
F	05-C	Test TX6: VSWR
G	06-C	Test TX7: 3 phase Input Power
H	07-C	Test TX8: Low Voltage Power Supplies
I	08-C	Test TX9: HV P.S. Over-temperature Hazard
J	09-C	Test TX10: HV P.S. Over-temperature Warning
K	10-C	Test TX11: TWT Helix Over-current
L	11-C	Test TX12: Cathode to Helix Arc
M	12-C	Test TX13: TWT Over-temperature Hazard
N	13-C	Test TX14: TWT Over-temperature Warning
O	14-C	Test TX15: Cathode Under-voltage
P	15-C	Test TX16: Cathode Over-voltage

Remark:

- The setting to logic "1" of any field (from A to P) indicates that a failure has been detected during the execution of the corresponding test.

7.2.8.20 Word B8-20: Transmitter Test Results (word 2)

Sheet 1 of 1

Word Name	: Transmitter Test Results (word 2)		
Word ID	: B8/20	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description
A	00-C	Test TX17: Collector Under-voltage
B	01-C	Test TX18: Collector Over-voltage
C	02-C	Test TX19: Rectified Voltage
D	03-C	Test TX20: Cathode Inv. Current fail
E	04-C	Test TX21: Collector Inv. Current fail
F	05-C	Test TX22: Waveguide Pressurization
G	06-C	Test TX23: Grid window over-duty
H	07-C	Test TX24: Floating deck fail
I	08-C	Test TX25: Floating deck P.S. fail
J	09-C	Test TX26: Power Supplies Synch.
K	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
	15	spare

Remark:

- The setting to logic "1" of any field (from A to J) indicates that a failure has been detected during the execution of the corresponding test.

7.2.8.21 Word B8-21: Receiver and Rx Front-End Test Results

Sheet 1 of 1

Word Name	: Receiver and Rx Front-end Test Results		
Word ID	: B8/21	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description
A	00-C	Test RX1: Synthesizer Commands
B	01-C	Test RX2: Synthesizer Internal Tests
C	02-C	Test RX3: UHF Oscillator Level
D	03-C	Test RX4: Downconverter L.O. Level
E	04-C	Test RX5: Upconverter L.O. Level
F	05	spare
	06	spare
	07	spare
G	08-C	Test FE1: LNA
H	09-C	Test FE2: AGC Attenuators
I	10	spare
	11	spare
	12	spare
	13	spare
	14	spare
	15	spare

Remark:

- The setting to logic "1" of any field (from A to E and from G to H) indicates that a failure has been detected during the execution of the corresponding test.

7.2.8.22 Word B8-22: Integrated System Test Results and LRU status

Sheet 1 of 1

Word Name	: Integrated System Test Results and LRU status		
Word ID	: B8/22	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 10 Hz	MSB	: NA
Signal Type	: Coded	LSB	: NA
Units	: NA	Full scale	: NA

Field Name	Bit No	Description
A	00-C	Test IS1: Upconverter Chain Levels
B	01-C	Test IS2: Downconverter Chain Levels
C	02-C	Test IS3: Antenna Status Inconsistent
D	03-C	Test IS4: Tx Status Inconsistent
E	04-C	Test IS5: Tx Power Level
F	05-C	Array status
	06-C	Pedestal status
	07-C	Servoloop status
	08-C	Rx Front-end status
	09-C	Receiver status
	10-C	Transmitter status
	11-C	Processor status
G	12-C	Calibration: Noise fail
H	13-C	Calibration: Injection fail
I	14-C	Calibration: Delta channel fail
J	15	spare

Remark:

1. The setting to logic "1" of any field (from A to E) indicates that a failure has been detected during the execution of the corresponding test.
2. The setting to logic "1" of any bit of field F indicates the occurrence of a failure in the corresponding LRU.
3. The setting to logic "1" of field G indicates that the Noise level test failed during the last performed Power-Up calibration.
4. The setting to logic "1" of field H indicates that the injection level test failed during the last performed Power-Up cal.
5. The setting to logic "1" of field I indicates that the last performed cal. (Power-Up or Run Time) failed on Delta channel.

7.2.9 Message B9: Reserved Message #1 (Search Target Message)

This message is inserted in the frame only for diagnostic purpose and to make a certain number of data available to IFF equipment

Message Name	: Reserved Message #1 (Search Target Message)		
Message ID	: B9	Transfer Type	: RT-to-BC
Source	: RDR	Word Count	: 32
Destination	: MC	Xmit Rate	: 50 Hz

Word Name	Word No	Description	Section
Transmit Command Word	CW	To RDR, subaddress 10011 (19)	
Status Word	ST		
Antenna Timetag (word 1)	01	Time Tag of the Antenna (LSW)	7.2.9.1
Antenna Timetag (word 2)	02	Time Tag of the Antenna (MSW)	7.2.9.1
Reserved word #3	03		
Antenna Nav Az Pos	04	Azimuth position of the array in the navigation (inertial) frame of reference	7.2.9.3
Antenna Nav El Pos	05	Elevation position of the array in the navigation (inertial) frame of reference	7.2.9.4
Antenna Body Az Pos	06	Azimuth position of the array in the body frame of reference	7.2.9.5
Antenna Body El Pos	07	Elevation position of the array in the body frame of reference	7.2.9.6
Reserved word #8	08		
Reserved word #9	09		
Reserved word #10	10		
Reserved word #11	11		
Reserved word #12	12		
Reserved word #13	13		
Reserved word #14	14		
Reserved word #15	15		
Reserved word #16	16		
Reserved word #17	17		
Reserved word #18	18		
Reserved word #19	19		
Reserved word #20	20		
Reserved word #21	21		
Reserved word #22	22		
Reserved word #23	23		
Reserved word #24	24		
Reserved word #25	25		
Reserved word #26	26		
Reserved word #27	27		
Reserved word #28	28		
Reserved word #29	29		
Reserved word #30	30		
Reserved word #31	31		
Reserved word #32	32		

7.2.9.1 Word B9-01/02: Antenna Time Tag

Sheet 1 of 1

Word Name	: Antenna Time Tag (word 1 and 2)		
Word ID	: B9/01-02	Max Value	: NA
Source(s)	: RDR	Min Value	: NA
Destination(s)	: MC	Resolution	: NA
Comp Rate	: NA	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: see NOTE 1
Signal Type	: Unsigned numeric	LSB	: see NOTE 1
Units	: μsec	Full scale	: see NOTE 1

Field Name	Bit No	Description	
MSW	00-C MSB	Antenna Time Tag (Word 2)	(Note 1)
	01-C		
	02-C		
	03-C		
	04-C		
	05-C		
	06-C		
	07-C		
	08-C		
	09-C		
	10-C		
	11-C		
	12-C		
	13-C		
	14-C		
15-C			
LSW	00-C	Antenna Time Tag (Word 1)	(Note 1)
	01-C		
	02-C		
	03-C		
	04-C		
	05-C		
	06-C		
	07-C		
	08-C		
	09-C		
	10-C		
	11-C		
	12-C		
	13-C		
	14-C		
15-C LSB			

NOTE 1

Bit 00 through bit 15 of MSW and Bit 00 through bit 15 of LSW compose a thirty two bit word which defines the Antenna Time Tag.

The MSW's MSB is $1.37 * 10^{11} \mu\text{sec}$ and the MSW's LSB is $4.19 * 10^6 \mu\text{sec}$.
The LSW's MSB is $2.1 * 10^6 \mu\text{sec}$ and the LSW's LSB is $64 \mu\text{sec}$.
The full scale value of the 32 bit word is $2.75 * 10^{11} \mu\text{sec}$.

7.2.9.2 Word B9-08÷32 and B9-03: Reserved word

Sheet 1 of 1

Word Name	: Reserved word #8÷#32 and #03		
Word ID	: B9/08÷32 and B9-03	Max Value	: Any
Source(s)	: RDR	Min Value	: Any
Destination(s)	: MC	Resolution	: NA
Comp Rate	: Any	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: Any
Signal Type	:	LSB	: Any
Units	: rad	Full scale	: Any

Field Name	Bit No	Description
A	00 MSB	Reserved word #8÷#32 and #03
	01	
	02	
	03	
	04	
	05	
	06	
	07	
	08	
	09	
	10	
	11	
	12	
	13	
	14	
	15 LSB	

7.2.9.3 Word B9-04: Antenna Nav Az Pos

Sheet 1 of 1

Word Name	: Antenna Nav Az Pos		
Word ID	: B9/04	Max Value	: 1
Source(s)	: RDR	Min Value	: -1
Destination(s)	: MC	Resolution	: NA
Comp Rate	: Any	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 0.5
Signal Type	: 2's complement	LSB	: 3.05176E-05
Units	: Semicircles	Full scale	: 1

Field Name	Bit No	Description
A	00 MSB	Antenna Nav Az Pos
	01	
	02	
	03	
	04	
	05	
	06	
	07	
	08	
	09	
	10	
	11	
	12	
	13	
	14	
	15 LSB	

7.2.9.4 Word B9-05: Antenna Nav El Pos

Sheet 1 of 1

Word Name	: Antenna Nav El Pos		
Word ID	: B9/05	Max Value	: 1
Source(s)	: RDR	Min Value	: -1
Destination(s)	: MC	Resolution	: NA
Comp Rate	: Any	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 0.5
Signal Type	: 2's complement	LSB	: 3.05176E-05
Units	: Semicircles	Full scale	: 1

Field Name	Bit No	Description
A	00 MSB	Antenna Nav El Pos
	01	
	02	
	03	
	04	
	05	
	06	
	07	
	08	
	09	
	10	
	11	
	12	
	13	
	14	
	15 LSB	

7.2.9.5 Word B9-06: Antenna Body Az Pos

Sheet 1 of 1

Word Name	: Antenna Body Az Pos		
Word ID	: B9/06	Max Value	: 1
Source(s)	: RDR	Min Value	: -1
Destination(s)	: MC	Resolution	: NA
Comp Rate	: Any	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 0.5
Signal Type	: 2's complement	LSB	: 3.05176E-05
Units	: Semicircles	Full scale	: 1

Field Name	Bit No	Description	
A	00 MSB	Antenna Body Az Pos	(Note 1)
	01		
	02		
	03		
	04		
	05		
	06		
	07		
	08		
	09		
	10		
	11		
	12		
	13		
	14		
	15 LSB		

NOTE 1

Antenna body az pos information is not available on this word in DBS mode; being DBS a medium resolution mapping mode, IFF functionality is not envisaged to be provided to the pilot.

7.2.9.6 Word B9-06: Antenna Body El Pos

Sheet 1 of 1

Word Name	: Antenna Body El Pos		
Word ID	: B9/07	Max Value	: 1
Source(s)	: RDR	Min Value	: -1
Destination(s)	: MC	Resolution	: NA
Comp Rate	: Any	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: 0.5
Signal Type	: 2's complement	LSB	: 3.05176E-05
Units	: Semicircles	Full scale	: 1

Field Name	Bit No	Description	
A	00 MSB	Antenna Body El Pos	(Note 1)
	01		
	02		
	03		
	04		
	05		
	06		
	07		
	08		
	09		
	10		
	11		
	12		
	13		
	14		
	15 LSB		

NOTE 1

Antenna body el pos information is not available on this word in DBS mode; being DBS a medium resolution mapping mode, IFF functionality is not envisaged to be provided to the pilot.

7.2.10 Message B10: Reserved Message #2 (Mode Data Message)

This message is normally not managed by the current configuration of the MC. It is inserted in the frame only when needed, for diagnostic purposes.

Message Name	: Reserved Message #2 (Mode Data Message)		
Message ID	: B10	Transfer Type	: RT-to-BC
Source	: RDR	Word Count	: 32
Destination	: MC	Xmit Rate	: 50 Hz

Word Name	Word No	Description	Section
Transmit Command Word	CW	To RDR, subaddress 10100 (20)	
Status Word	ST		7.2.10.1
Reserved word #1	01		
Reserved word #2	02		
Reserved word #3	03		
Reserved word #4	04		
Reserved word #5	05		
Reserved word #6	06		
Reserved word #7	07		
Reserved word #8	08		
Reserved word #9	09		
Reserved word #10	10		
Reserved word #11	11		
Reserved word #12	12		
Reserved word #13	13		
Reserved word #14	14		
Reserved word #15	15		
Reserved word #16	16		
Reserved word #17	17		
Reserved word #18	18		
Reserved word #19	19		
Reserved word #20	20		
Reserved word #21	21		
Reserved word #22	22		
Reserved word #23	23		
Reserved word #24	24		
Reserved word #25	25		
Reserved word #26	26		
Reserved word #27	27		
Reserved word #28	28		
Reserved word #29	29		
Reserved word #30	30		
Reserved word #31	31		
Reserved word #32	32		

Remark:

1. This message is used for experimental purposes only, to collect Radar data.

7.2.10.1 Word B10-01÷32: Reserved word

Sheet 1 of 1

Word Name	: Reserved word #1÷#32		
Word ID	: B10/01÷32	Max Value	: Any
Source(s)	: RDR	Min Value	: Any
Destination(s)	: MC	Resolution	: NA
Comp Rate	: Any	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: Any
Signal Type	: Any	LSB	: Any
Units	: Any	Full scale	: Any

Field Name	Bit No	Description
A	00 MSB	Reserved word #1÷#32
	01	
	02	
	03	
	04	
	05	
	06	
	07	
	08	
	09	
	10	
	11	
	12	
	13	
	14	
	15 LSB	

7.2.11 Message B11: Reserved TX Message (Debug Message)

This message is normally not managed by the current configuration of the MC. It is inserted in the frame only when needed, for diagnostic purposes.

Message Name	: Reserved TX Message (Debug Message)		
Message ID	: B11	Transfer Type	: RT-to-BC
Source	: RDR	Word Count	: 1 to 32
Destination	: MC	Xmit Rate	: 50 Hz

Word Name	Word No	Description	Section
Transmit Command Word	CW	To RDR, subaddress 10101 (21)	
Status Word	ST		7.2.11.1
Reserved word #1	01	Reserved	
Reserved word #2	02	Reserved	
Reserved word #3	03	Reserved	
Reserved word #4	04	Reserved	
Reserved word #5	05	Reserved	
Reserved word #6	06	Reserved	
Reserved word #7	07	Reserved	
Reserved word #8	08	Reserved	
Reserved word #9	09	Reserved	
Reserved word #10	10	Reserved	
Reserved word #11	11	Reserved	
Reserved word #12	12	Reserved	
Reserved word #13	13	Reserved	
Reserved word #14	14	Reserved	
Reserved word #15	15	Reserved	
Reserved word #16	16	Reserved	
Reserved word #17	17	Reserved	
Reserved word #18	18	Reserved	
Reserved word #19	19	Reserved	
Reserved word #20	20	Reserved	
Reserved word #21	21	Reserved	
Reserved word #22	22	Reserved	
Reserved word #23	23	Reserved	
Reserved word #24	24	Reserved	
Reserved word #25	25	Reserved	
Reserved word #26	26	Reserved	
Reserved word #27	27	Reserved	
Reserved word #28	28	Reserved	
Reserved word #29	29	Reserved	
Reserved word #30	30	Reserved	
Reserved word #31	31	Reserved	
Reserved word #32	32	Reserved	

Remark:

2. This message is used for experimental purposes only, to collect debug Radar data.

7.2.11.1 Word B11-01÷32: Reserved word

Sheet 1 of 1

Word Name	: Reserved word #1÷#32		
Word ID	: B10/01÷32	Max Value	: Any
Source(s)	: RDR	Min Value	: Any
Destination(s)	: MC	Resolution	: NA
Comp Rate	: Any	Accuracy	: NA
Xmit Rate	: 50 Hz	MSB	: Any
Signal Type	: Any	LSB	: Any
Units	: Any	Full scale	: Any

Field Name	Bit No	Description
A	00 MSB	Reserved word #1÷#32
	01	
	02	
	03	
	04	
	05	
	06	
	07	
	08	
	09	
	10	
	11	
	12	
	13	
	14	
	15 LSB	

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CASSANI	GIANLUIGI	PIERRI	FRANCESCO
CHESSA	ALBERTO	PIGLIAFREDDO	DANILO ANGELO
CIANCHI	FRANCESCO	PISONI	ALBERTO BATTISTA
CIUTI	GIANLUCA	PULSONI	GABRIELE
CONTESSA	MASSIMO	RAGGI	ALESSANDRO
COZZI	TIZIANO VIRGINI	RIFICI	VINCENZO
CROCI	LANFRANCO	SALA	CARLO
DELL'ARCIPRETE	LUCA	SARINI	FABIO
DI TOMMASO	FERDINANDO	SAVIO	ROBERTO

FARINOSI	DIEGO	SCARDIGNO	MARINO
FIORINI	DAVIDE	SCARPACI	ANTONINO
FRANCHIN	GIANMARIO	SEDAZZARI	GIORGIO MARIO RENATO
GALLAZZI	LUCIANO	SEMINARI	MATTEO
GASCIARINI	DIEGO	SERRECCHIA	DOMENICO
GERMINARA	MARIO	SIBIO	MARCO
GILIOI	ALESSANDRO	SOPRANZI	CLAUDIA
GIOVANNUCCI	LUDOVICO	STRADELLA	MARCO
GIUDICI	MARCO	TERRENI	ELISA
IANNINI	MASSIMO	TONELLI	GIANCARLO
INTROINI	STEFANO	TOSETTO	STEFANO
IOVINE	PASQUALE	TRUFFO	SILVIO
IRLANDINI	ALBERTO	VERTEMATI	GIOVANNI
LOMBARDI	PAOLO	VIGATO	ANDREA GIUSEPPE
LUCCI	LEONARDO	VITALE	GREGORIO
LUDOVICI	STEFANO	ZANARDI	CAMILLO
MALATESTI	STEFANO	ZEPI	RUGGERO

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ALBERTINO	GIULIO	SGARBI	GABRIELE
ALCIATI	ANDREA	VECCHI	SEBASTIANO