NOTICE OF CHANGE

METRIC

MIL-STD-1760C
NOTICE 1
2 March 1999

DEPARTMENT OF DEFENSE
INTERFACE STANDARD FOR

AIRCRAFT/STORE ELECTRICAL INTERCONNECTION SYSTEM

TO ALL HOLDERS OF MIL-STD-1760C

1. THE FOLLOWING PAGES OF MIL-STD-1760C HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

NEW PAGE	DATE	SUPERSEDED PAGE	DATE
3	20 March 1997	-	REPRINTED WITHOUT CHANGE
4	2 March 1999	4	20 March 1997
5	2 March 1999	5	20 March 1997
6	20 March 1997	-	REPRINTED WITHOUT CHANGE
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2. RETAIN THIS NOTICE AND INSERT BEFORE TABLE OF CONTENTS.

3. Holders of MIL-STD-1760C will verify that page changes indicated above have been entered. This notice page will be retained as a check sheet. This issuance, together with appended pages, is a separate publication. Each notice is to be retained by stocking points until the military standard is completely revised or cancelled.

Custodians:
Army – AV
Navy - AS
Air Force - 11

Preparing activity:
Air Force - 11

Project Nr. GDRQ-0160

MS27488 Plug, End Seal, Electrical Connector

STANDARDS

Department of Defense

MIL-STD-704 Aircraft Electric Power Characteristics

MIL-STD-1553B Not. 4 Digital Time Division Command/Response Multiplex Data Bus NOTE: Revision B Notice 4 is specifically required.

MIL-STD-1560 Insert Arrangements for MIL-C-38999 and MIL-C-27599 Electrical, Circular Connectors

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

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

NATO
STANAG 3350 AVS Analogue Video Standard for Aircraft System Applications

(Copies of NATO standards are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094, phone (215) 697-2179.)

2.3 Non-Government publications.

The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2).

SOCIETY OF AUTOMOTIVE ENGINEERS, INC.

SAE-AS15531 Digital Time Division Command/Response Multiplex Data Bus

(Copies of SAE documents may be obtained from: Society of Automotive Engineers, Inc., 400 Commonwealth Dr., Warrendale, PA 15096-0001, phone (412) 776-4841.)

2.4 Order of precedence.

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

3. DEFINITIONS

3.1 Definitions.

Definitions applicable to this standard are as follows.

3.1.1 Aircraft.
Any vehicle designed to be supported by air, being borne up either by the dynamic action of the air upon the surfaces of the vehicle, or by its own buoyancy. The term includes fixed and movable wing airplanes, helicopters, gliders, and airships, but excludes air-launched missiles, target drones, and flying bombs.

3.1.2 Aircraft/store Electrical Interconnection System (AEIS).
The AEIS is a system composed of a collection of electrical (and fiber optic) interfaces on aircraft and stores through which aircraft energize, control, and employ stores. The AEIS consists of the electrical interfaces and interrelationships between the interfaces necessary for the transfer of electrical power and data between aircraft and stores and from one store to another store via the aircraft.

3.1.3 Electrical interface types.
The five electrical interface types for the aircraft/store electrical interconnection system shall be as specified below.

3.1.3.1 Aircraft Station Interface (ASI).
The electrical interface(s) on the aircraft structure where the mission or carriage store(s) is electrically connected. The connection is usually on the aircraft side of an aircraft-to-store umbilical cable. The aircraft station interface locations include, but are not limited to, pylons, conformal and fuselage hard points, internal weapon bays, and wing tips (see 4.1). **[Note 7]**

3.1.3.2 Carriage Store Interface (CSI).
The electrical interface on the carriage store structure where the aircraft is electrically connected. This connection is usually on the store side of an aircraft-to-store umbilical cable (see 4.1) **[Note 8]**

3.1.3.3 Carriage Store Station Interface (CSSI).
The electrical interface(s) on the carriage store structure where the mission store(s) are electrically connected. This connection is usually on the carriage store side of an umbilical cable (see 4.1).

3.1.3.4 Mission Store Interface (MSI).
The electrical interface on the mission store external structure where the aircraft or carriage store is electrically connected. This connection is usually on the mission store side of an umbilical cable (see 4.1).

3.1.3.5 Routing Network Aircraft Subsystem Port (RNASP).
The electrical interface between the high bandwidth network or low bandwidth network and other subsystems within the aircraft. This interface point is defined in order to identify the “aircraft” end of the high bandwidth and low bandwidth networks and allow network performance to be specified in two-port network terms.

3.1.4 Provisions.
Space in all feed-through connections and in all wire runs that will allow future incorporation in the aircraft or store without modification other than the addition or changes to connectors, cables, and hardware/software necessary to control the added functions.

3.1.5 Store.
Any device intended for internal or external carriage and mounted on aircraft suspension and release equipment, whether or not the item is intended to be separated in flight from the aircraft. Stores are classified in three categories as specified below.

3.1.5.1 Carriage stores.
Suspension and release equipment that is mounted on aircraft on a non-permanent basis as a store and is intended to carry other MIL-STD-1760 compatible store(s) shall be classified as a carriage store. Carriage store includes both single adapters and multiple store carriers. Pylons and primary racks (such as a MAU-12 and BRU-10) shall not be considered carriage stores.

3.1.5.2 Mission stores.
All stores excluding suspension and release equipment (carriage stores, dispensers) are classified as mission stores. In general, these stores directly support a specific mission of an aircraft. Mission stores include, but are not limited to, missiles, rockets, bombs, torpedoes, buoys, flares, pods, and fuel tanks.

3.1.5.3 Dispensers.
Equipment that is mounted on an aircraft on a non-permanent basis as a store and is intended to carry devices that are non-compliant with MIL-STD-1760 is classified as a dispenser. Dispensers include, but are not limited to, chaff and flare dispensers, rocket pods, and small munitions dispensers. This standard does not include requirements for dispensers. It is assumed that a dispenser's interface to the aircraft or carriage store will comply with the MSI requirements herein, unless the dispenser will never be carried on a carriage store, in which case it may use the CSI requirements **[Note 8a].**

3.1.6 Stores management system.
The avionics subsystem which controls and monitors the operational state of aircraft installed stores and provides and manages the communications between aircraft stores and other aircraft subsystems.

3.1.7 Suspension and release equipment (S&RE).
All airborne devices used for carriage, suspension, employment, and jettison of stores, such as, but not limited to, racks, adapters, launchers, and pylons.

3.1.8 Random noise.
Randomly occurring noise which is distributed over a large bandwidth (sometimes known as white or pink noise). Random noise which is keyed on and off from time to time (sometimes known as burst noise) is included.

3.1.9 Periodic noise.
Noise made up of discrete frequency components. Periodic noise includes the effects of crosstalk from aircraft and store signal sources.

3.1.10 Impulse noise.
Spurious spikes which may occur randomly or at fixed intervals.

3.1.11 Stimulated noise.
Additional noise which is induced by the presence of an input signal.

3.1.12 Common mode noise.

a. For HB interfaces, common mode noise is the potential difference between the signal return (shield) connection and the local structure ground.

b. For LB interfaces, common mode noise is the sum of the potential differences between (i) the non-inverting connection and local structure ground, and (ii) the inverting connection and local structure ground.

3.1.13 Latency.
Signal or data latency is the time difference between a signal or data output of a system and the time at which the signal or data was valid.

3.1.14 Delay.
Signal or data delay is the elapsed time between the input stimulus and output response of a particular signal or data path.

3.1.15 Power interruption.
An excursion of aircraft power outside the specified normal steady state limits established by this standard.

3.2 Acronyms and abbreviations.

The following acronyms and abbreviations are applicable.

AEIS	Aircraft/Store Electrical Interconnection System
ANSI	American National Standards Institute
A/R	as required
ASCII	American Standard Code for Information Interchange
ASI	Aircraft Station Interface
BC	Bus Controller
BCH	Bose-Chaudhuri Hocquenghem (codes)
BIT	Built-In-Test
CSI	Carriage Store Interface
CSSI	Carriage Store Station Interface
dB	decibel
dBm	decibels above 1 milliwatt
DoDISS	Department of Defense Index of Specifications and Standards
EIA	Electronic Industries Association
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
GHz	gigahertz
HB	High Bandwidth
Hz	hertz
ICD	Interface Control Document
ISO	International Standards Organization
kHz	kilohertz
kVA	kilovolt-ampere
LB	Low Bandwidth
LLSP	Lower Least Significant Part
LSB	Least Significant Bit
LSP	Least Significant Part
MHz	megahertz
ms	millisecond
MSI	Mission Store Interface
MSB	Most Significant Bit
MSP	Most Significant Part
MUX	Multiplex (Digital Data Interface)
NATO	North Atlantic Treaty Organization
pp	peak-to-peak
PRF	Pulse Repetition Frequency
RMS	Root Mean Squared
RNASP	Routing Network Aircraft System Port
RT	Remote Terminal
S&RE	Suspension and Release Equipment
SMS	Stores Management System
STANAG	NATO Standardization Agreement
TC	Transfer Control
TD	Transfer Data
TM	Transfer Monitor
V	volt

4. GENERAL REQUIREMENTS

4.1 Aircraft/store configurations.

This standard provides for a variety of aircraft/store configurations, as depicted in figure 1, by specifying requirements measurable at the Aircraft Station Interface (ASI), the Mission Store Interface (MSI), the Carriage Store Interface (CSI), the Carriage Store Station Interface (CSSI), and the Routing Network Aircraft System Port (RNASP). As depicted in figure 1, the requirements on the ASI and MSI allow for possible installation of a carriage store between the ASI and MSI.

4.2 Interface classes.

All functions of the AEIS shall be allocated between two separate signal sets; the primary interface signal set (figure 2) and the auxiliary power signal set (figure 3). Separate connectors shall be required for each set. The ASI shall implement, and the MSI shall be compatible with, one of the following interface classes.

a. Class I. Class I shall be the full primary interface.

b. Class IA. Class IA shall consist of class I, plus the auxiliary power interface.

c. Class II. Class II shall be the full primary interface without high bandwidth 2 and 4, fiber optic 1 and 2, 270 V dc power and 270 V dc return.

d. Class IIA. Class IIA shall consist of class II, plus the auxiliary power interface without the 270 V dc power and 270 V dc return **[Note 8b]**

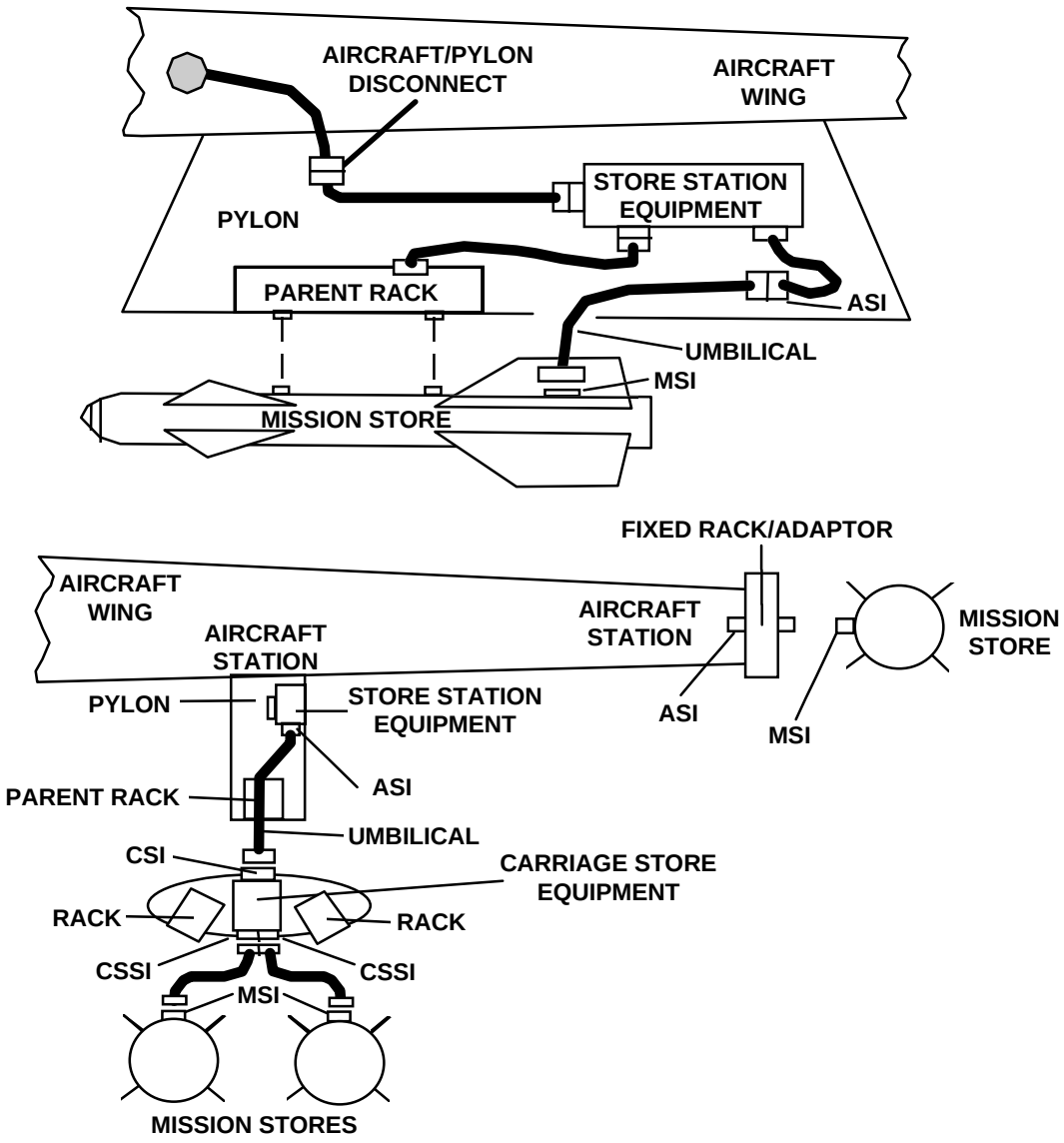
On carriage stores, the CSI and the CSSI(s) shall implement either the class I or class IA interface. **[Note 9]**

4.3. Primary interface signal set.

The primary interface signal set, as shown in figure 2, shall be comprised of interfaces for high bandwidth signals, redundant data bus signals, low bandwidth signals, a specified number of dedicated discrete signals, aircraft power and fiber optic signals.**[Note 10]** Detailed electrical requirements for each of these functions at the ASI, MSI, CSI, and CSSI shall comply with the requirements of section 5 herein. **[Note 11]** Equipment shall not be functionally damaged by the removal of a termination on any interface.

4.3.1. [Note 12] High bandwidth (HB) interfaces.

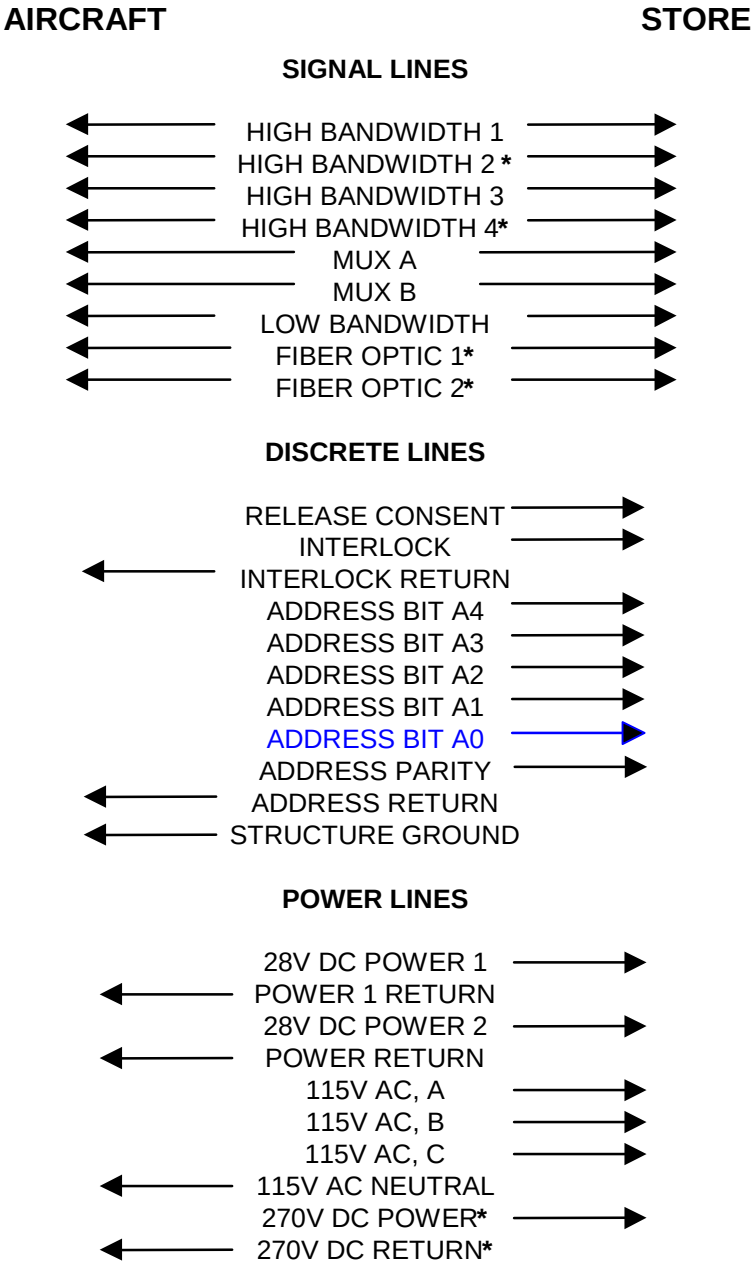
HB interfaces shall support the transfer of two general signal types (type A and type B) sourced either by internal aircraft subsystems or by mission stores. Type A signals shall be compatible with a transmission passband of 20 Hz to 20 MHz. Type B signals shall be compatible with a transmission passband of 20 MHz to 1.6 GHz. The nominal source and sink impedance of the HB interfaces shall be 50 ohms for HB1 and HB2 and 75 ohms for HB3 and HB4. Each HB interface shall include a signal connection and a signal return (shield) connection. The requirements in 4.3.1 and sub paragraphs apply at the RNASP for signals originating in the aircraft and at the MSI for signals originating in the mission store. **[Note 13]** Any transmission scheme may be used between the RNASP and the ASI (e.g., the signal at the RNASP may be a purposely modulated or amplitude-adjusted or digitized form of the signal at the ASI). The aircraft requirements herein, however, are expressed in terms of deviations from an ideal linear, unity-gain non-inverting transmission system. Where a different transmission scheme is implemented between the RNASP and MSI, an equivalent signal fidelity shall be achieved for each stated requirement. These requirements apply with the interfaces terminated by the proper nominal impedance and include the effect of the applicable mating contacts. Figure 4 shows a number of possible interface configurations.



ASI - AIRCRAFT STATION INTERFACE
CSI - CARRIAGE STORE INTERFACE
CSSI - CARRIAGE STORE STATION INTERFACE
MSI - MISSION STORE INTERFACE

} ONLY THESE INTERFACES ARE CONTROLLED BY THIS STANDARD

FIGURE 1. Aircraft-store configuration examples.



* NOT APPLICABLE TO CLASS II INTERFACE

FIGURE 2. Primary interface signal set.

[Note 13a]

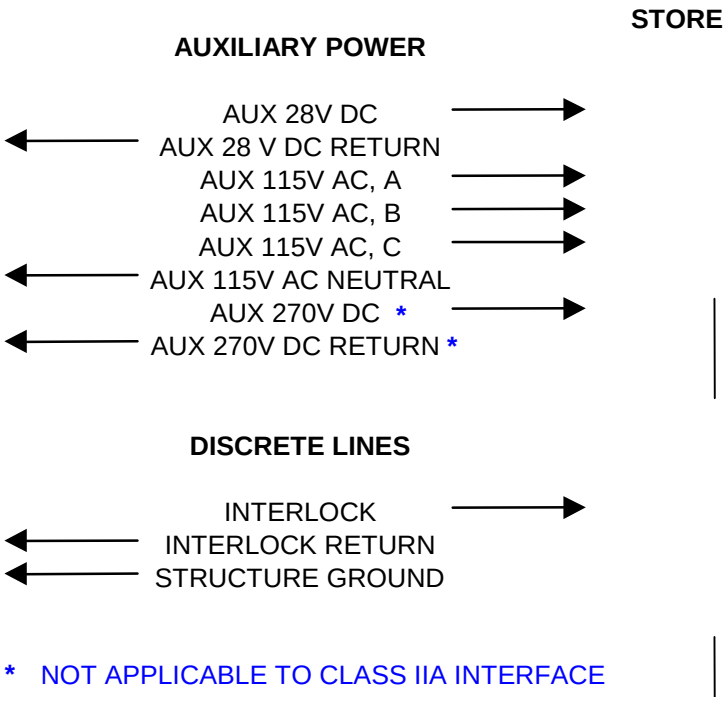


FIGURE 3. Auxiliary power signal set.

[Note 13b]

4.3.1.1 Type A signal requirements.

a. Type A signals shall be limited to 1.3 Vpp within the range of ±1.55 V under steady state conditions or within the range of ±2.0 V under transient conditions. The signal peak voltage shall return to within 5 percent of the steady state voltage limits in less than 250 ms following a transient change in the dc component of the signal.

b. The power spectral components above 20 MHz shall not exceed a limit line which decreases at a rate of 14 dB/octave. At 20 MHz the limit line shall be equal to the largest power spectral component determined over the nominal transmission passband of 4.3.1. The requirement shall apply until 200 MHz.

c. The slew rate shall not exceed 65 volts/microsecond.

4.3.1.2 Type B signal requirements.
Type B signal peak envelope power shall not exceed -20 dBmRMS. This requirement applies to the sum of the individual peak envelope power values if more than one signal is simultaneously present.

4.3.1.3 Signal assignment.
Signals on the HB interfaces shall be limited to the following:

a. Signals which comply with type B signal characteristics shall only be transferred on HB1.

b. Time correlation (synchronization, clocking and blanking) signals which comply with type A signal characteristics shall only be transferred on HB1 or HB2 or both.

c. Monochrome raster composite video shall only be transferred on HB3 or HB4 or both. Raster composite video shall comply with STANAG 3350. **[Note 14]**

signal shall be represented by the difference between the non-inverting signal and the inverting signal as shown in figure 16b. The shield shall be connected to ground.

Notes: 1. V1-V2 is the Thevenin equivalent voltage source (balanced with respect to ground).

2. R1+R2 is the Thevenin equivalent source impedance.

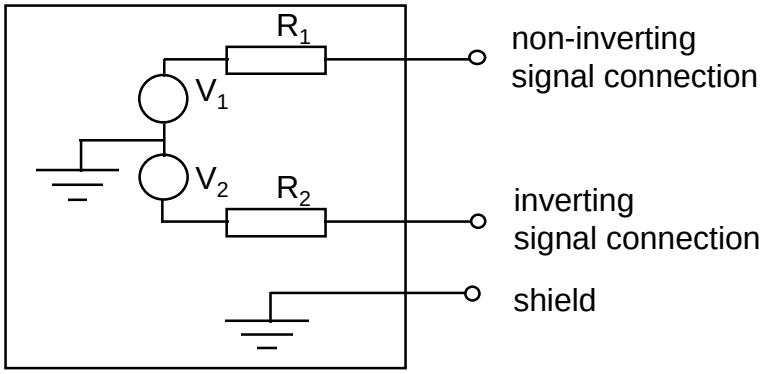


FIGURE 16a. Equivalent circuit of ASI or MSI when sending a LB signal.

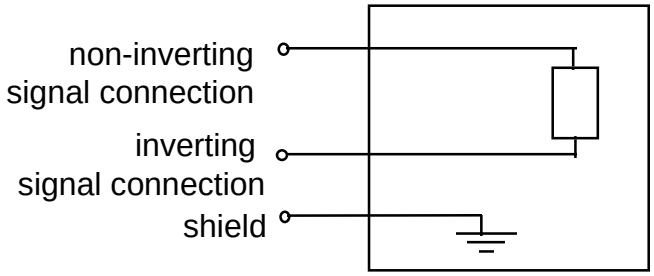


FIGURE 16b. Equivalent circuit of ASI or MSI when receiving a LB signal.

FIGURE 16. Equivalent circuits for LB interfaces.

5.1.4 Aircraft release consent interface.
The aircraft shall provide a release consent interface at each primary signal set ASI for transferring an enable/inhibit signal to the connected store. Release consent, when in the enabled state, shall indicate aircraft consent for stores to perform safety-critical functions (such as store release from a carriage store, missile launch from a rail launcher or rocket firing from a dispenser) when commanded over the data bus interface (see 4.3.4).The aircraft shall require positive crew action to generate the enabled state of the release consent signal. When in the inhibited state, the release consent interface at an ASI shall be electrically isolated from the release consent interface at all other ASIs. The isolation shall be 100 kilohms minimum at dc.

5.1.4.1 Voltage level.
The voltage level measured between the release consent connection and 28 V dc power 2 return connection at the ASI shall be:

a. Steady State Conditions

(1) Enable: Minimum voltage of 19.0 V dc

Maximum voltage, in accordance with MIL-STD-704 for 28 V dc

(2) Inhibit: 1.50 V dc (maximum)

b. Voltage transients shall comply with MIL-STD-704 limits for 28 V dc applications. **[Note 32]**

5.1.4.2 Current level.
Mission and carriage stores may require 100 milliamperes steady state through the ASI during the enable state and the aircraft shall be able to supply that current. The aircraft is not, however, required to supply any current in excess of 100 milliamperes. **[Note 33]** The aircraft shall comply with the requirements herein for store imposed load currents of 5.0 milliamperes minimum through the ASI.

5.1.4.3 Stabilization time.
With any resistive load between 320 ohms and 3.8 kilohms connected between release consent and 28 V dc power 2 return, the voltage at the ASI shall reach steady state levels (see 5.1.4.1.a) within 3 milliseconds during transition between enable and inhibit states.

5.1.4.4 Enable lead time.
If release consent is required by a store, the release consent signal shall attain the enable state at least 20 milliseconds prior to transferring the safety critical command over the data bus interface or prior to the firing signal to the parent S&RE, as applicable.

5.1.4.5 Inhibit delay.
If release consent at an ASI has been enabled, the aircraft shall operate under the assumption that the store(s) connected to that ASI may remain in an enable state for up to 20 milliseconds after the release consent signal has been returned to the inhibit state.

5.1.4.6 Ground reference.
The 28 V dc power 2 return connection shall be the ground reference for release consent.

5.1.5 Aircraft interlock interface.
The aircraft shall provide an interlock interface at each primary signal set ASI and auxiliary power signal set ASI for monitoring the mated status of the associated connectors. The interlock interface at each primary and auxiliary ASI consists of an interlock connection and an interlock return connection. If the aircraft monitors the interlock interface, then the aircraft shall comply with the following requirements. These requirements apply to the interlock connection referenced to the interlock return connection.

a. Open circuit voltage

(1) Minimum voltage of 4.0 V dc

(2) Maximum voltage, in accordance with MIL-STD-704 for 28 V dc

(3) Voltage transients shall not exceed the upper limit defined in MIL-STD-704 for 28 V dc

b. Excitation current

(1) Minimum current of 5.0 milliamperes

(2) Maximum current of 100 milliamperes

c. Impedance detection threshold. An interface disconnected condition shall be detected for any impedance level of 100 kilohms or greater. An interface connected condition shall be detected for any impedance level of 2.0 ohms or less. These impedance values apply over the frequency range of dc to 4 kHz.

5.1.6 Aircraft address interface.
The aircraft shall provide an address interface at each primary signal set ASI for assigning a data bus address to the MIL-STD-1553 remote terminal in the store mated to the ASI. Each address interface shall include five binary encoded address bit connections (A0, A1, A2, A3, and A4), one address parity connection and one common address return connection. The aircraft shall use this interface only for assigning an address to the remote terminal associated with the directly connected carriage store or mission store.

5.1.6.1 Address assignment.
The aircraft shall supply a logic 0 state or logic 1 state on each of the five binary weighted address bit connections at each ASI. The remote terminal address assigned to an ASI shall be defined as follows:

crosstalk voltage at the signal path output. The frequency of the stimulus signal may be different at each interface. The calculated noise voltage shall be the root sum of squares of the individual crosstalk voltages plus the unstimulated periodic and random noise voltage at the signal path output when all LB and HB interfaces are terminated.

5.3.3.6.2 Impulse noise.
With the input of the signal path terminated, there shall be (to one standard deviation) no more than one occurrence of impulse noise exceeding 20 mV peak over a three minute period. The impulse noise voltage shall apply when band-limited to 8 kHz low pass.

5.3.3.6.3 Stimulated noise.
For any frequency between 300 Hz and 3.4 kHz, application of a 12 Vpp sinusoidal excitation signal to the signal path input shall not add more than 50 mV RMS of noise to the output over the frequency band 150 Hz to 8 kHz.

5.3.3.6.4 Common mode noise.
The peak common mode noise voltage at the output of each signal path (CSI and CSSI) shall not exceed ±0.5 V when the input is terminated and the input shield is at the same potential as local structure ground. This requirement shall apply over the band 150 Hz to 50 kHz.

5.3.3.7 Ground reference.
LB signal paths through the carriage store shall be either:

a. Passive, as shown in figure 23a, or

b. Active, with outputs referenced to carriage store ground, as shown in figure 23b.

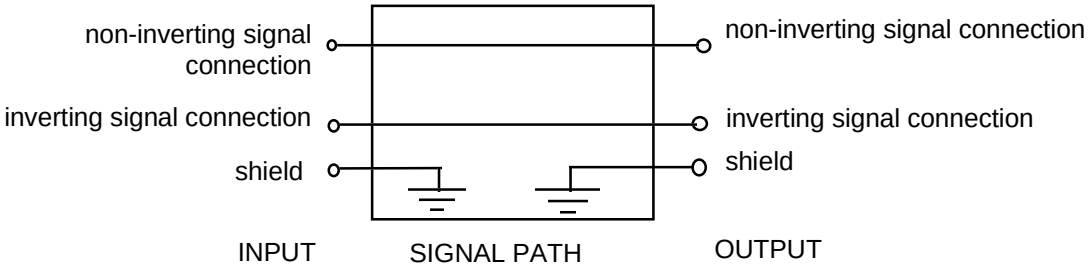
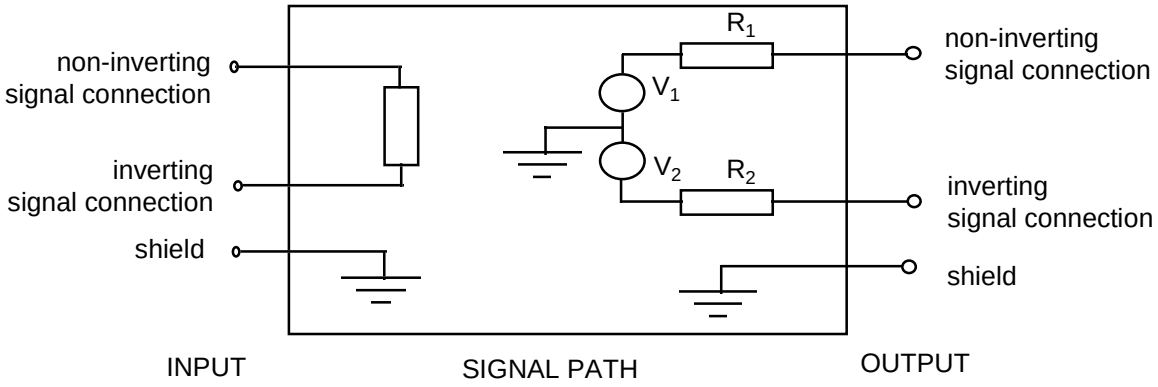


FIGURE 23a Equivalent circuit for LB passive signal path.



Notes: 1. V1-V2 is the Thevenin equivalent voltage source (balanced with respect to ground).
2. R1+R2 is the Thevenin equivalent source impedance.

FIGURE 23b. Equivalent circuit for LB active signal path.

FIGURE 23. Equivalent circuits for LB carriage store signal paths.

5.3.4 Carriage store release consent interface.
The carriage store shall provide connections for a release consent interface at the CSI and each CSSI.

5.3.4.1 CSI.
The carriage store shall use the release consent signal from the aircraft to enable/inhibit fire, launch, release, or jettison functions. The carriage store shall act on release consent-interlocked safety critical commands received over the data bus interface only if the release consent signal is in the enabled state. Release consent at a CSI shall meet the same requirements as release consent at an MSI, as stated in paragraphs 5.2.4.1 through 5.2.4.6.

5.3.4.2 CSSI.
The carriage store shall provide a release consent interface at each primary signal set CSSI for transferring an enable/inhibit signal to the connected store(s). Release consent, when in the enabled state, shall indicate consent for stores to perform safety critical functions (such as missile launch from a rail launcher or rocket firing from a dispenser) when commanded over the data bus interface. When in the inhibited state, the release consent interface at a CSSI shall be electrically isolated from the release consent interface at all other CSSIs. The isolation shall be 100 kilohms minimum at dc. Release consent

5.4.8 Umbilical 28 V dc power interface.
Each primary interface 28 V dc power interface line shall have a resistance not exceeding 14 milliohms per meter length of umbilical, plus 4.54 milliohms for each mated contact pair. Each auxiliary 28 V dc power interface line shall have a resistance not exceeding 4 milliohms per meter length of umbilical, plus 1.21 milliohms for each mated contact pair. For both umbilical types, the requirement applies when passing the worst case voltages and steady state current defined in paragraphs 5.1.8.2 and 5.2.8.2.

5.4.9 Umbilical 115 V ac power interface.
Each primary 115 V ac power interface line shall have a resistance not exceeding 14 milliohms per meter length of umbilical, plus 4.54 milliohms for each mated contact pair. Each auxiliary 115 V ac power line shall have a resistance not exceeding 4 milliohms per meter length of umbilical, plus 1.21 milliohms for each mated contact pair. For both umbilical types, the requirement applies when passing the worst case voltages and steady state current profiles defined in 5.1.9.2 and 5.2.9.2.

5.4.10 Umbilical 270 V dc power interface.
The 270 V dc power interface shall not be implemented until characteristics and performance details are added to this standard. The connectors of the umbilical cable shall include contact provisions (plugged cavities) for 270 V dc power and 270 V dc power return.

5.4.11 Primay umbilical fiber optic interface.
The fiber optic interfaces shall comply with paragraph 5.1.11.

5.4.12 Umbilical gross shield.
The umbilical cable shall include a gross shield enclosing the entire umbilical wire bundle (360 degree coverage) and electrically connecting the connector shells on each end of the umbilical. The umbilical shield shall be 360 degree bonded to the connector shell on each end of the umbilical. DC resistance of the bond between the shield and the connector shell shall not exceed 2.5 milliohms.

5.5 Power interface interrupts. [Note 66]

5.5.1 Mission store compatibility.
Power interrupts of 200 **[Note 67]** microseconds or less on either 28 V dc or 115 V ac power interfaces, or both, shall have no effect on store function. Full function, including communication, shall be maintained during such interrupts and no power interrupt notification shall occur. For power interrupts greater than 200 microseconds, the store may request full or partial initialization.

5.5.2 Carriage store compatibility.
Power interrupts of 200 microseconds or less on either 28 V dc or 115 V ac power interfaces, or both, shall have minimal effect on carriage store function, i.e., any carriage store function not maintained during the interrupt shall be re-established immediately following restoration of power. The following functions shall be maintained during interrupts of up to 200 microseconds: (1) all computing capabilities and (2) transmission/reception of data via the data bus interfaces. Furthermore, no re-initialization is permitted and no power interrupt notification shall occur. For power interrupts greater than 200 microseconds, the carriage store may request full or partial initialization.

5.5.3 Aircraft compatibility.
The aircraft shall be compatible with stores which request full or partial store system initialization following a 28 V dc and/or 115 V ac power interrupt in excess of that allowed in 5.5.1 and 5.5.2. **[Note 68]**

5.5.3.1 Full initialization.
If the store requests full initialization, then the aircraft shall use paragraphs 5.1.12.1 through 5.1.12.3 to satisfy the request. The aircraft, however, is not required to request the store description message demanded in 5.1.12.3. **[Note 69]**

5.5.3.2 Partial initialization.
If no partial initialization procedure has been agreed in the Interface Control Document between the aircraft and store, the aircraft shall substitute full initialization. **[Note 70]**

5.5.4 Store power interrupt notification.
In the event that the store requires a full or partial initialization after a power interrupt in excess of that allowed in paragraph 5.5.1 and 5.5.2, the store shall notify the aircraft utilizing the service request with vector word procedure in paragraphs B.4.1.5.4 through B.4.1.5.7. That procedure utilizes the asynchronous vector word (Table B-III) which shall indicate whether full or partial initialization (as defined in the ICD) is required. **[Note 71]**

5.6 Connector characteristics. [Note 72]

5.6.1 Primary interface connectors.

a. ASI and CSSI Type 1 (hand mated) connectors shall meet the form, fit, function, and interface requirements of MIL-C-38999/20 or /24, Series III, Shell Size 25, Polarization Key Identification N connectors. The contacts/termini and seal plugs/dummy contacts shall be compatible with the form, fit, function, and interface characteristics of those listed in table II. **[Note 73]**

b. ASI and CSSI Type 2 (blind mated) connectors shall meet the form, fit, function, and interface requirements of the MIL-C-83538 Launcher Receptacle and be intermateable with the MIL-C-83538 Buffer Plug. The receptacle contacts/termini and seal plugs/dummy contacts shall meet the form, fit, function, and interface characteristics of those listed in table II. **[Note 74]**

c. MSI and CSI Type 1 (hand mated) connectors shall be intermateable with MIL-C-38999/31, Series III, Shell Size 25, Polarization Key Identification N connectors. The contacts/termini and seal plugs/dummy contacts used shall be intermateable with those listed in table II.

d. MSI and CSI Type 2 (blind mated) connectors shall meet the form, fit, function, and interface requirements of the MIL-C-83538 Store Receptacle and shall be intermateable with the MIL-C-83538 buffer plug. The contacts/termini and seal plugs/dummy contacts used shall be intermateable with those listed in table II.

e. The Type 2 Buffer Plug, which is the interconnecting mechanism used between the Type II Launcher Receptacle and the Type II Store Receptacle, shall meet the form, fit, function, and interface requirements of the MIL-C-83538 Buffer Plug and shall be intermateable with the MIL-C-83538 Launcher Receptacle and Store Receptacle. The buffer plug shall use fixed contacts as defined in MIL-C-83538.

f. All primary signal set connector insert arrangements shall be in accordance with MIL-STD-1560, Insert Arrangement No. 25-20.

g. The contact assignments in all primary signal set connectors shall be in accordance with table III.

5.6.2 Auxiliary power interface connector.

a. The connector shall meet the form, fit, function, and interface characteristics of a MIL-C-38999, Series III, Shell Size 25, Polarization Key Identification A connector.

b. The contacts/termini and seal plugs/dummy contacts shall meet the form, fit, function, and interface characteristics of those listed in table IV.

c. All auxiliary power interface connector insert arrangements shall be in accordance with MIL-STD-1560, Insert Arrangement No. 25-11.

d. The contact assignments shall be in accordance with table V. **[Note 75]**

5.6.3 Connector receptacle.
The ASI, CSI, CSSI, and MSI primary and auxiliary connectors shall be receptacles with socket contacts or socket termini. **[Note 76]**

5.6.4 Plugged cavities.
The ASI, CSI, and CSSI may use plugged cavities in lieu of socket contacts or socket termini for the 270 V dc interface and the fiber optic interface. The ASI may also use plugged cavities in lieu of socket contacts for the HB2 and HB4 interfaces if only a class II interface is implemented. The MSI may use plugged cavities in lieu of socket contacts or socket termini for any unused interface. Details on seal plugs can be found in tables II and IV. **[Note 77]**

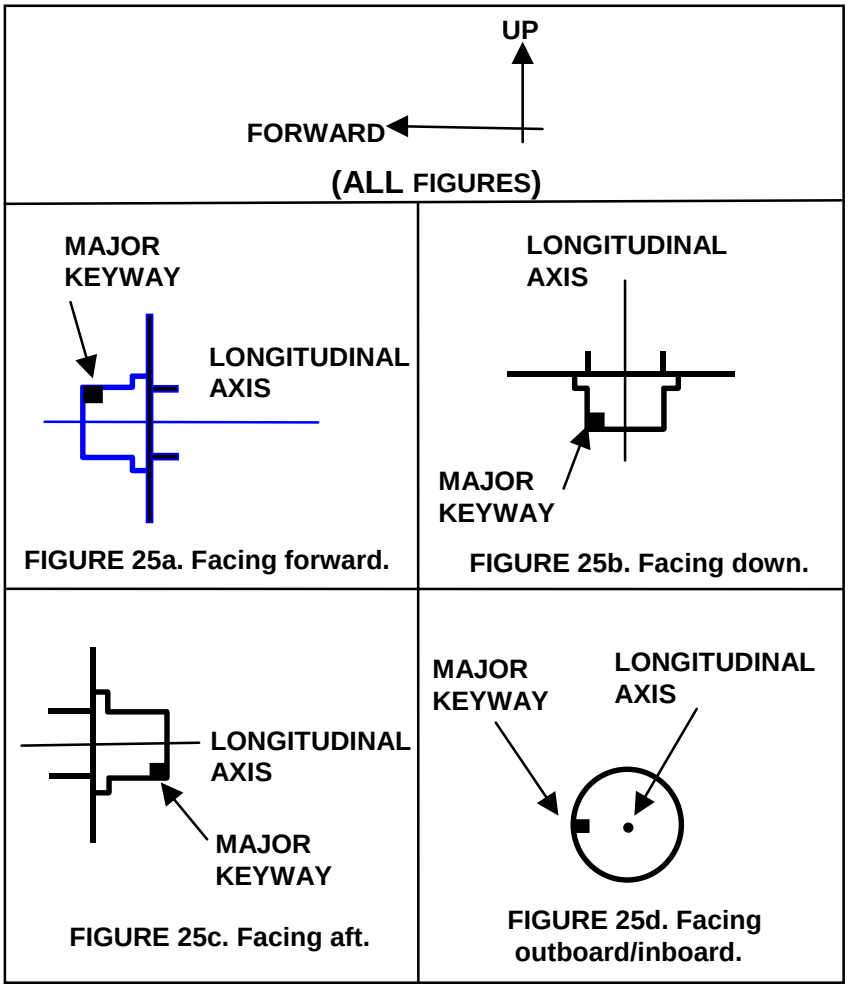


FIGURE 25. Connector orientation **[Note 86a]**.

6. NOTES

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

6.1 Intended use.

This standard is intended to be used for airborne military applications and applies to all aircraft and stores that electrically interface with each other.

6.1.1 Implementation.

Implementation and application of the standard are the responsibility of each military service, with technical guidance and direction provided by appropriate service program offices.

6.2 Issue of DoDISS.

When this standard is used in acquisition, the issue of the DoDISS to be applicable to this solicitation must be cited in this solicitation (see 2.2.1 and 2.3).

6.3 International standardization agreements.

Certain provisions of this standard are subject to international standardization agreements: NATO STANAG and ASCC Air Standard. When change notice, revision, or cancellation of this standard is proposed that will modify the international agreement concerned, the preparing activity will take appropriate action through international standardization channels, including departmental standardization offices, to change the agreement or make other appropriate accommodations. It is intended that MIL-STD-1760 will be compatible with the following documents:

a. STANAG 3350AVS, Analogue Video Standard for Aircraft System Applications;

b. STANAG 3837AA, Standard Aircraft/Store Electrical Interface; and

c. STANAG 3838AVS, Digital Time Division Command/Response Data Bus.

6.4 Tailoring guidance.

MIL-STD-1760 defines a standard connector and signal interface between stores and aircraft. As such, most of the requirements are essential to the interoperability of these stores and aircraft; exceptions are discussed in the draft handbook, which also discusses the design of the systems in the aircraft and store that support and use this interface and must be tailored to the mission of the system. **[Note 87]**

6.5 Keyword listing.

aircraft
aircraft station
audio signals
avionics
bus controller
data word
discrete signals
electrical connector
electrical interface
electrical power
high bandwidth signals
low bandwidth signals
remote terminal
serial data bus
store
stores management system

suspension and release equipment
video signals

6.6 Changes from previous issue.

Changes between revision C and revision C Notice 1 are indicated by vertical lines in the margin. These change markings are not guaranteed to be complete or correct. Major changes between revision B and revision C and between revision C and revision C notice 1 are explained by comments. **[Note 87a]** These comments consist of a note number in parenthesis in the text, referring to a note in the list of notes that appears as appendix C. A Microsoft Word™ computer file, with revisions (additions, modifications, corrections, deletions) from the previous issue marked, along with the comments, is available to users from the Responsible Engineer at the preparing activity. The comments and the computer file with revisions marked are provided as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the change notations and relationship to the last previous issue.

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B.3.1.4.4 File.
A file is a set of data related to specific information such as an operational flight program, a test or maintenance program, mission data, bit patterns for memory test, etc. A file contains 1 to 255 data records.

B.3.1.4.5 Record.
A record is a data subset containing 1 to 255 data blocks which when combined with other records forms a file.

B.3.1.4.6 Upload.
Upload is defined as the process of transferring files out of the store.

B.3.1.4.7 Buffer.
To initially locate or relocate in memory such that a subsequent mass data transfer does not overlay data received on a previous mass data transfer. It is also used to denote the storage memory that mass data transfer occupies.

B.3.2 Acronyms and abbreviations.
The acronyms and abbreviations in section 3.0 of the basic document apply to this appendix.

B.4 REQUIREMENTS

B.4.1 Communication rules.
The data bus inteface shall comply with **[Note B-2]** the requirements of MIL-STD-1553 with the additional requirements defined herein. The aircraft shall be responsible for the bus controller function for the ASI. The mission store shall provide the remote terminal function at the MSI. The carriage store **[Note B-3]** shall provide the remote terminal function at the CSI and be responsible for the bus controller function at the CSSI. SAE-AS15531 may be used in lieu of MIL-STD-1553 **[Note B-4]**.

B.4.1.1 Command word.
Command words shall be as defined by MIL-STD-1553. All command words shall be generated by an AEIS bus controller.

B.4.1.1.1 Remote terminal address field.
The remote terminal address field shall be used to address the required store. If broadcast is implemented, then the broadcast address shall be in accordance with MIL-STD-1553.

B.4.1.1.2 Subaddress/mode field.
The subaddress/mode field shall be used for message identification and as a mode code indicator as defined in table B-I.

B.4.1.1.3 Mode commands.
Aircraft and stores shall implement mode commands as defined herein. Aircraft and stores shall utilize a subaddress of 11111 (binary) as a mode code indicator. Stores shall also utilize subaddress 00000 (binary) as a mode code indicator.

B.4.1.1.3.1 Mandatory mode commands.
Stores shall implement the mode commands as specified in B.4.1.1.3.1.1 through B.4.1.1.3.1.7. Aircraft shall, as a minimum, implement the mode commands specified in B.4.1.1.3.1.5 and B.4.1.1.3.1.6. If the aircraft uses the other mode commands defined in B.4.1.1.3.1.1 through B.4.1.1.3.1.7, the implementation shall comply with these specified requirements.

B.4.1.1.3.1.1 Transmit status word.
Stores shall implement and respond to valid transmit status word mode codes as required by MIL-STD-1553.

B.4.1.1.3.1.2 Transmitter shutdown.
Stores shall implement and respond to valid transmitter shutdown mode codes as required by MIL-STD-1553. The shutdown transmitter shall not generate any bus activity until the mode code is overridden by either an override transmitter shutdown mode code or a reset remote terminal mode code received on the non-shutdown bus.

B.4.1.1.3.1.3 Override transmitter shutdown.
Stores shall implement and respond to valid override transmitter shutdown mode codes as required in MIL-STD-1553 and B.4.1.1.3.1.2.

B.4.1.1.3.1.4 Reset remote terminal.
Stores shall implement and respond to valid reset remote terminal mode codes as required by MIL-STD-1553. Receipt of this mode code shall re-enable all shutdown transmitters. The remote terminal is the only element that shall be reset; the subsystem shall be unaffected.

B.4.1.1.3.1.5 Transmit vector word.
Stores shall implement and respond to valid transmit vector word mode codes as required by MIL-STD-1553. The associated data word formats shall be as specified by tables B-II and B-III. The aircraft shall issue transmit vector word mode codes during the request servicing process defined in B.4.1.5.5.

B.4.1.1.3.1.6 Synchronize with data word.
Stores shall implement and respond to valid synchronize with data word mode codes as required by MIL-STD-1553. The synchronize with data word format shall use the TIME (L) format as defined in table B-XXVII **[Note B-4a]**.

B.4.1.1.3.1.7 Transmit last command.
Stores shall implement and respond to valid transmit last command mode codes as required by MIL-STD-1553.

B.4.1.1.3.2 Prohibited mode commands.
Aircraft shall not transmit the dynamic bus control mode command, nor any of the reserved mode codes designated in MIL-STD-1553, nor any mode code not defined in MIL-STD-1553. If a store receives a prohibited mode command, the store shall not alter the state of the store subsystem.

B.4.1.1.3.3 Permitted mode commands.
Stores may implement mode commands not defined as mandatory or prohibited. Stores implementing the inhibit terminal flag bit mode command shall implement the override inhibit terminal flag bit mode command. No store or aircraft shall require for operation that an aircraft or store implement a permitted mode command.

B.4.1.2 Status word.
The status word shall be as defined by MIL-STD-1553. The status word bits at bit times 10, 12, 13, 14, and 18 shall be set to a logic zero. Bit time 10 shall not be used by a terminal, in conjunction with a logic 1 in bit time 10 of the command word, to distinguish between a command word and a status word **[Note B-5]**. The message error and broadcast command received bits shall be used as defined in MIL-STD-1553. The service request, busy, subsystem flag, and terminal flag bits shall be used as defined herein.

B.4.1.2.1 Service request bit.
The status word bit at bit time 11 shall be utilized only for request notification as specified in B.4.1.5.4.

B.4.1.2.2 Busy bit.
The status word bit at bit time 16 shall be set to logic 1 only to notify that the RT is unable to move data to or from the store subsystem in compliance with a command. The busy bit shall only be set temporarily to a logic 1 and shall comply with B.4.1.5.3. The busy bit shall be the only indication that a message has thus been discarded and no additional notification shall be implemented.

B.4.1.2.3 Subsystem flag bit.
The status word bit at bit time 17 shall be used to indicate the presence of fault condition(s) within the store or store-to-terminal interface which destroys the credibility of data words at the data bus interface. The bus controller shall interpret the subsystem flag bit as a total loss of store function. A logic zero shall indicate the absence of such an aforementioned store fault.

B.4.1.2.4 Terminal flag bit.
The status word bit at bit time 19 shall be set to logic 1 only to indicate a detected fault in the RT hardware. Stores not implementing the inhibit terminal flag bit mode command as specified in B.4.1.1.3.3 shall set the terminal flag bit only if the fault is in that portion of the redundant RT to which the preceding command was sent. Stores detecting an interface address discrete error shall not interpret that error as a RT hardware fault.

B.4.1.3 Data words.
Data words shall comply with MIL-STD-1553 and shall be sequenced and formatted as specified in B.4.2.

B.4.1.4 Internal state change.
Stores shall not change the store subsystem state as a direct result of receiving a transmit command nor as a direct result of receiving a receive command. In other words, store state changes shall occur when the contents of a receive message command a state change and shall not change because a receive message was only detected **[Note B-6]**.

B.4.1.5 Protocol execution.

B.4.1.5.1 Protocol checks.
Protocol checks shall include the following verifications. Any message that fails any one of them shall be discarded **[Note B-7]**.

a. Verification of checksum, if implemented.

b. Verification of message header.

c. For the store control message, verification of the critical control 1, critical control 2, and critical authority words shall be as follows:

(1) For a critical control 1 or critical control 2 word not marked invalid, both the IDENTIFIER and ADDRESS CONFIRM fields must be correct. The invalidity, critical control 1, and critical control 2 words are defined in tables B-XXXI, B-XXXII, and B-XXXIII respectively.

(2) For the critical authority word, the CODED CHECK field must be correct. The critical authority word is defined in table B-XXXIV.
Detected errors in protocol checks shall be reported in accordance with B.4.2.2.2.

B.4.1.5.2 Checksum requirement.
The use of checksums for the standard data messages specified in B.4.2.2.1, B.4.2.2.2, B.4.2.2.3, B.4.2.3.2.1.8 and B.4.2.3.2.2.9 are **[Note B-7a]** mandatory. The use of checksums for all other messages is optional and determined by the store. When utilized, the checksum shall occupy the last word position of both receive and transmit messages and shall be formatted as specified in B.4.1.5.2.1. When not utilized, the last word position shall be a data entity.

B.4.1.5.2.1 Checksum algorithm.
All checksummed messages shall include a checksum word which satisfies the following algorithm: When each data word (including the checksum word) of a message is rotated right cyclically by a number of bits equal to the number of preceding data words in the message, and all the resultant rotated data words are summed using modulo 2 arithmetic to each bit (no carries), the sum shall be zero. The following are examples of messages satisfying the checksum algorithm.

EXAMPLE (a):	FOUR WORD MESSAGE	
1st Word	0000-0000-0000-0001 (0001 hex.)	data
2nd Word	1100-0000-0000-0000 (C000 hex.)	data

3rd Word	0000-1111-0000-0000 (0F00 hex.)	data
4th Word	0001-1110-0000-1011 (lE0B hex.)	checksum word
EXAMPLE (b):	SIX WORD MESSAGE	
lst Word	0001-0010-0011-0100 (1234 hex.)	data
2nd Word	0101-0110-0111-1000 (5678 hex.)	data
3rd Word	1001-1010-1011-1100 (9ABC hex.)	data
4th Word	1101-1110-1111-0000 (DEF0 hex.)	data
5th Word	0000-0000-0000-0000 (0000 hex.)	data
6th Word	1000-1111-0010-0000 (8F20 hex.)	checksum word

B.4.1.5.3 Execution time.
If a store is to reject further messages while executing protocol checks on a previous received message, the store shall set the busy bit in the status word. The busy bit may only be set for the time specified in B.4.1.5.3.2 and only when one or more of the following criteria are met.

a. Acceptance of a valid initiate RT self test or reset RT mode command as specified in MIL-STD-1553.

b. Acceptance of a valid receive command (including synchronize with data word mode command).

c. During the initialization sequence of 5.2.2, or as a consequence of store fault or failure resulting in the inability of the RT to move data to or from the subsystem.

B.4.1.5.3.1 Aircraft compatibility
The aircraft shall be compatible with this execution time and busy bit application for store operation.

B.4.1.5.3.2 Busy time.
Busy time is the duration for which the busy bit is set to logic 1. The maximum busy time following the receipt of a valid initiate RT self test mode command or valid reset RT mode command shall comply with MIL-STD-1553. The maximum busy time following power application (ac, dc, or both, as required by the store) shall not exceed 500 milliseconds. The maximum busy time for all other allowed busy conditions shall not exceed 50 microseconds.

B.4.1.5.3.3 Busy time measurement.
Busy time shall be the time measured from the zero crossing of the parity bit of the last word of the previous message to the zero crossing of the first command word sync which is accepted and whose status response has the busy bit set to logic 0.

B.4.1.5.4 Service request notification.
Service request notification, if implemented by stores, shall be accomplished by setting the service request bit in the status word to a logic 1. Stores shall ensure that once the service request bit is set to logic 1, the vector word as defined in B.4.1.1.3.1.5 is immediately available. The service request bit shall be reset to logic 0 when, and only when, the store has received the transmit vector word mode command for the active service request and the vector word has been transmitted.

B.4.1.5.4.1 Additional request for service.
All requests for servicing shall be covered by the one service request notification. The vector word shall contain all the data concerning the request(s) for servicing indicated by the setting of status word bit time 11. However, if further request for servicing occurs after status word bit time 11 has been set, then that additional request for servicing shall be treated as a new arising and shall not be actioned by the store until the current service request has been completely dealt with. Stores shall not use multiple settings of status word bit time 11 to avoid packing of more than one service request into the vector word demand.

B.4.1.5.5 Request servicing.
The aircraft shall interpret the receipt of a store status word with service request bit set to logic 1 as a request for a transmit vector word mode command. If, however, the service request bit is still set to a logic 1 in a second or subsequent response to the same service request, the service request bit shall be disregarded by the aircraft. The aircraft shall extract information from the store on the service request details by sending a transmit vector word command to the store. Acknowledgment of receipt of a valid vector word shall not be a requirement on the aircraft.

B.4.1.5.6 Vector word demand.
The store shall maintain the current contents of the vector word until a subsequent and different valid command has been received after receiving a transmit vector word mode command. When specified in the system specification or Interface Control Document (ICD), the store shall also maintain the current contents of any subaddress notified in the vector word until the requested data transaction has occurred and a subsequent and different valid command has been received.

B.4.1.5.7 General form of service request routine.
The general form of a complete service request routine is shown in figure B-1.

B.4.1.5.8 Mass data transfer.
Applications which require transfer of large data files through the AEIS interface shall use the applicable options of the mass data transfer procedure and messages defined in B.4.2.3.

B.4.1.5.9 Carriage store routing.
A procedure for the transfer of data through a carriage store (routing) is not defined in this standard except as required by paragraph 5.1.2.1 d.

B.4.1.5.10 Data consistency.
The aircraft and store shall ensure that messages transmitted over the bus contain only mutually consistent samples of information. Different words in a message used to transmit multiple precision parameters shall all be members of the same set.

B.4.1.5.11 Broadcast.
Aircraft and stores are not required to implement broadcast. However, if implemented, then aircraft and stores shall comply with the following paragraphs.

B.4.1.5.11.1 Broadcast restricted subaddresses.
The bus controller shall not issue a broadcast command to the subaddresses given below.

SUBADDRESS	TRANSMIT*	RECEIVE
00001 (01)	x	
01000 (08)	x	x
01011 (11)	x	x
10011 (19)	x	x
11011 (27)	x	x
11110 (30)	x	

* The transmit column applies only to the transmitting remote terminal in RT-to-RT transfers.

B.4.1.5.11.2 Broadcast verification.
The bus controller and stores which use broadcast shall implement some error detection scheme to determine that broadcast messages were received correctly unless it is determined that errors in the data being broadcast are not significant to system performance **[Note B-8]**.

B.4.1.5.11.3 Broadcast command received bit.
Stores shall implement the broadcast command received bit in the status word.

B.4.1.5.11.4 Stores compatibility with non-broadcast.
A store which accepts broadcast messages shall also accept the same data in non-broadcast mode, i.e., it will work with an aircraft or carriage store that does not do broadcast.

B.4.1.5.12 Time tagging [Note B-8a].
Applications which require precision time referencing of data entities transferred from the aircraft to the store through the AEIS shall use the time tagging protocol defined in B.4.2.4.

B.4.2 Message requirements.

Aircraft and stores shall utilize the standard message formats specified in B.4.2.2 and the mass data transfer formats specified in B.4.2.3, as applicable. Safety critical data shall only be transferred in the standard message formats of B.4.2.2.1, B.4.2.2.2, B.4.2.2.4, and B.4.2.2.5. All messages required by a store which are not defined in B.4.2.2 or B.4.2.3 shall:

a. employ the base message format specified in B.4.2.1, and
b. use subaddresses selected in accordance with B.4.1.1.2.

B.4.2.1 Base message data format.
All messages not covered by B.4.2.2 or B.4.2.3 shall use the base message format. The general format is shown in tables B-VII, B-VIII, and B-IX. Messages to/from carriage stores may be of any length up to the maximum of 32 data words. Messages to/from mission stores shall not exceed 30 data words and if routed via a carriage store shall not exceed 30 data words when output at, or input to, the CSSI **[Note B-9]**.

B.4.2.1.1 Data word 1.
The first word of the message shall be a HEADER word for message identification. The HEADER word shall be a hexadecimal code which complies with table B-X and table B-XLII **[Note B-10]**.

B.4.2.1.2 Data words 2-32 and 2-30.
Data words 2-32 are available for the transfer of up to 31 words of carriage store message data which may include a checksum. Data words 2-30 are available for the transfer of up to 29 words of mission store message data which may include a checksum.

B.4.2.2 Standard messages.
Standard AEIS messages are defined as standard message data formats for safety critical control and monitor functions of conventional and nuclear weapons and for store descriptions. A receive message is defined as the data word or words received by a store in conjunction with a receive command word and the status word response. A transmit message is defined as the status word and data word or words transmitted by a store resultant from a transmit command word.

B.4.2.2.1 Store control.
The store control standard message shall be used for controlling the state of stores and specifically standardizes the format for safety critical commands. Aircraft shall be capable of issuing this message to the appropriate stores. Stores which require any of these safety critical commands shall implement this message. The store control message shall be a 30 data word receive message with a subaddress of 11 (decimal) and formatted as specified in table B-XI **[Note B-11]**.

B.4.2.2.2 Store monitor.
The store monitor standard message shall be used as a statusing message to reflect the safety critical condition of the store. The message also includes other non-safety critical store condition information. Aircraft shall be capable of issuing a transmit store monitor command and receiving the resulting monitor message response from the store. Stores shall be capable of responding to a transmit store monitor command with the required status and data words. The store monitor message shall be a 30 data word transmit message with subaddress 11 (decimal) and formatted as specified in table B-XII.

B.4.2.2.3 Store description.
The store description standard message transfers store identity from the store to the aircraft. The store description message shall use subaddress 1 (decimal) and comply with the format of table B-XIII. The message includes a header word, country code word, store identification words, maximum interruptive BIT time word, store configuration identifier words, and a checksum word. The country code (see table B-XIV)

and store identification codes shall remain invariant through the life of the store or until modification to the store justifies a new store identity. The store identifier shall be either a binary code in accordance with table B-XV, or an ASCII code in accordance with table B-XVI, or both. The aircraft has the option of verifying or not verifying that the message passes the checksum test **[Note B-12]**.

B.4.2.2.4 Nuclear weapon control.
Receive messages with a subaddress field of 19 and 27 (decimal) shall only be used for control of nuclear weapons. For all aircraft applications, usage of these subaddresses shall comply with the Aircraft Monitor and Control Project Officers Group System 2 specification: standard no. SYS 2001-01.

B.4.2.2.5 Nuclear weapon monitor.
Transmit messages with a subaddress field of 19 and 27 (decimal) shall only be used for monitor of nuclear weapons. For all aircraft applications, usage of these subaddresses shall be in compliance with the Aircraft Monitor and Control Project Officers Group System 2 specification: standard no. SYS 2001-01.

B.4.2.2.6 Aircraft description [Note B-12a].
The aircraft description standard message transfers aircraft identity from the aircraft to the store. The aircraft description message shall use subaddress 1 (decimal) and comply with the format of table B-XLVII. The message includes a header word, invalidity words, a country code word, aircraft identification words, a station number, a pylon/bay identity and a checksum word. The country code (see table B-XIV) and aircraft identification codes shall remain invariant through the life of the aircraft or until modification to the aircraft justifies a new aircraft identity. The aircraft identifier shall be an ASCII code in accordance with table B-XVI. The store has the option of verifying or not verifying that the message passes the checksum test. The aircraft description message shall only be used with prior agreement via the system specification or interface control document.

B.4.2.3 Mass data transfer messages [Note B-13].
Aircraft and stores which require Mass Data Transfer (MDT) operations shall utilize the applicable operations defined herein. MDT shall be implemented through the use of three data message types. The Transfer Control (TC) message (B.4.2.3.2.1) is a standard receive message for controlling the transfer operating modes and designation of file, record, and block numbers. The Transfer Monitor (TM) message (B.4.2.3.2.2) is a standard transmit message for monitoring the status of the mass data transfer operations in the store. The Transfer Data (TD) message (B.4.2.3.2.3) is a standard transmit, or standard receive, message for transferring the file data blocks between aircraft and stores (or between stores). The system specification or interface control document defines the applicable operations, specific data files, and file data formats to be transferred using the MDT protocol.

B.4.2.3.1 File Structure.
Each selected file (Sf) to be transferred using the MDT protocol shall be divided into 1 to 255 consecutive records (Nr) with each record divided into 1 to 255 consecutive blocks (Nb). Each block is transferred with a single TD message and shall contain 30 words with word one being the record/block number and the remaining 29 words utilized for file data (see B.4.2.3.2.3.2 and B.4.2.3.2.3.3). All records within a specific file shall contain the same number of blocks. Unused words in each record shall be zero-filled.

B.4.2.3.2 Message formats.

B.4.2.3.2.1 Transfer Control (TC) message.
The TC message shall be sent as a receive message to subaddress 14 and formatted in accordance with table B-XVII. The aircraft shall set the TC message in accordance with the following requirements.

B.4.2.3.2.1.1 TC message - header word.
The aircraft shall set this word in accordance with paragraph B.4.2.1.1.

B.4.2.3.2.1.2 TC message - instruction word.
This word shall be formatted in accordance with table B-XVIII and the INSTRUCTION TYPE field shall be set to one of the valid bit combinations of table B-XIX. If the aircraft requires the store to enable the echo of the TD message (table B-XXIV) to the aircraft then the aircraft shall set bit 07 to logic 1, else bit 07 shall be set to logic zero. If the format of the Sf data being transferred to/from the store includes an embedded message checksum in word 30 of every TD message, the aircraft shall set bit 12 to logic 1, else bit 12 shall be set to logic zero.

B.4.2.3.2.1.3 TC message - subaddress select word.
This word shall be formatted in accordance with table B-XX. The aircraft shall set this word to 0000 Hex for all bit combinations in table B-XIX except 1, 3, and 10. For bit combination 1, if the aircraft requires the store to update the status of the TM message for a TD message sent to a particular subaddress, the aircraft shall set this word to the subaddress for the TD message it requires the status of, else this word shall be set to 0000 Hex. For bit combination 3 or 10 of table B-XIX, in applications where the store can use different subaddresses for file data transfer, this word shall be set to the receive/transmit subaddress for the TD message. The system specification or interface control document shall identify those subaddresses available for the TD messages and the number of different files, records, or blocks that can be transferred through those different subaddresses. As an alternative, the system specification or interface control document may pre-assign specific subaddresses to specific file, record, or block numbers and then the subaddress select word shall be set to 0000 hexadecimal, or to the applicable pre-assigned subaddress.

B.4.2.3.2.1.4 TC message - file number word.
The aircraft shall set the NUMBER A and NUMBER B fields (table XXI) of word 04 of the TC message as follows. NUMBER A and NUMBER B are valid file numbers ranging from 1 through 255.

a. For table XIX bit combination numbers 1, 2, 4, 9, and 14, NUMBER A = 00 Hex and NUMBER B = 00 Hex.

b. For table XIX bit combination 3, NUMBER A = Nf to be downloaded and NUMBER B = the number of the Sf in which the current download operation will be executed.

c. For table XIX bit combination 5, NUMBER A = 01 Hex and NUMBER B = the number of the Sf to be erased.

d. For table XIX bit combination 6, NUMBER A = 01 Hex and NUMBER B = the number of the Sf in which the Sr will be erased.

e. For table XIX bit combination 7, NUMBER A = 01 Hex and NUMBER B = the number of the Sf to be checksummed.

f. For table XIX bit combination 8, NUMBER A = 01 Hex and NUMBER B = the number of the Sf in which the Sr will be checksummed.

g. For table XIX bit combination 10, NUMBER A = Nf to be uploaded and NUMBER B = the number of the Sf in which the current upload operation will be executed.

h. For table XIX bit combination 11, NUMBER A = 01 Hex and NUMBER B = the number of the Sf in which the checksum value is embedded that the store is required to authenticate against the file/record checksum word in this message.

I. For table XIX bit combination 12, NUMBER A = 01 Hex and NUMBER B = the number of the Sf where the Sr is located, in which the checksum value is embedded that the store is required to authenticate against the file/record checksum word in this message.

j. For table XIX bit combination 13, NUMBER A = 00 Hex and NUMBER B = the number of the Sf in which execution will start in download mode; In upload mode, set to 00 Hex.

B.4.2.3.2.1.5 TC message - record number word.
The aircraft shall set the NUMBER A and NUMBER B fields (table XXI) of word 05 of the TC message as follows. NUMBER A and NUMBER B are valid file numbers ranging from 1 through 255.

a. For table XIX bit combination numbers 1, 2, 4, 7, 9, 11, and 14, NUMBER A = 00 Hex and NUMBER B = 00 Hex.

b. For table XIX bit combination number 3, NUMBER A = Nr for the Sf to be downloaded. The value of Nr will remain fixed for the Sf during the commanded operation. NUMBER B = the number of the Sr in which the current download operation will start.

c. For table XIX bit combination number 5, NUMBER A = the Nr for Sf to be erased and NUMBER B = 01 Hex. The value of Nr will remain fixed for the Sf during the commanded operation.

d. For table XIX bit combination number 6, NUMBER A = 01 Hex and NUMBER B = the number of the Sr to be erased.

e. For table XIX bit combination number 8, NUMBER A = 01 Hex and NUMBER B = the number of the Sr to be checksummed.

If the store sets the MODE STATUS field to bit combination 16 of table B-XXV the store shall set the NUMBER A field to the number of blocks of the Sf of the Sr that are to be retransmitted, and the NUMBER B field to the block number for which the retransmission of data is to start.

B.4.2.3.2.2.8 TM message - current file/record checksum word.
Word 08 of the TM message shall be set to the current checksum calculated by the store for the current active file or current active record, as applicable. If no file or record checksum calculation has been commanded in the TC message, or if the commanded checksum calculation has not been completed, this word shall be set to 0000 hexadecimal. This word shall be reset to 0000 hexadecimal when bit 07 of the TM status word (table B-XXIII) is reset.

B.4.2.3.2.2.9 TM message - checksum word position.
Word 09 of the TM message shall be set to the TM message checksum, calculated as required by paragraph B.4.1.5.2.

B.4.2.3.2.3 Transfer Data (TD) message.
The TD message shall comply with table B-XXIV and with the following requirements. It shall be a 30 data word message received or transmitted in the subaddress specified in the TC message in accordance with paragraph B.4.2.3.2.1.3. The TD message subaddress assignment shall comply with the requirements specified as follows and in the store/aircraft system specification or ICD.

B.4.2.3.2.3.1 TD message - record/block number word.
This data word shall be formatted in accordance with table XXI. In the download mode, the aircraft shall set the NUMBER A field of this word to Sr and the NUMBER B field of this word to Sb for the data in words 02-30 of the current TD message. If the aircraft requires a no-operation transaction of the TD message, it shall set the NUMBER B field to zero. Stores that receive a valid NUMBER A field and with a NUMBER B field set to zero shall discard the contents of this TD message and update the TM message (table B-XXII) to reflect the status of the last TD message received at the current subaddress. Stores which receive a NUMBER A field set to zero, a non-initialized value, or a non-consecutive value from the last TC message, shall discard the contents of this message and shall not update the TM message.

In the upload mode, the store shall set the NUMBER A field of this word to the Sr and the NUMBER B field of this word to the Sb for the data in words 02-30 of the current TD message. After each TD transmission, the store shall increment the Sb starting with the Sb specified in the NUMBER B field of the block number word of the last valid TC message, until the Nb specified in the NUMBER A field of the block number word of the last valid TC message are transferred, or until a new TC message is received. The store shall increment the record number, starting with the record number specified as the Sr in the NUMBER B field of record number word of the last valid TC message, each time Nb (NUMBER B field of this word) roles over to 01 Hex, or until the Nr specified in the NUMBER A field Nr of the last valid TC message are transferred, or until a new TC message is received.

B.4.2.3.2.3.2 TD message - file data words.
In download mode the aircraft shall fill these words with either 29 words of the operational file data, or sufficient words set to 0000 Hex to complete filling the fixed length 30 word TD message. In upload mode the store shall fill these words with either words from the Sf data, or sufficient words set to 0000 Hex to complete filling the fixed length 30 word TD message. The file data shall be placed in memory by the receiving system such that word 02 shall be placed in memory location N, word 03 is placed in memory location N+1, and so forth to complete the 29 word block transfer. The value of N shall be determined by Sf, Sr, and Sb.

B.4.2.3.2.3.3 TD message - file data words with message checksum option.
When in download mode, if bit 12 of the instruction word of the TC message is set to logic one, the aircraft shall fill the first word of the TD message with the record/block number word, the next 28 words with either words of the operational file data, or sufficient words set to 0000 Hex to complete filling the 28 words, and set word 30 to the checksum for the TD message.

When in upload mode, if bit 12 of the instruction word of the TC message is set to logic one, the store shall fill the first word of the TD message with the record/block number word, the next 28 words with either words from the Sf data, or sufficient words set to 0000 Hex to complete filling the 28 words, and set word 30 to the checksum for the TD message. The file data shall be placed in memory by the receiving system such that word 02 shall be placed in memory location N, word 03 is placed in memory location N+1, and so forth to complete the 28 word block transfer. The value of N shall be determined by the Sf, Sr, and Sb. The checksum for the TD message shall be as specified in paragraph B.4.2.3.4.

B.4.2.3.3 MDT file/record checksum.
The checksum value for downloaded MDT files or records is provided in the TC message which commands a file or record checksum. The checksum value for uploaded MDT files or records is provided in the TM message after completion of the file or record upload.

File/record checksums shall be computed in accordance with the algorithm described in paragraph B.4.1.5.2., except that no cyclical right rotation of the MDT checksum word shall be performed since it is not a part of the downloaded/uploaded data. The MDT file/record checksum word provides a zero result using modulo 2 arithmetic to each bit (no carries) when summed with all TD message words (including TD message word 01) downloaded/uploaded (for designated file or record) after having been rotated right cyclically by a number of bits equal to the number of preceding data words in the TD message in which the data word was received.

B.4.2.3.4 Modes of operation.
B.4.2.3.4.1 Download mode.
The operating procedure for downloading data files from the aircraft to the store shall consist of the following steps. If the store response time to the MDT commands (TC instruction word table B-XVIII) is required by the aircraft, it shall be documented in the system specification or interface control document.

B.4.2.3.4.1.1 Initiation of download mode.
To initiate the download mode:

a. Aircraft Requirements: The aircraft shall send a TC message (table B-XVII) to the store set in accordance with paragraph B.4.2.3.2.1 with the INSTRUCTION TYPE field of the instruction word set to bit combination 2 of table B-XIX. The aircraft shall not proceed with the MDT process until the store response indicates it is “in download mode” (TM status table B-XXIII).

b. Store requirements: The store shall enter the download mode and set the TM message (table B-XXII) in accordance with paragraph B.4.2.3.2.2 with the MODE STATUS field of the transfer mode status word (table B-XXIII) set to bit combination 1 of table B-XXV.

B.4.2.3.4.1.2 Erasure of all MDT files.
The aircraft has the option to not erase previously loaded MDT data or to command the mission store to erase all files, a specific file or a specific record space. For erasure of all MDT file data:

a. Aircraft Requirements: The aircraft shall send a TC message (table B-XVII) to the store set in accordance with paragraph B.4.2.3.2.1 with the INSTRUCTION TYPE field of the instruction word set to bit combination 4 of table B-XIX. The aircraft shall not proceed with the MDT process until the store response indicates “Erase Completed” (TM status table B-XXIII).

b. Store requirements: The store shall initiate erasure of all MDT file memory locations and shall set the TM message (table B-XXII) in accordance with paragraph B.4.2.3.2.2 with the MODE STATUS field of the transfer mode status word (table B-XXIII) set to bit combination 3 of table B-XXV. After the store has erased all MDT memory, it shall set the TM message in accordance with paragraph B.4.2.3.2.2 with the MODE STATUS field of the transfer mode status word (table B-XXIII) set to bit combination 4 of table B-XXV.

(1) Repeat B.4.2.3.4.1.5. or B.4.2.3.4.2.2, as applicable, until the mapping of each file, record, or block to its subaddress is designated; or

(2) The system specification or interface control document shall define a fixed mapping of files, records, or blocks to specific TD message subaddresses. B.4.2.3.4.l.5 or B.4.2.3.4.2.2 would be issued once with the selected subaddress word of the TC message set to 0000 Hex to start the data transfer in accordance with the fixed mapping.

B.4.2.3.4.5 System start.

B.4.2.3.4.5.1 System start - download mode.
To initiate start of software execution in a store after downloading the executable software code to the store as described in B.4.2.3.4.1:

a. Aircraft requirements: The aircraft shall send a TC message (table B-XVII) to the store set in accordance with paragraph B.4.2.3.2.1 with the INSTRUCTION TYPE field of the instruction word set to bit combination 13 of table B-XIX.

b. Store requirements: Stores receiving a system start command while in the download mode shall initiate program execution at the memory location designated Sf, Sr, and Sb of the TC message. The store shall set the TM message in accordance with paragraph B.4.2.3.2.2 with the MODE STATUS field of the transfer mode status word (table B-XXIII) set to bit combination 8 of table B-XXV. The store shall exit the download mode as required in paragraph B.4.2.3.4.11.

B.4.2.3.4.5.2 System start - upload mode.
To initiate start of software execution in an aircraft after uploading executable software code from the store as described in B.4.2.3.4.2:

a. Aircraft requirements: After uploading the executable software code from the store in accordance with paragraph B.4.2.3.4.2, the aircraft shall send a TC message (table B-XVII) to the store set in accordance with paragraph B.4.2.3.2.1 with the INSTRUCTION TYPE field of the instruction word set to bit combination 13 of table B-XIX.

b. Store requirements: Stores receiving a system start command while in the upload mode shall designate the memory location at which the aircraft is to initiate program execution by setting the Sf, Sr, and Sb fields of the TM message to the starting point for execution, in accordance with paragraph B.4.2.3.2.2 with the MODE STATUS field of the transfer mode status word (table B-XXIII) set to bit combination 14 of table B-XXV. The store shall exit the upload mode as required in paragraph B.4.2.3.4.2.8.

c. Aircraft requirements: The aircraft shall initiate execution at the memory location identified by the Sf, Sr, and Sb sent in the TM message.

B.4.2.4 Protocol for time tagging [Note 13a].
Aircraft and stores which require that a precision time reference be established for messages, or for one or more data entities within a message, shall utilize the applicable options herein. A message or data entity time tagging protocol shall be implemented using a reference time established by a synchronize with data word mode code as described in B.4.1.1.3.1.6, the aircraft system time at reset (Table B-XXVI line 76), and time tag (Table B-XXVI Line 85). The system specification or ICD shall define the applicable operations, accuracy, and allowed data latency of time tagged data messages and entities. The linear data entities (Table B-XXVII) may be used collectively or individually, as required for the system application.

B.4.2.4.1 Time tag reference time.
To establish a reference time event which will allow the store to convert a time tag for either: (1) a message, or (2) one or more data entities, into its own time keeping reference frame:

a. Aircraft Requirements: The aircraft shall send its system time in a synchronize with data word mode code to ensure that no more than one aircraft clock rollover or reset can exist between the synchronize time event and the time tag value. The maximum latency between the time synchronization and the synchronize with data word mode code transmission time shall be defined by the system specification or ICD.

b. Store Requirements: The store shall establish the reference between its system clock and the receipt of the synchronize with data word mode code which will be used for time tag conversion.

B.4.2.4.2 Aircraft system time at reset.
To report the maximum value that the aircraft system time clock attains prior to rollover or reset for receive data messages that contain time tags:

a. Aircraft Requirements: The aircraft shall state its system time at reset in all receive data messages which contain time tags or all the data messages which contain time tags shall be members of the same aircraft clock cycle. That time shall be the highest value that its system time clock attained at the most recent rollover or reset event. The latency between the system time at reset event and the recording of that event in data messages shall be defined in the system specification or ICD. To allow the store to convert time tags to its own system time, the aircraft system time shall be reset to zero after attaining the stated aircraft system time at reset value which has exceeded the allowed value stated in the system specification or ICD.

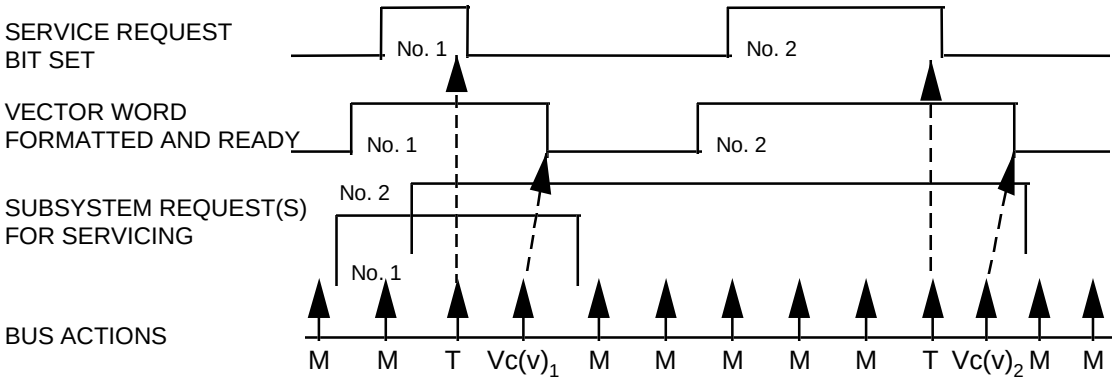
b. Store Requirements: The store shall utilize the aircraft system time at reset to convert receive time tags to its system time if the aircraft system time at reset occurs between the time tag reference time and time tag.

B.4.2.4.3 Receive time tag.
To establish the receive time tag value in conjunction with a message or data entity:

a. Aircraft Requirements: The aircraft shall utilize the time tag. The time tag is the value of the aircraft system clock when the data is valid. The maximum latency between the time tag and data validity shall be defined in the system specification or ICD.

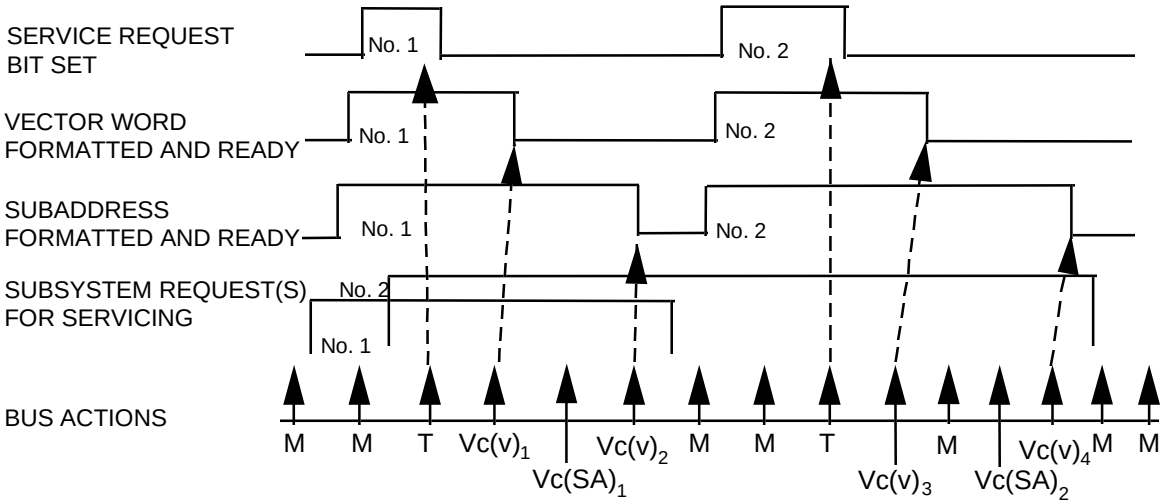
b. Store Requirements: The store shall utilize the time tag to determine the validity time of the sensitive data. The store shall consider time tagged data as invalid if the data latency exceeds the maximum data latency defined by the system specification or ICD.

B.4.3 Standard data entities.
All AEIS messages shall be composed from the data entities (see B.3.1.1) listed in table B-XXVI. If a store or aircraft requires a specific data entity not covered by this table, then use of a non-standard data entity is permitted if authorized by the contracting authority or specified in the approved ICD. The data word format of a non-standard data entity shall, in order of preference: (1) comply with the data word format requirements of table B-XXVII, (2) comply with the data word format requirements of MIL-HDBK-1553, or (3) use a unique user-defined data word format **[Note B-14]**.



a) ASYNCHRONOUS REQUEST REPORTING

M = NORMAL MESSAGE
T = TRANSMIT VECTOR WORD
$Vc(v)_n$ = NEXT DIFFERENT VALID COMMAND
$Vc(SA)_n$ = REQUESTED DATA TRANSACTION



b) ASYNCHRONOUS MESSAGE (SUBADDRESS) REQUEST
NOTE: The requirement for subaddress retention, if required by the system specification or ICD, shall be satisified by this routine.

FIGURE B-1. Examples of general form of service request protocol.

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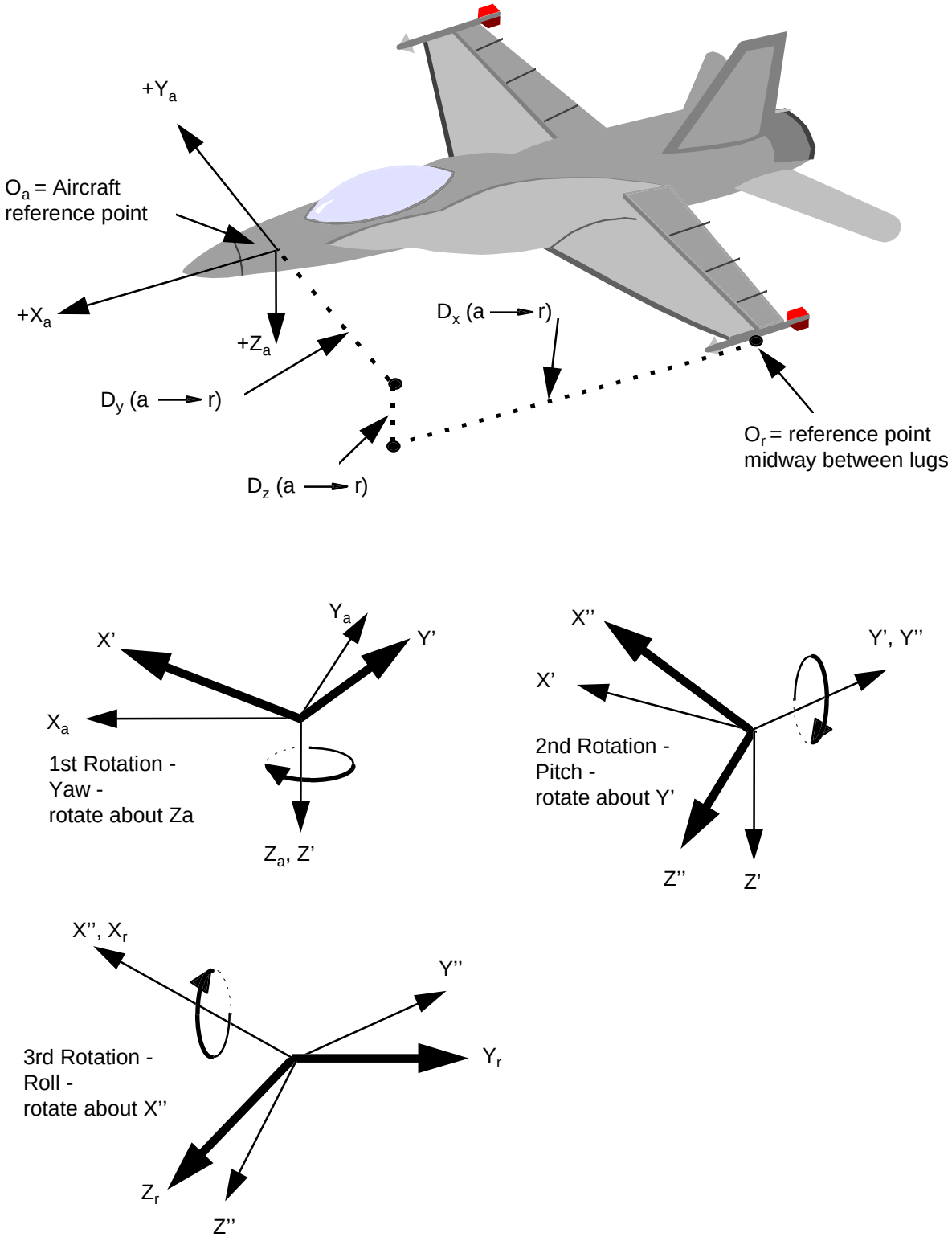
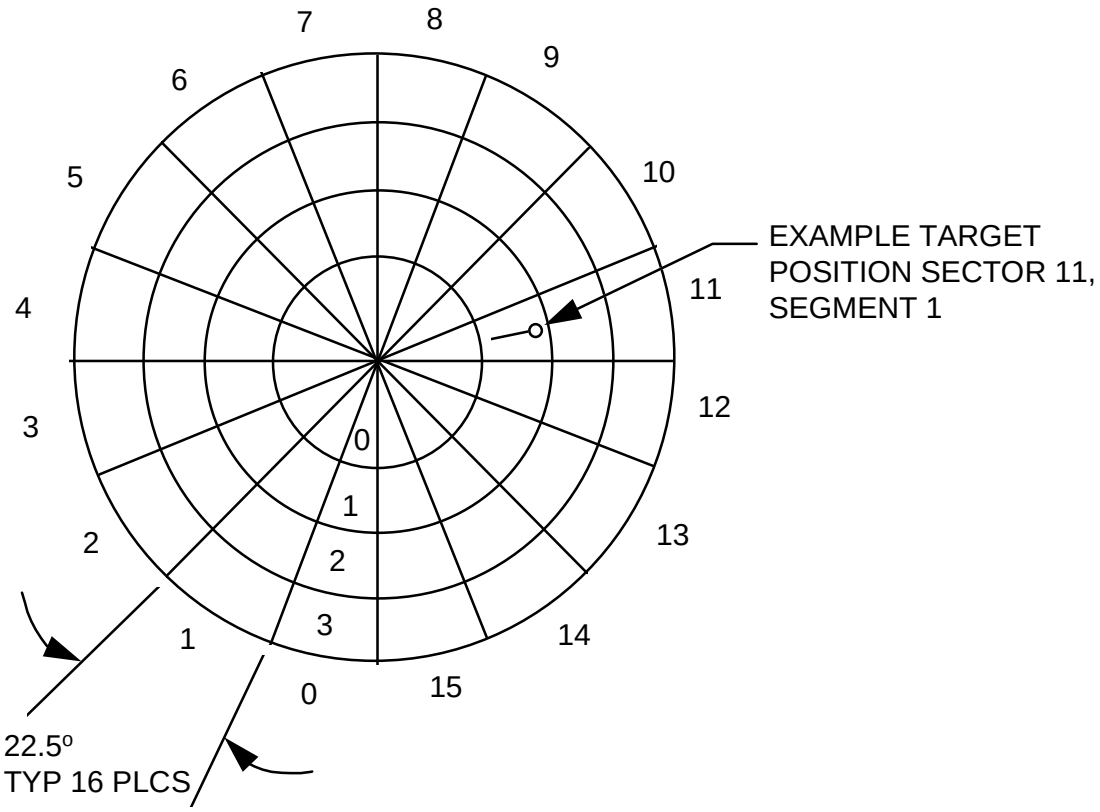


FIGURE B-6. Aircraft-store alignment.

NOTES:
1. The coordinate system Or, Xap, Yap, Zap is a coordinate system parallel to the aircraft coordinate system but with an origin coincident with the reference axis origin.
2. The coordinate system Oa, Xa, Ya, Za describes the axis system of the aircraft or an aircraft sensor.
3. The coordinate system Os, Xs, Ys, Zs describes the axis system of the store or store sensor **[Note B-18].**
4. The coordinate system Or, Xr, Yr, Zr describes the reference axis. The origin Or is defined as the reference point and is midway between the attachment points (such as lugs) of the store to the aircraft.
5. The reference axis yaw, pitch and roll alignment angles are defined by rotating the aircraft coordinate system Oa, Xa, Ya, Za through first yaw then pitch and finally roll angles to align parallel to the reference axis Or, Xr, Yr, Zr.
6. The angle defined as pitch is the angular displacement of the Xr axis from the plane defined by the axis Xa, Ya.
7. The angle defined as roll is the angular displacement of the Yr axis from the plane defined by the axis Xa, Ya.
8. The angle defined as yaw is the angular displacement of the Xr axis from the plane defined by the axis Xa, Za.
9. The distances Dx(a-r), Dy(a-r), Dz(a-r) are defined as the offset distances from the aircraft axis origin Oa to the reference axis origin Or.
10. If a store uses an axis system different than the reference axis defined in note 5 above, it shall be related as follows: The distances Dx(r-s), Dy(r-s), Dz(r-s) are defined as the offset distances from the reference axis origin Or to the store axis origin Os. The store axis yaw, pitch and roll alignment angles are defined by rotating the reference coordinate system Or, Xr, Yr, Zr through first yaw then pitch and finally roll angles to align parallel to the store axis Os, Xs, Ys, Zs **[Note B-19].**

FIGURE B-6. Aircraft-store alignment. Continued.



NOTES: 1. This target sector and segment position pattern shall be used in conjunction with the DISCRIMINATOR DESCRIPTION data entity of table B-XLI.

2. Example of application: A bit pattern of 101101 in bit numbers 03 through 08 of the DISCRIMINATOR DESCRIPTION data entity indicates that the target is positioned in sector 11, segment 1.

3. The pattern should be positioned over the target group so as to encompass all targets under consideration. The pattern position, orientation, and scaling shall be specified in the system specification of ICD.

FIGURE B-10. Target sector and segment position.

TABLE B-I. Subaddress/mode field application.

SUBADDRESS FIELD	MESSAGE FORMATS (NOTES 1 and 2)		DESCRIPTION
	RECEIVE	TRANSMIT	
00000 (00)	B.4.1.1.3	B.4.1.1.3	MODE CODE INDICATOR
00001 (01)	B.4.2.2.6 **[Note B-19a]**	B.4.2.2.3	STORE DESCRIPTION, AIRCRAFT DESCRIPTION
00010 (02)	USER DEFINED	USER DEFINED	
00011 (03)	USER DEFINED	USER DEFINED	
00100 (04)	USER DEFINED	USER DEFINED	
00101 (05)	USER DEFINED	USER DEFINED	
00110 (06)	USER DEFINED	USER DEFINED	
00111 (07)	B.4.1.5.9	B.4.1.5.9	DATA PEELING
01000 (08)	RESERVED	RESERVED	TEST ONLY (NOTE 3)
01001 (09)	USER DEFINED	USER DEFINED	
01010 (10)	USER DEFINED	USER DEFINED	
01011 (11)	B.4.2.2.1	B.4.2.2.2	STORE CONTROL/MONITOR
01100 (12)	USER DEFINED	USER DEFINED	
01101 (13)	USER DEFINED	USER DEFINED	
01110 (14)	B.4.1.5.8	B.4.1.5.8	MASS DATA TRANSFER
01111 (15)	USER DEFINED	USER DEFINED	
10000 (16)	USER DEFINED	USER DEFINED	
10001 (17)	USER DEFINED	USER DEFINED	
10010 (18)	USER DEFINED	USER DEFINED	
10011 (19)	B.4.2.2.4	B.4.2.2.5	NUCLEAR WEAPON
10100 (20)	USER DEFINED	USER DEFINED	
10101 (21)	USER DEFINED	USER DEFINED	
10110 (22)	USER DEFINED	USER DEFINED	
10111 (23)	USER DEFINED	USER DEFINED	
11000 (24)	USER DEFINED	USER DEFINED	
11001 (25)	USER DEFINED	USER DEFINED	
11010 (26)	USER DEFINED	USER DEFINED	
11011 (27)	B.4.2.2.4	B.4.2.2.5	NUCLEAR WEAPON
11100 (28)	USER DEFINED	USER DEFINED	
11101 (29)	USER DEFINED	USER DEFINED	
11110 (30)	USER DEFINED	USER DEFINED	DATA WRAPAROUND (NOTE 4)
11111 (31)	B.4.1.1.3	B.4.1.1.3	MODE CODE INDICATOR

TABLE B-III. Vector word (asynchronous action demand) format.

FIELD NAME	BIT NO.	DESCRIPTION
FORMAT FLAG	-00-	Shall be set to logic 1.
NOTIFICATION FLAG (NOTE 1)	-01-	User defined.
	-02-	User defined.
	-03-	User defined.
	-04-	User defined.
	-05-	User defined.
	-06-	User defined.
	-07-	User defined.
	-08-	User defined.
	-09-	User defined.
	-10-	User defined.
	-11-	User defined.
	-12-	User defined.
	-13-	User defined.
	-14-	User defined.
	-15-	User defined.

1/ The user defined field definitions apply only when bit number 00 is set to logic 1. See table B-II for alternate vector word format.

2/ The vector word shall be set to 0000 hexadecimal, unless the service request notification protocol (B.4.1.5.4) is in progress.

TABLE B-IV. DELETED

TABLE B-V. DELETED **[Note B-19b].**

TABLE B-VI. DELETED.

TABLE B-XI. Store control (BC-RT transfer). (Note 1)

WORD NO.	DESCRIPTION/COMMENT	PARAGRAPH or TABLE
-CW-	COMMAND WORD (Subaddress 01011 Binary)	B.4.1.1
-01-	HEADER (0400 hexadecimal)	B.4.2.1.1
-02-	Invalidity for words 01-16	B-XXVI line 2
-03-	Invalidity for words 17-30	B-XXVI line 2
-04-	Control of critical state of store -	B-XXVI line 3
-05-	Set 1 with critical authority	B-XXVI line 5
-06-	Control of critical state of store -	B-XXVI line 4
-07-	Set 2 with critical authority	B-XXVI line 5
-08-	Fuzing mode 1	B-XXVI line 8
-09-	Arm delay from release	B-XXVI line 12
-10-	Fuze function delay from release	B-XXVI line 13
-11-	Fuze function delay from impact	B-XXVI line 14
-12-	Fuze function distance	B-XXVI line 18
-13-	Fire interval	B-XXVI line 20
-14-	Number to fire	B-XXVI line 21
-15-	High drag arm time **[Note B-22]**	B-XXVI line 16
-16-	Function time from event	B-XXVI line 17
-17-	Void/layer number	B-XXVI line 23
-18-	Impact velocity	B-XXVI line 24
-19-	Fuzing mode 2	B-XXVI line 9
-20-	Dispersion data	B-XXVI line 165
-21-	Duration of dispersion	B-XXVI line 166
-22-	Carriage Store S&RE Unit(s) Select (Note 2)	B-XXVI line 167
-23-	Separation elements	B-XXVI line 168 or 169
-24-	Surface delays	B-XXVI line 170 or 171
-25-		
-26-		
-27-	Reserved data words (0000 hexadecimal)	B-XXVI line 1
-28-		
-29-		
-30-	Checksum word	B.4.1.5.2
-SW-	STATUS WORD	B.4.1.2

1/ The message format shown is for BC-RT transfers. The data entities and entity sequence for word numbers 01 through 30 may also be applied to RT-RT transfers providing that the transmitting RT is not an AEIS store.

2/ Word 22 to be used to identify the selected carriage store S&RE unit(s) when D10 (Bit 00) of word 04 is set to logic 1 and D2 through D0 (Bits 08 through 10) are set to logic 010 respectively.

TABLE B-XII. Store monitor (RT-BC transfer). (Note 1)

WORD NO.	DESCRIPTION/COMMENT	PARAGRAPH or TABLE
-CW-	COMMAND WORD (Subaddress 01011 Binary)	B.4.1.1
-SW-	STATUS WORD	B.4.1.2
-01-	HEADER (0420 hexadecimal)	B.4.2.1.1
-02-	Invalidity for words 01-16	B-XXVI line 2
-03-	Invalidity for words 17-30	B-XXVI line 2
-04-	Critical monitor 1	B-XXVI line 6
-05-	Critical monitor 2	B-XXVI line 7
-06-	Fuzing/arming mode status 1	B-XXVI line 10
-07-	Protocol status	B-XXVI line 25
-08-	Monitor of arm delay from release	B-XXVI line 12
-09-	Monitor of fuze function delay from release	B-XXVI line 13
-10-	Monitor of fuze function delay from impact	B-XXVI line 14
-11-	Monitor of fuze function distance	B-XXVI line 18
-12-	Monitor of fire interval	B-XXVI line 20
-13-	Monitor of number to fire	B-XXVI line 21
-14-	Monitor of high drag arm time	B-XXVI line 16
-15-	Monitor of function time from event	B-XXVI line 17
-16-	Monitor of void/layer number	B-XXVI line 23
-17-	Monitor of impact velocity	B-XXVI line 24
-18-	Fuzing/arming mode status 2	B-XXVI line 11
-19-	Monitor of dispersion data	B-XXVI line 165
-20-	Monitor of dispersion duration	B-XXVI line 166
-21-	Monitor of carriage store S&RE Unit(s) select	B-XXVI line 167
-22-	Monitor of separation elements	B-XXVI line 168 or 169
-23-	Monitor of surface delays	B-XXVI line 170 or 171
-24-		
-25-		
-26-		
-27-	Reserved words (0000 hexadecimal)	B-XXVI line 1
-28-		
-29-		
-30-	Checksum word	B.4.1.5.2

1/ The message format shown is for RT-BC transfers. The data entities and entity sequence for word numbers 01 through 30 may also be applied to RT-RT transfers provided that the receiving RT is not an AEIS store.

TABLE B-XV. Store identity (binary).

FIELD NAME	BIT NUMBER	DESCRIPTION
STORE TYPE	-00- MSB = 1024 -01- -02- -03- -04- -05- -06- -07- -08- -09- -10- LSB = 1	Shall be set to indicate the store type code value as assigned by the control point for store nomenclature.
STORE VARIANT	-11- MSB = 16 -12- -13- -14- -15- LSB = 1	Shall be set to indicate the store variant code value as assigned by the control point for store nomenclature.

TABLE B-XVI. Store or aircraft identity (ASCII) **[Note B-22a].**

FIELD NAME	BIT NUMBER	DESCRIPTION
CHARACTER 1	-00-	(Shall be set to logic 0.)
	-01-	High Order Bit
	-02-	
	-03-	
	-04-	
	-05-	
	-06-	
	-07-	Low Order Bit
CHARACTER 2	-08-	(Shall be set to logic 0.)
	-09-	High Order Bit
	-10-	
	-11-	
	-12-	
	-13-	
	-14-	
	-15-	Low Order Bit.

1/ The characters shall be represented by the American National Standard for Information Interchange (ASCII) character code set defined in ANSI X3.4. Alphabetical characters shall be upper case.

2/ Bit numbers 00 and 08 shall be set to logic 0.

3/ The store, or aircraft, type designator shall be a 16 character maximum code assigned by the control point for nomenclature. The type designator shall be left justified blank filled into the eight store identity (ASCII) data words in the store description message (table B-XIII).

Example 1: For type designators AGM-65C and AN/ALQ-137A(V)10:

Store identity (ASCII) word no.	1		2		3		4		5		6		7		8	
Character no.	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
	A	G	M	-	6	5	C									
	A	N	/	A	L	Q	-	1	3	7	A	(	V	)	1	0

Example 2: For type designators F-16C/D and TORNADO-GR4:

Aircraft identity (ASCII) word no.	1		2		3		4		5		6		7		8	
Character no.	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
	F	-	1	6	C	/	D									
	T	O	R	N	A	D	O	-	G	R	4					

TABLE B-XXVI. Data entity list. (Continued)

Line no.	Data entity name	Entity Type and Table number	Entity shall comply with the following requirements and description:
13	Fuze function delay from release	TIME(F), B-XXVII	Shall be used by stores with interface controllable fuzing as the time delay from separation from the aircraft to fuze function.
14	Fuze function delay from impact	TIME(F), B-XXVII	Shall be used by stores with interface controllable fuzing as the time delay from impact to fuze function.
15	Post launch operation delay MSP and LSP	TIME(M) & TIME(L), B-XXVII	The delays required in operation of store assemblies, such as motor fire, flight control, etc. Shall not be used for fuzing/arming.
16	High drag arm time	TIME(F), B-XXVII	(for stores with interface controllable fuzing) Time delay from store separation from the aircraft to fuze arming when store retardation is selected **[Note B-25a].**
17	Function time from event	TIME(F), B-XXVII	(for stores with interface controllable fuzing) Time delay from a specifically defined event to the function of the fuze or store retard mechanism.
18	Fuze function distance	DISTANCE(F), B-XXVII	Shall be used by stores with interface controllable fuzing as the distance from the target required for function. When used for Fuze function height, it represents altitude or depth from local surface required for function. For pressure activated sensors, a surface air pressure of 82 kilopascals shall be assumed.
19	deleted		
20	Fire interval	TIME(L), B-XXVII	Shall be used to set the time interval between successive releases, launches or firings of associated munitions or submunitions.
21	Number to fire	NUMBER(L), B-XXVII	Shall be used to set the number of munitions or submunitions to be released or fired for each release or fire commanded by table B-XXXII, bit number 00.
22	Rounds remaining	NUMBER(L), B-XXVII	The number of submunitions or stores remaining within the store.
23	Void/layer number	NUMBER(L), B-XXVII	(for stores with interface controllable fuzing) Void/layer number at which the fuze is to function.
24	Impact velocity	VELOCITY(M), B-XXVII	Sets the impact velocity.
25	Protocol status	PROTOCOL STATUS, B-XXXIX	Shall be used to report data bus interface protocol errors detected by the applicable subsystem. (See B.4.1.5.1.)

TABLE B-XXVI. Data entity list. (Continued)

Line no.	Data entity name	Entity Type and Table number	Entity shall comply with the following requirements and description:
26	Country code	COUNTRY CODE, B-XIV	Shall use the appropriate country code specified in ISO 3166, upper case alphabetic characters only. Shall be used as a qualifier of STORE IDENTITY (BINARY) and STORE IDENTITY (ASCII) to distinguish between store identities which may be duplicative between different countries.
27	Store identity (binary)	STORE IDENT-ITY (BINARY), B-XV	A binary code assigned by the control point for store nomenclature. When this entity is not used, the word shall be set to 0000 hexadecimal.
28	Store or aircraft identity (ASCII) **[Note B-25b]**	STORE OR AIRCRAFT IDENTITY (ASCII), B-XVI	A code assigned by the control point for nomenclature (ASC/ENS for US DoD). It shall be left justified into the eight data words (max. 16 characters) per table B-XIII. Unused characters shall be set to ASCII blanks. When this entity is not used, the words shall be set to 0000 hexadecimal.
29	Store configuration identifier	ASCII PACKED, B-XL	Specific configuration information about a store, such as the software version installed. It shall be left justified into the three data words (max. 6 characters) per table B-XIII. Unused characters shall be set to ASCII blanks. When this entity is not used, the words shall be set to 0000 hexadecimal.
30	Maximum interruptive BIT time	TIME(F), B-XXVII	The maximum time duration the store may be non-operational while conducting interruptive Built-In-Test (BIT) commanded by the aircraft. If interruptive BIT is not used by the store, the word shall be set to 0000 hexadecimal.
31	ASCII characters	ASCII PACKED, B-XL	Shall be used for the transfer of ASCII encoded characters on the data bus.
32	Indicated airspeed MSP & LSP	VELOCITY(M) & VELOCITY(L), B-XXVII	Indicated airspeed of the aircraft, represented as positive when the aircraft is traveling through static air in the X_a direction defined in figure B-2.
33	True airspeed MSP & LSP	VELOCITY(M) & VELOCITY(L), B-XXVII	True airspeed of the aircraft, represented as positive when the aircraft is traveling through static air in the X_a direction defined in figure B-2.
34	Calibrated airspeed MSP & LSP	VELOCITY(M) & VELOCITY(L), B-XXVII	Calibrated airspeed of the aircraft, represented as positive with the aircraft traveling through static air in the X_a direction defined in figure B-2.
35	Windspeed North MSP & LSP	VELOCITY(M) & VELOCITY(L), B-XXVII	Local windspeed with north defined as the component measured relative to local surface in the north (N) axis as defined by figure B-3.
36	Windspeed East MSP & LSP	VELOCITY(M) & VELOCITY(L), B-XXVII	Local windspeed with east defined as the component measured relative to local surface in the east (E) axis as defined by figure B-3.

TABLE B-XXVI. Data entity list. (Continued)

Line no.	Data entity name	Entity Type and Table number	Entity shall comply with the following requirements and description:
60	Aircraft pitch	ANGLE(M), B-XXVII	Pitch of the aircraft as defined in figure B-5 using the local vertical axis defined in figure B-3.
61	Aircraft roll	ANGLE(M), B-XXVII	Roll of the aircraft as defined in figure B-5 using the local vertical axis as defined in figure B-3.
62	Aircraft magnetic heading	ANGLE(M), B-XXVII	Heading of the aircraft relative to magnetic north as defined in figure B-5 using the local vertical axis as defined in figure B-3.
63	Aircraft-reference X axis offset	DISTANCE(S), B-XXVII	The X component of the distance from the aircraft body axis or sensor axis to the reference axis (D_{xa-r}) as defined in figure B-6.
64	Aircraft-reference Y axis offset	DISTANCE(S), B-XXVII	The Y component of the distance from the aircraft body axis or sensor axis to the reference axis (D_{ya-r}) as defined in figure B-6.
65	Aircraft-reference Z axis offset	DISTANCE(S), B-XXVII	The Z component of the distance from the aircraft body axis or sensor axis to the reference axis (D_{za-r}) as defined in figure B-6.
66	Aircraft-reference axis yaw difference	ANGLE(M), B-XXVII	The yaw angle between the aircraft body axis or sensor axis and the reference axis as defined by figure B-6. Positive angles shall indicate the reference axis is yawed right.
67	Aircraft-reference axis pitch difference	ANGLE(M), B-XXVII	The pitch angle between the aircraft body axis or sensor axis and the reference axis as defined by figure B-6. Positive angles shall indicate the reference axis is pitched up.
68	Aircraft-reference axis roll difference	ANGLE(M), B-XXVII	The roll angle between the aircraft body axis or sensor axis and the reference axis as defined by figure B-6. Positive angles shall indicate the reference axis is banked right (right wing down).
69	Aircraft velocity North MSP & LSP	VELOCITY(M) & VELOCITY(L), B-XXVII	North component of the velocity of the origin of the aircraft axis system as defined in figure B-2 using the local vertical earth axis coordinate system as defined in figure B-3.
70	Aircraft velocity East MSP & LSP	VELOCITY(M), VELOCITY(L), B-XXVII	East component of the velocity of the origin of the aircraft axis system as defined in figure B-2 using the local vertical earth axis coordinate system as defined in figure B-3.
71	Aircraft velocity down MSP & LSP	VELOCITY(M), VELOCITY(L), B-XXVII	Down component of the velocity of the origin of the aircraft axis system as defined in figure B-2 using the local vertical earth axis coordinate system as defined in figure B-3.

TABLE B-XXVI. Data entity list. (Continued)

Line no.	Data entity name	Entity Type and Table number	Entity shall comply with the following requirements and description:
72	Aircraft heading rate	ANGULAR RATE(M),B-XXVII	Rate of change of the information specified in line 58.
73	Aircraft ground track rate	ANGULAR RATE(M), B-XXVII	Rate of change of the information specified in line 59.
74	Aircraft pitch rate	ANGULAR RATE(M), B-XXVII	Rate of change of the information specified in line 60.
75	Aircraft roll rate	ANGULAR RATE(M), B-XXVII	Rate of change of the information specified in line 61.
76	Aircraft system time at reset	TIME(L) B-XXVII **[Note B-25c]**	Aircraft system time at the last reset of the aircraft system clock used by the aircraft as its reference for time tagging data. Stores using time tagged data shall utilize this data in conjunction with present system time to determine the age of the time tagged data.
77	Mach number	NUMBER(S), B-XXVI	Vehicle Mach number.
78	Direction cosine MSP & LSP	FRACTION(M), FRACTION(L), B-XXVII	A matrix element of a 3x3 transformation matrix between the aircraft and reference coordinate systems in accordance with the following matrix equation: $X_r = C * X_{ap}$; where C is the 3x3 transformation matrix and both X_r and X_{ap} are column vectors as defined in figure B-6. The quantity and identification of the matrix elements in C and interpretation of the matrix equation shall be defined in the store interface control document.
79	Initialization year	NUMBER(L), B-XXVII	The current year.
80	Initialization month	NUMBER(L), B-XXVII	Current month of the current year as specified in line 79.
81	Initialization day of month	NUMBER(L), B-XXVII	Current day of the current month as specified in line 80.
82	Initialization day of year	NUMBER(L), B-XXVII	Current day of the current year as specified in line 79 where January 1 is day 1.

TABLE B-XXVI. Data entity list. (Continued)

Line no.	Data entity name	Entity Type and Table number	Entity shall comply with the following requirements and description:
83	Twenty-four hour period	NUMBER(L), B-XXVII	Used by aircraft or stores; the number of whole 24 hour periods to, or from, the referenced event. It is used as required to compliment the time data entity in line 84..
84	Time MSP, LSP, & LLSP	TIME(M), TIME(L), TIME(LL), B-XXVII	Used by aircraft or stores; the time to, or from, the referenced event.
85	Time tag	TIME(L), B-XXVII	Inserted into the message by the source equipment responsible for the data entity(s) on which the time tag is to be used and shall be the aircraft time current at the data measurement or event.
86	Aircraft time	TIME(L), B-XXVII	Aircraft time to be transmitted to the store to allow base time synchronization to take place. It shall be valid at the zero crossing of the parity bit of the associated command word received at the ASI, with the tolerance specified in the ICD.
87	Representative group envelope delay	TIME(LL), B-XXVII	Delay to a signal from the signal source to the signal sink.
88	Store repre-sentative group envelope delay	TIME(LL), B-XXVII	Delay to a signal from the signal source in the store to the MSI or from the MSI to the signal sink in the store.
89	Signal or data latency MSP, LSP, & LLSP	TIME(M), TIME(L) & TIME(LL), B-XXVII	Latency of the signal or data during transfer between a source and the MSI.
90	Signal or data response time MSP, LSP, & LLSP	TIME(M), TIME(L) & TIME(LL), B-XXVII	Time between the signal or data at an MSI and its resultant response or event.
91	Signal or data delay time MSP, LSP, & LLSP	TIME(M), TIME(L) & TIME(LL), B-XXVII	Delay caused to the signal or data during the transfer between a sink and the source.
92	Target time MSP & LSP	TIME(M), TIME(L), B-XXVII	System time at the point in time when the target position is valid.
93	Waypoint number of target	INTEGER, B-XXVII	Waypoint number, as specified in line 138, of the target position where a course to target trajectory defined by waypoints is used.

TABLE B-XXVI. Data entity list. (Continued)

Line no.	Data entity name	Entity Type and Table number	Entity shall comply with the following requirements and description:
94	Target file number	NUMBER(L), B-XXVII	Indicates the selected target file.
95	Target probability	FRACTION(M), B-XXVII	Probability that the target can be successfully intercepted by the store where all unknown factors are assumed to not adversely affect the probability.
96	Target discriminator	DISCRIMINATOR DESCRIPTION, B-XLI	Indicates which of a group of targets shall be selected by terminal guidance.
97	Sea level air pressure at target MSP & LSP	PRESSURE(M) & PRESSURE(L), B-XXVII	Sea-level referenced air pressure at the target position.
98	Current active target number	NUMBER(L), B-XXVII	Target number for which all information received by the store applys, and which also is the preferred target once the store is released. Stores implementing multiple targeting shall assume that information received corresponds to the last target number received.
99	Target invalidity	INVALIDITY, B-XXXI	Validity for sixteen targets where valid (logic 0) shall equate to an available-for-use state.
100	Target latitude MSP & LSP	ANGLE(M) & ANGLE(L), B-XXVII	Geodetic latitude of the target position as defined in figure B-3.
101	Target longitude MSP & LSP	ANGLE(M) & ANGLE(L), B-XXVII	Geodetic longitude of the target position as defined in figure B-3.
102	Target geodetic altitude MSP & LSP	DISTANCE(M) & DISTANCE(L), B-XXVII	Geodetic altitude of the target position from the reference ellipsoid as defined in figure B-3.
103	North target distance from fixed point origin MSP & LSP	DISTANCE(M) & DISTANCE(L), B-XXVII	North component (N_t) of the current target position displacement from the fixed point as shown in figure B-4. The coordinate system shall be the local fixed point earth axis system defined in figure B-3.
104	East target distance from fixed point origin MSP & LSP	DISTANCE(M) & DISTANCE(L), B-XXVII	East component (E_t) of the current target position displacement from the fixed point as shown in figure B-4. The coordinate system shall be the local fixed point earth axis system defined in figure B-3.

TABLE B-XXVI. Data entity list. (Continued **[Note B-26a]**)

Line no.	**Data entity name**	**Entity Type and Table number**	**Entity shall comply with the following requirements and description:**
172	Store station number	STORE STATION NUMBER B-XLVIII, ZONE 1	Shall be used to indicate the store station number to which the store is attached. It is to be used only in conjunction with line no. 28.
173	Pylon/Bay identity	PYLON/BAY IDENTITY B-XLVIII, ZONE 2	Shall be used to indicate the pylon or bay to which the store is attached. It is to be used only in conjunction with line no. 28

TABLE B-XXVII. Linear data entities.

WORD TYPE	FORMAT AS TABLE	MSB VALUE	LSB VALUE
TIME(M) (MICROSECONDS)	B-XXIX (UNSIGNED)	2^{37} (1.37×10^{11})	2^{22} (4.19×10^{6})
TIME(L) (MICROSECONDS)	B-XXIX (UNSIGNED)	2^{21} (2.1×10^{6})	2^{6} (64)
TIME(LL) (MICROSECONDS)	B-XXIX (UNSIGNED)	2^{5} (32)	2^{-10} (9.77×10^{-4})
TIME(F) (MICROSECONDS)	B-XXX (SCIENTIFIC)	INTEGER:-(2^{11})(-2048) EXPONENT: 16^{8}	INTEGER: 2^{0}(1) EXPONENT: 16^{0}
FREQUENCY(M) (MHz)	B-XXIX (UNSIGNED)	2^{24} (1.68×10^{7})	2^{9} (512)
FREQUENCY(L) (MHz)	B-XXIX (UNSIGNED)	2^{8} (256)	2^{-7} (7.8×10^{-3})
FREQUENCY (LL) (MHz)	B-XXIX (UNSIGNED)	2^{-8} (3.9×10^{-3})	2^{-23} (1.19×10^{-7})
DISTANCE(M) (METERS)	B-XXVIII (2's COMPLEMENT)	-(2^{24} **[Note B-27]**) (-1.68X10^{7})	2^{9} (512)
DISTANCE(L) (METERS)	B-XXIX (UNSIGNED)	2^{8} (256)	2^{-7} (7.8×10^{-3})
DISTANCE(S) (METERS)	B-XXVIII (2's COMPLEMENT)	-(2^{8}) (-256)	2^{-7} (7.8×10^{-3})
DISTANCE(F) (METERS)	B-XXVIII (2's COMPLEMENT)	-(2^{14}) (-16384)	2^{-1} (0.5)
VELOCITY(M) (METERS/SECOND)	B-XXVIII (2's COMPLEMENT)	-(2^{13}) (-8192)	2^{-2} (0.25)
VELOCITY(L) (METERS/SECOND)	B-XXIX (UNSIGNED)	2^{-3} (0.125)	2^{-18} (3.8×10^{-6})
ACCELERATION(M) (METERS/SECOND^2)	B-XXVIII (2's COMPLEMENT)	-(2^{10}) (-1024)	2^{-5} (3.1×10^{-2})
ACCELERATION(L) (METERS/SECOND^2)	B-XXIX (UNSIGNED)	2^{-6} (1.56×10^{-2})	2^{-21} (4.77×10^{-7})
ANGLE(M) (SEMICIRCLES)	B-XXVIII (2's COMPLEMENT)	-(2^{0}) (-1)	2^{-15} (3.05×10^{-5})
ANGLE(L) (SEMICIRCLES)	B-XXIX (UNSIGNED)	2^{-16} (1.53×10^{-5})	2^{-31} (4.66×10^{-10})

TABLE B-XXVII. Linear data entities. (continued)

WORD TYPE	FORMAT AS TABLE	MSB VALUE	LSB VALUE
ANGULAR RATE(M) (SEMICIRCLES/SEC)	B-XXVIII (2's COMPLEMENT)	$-(2^{2})$ (-4)	2^{-13} **[Note B-27a]** (1.22×10^{-4})
ANGULAR RATE(L) (SEMICIRCLES/SEC)	B-XXIX (UNSIGNED)	2^{-14} (6.10×10^{-5})	2^{-29} (1.86×10^{-9})
TEMPERATURE (DEGREES CELSIUS)	B-XXVIII (2's COMPLEMENT)	$-(2^{11})$ (-2048)	2^{-4} (0.0625)
PRESSURE(M) (KILOPASCALS)	B-XXVIII (2's COMPLEMENT)	$-(2^{15})$ (-32768)	2^{0} (1)
PRESSURE(L) (KILOPASCALS)	B-XXIX (UNSIGNED)	2^{-1} (0.5)	2^{-16} (1.53×10^{-5})
INTEGER	B-XXVIII (2's COMPLEMENT)	$-(2^{15})$ (-32768)	2^{0} (1)
NUMBER(L)	B-XXIX (UNSIGNED)	2^{15} **[Note B-27b]** (32768)	2^{0} (1)
NUMBER(S)	B-XXVIII (2's COMPLEMENT)	$-(2^{5})$ (-32)	2^{-10} (9.77×10^{-4})
FRACTION(M)	B-XXVIII (2's COMPLEMENT)	$-(2^{0})$ (-1)	2^{-15} (3.05×10^{-5})
FRACTION(L)	B-XXIX (UNSIGNED)	2^{-16} (1.53×10^{-5})	2^{-31} (4.66×10^{-10})
RATIO	B-XXIX (UNSIGNED)	2^{7} (128)	2^{-8} (3.91×10^{-3})
AREA(M) **[Note B-28]** (SQUARE CENTIMETERS)	B-XXIX (UNSIGNED)	2^{31} (2.14748×10^{9})	2^{16} (65356)
AREA(L) (SQUARE CENTIMETERS)	B-XXIX (UNSIGNED)	2^{15} (32768)	2^{0} (1)

1/ (M) = Most significant part, (L) = Less significant part, (LL) = Lower Least significant part, (F) = Fuze, (S) = Single word format

2/ In a 2's complement number, the first bit has a value of minus twice the magnitude of the next highest order bit. The first bit is sometimes referred to as a sign bit instead of being designated the MSB **[Note B-28a].**

3/ The decimal values in parenthesis are for information only and are approximate in some cases **[Note B-28b].**

TABLE B-XXVIII. 2's complement format.

FIELD NAME	BIT NUMBER	DESCRIPTION
MSB	-00-	MOST SIGNIFICANT DATA BIT
	-01-	
	-02-	
	-03-	
	-04-	
	-05-	
	-06-	
	-07-	
	-08-	
	-09-	
	-10-	
	-11-	
	-12-	
	-13-	
	-14-	
LSB	-15-	LEAST SIGNIFICANT DATA BIT

1/ Bit numbers 00 through 15 shall be encoded in 2's complement format. To obtain a negative of the number, all bits are inverted and one LSB is added to the resulting number.

EXAMPLE: FFFF (hexadecimal) is the 2's complement of 1 (decimal), and therefore indicates -1 (decimal).

2/ The first bit of a two's complement number (bit number 00) is sometimes called the sign bit, as it was in MIL-HDBK-1553 **[Note B-28c]**. This results in the same bit pattern and is therefore functionally equivalent **[Note B-28d]**.

TABLE B-XXIX. Unsigned format.

FIELD NAME	BIT NUMBER	DESCRIPTION
MSB	-00-	MOST SIGNIFICANT DATA BIT
	-01-	
	-02-	
	-03-	
	-04-	
	-05-	
	-06-	
	-07-	
	-08-	
	-09-	
	-10-	
	-11-	
	-12-	
	-13-	
	-14-	
LSB	-15-	LEAST SIGNIFICANT DATA BIT

1/ For applications where an “unsigned" formatted data word is used as the least significant part of a two word data parameter, this least significant word shall be encoded consistent with the encoding of the most significant word in the set. If the most significant word is encoded as a 2's complement, then this least significant word shall represent a continuation of a 2's complemented value.

EXAMPLE: A/ Two word unsigned value:

System time 6,400,000 (decimal) microseconds using TIME(M) and TIME(L) -

MSP = 0001 Hexadecimal

LSP = 86A0 Hexadecimal

EXAMPLE: B/ Two word signed value:

Aircraft distance north of 1967 (decimal) meters using DISTANCE(M) and DISTANCE(L) -

MSP = 0003 Hexadecimal

LSP = D780 Hexadecimal

Aircraft distance north of -1967 (decimal) meters using DISTANCE(M) and DISTANCE(L) -

MSP = FFFC Hexadecimal

LSP = 2880 Hexadecimal

TABLE B-XXX. Binary scientific notation format.

FIELD NAME	BIT NUMBER	DESCRIPTION
MSB	-00-	= -2048 UNITS
	-01-	
	-02-	
	-03-	2's COMPLEMENT
	-04-	BINARY INTEGER
	-05-	
	-06-	
	-07-	
	-08-	
	-09-	
	-10-	
LSB	-11-	= 1 UNIT
EXPONENT MSB	-12-	= 8
	-13-	BINARY INTEGER
	-14-	
LSB	-15-	= 1

1/ The value represented by this format is given by:

$(\text{Integer}) \times 16^{(\text{Exponent})}$

EXAMPLE: 0142 (hexadecimal) shall equate to 20×16^2 (decimal) or 5120 (decimal)

TABLE B-XXXI. Invalidity word.

FIELD NAME	BIT NUMBER	DESCRIPTION
INVALIDITY	-00-	INVALIDITY OF WORD 1
	-01-	INVALIDITY OF WORD 2
	-02-	INVALIDITY OF WORD 3
	-03-	INVALIDITY OF WORD 4
	-04-	INVALIDITY OF WORD 5
	-05-	INVALIDITY OF WORD 6
	-06-	INVALIDITY OF WORD 7
	-07-	INVALIDITY OF WORD 8
	-08-	INVALIDITY OF WORD 9
	-09-	INVALIDITY OF WORD 10
	-10-	INVALIDITY OF WORD 11
	-11-	INVALIDITY OF WORD 12
	-12-	INVALIDITY OF WORD 13
	-13-	INVALIDITY OF WORD 14
	-14-	INVALIDITY OF WORD 15
	-15-	INVALIDITY OF WORD 16

1/ Invalidity bit set to logic 1 shall indicate that a word is invalid **[Note B-28e].**

2/ For the standard message to/from subaddress 11, the invalidity bits associated with the reserved words and those associated with words that are defined in the system specification or ICD as not utilized, shall be set to logic 0 (valid).

3/ For the standard message to/from subaddress 11, bits 00 through 15 in the invalidity word shall indicate invalidity of words 1 through 16 in the message and bits 00 through 15 in a second invalidity word shall indicate the invalidity of words 17 through 32 in the message. Bits 14 and 15 in the second word shall only be utilized during the routing of message to/from a mission store carried on a carriage store and shall be set to logic 0 at all other times.

4/ For user defined messages, utilization and setting of the invalidity bits shall be as defined in the system specification or ICD.

TABLE B-XLVII. Aircraft description message. (Note 1 **[Note B-29a]**)

WORD NO.	DESCRIPTION/COMMENT	PARAGRAPH or TABLE
-CW-	COMMAND WORD (Subaddress 00001 Binary)	B.4.1.1
-01-	HEADER (0421 hexadecimal)	B.4.2.1.1
-02-	Invalidity for words 01-16	BXXVI line 2
-03-	Invalidity for words 17-32	BXXVI line 2
-04-	Country code	B-XXVI line 26
-05-	Aircraft identity (ASCII) 1	B-XXVI line 28
-06-	Aircraft identity (ASCII) 2	B-XXVI line 28
-07-	Aircraft identity (ASCII) 3	B-XXVI line 28
-08-	Aircraft identity (ASCII) 4	B-XXVI line 28
-09-	Aircraft identity (ASCII) 5	B-XXVI line 28
-10-	Aircraft identity (ASCII) 6	B-XXVI line 28
-11-	Aircraft identity (ASCII) 7	B-XXVI line 28
-12-	Aircraft identity (ASCII) 8	B-XXVI line 28
-13-	Station number and pylon/bay identity	B-XXVI lines 172 & 173
-14-		
-15-		
-16-		
-17-		
-18-		
-19-		
-20-		
-21-		
-22-		
-23-	Reserved words (0000 hexadecimal)	B-XXVI line 1
-24-		
-25-		
-26-		
-27-		
-28-		
-29-		
-30-	Checksum word	B.4.1.5.2.1
-SW-	STATUS WORD	B.4.1.2

1/ The message format shown is for BC-RT transfers.

TABLE B-XLVIII. Store station number and pylon/bay identity **[Note B-29b]**.

FIELD NAME	BIT NUMBER	DESCRIPTION
ZONE 1 STORE STATION NUMBER	-00- -01- -02- -03- -04- -05- -06- -07-	MSB = 128 LSB = 1
ZONE 2 PYLON/BAY IDENTITY (See note 2)	-08- -09- -10- -11- -12- -13- -14- -15-	Shall be set to logic 0 High Order Bit Low Order Bit

1/ Bit number 08 shall be set to logic 0.

2/ PYLON/BAY IDENTITY shall be represented by the ASCII character code set defined in ANSI X3.4. Alphabetic characters shall be uppercase.

ANNOTATIONS EXPLAINING DIFFERENCES FROM PRIOR REVISIONS.

This is a continuation of the notes list. This listing is only a summary and does not include all changes. Note numbers in this list correspond to the [Note #] comments in the body of this document.

Page: 5
[Note8a] This paragraph, and changes to the above paragraphs, were inserted in Notice 1 to clarify the status of devices such as rocket pods, flare dispensers and small smart bomb dispensers. Basic options considered were: a) Call them “mission stores”, which is confusing since they drop weapons, like a carriage store, or, b) Call them “carriage stores”, so they can claim the higher input power voltages allocated to carriage stores, but this ignores the fact that they will be carried on other carriage stores in some applications and their lack of CSSIs violates the carriage store section of 1760C, or, c) define another class of store called a “dispenser” which has a 1760 interface on the top and some smaller, lower cost interface (or no electrical interface at all) to the devices they carry. Option C was chosen.

Page: 7
[Note8b] Phrase inserted in Notice 1 to clarify that 270 V dc is not required in the Class IIA interface

Page: 9
[Note13a] Address bit A0 was re-inserted on this figure in notice 1 to correct a typo.

Page: 10
[Note13b] Asterisks added in Notice 1 to clarify that 270 V dc power is not included in the class IIA interface.

Page: 59
[Note86a] Notice 1 added the lines that were missing from Figure 25a, with no change in the intended requirement.

Page: 61
[Note87a] This changed in Notice 1 because the minor changes made in notice 1 are marked by change bars in the margin.

Page: 68
[Note B-4a] Notice 1 changed the time format as part of the addition of time tagging requirements.

Page: 69
[Note B-7a] Missing paragraph references were added in Notice 1.

Page: 72
[Note B-8a] Notice 1 added time tagging to reduce the proliferation of functionally equivalent but technically different ways to pass time tags. Note, this version is only the aircraft-to-store part. AS1B has not yet voted on the store-to-aircraft part.

Page: 73
[Note B-12a] Notice 1 added a new Aircraft Identity message, to be used by stores which need information about the aircraft they are being launched from. It is patterned off the existing store identity message.

Page: 85
[Note B-13a] Notice 1 added time tagging to reduce the proliferation of functionally equivalent but technically different ways to pass time tags. Note, this version is only the aircraft-to-store part. AS1B has not yet voted on the store-to-aircraft part.

Page: 96
[Note B-19a] Notice 1 changed this from “user defined”, since it is now assigned for aircraft description.

Page: 101
[Note B-19b] Notice 1 deleted these three tables which are no longer needed because of the time tagging change.

Page: 112
[Note B-22a] Notice 1 revised this table to add aircraft identity.

Page: 123
[Note B-25a] Notice 1 changed the wording of these two fuzing entities to correctly state the intent.

Page: 124
[Note B-25b] Reference to aircraft identity added by Notice 1.

Page: 128
[Note B-25c] Notice 1 changed this entity to use only TIME (L).

Page: 136a
[Note B-26a] Notice 1 added entities 172 and 173 as part of the addition of aircraft description.

Page: 138
[Note B-27a] Notice 1 deleted the minus sign from in front of the “2”. It was apparently a typo.

Page: 138
[Note B-27b] Notice 1 moved up the exponent on these two numbers, to appear as proper superscripts.

Page: 138
[Note B-28a] Notice 1 added this note to explain why the sign of the MSB is different than the sign of the LSB, and to explain that other documents call the first bit a sign bit.

Page: 138
[Note B-28b] Notice 1 added this note to clarify that the binary values in the table are the actual values and the decimal numbers are rounded off in some cases.

Page: 139
[Note B-28c] MIL-HDBK-1553 is being re-published by the SAE as AS-15532. This new document might also refer to the first bit as the sign bit.

Page: 139
[Note B-28d] This note added by Notice 1 to clarify.

Page: 142
[Note B-28e] Notes on invalidity words were revised in Notice 1 to clarify.

Page: 158a
[Note B-29a] This new table added in Notice 1 to allow aircraft to identify themselves to stores when necessary.

Page: 158b
[Note B-29b] This new table added in Notice 1 to allow aiircraft to tell stores where they are located when necessary.

CONCLUDING MATERIAL

Custodians:
Army - AV
Navy - AS
Air Force - 11

Preparing activity:
Air Force - 11

Review activities:
Navy - EC, SH, OS, MC, TD
Air Force - 15

Project No. GDRQ-0160

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AIRCRAFT/STORE ELECTRICAL INTERCONNECTION SYSTEM

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