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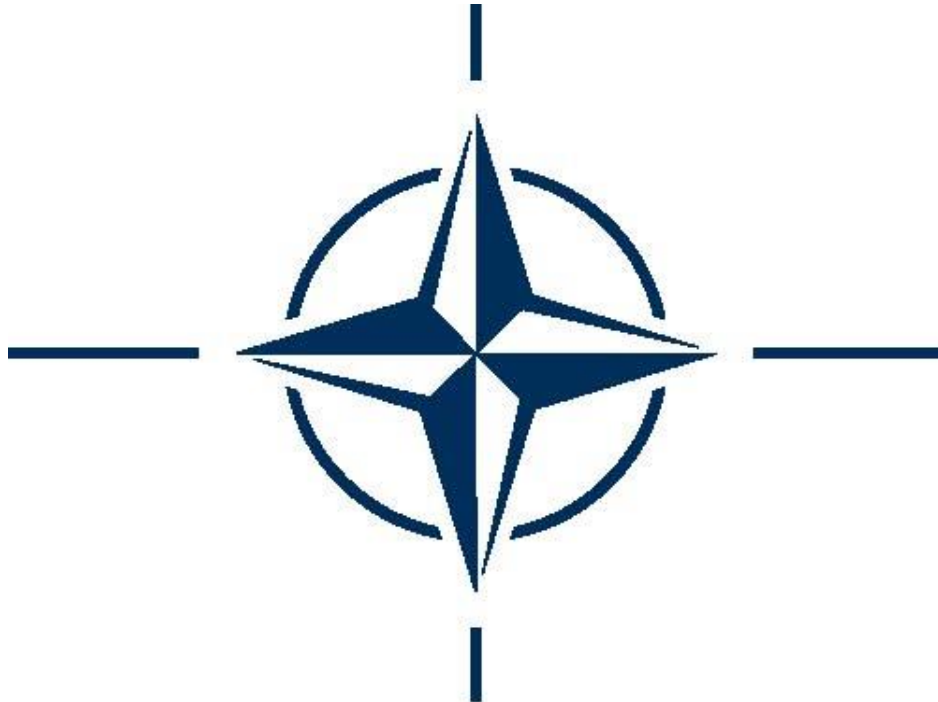
**NATO STANDARD**

**AETP-12.8**

**NATO IFF TEST REQUIREMENTS –  
INTERROGATOR PLATFORM  
INTEGRATION  
MARK XIIA AND MODE S**

**Edition A Version 1**

**SEPTEMBER 2019**



**NORTH ATLANTIC TREATY ORGANIZATION**

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**NATO STANDARDIZATION OFFICE (NSO)**

**NATO LETTER OF PROMULGATION**

26 September 2019

1. The enclosed Allied Electronic Publication AEtP-12.8, Edition A, Version 1, NATO IFF TEST REQUIREMENTS – INTERROGATOR PLATFORM INTEGRATION MARK XIIA AND MODE S, which has been approved by the nations in the Consultation Command and Control (C3) Board, is promulgated herewith. The recommendation of nations to use this publication is recorded in STANREC 5647.
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## **RECORD OF SPECIFIC RESERVATIONS**

[nation]	[detail of reservation]
<p>Note: The reservations listed on this page include only those that were recorded at time of promulgation and may not be complete. Refer to the NATO Standardization Document Database for the complete list of existing reservations.</p>	

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# 1 GENERAL

## 1.1 Safety

Coordinate with the local Air Traffic Control (ATC) before performing any testing. Ensure no radiation of false altitudes, Mode 3/A Codes, or Emergency. Frequency Authorization must be obtained for all interrogators and Identification Friend or Foe (IFF) test equipment.

## 1.2 Introduction

These test requirements have been prepared by the North Atlantic Treaty Organization (NATO) IFF Capability Team (CaT). The requirements were developed in order to perform installed-level qualification testing for transponders in accordance with STANAG 4193 Edition 3.

## 1.3 Objective

The purpose of these test requirements is to provide a minimum set of tests to evaluate the installed interrogator system compliance with the STANAG 4193 Edition 3 specification. Successful completion of these tests provides an acceptable confidence level that this Mark XIIA interrogator system installation is ready for the operational testing contained within AEtP-12.9, the NATO Test Requirements – Interrogator Flight Mark XIIA and Mode S.

## 1.4 Scope

These test requirements define the system checks required to demonstrate compliance to STANAG 4193 Edition 3 for interrogator system installations on air, land, and sea-based platforms. The NATO IFF Performance Test – Interrogator Bench should be completed prior to platform installation. This document does not attempt to cover all system specific requirements; however, all system requirements must be evaluated.

## 1.5 General Guidance

- Unless otherwise directed, Standard Reply/Report Signals (SRS) as defined in A STANAG 4193 Edition 3 Part I Annex K should be used for all testing.
- When testing using a direct connection, the channels not under test must be connected to a dummy load.
- Flight Line test equipment is allowed for all measurements of power, sensitivity and frequency in this document. The tolerances of the measurement can be adjusted in accordance with the tolerance of the test equipment. Example: If a tolerance is  $\pm 2$  dB in the document and the measurement equipment has an accuracy tolerance of  $\pm 2$  dB, the tolerance of the measurement for that test can be adjusted to  $\pm 4$  dB.
- Ensure tester is aware of any classified parameters prior to testing i.e. range, etc...

## 1.6 Equipment List

The tester(s) must provide the information requested in Section 2.

## 1.7 Information Needed

*STANAG 4193 Ed 3: Part III Annex A 2.2.4.3*

Complete the following checklist prior to scheduling the testing event:

- Frequency authorization for platform
- Frequency authorization for test set(s)

- Platform IFF specification
- Dry run data sheets
- Software Description Document (SDD) / Version Description Document (VDD) for platform controlling software
- Electromagnetic Environmental Effects (E3) Test Report
- Antenna patterns (if not provided with the NATO IFF Performance Test – Interrogator Bench testing), antenna specification, Voltage Standing Wave Ratio (VSWR), cable loss measurements
- Schematic diagram of IFF emergency bus (if applicable)
- Schematic diagram of suppression bus
- IFF system interconnection diagram(s)
- Pictures/diagrams/schematics of the control interface (e.g. 1553, ARINC 429, Ethernet...)
- Description of how keys are protected during crash (if applicable)
- Data / white papers for all testing conducted by analysis
- Built-In-Test (BIT) failure codes (if applicable)
- Certification test plans / procedures derived from this document (if applicable)

## 1.8 List of Acronyms

1090ES	Mode S Extended Squitter
ADS-B	Automatic Dependent Surveillance-Broadcast
ATC	Air Traffic Control
ATCRBS	Air Traffic Control Radar Beacon System
BIT	Built-In-Test
CaT	Capability Team
E3	Electromagnetic Environmental Effects
FOM	Figure of Merit
GNSS	Global Navigation Satellite System
ID	Identification
IFF	Identification Friend or Foe
II	Interrogator Identifier
I/P	Identification of Position
ISLS	Interrogation Sidelobe Suppression
MDL	Minimum Decode Level
NATO	North Atlantic Treaty Organization
NO	National Origin
PIN	Platform Identification Number
RF	Radio Frequency
SDD	Software Description Document
SI	Surveillance Identifier
SIF	Selective Identification Feature
SRS	Standard Reply (or Report) Signal
SUR	Suppression of Unnecessary Replies
TCAS	Traffic Alert and Collision Avoidance System
TEK	Traffic Encryption Key

TOD	Time of Day
UAT	Universal Access Transceiver
UF	Uplink Format
UTC	Coordinated Universal Time
VDD	Version Description Document
VSWR	Voltage Standing Wave Ratio

## 1.9 References

- 1) STANAG 4193 Edition 3  
Technical Characteristics of the IFF Mk XIIA System
- 2) AEtP-12.9  
NATO IFF Test Requirements – Interrogator Flight Mark XIIA and Mode S
- 3) AEtP-12.5  
NATO IFF Test Requirements – Interrogator Box Mark XIIA and Mode S
- 4) ICAO Annex 10 Volume IV  
International Standards and Recommended Practices for Aeronautical Telecommunications, Surveillance and Collision Avoidance Systems

## 2 PLATFORM INFORMATION

### 2.1 General

Engineer(s) witnessing test \_\_\_\_\_

Date \_\_\_\_\_

Platform Type (i.e. DDG, F-15, F-18...) \_\_\_\_\_

Tail number or other Platform Identifier \_\_\_\_\_

Supported Modes (1, 2, 3/A, C, 4, 5 Level 1, 5 Level 2, S, Automatic Dependent Surveillance-Broadcast)

### 2.2 Interrogator

System nomenclature \_\_\_\_\_

Model \_\_\_\_\_

Part number \_\_\_\_\_

Serial number \_\_\_\_\_

Software version \_\_\_\_\_

### 2.3 Cryptographic Computer

System nomenclature \_\_\_\_\_

Part number \_\_\_\_\_

Serial number \_\_\_\_\_

Version \_\_\_\_\_

### 2.4 Test Set(s)

System nomenclature \_\_\_\_\_

Model \_\_\_\_\_

Part number \_\_\_\_\_

Serial number \_\_\_\_\_

Software version \_\_\_\_\_

Calibration date \_\_\_\_\_



**2.5 Mode 5 Time Source**

Formats Interrogated 0, 1, 2, 3, 4, 8, 9, 16, 17, 18, 19, 20

System nomenclature \_\_\_\_\_

Model \_\_\_\_\_

Part number \_\_\_\_\_

Software version \_\_\_\_\_

Update rate \_\_\_\_\_

**2.6 Position Source(s)**

**2.6.1 Mode 5 Position Source**

System nomenclature \_\_\_\_\_

Model \_\_\_\_\_

Part number \_\_\_\_\_

Software version \_\_\_\_\_

Update rate \_\_\_\_\_

Verify that the position is provided by a secure source PASS/FAIL

**2.6.2 ADS-B (if different and required)**

System nomenclature \_\_\_\_\_

Model \_\_\_\_\_

Part number \_\_\_\_\_

Software version \_\_\_\_\_

Update rate \_\_\_\_\_

**2.7 Antenna(s)**

Type \_\_\_\_\_

Model \_\_\_\_\_

Part number \_\_\_\_\_

Rotation Rate(s) \_\_\_\_\_

Cable type used \_\_\_\_\_

## 2.8 IFF Control Unit

System nomenclature \_\_\_\_\_

Model \_\_\_\_\_

Part number \_\_\_\_\_

Software Version \_\_\_\_\_

## 2.9 Frequency Assignment

1030 Radio Frequency Assignment Number \_\_\_\_\_

1090 Radio Frequency Assignment Number \_\_\_\_\_

### 3 ANTENNA ANALYSIS

#### 3.1 USA Specific Requirement - Link 16 Compatibility

For platforms with a Link 16 terminal, verify that the Link 16 emissions received by the interrogator are at least 10 dB below Minimum Decode Level (MDL) at 1090 MHz.

PASS / FAIL / NA

#### 3.2 Antenna Characteristics

*STANAG 4193 Ed 3: Part III Annex A 2.2.1.3*

Using information from the antenna manufacturer(s), verify that the antenna(s) are vertically polarized.

PASS / FAIL

#### 3.3 Antenna Pattern

*STANAG 4193 Ed 3: Part I Annex E 2.4.1.1; Part III Annex A 2.2.1; Part III Annex A 2.2.1.4; Part III Annex A 2.2.1.7; Part III Annex A 2.2.2.2; Part I Annex A 2.2.2.3*

Verify that two Interrogation Sidelobe Suppression (ISLS) pulses are radiated for Mode 5.

PASS / FAIL

Inspect the antenna patterns (taking into account all defined operational configurations of the platform) for the following:

Verify that the interrogation pulses are radiated in a directional pattern.

PASS / FAIL

Verify that the ISLS control pulse(s) cover the side and back lobes of the directional pattern.

PASS / FAIL

Verify that the ISLS control pulse(s) is radiated at a Radio Frequency (RF) level at least 9 dB below the main beam component within the desired sector of interrogation (USA requires the RF level to be at least 11 dB below the main beam component within the desired sector of interrogation).

PASS / FAIL

Verify that the antenna covers the ranges, elevation angles, and azimuths as required by the platform specifications.

Range: \_\_\_\_\_ Elevation  $\pm$ : \_\_\_\_\_ Azimuths: \_\_\_\_\_

PASS / FAIL

#### 3.4 ISLS Pulse Spacing

*STANAG 4193 Ed 3: Part I Annex B, C, E 2.4.1.3; Part III Annex A 2.2.1.6; ICAO Annex 10: 3.1.2.1.5.2.4*

If there are multiple antenna configurations / back-up configurations, each one must be verified. Items (b) and (c) include transmission time through RF cables and connectors; and any installed RF filters, diplexers, rotary joints, and RF switches (if external to the interrogator or antenna).

Calculate the minimum and maximum ISLS spacing errors using the following:

(a) ISLS pulse(s) box level spacing error (from the NATO IFF Performance Test – Interrogator Bench):

Mode 1: \_\_\_\_\_ μs      Mode 2: \_\_\_\_\_ μs      Mode 3/A: \_\_\_\_\_ μs

Mode C: \_\_\_\_\_ μs      Mode 4: \_\_\_\_\_ μs      Mode S: \_\_\_\_\_ μs

Mode 5 (worst case): \_\_\_\_\_ μs

(b) Transmission time from interrogator to main beam antenna: \_\_\_\_\_ μs

(c) Transmission time from interrogator to antenna used for ISLS pulses: \_\_\_\_\_ μs

(d) Horizontal distance between the two antennas: \_\_\_\_\_ m

Using the following equation, verify that the timing offset of main beam and control beam signals received at any location relative to the host platform does not exceed ± 0.1 μs (± 0.05 μs for Mode S installations). (Note that the USA does not have this requirement).

$$[(|[(c) - (b)]|) + ((d) * 0.00334)] \text{ _____ } \mu\text{s}$$

Using the following equation, verify that each mode is within the spacing tolerance required for that mode and record the results in the table below.

$$(a) \pm [(|[(c) - (b)]|) + ((d) * 0.00334)] \text{ _____ } \mu\text{s} \text{ \& } \text{ _____ } \mu\text{s}$$

Mode	Min Spacing Error	Max Spacing Error	Required Spacing Error	Result
1			-0.15 to +0.05 μs	PASS / FAIL / NA
2, 3/A, C			-0.15 to +0.15 μs	PASS / FAIL / NA
4			-0.1 to +0.1 μs	PASS / FAIL / NA
5			-0.125 to +0.125 μs	PASS / FAIL / NA
S			-0.05 to +0.05 μs	PASS / FAIL / NA

Verify that Mode S P<sub>5</sub> is radiated using a separate antenna pattern.

PASS / FAIL / NA

## 4 TRANSMITTER ANALYSIS

### 4.1 Effective Radiated Power

STANAG 4193 Ed 3: Part III Annex A 2.2.2.1

Record the required operational maximum range of the system: R = \_\_\_\_\_ km

Calculate the interrogator effective radiated power from the following equation:

$$P_{IE} = T_S + L_P + M_L + L_S \text{ dBm}$$

$P_{IE}$  = Interrogator effective radiated power

$T_S$  = Transponder effective sensitivity =  $MTL + L_T + L_A - G_T$  dBm

$MTL$  = Transponder sensitivity = -74 dBm (non-Mode 5); -80 dBm (Mode 5)

$L_T$  = Transponder feeder losses = 3 dB

$L_A$  = Transponder antenna pattern loss = 3 dB

$G_T$  = Transponder antenna gain = 0 dBi

$L_P$  = Propagation losses =  $L_{FS} + L_{AT} + L_{PR}$  dB

$L_{FS}$  = Free space path loss =  $93 + 20 \log_{10} R$

$L_{AT}$  = Atmospheric losses  $\leq 1.3$  dB

$L_{PR}$  = Propagation loss due to multipath antenna lobing  $\leq 3$  dB

$M_L = M + M_M$  dB

$M$  = A margin that allows for tolerances and computational accuracy (dB)  $\leq 3$  dB

$M_M$  = A mode specific link margin that compensates for differential transponder sensitivities in different modes of operation = 0 dB (non-Mode 5); 6 dB (Mode 5)

$L_S$  = Interrogator antenna pattern / scan loss = difference between the maximum gain on the antenna boresight and the minimum gain over the beamwidth in which system performance is defined

Values used:

$L_{AT}$ : \_\_\_\_\_ dB

$L_{PR}$ : \_\_\_\_\_ dB

$M$ : \_\_\_\_\_ dB

$L_S$ : \_\_\_\_\_ dB

**Calculated value:**  $P_{IE}$ : \_\_\_\_\_ dBm

Verify that the peak power radiated in each mode is less than or equal to the value calculated. Peak power values may be taken from AETP-12.5, the NATO IFF Test Requirements – Interrogator Box Mk XIIA and Mode S, or may be captured using a direct connection to the test set.

Mode	Peak Power (dBm)	Maximum Allowed (dBm)	Result
1			PASS / FAIL / NA
2			PASS / FAIL / NA
3/A			PASS / FAIL / NA
C			PASS / FAIL / NA
4			PASS / FAIL / NA
5			PASS / FAIL / NA
S			PASS / FAIL / NA

**4.1.1 Effective Radiated Power Adjustment**

STANAG 4193 Ed 3: Part III Annex A 2.2.2

Is the effective radiated power adjustable? YES / NO

Record all of the values to which the effective radiated power can be adjusted:

Adjusted effective radiated power value(s): \_\_\_\_\_ dBm

For systems with a maximum effective radiated power greater than 82.5 dBm, verify that the system has the capability to adjust the effective radiated power to a level that is less than or equal to 82.5 dBm.

PASS / FAIL / NA

Describe the method used to adjust the effective radiated power (*attach white paper if necessary*).

**4.2 Peak Power**

STANAG 4193 Ed 3: Part III Annex A 2.2.2.3

Calculate the interrogator peak power from the following equation:

$$P_{IM} = P_{IE} + L_{IM} - G_{IM} \text{ dBm}$$

$P_{IM}$  = Interrogator peak power, main beam component

$P_{IE}$  = Interrogator effective radiated power, main antenna = Value from 4.1(dBm)

$L_{IM}$  = Total interrogator antenna subsystem signal path losses, main antenna transmission channel (dB)

$G_{IM}$  = Interrogator antenna gain on boresight, main antenna (dBi)

Values used:

$L_{IM}$ : \_\_\_\_\_ dB

$G_{IM}$ : \_\_\_\_\_ dBi

Calculated value:  $P_{IM}$ : \_\_\_\_\_ dBm

**4.3 Sensitivity**

STANAG 4193 Ed 3: Part III Annex A 2.2.3.1

Verify that the sensitivity is low enough to accomplish proper target detection at the required operational maximum range.

Calculate the interrogator required sensitivity from the following equation:

$$S = T_P - (L_P + M_L + L_S) \text{ dBm}$$

S = Interrogator effective sensitivity

$T_P$  = Transponder effective radiated power =  $P_T + G_T - (L_T + L_A)$  dBm

$P_T$  = Minimum transponder peak power = 55 dBm

$G_T$  = Transponder antenna gain = 0 dBi

$L_T$  = Transponder feeder losses = 3 dB

$L_A$  = Transponder antenna pattern loss = 3 dB

$L_P$  = Propagation losses =  $(L_{FS} + L_{AT} + L_{PR})$  dB

$L_{FS}$  = Free space path loss =  $93 + 20 \log_{10} R$  (where R is the maximum range of the system in km)

$L_{AT}$  = Atmospheric losses  $\leq 1.3$  dB

$L_{PR}$  = Propagation loss due to multipath antenna lobing  $\leq 3$  dB

$M_L = M + M_M$  dB

M = A margin that allows for tolerances and computational accuracy (dB)  $\leq 3$  dB

$M_M$  = A mode specific link margin that compensates for differential transponder sensitivities in different modes of operation = 0 dB (non-Mode 5); 6 dB (Mode 5)

$L_S$  = Interrogator antenna pattern / scan loss = difference between the maximum gain on the antenna boresight and the minimum gain over the beamwidth in which system performance is defined

**Calculated value:** S: \_\_\_\_\_ dBm

Verify sensitivity is at least as low as required for each supported mode (refer to AEtP-12.5, the NATO IFF Test Requirements – Interrogator Box Mk XIIA and Mode S).

PASS / FAIL

## 5 INTERROGATION MANAGEMENT ANALYSIS

### 5.1 General

#### 5.1.1 USA Specific Requirement - Supermode

Verify that the platform uses Supermode when requesting SIF or Mode 4 data in the same interrogation period as Mode 5 data.

PASS / FAIL / NA

#### 5.1.2 Overall Rate

*STANAG 4193 Ed 3: Part I Annex B, C, D 3.3.2*

Verify that the interrogator uses the lowest practical interrogation rate consistent with the reply evaluation requirements, antenna beamwidth, and antenna rotation speed.

PASS / FAIL

#### 5.1.3 USA Specific Requirements - Jitter/Stagger

Verify that a pseudo-random jitter/stagger around the base system interrogation repetition frequency is implemented such that within any sequence of five consecutive interrogation periods, the intervals between any two interrogation periods differ by at least 2  $\mu$ s.

PASS / FAIL / NA

Verify that two co-located systems using the same technique will have a less than 1% chance of causing false targets to each other during fully overlapped interrogation dwells.

PASS / FAIL / NA

### 5.2 USA Specific Requirement - Mode 4

Verify that there is a means to limit Mode 4 interrogations on targets that have already been identified and for which track continuity is maintained. Include a white paper detailing all the methods used to limit Mode 4 interrogations.

PASS / FAIL / NA

### 5.3 Mode 5

#### 5.3.1 Overall Rate

*STANAG 4193 Ed 3: Part I Annex E 3.3.2*

Verify that the Mode 5 interrogation rate never exceeds 225 Hz, averaged over 1 second.

PASS / FAIL / NA

#### 5.3.2 Short Term Rates

*STANAG 4193 Ed 3: Part I Annex E 3.3.2*

USA Specific Requirement – For rotating antennas, verify that no more than 12 Mode 5 interrogations are transmitted per antenna beam dwell.

PASS / FAIL / NA

Verify that no more than 12 Mode 5 interrogations are ever sent within a 30 ms period.

PASS / FAIL



**5.3.3 SHORAD**

*STANAG 4193 Ed 3: Part I Annex E 2.2.2*

For platforms using Mode 5 formats 8 and/or 9, verify that the dwell time of the interrogator is < 35 ms.

PASS / FAIL / NA

**5.3.4 USA Specific Requirements - Level 2**

Verify that Mode 5 Level 1 can be interrogated without the use of Mode 5 Level 2 interrogations.

PASS / FAIL / NA

Verify that an interrogation scheme using Mode 5 Level 2 lethal interrogations also includes interrogations using Mode 5 Level 1 lethal.

PASS / FAIL / NA

**5.4 Mode S**

Note that there are US specific Mode S requirements. Tests to cover the US specific requirements will be added at a later date.

**5.4.1 All-Call**

*ICAO Annex 10 Volume IV: 3.1.2.5.2.1.4.1*

Verify that the Mode S-only all-call rate when using acquisition based on lockout override complies with the following:

Reply Probability	Interrogations per 3 dB beam dwell	Max Interrogations per 3 dB beam dwell	Interrogation Rate (Hz)	Max Interrogation Rate (Hz)
1.0		3		30
0.5		5		60
≤ 0.25		10		125

**5.4.2 Directed Rate**

*ICAO Annex 10 Volume IV: 3.1.2.11.1.2.1, 3.1.2.11.1.3.1, 3.1.2.11.1.3.2*

Note: Directed interrogations as the same as what ICAO refers to as selective interrogations.

Verify that the Mode S directed interrogation rates comply with the following:

Time Period	Interrogation Rate (Hz)	Max Interrogation Rate (Hz)
40 ms		2400
1 second		1800

Time Period	Interrogation Rate (Hz)	Max Interrogation Rate (Hz)
4 seconds		1200

Verify that no more than 480 directed Mode S interrogations are transmitted into any 3-degree sector over a 1 second interval.

PASS / FAIL / NA

Verify that no two Mode S interrogations requiring a reply from the same aircraft are transmitted at an interval shorter than 400 μs.

PASS / FAIL / NA

## 5.5 SIF

*STANAG 4193 Ed 3: Part I Annex B 3.3.4.2*

Verify that a Mode 1, 2, 3/A or C interrogation is not transmitted sequentially with any other Mode 1, 2, 3/A or C interrogation within the same interrogation period.

PASS / FAIL / NA

## 5.6 USA Specific Requirements - Backwards Compatibility

Verify that the interrogator is capable of Mode 3/A interrogations.

PASS / FAIL

Verify that any interrogator with a Secure ID requirement is capable of Mode 4 interrogations.

PASS / FAIL / NA

## 5.7 Interrogation Management Required Information

Provide white paper(s) giving the following information:

### INTERROGATION SCHEME

- List all potential interrogation schemes used by the platform, including any controlled by external systems (and provide the external system). If supermode interrogations are used, clearly identify which interrogations are sent as a supermode pair. If there are more potential interrogation schemes than can be practically listed, describe how the pattern is assembled from the modes and formats requested.
- Explain how the requested information supports mission requirements
- If the scheme is not used for constant surveillance, indicate the total number of interrogations sent and the azimuth impacted.
- Indicate if the interrogation scheme changes based upon a target response or lack thereof (ex. Interrogations cease once a Friend ID is acquired, if no ID is made X attempts are automatically transmitted, targets are revisited every X seconds/scans, etc ...)
- Describe any limitations placed upon the system and/or the operator (either programmed into the equipment or operational restrictions)
- Give the number of interrogations a transponder is expected to respond to assuming a transponder has an ISLS threshold of -9 dB (if this varies based upon range, give the minimum and maximum values)
- Describe any provisions for adjustment of the transmitter power, including number and size of power steps and whether the adjustment is operator controlled or automatic

**INTERROGATION RATES**

- List the interrogation rate(s) for each mode supported by the platform which allow the platform to meet the target detection, decoding, and identification requirements.
- If multiple interrogation rates are used, indicate which interrogation schemes are used with which interrogation rates.
- Describe how the tracker influences target revisits (coasting duration, etc...)

**ANTENNA**

- Describe the antenna design: monopulse or sliding-window capabilities; rotating or electronically-scanned
- For rotating antennas, list the antenna rotation rate(s). For scanning antennas, list the scan rate(s)
- If multiple rotation rates are used, indicate which interrogation schemes are used with which rotation rates.
- Indicate the beam width at the 0, -2, and -9 dB ISLS differential points.

**TARGET IDENTIFICATION**

- Describe any ability to use passive surveillance techniques to obtain information, such as using 978 UAT, 1090ES, TCAS squitters, transponder replies, or data link information to eliminate or reduce the necessity for active interrogation
- Describe the Mode S acquisition and lock-out methods that the system will use
- Describe the Mode S all-calls lockout protocol (including the ranges or percentages of aircraft in coverage that will not be locked out)
- Describe how the system avoids redundant SIF and Mode S replies from Mode S transponders
- Describe the roll call scheduling scheme
- Give details about the processes used in Mode S to track and maintain targets

## 6 TIME OF DAY ANALYSIS

*STANAG 4193 Ed 3: Part I Annex J 2.2*

Verify that time is maintained to an accuracy of at least 4 seconds over any designated mission period.  
PASS / FAIL

Note: If the platform passes all of the USA Specific Requirements in 6.1, this test can be marked as passed.

Verify that the time is provided from a secure source. PASS / FAIL

### 6.1 USA Specific Requirements

If the TOD is controlled by means other than a manual entry override, document the TOD update process.

Verify that there is a way for the operator to manage or control the update of TOD in use by the interrogator.

PASS / FAIL / NA

*Note that the following tests will likely need to be verified by analysis / white paper:*

Verify that when TOD is entered, the time provided is within 2 seconds of Coordinated Universal Time (UTC).

PASS / FAIL / NA

Verify that an alert is displayed when the system is within 12 hours of the time at which it is no longer guaranteed to achieve 4 second accuracy to UTC.

PASS / FAIL / NA

Verify that the calculation used to give the alert assumes a 2 second initial time error or that the maximum initial error is programmed into the platform.

PASS / FAIL / NA

If a maximum initial error other than 2 seconds is assumed, record the value used: \_\_\_\_\_

## 7 OPTIONAL FUNCTION ANALYSIS

### 7.1 USA Specific Requirements - Multipath

Describe any special provisions that are implemented to deal with multipath. Tests may need to be conducted to verify proper functionality of these provisions.

### 7.2 FOM

If Figure of Merit (FOM) is used within the evaluation / correlation algorithm, provide details on the use with a white paper.

### 7.3 USA Specific Requirements - Sensitivity Reduction

Verify that any sensitivity reduction techniques do not degrade Mode 5 performance. PASS / FAIL / NA

### 7.4 Suppression Out

*STANAG 4193 Ed 3: Part I Annex A 2.2.4.4*

Verify that the suppression periods are the minimum necessary to ensure co-sited system interoperability.

PASS / FAIL / NA

## 8 PRE-TEST INSPECTION

### 8.1 Controls and Display

Control panels mount securely.	PASS / FAIL / NA
Faceplate and light indicators are not broken or cracked.	PASS / FAIL / NA
Knobs and dials, if any, are free from backlash, binding, and scraping.	PASS / FAIL / NA
Interrogation display unit is not broken or cracked.	PASS / FAIL / NA

### 8.2 Mounting Base

Inspect seating and attachment.	PASS / FAIL / NA
Check for loose or missing hardware.	PASS / FAIL / NA
Interrogator hold down nut and bolt assemblies not stripped or damaged.	PASS / FAIL / NA

### 8.3 Interrogator

Interrogator fits in mount securely.	PASS / FAIL / NA
Antenna cables have required length to reach the interrogator without stress.	PASS / FAIL / NA
Connectors properly installed on coax cables.	PASS / FAIL / NA
Connectors and pins are free of damage.	PASS / FAIL / NA
Hold down brackets not broken or missing on the interrogator.	PASS / FAIL / NA

### 8.4 Antennas and Associated Cables

Check for dents or chips.	PASS / FAIL / NA
Mounting to platform is tight.	PASS / FAIL / NA
Check for broken wires.	PASS / FAIL / NA
Check for loose connectors.	PASS / FAIL / NA
Harness is securely clamped to platform frame as required.	PASS / FAIL / NA
Check for binding and scraping.	PASS / FAIL / NA

## 9 ELECTRICAL POWER

*STANAG 4193 Ed 3: Part I Annex C, E 3.8.6.1; Part I Annex A 3.9.4*

Ensure it is safe to apply electrical power to the platform. Load TOD (if not done automatically). Load Mode 4 and Mode 5 cryptographic keys and codes. Power on the interrogator.

Cryptographic keys and codes are retained. PASS / FAIL

On the interrogator, run BIT and verify no failures are present. PASS / FAIL / NA

On the controller, run BIT and verify no failures are present. PASS / FAIL / NA

Is Interrogator connected to an Emergency Bus? YES / NO

If applicable, transition to emergency power and ensure all applicable systems remain operating.

Asset	State	Pass / Fail
IFF Control Unit	On / Off	PASS / FAIL / NA
Interrogator	On / Off	PASS / FAIL / NA

If applicable, transition from emergency power and ensure all systems remain operating.

Asset	State	Pass / Fail
IFF Control Unit	On / Off	PASS / FAIL / NA
Interrogator	On / Off	PASS / FAIL / NA

## 10 INTERROGATION SCHEMES DIRECT CONNECT

*STANAG 4193 Ed 3: Part I Annex B, C, D 3.3.2; Part I Annex B, C 3.3.4.1*

Configure the system to each of the combinations described in the interrogation management plan. Measure the interrogation rates using a test set. Verify compliance with the expected rates described in the interrogation management plan.

Complete the table below by listing all applicable interlaced and supermode combinations. Verify that the maximum number of interrogations in all combinations listed do not exceed the limit of 450 interrogations per second.

Modes Interrogated	Number of Interrogations in each Mode	≤ 450 interrogations/second
		PASS / FAIL
		PASS / FAIL
		PASS / FAIL
		PASS / FAIL
		PASS / FAIL
		PASS / FAIL
		PASS / FAIL



## 11 USA SPECIFIC REQUIREMENTS - SECTORED INTERROGATIONS DIRECT CONNECT

### 11.1 Sector Enable

Exercise sector enable for Mode 4 and Mode S and any additional mode(s) as required by the system specification. (Note: Mode 4 and Mode S are required, all other modes are optional.)

If the sector is established automatically by a Pop-Up or redirect method, identify the azimuth size.

Width of sector \_\_\_\_\_ degrees

If the sector is established with manual input, provide the azimuth limits and increments of the selection.

Minimum sector width \_\_\_\_\_ degrees

Maximum sector width \_\_\_\_\_ degrees

Increments (1, 5, 10...) \_\_\_\_\_ degrees

Enable a sector to interrogate and interrogate each mode individually from the table below (as applicable). Verify that interrogations are only produced when passing through the enabled sector. Create 2 targets, one inside the enabled sector and one outside the enabled sector. Verify only the target within the enabled sector is decoded.

Mode	Target in Sector Decoded (Y/N/NA)	Target Outside of Sector Not Decoded (Y/N/NA)
4		
S		
3/A		
5 Level 1		
5 Level 2		

### 11.2 Sector Interrogation Blanking

Exercise sector interrogation blanking, as required by the system specification.

Create a target in a given azimuth. Verify that it is possible to disable Mode 4 interrogations in the sector containing the target.

PASS / FAIL / NA

Create a target in a given azimuth. Verify that it is possible to disable Mode S interrogations in the sector containing the target.

PASS / FAIL / NA

## 12 REPLY DECODING DIRECT CONNECT

### 12.1 SIF Modes

Using a test set, simulate the following replies and verify on the platform's display

Mode 1 Code	Result
0000	PASS / FAIL
1111	PASS / FAIL
2222	PASS / FAIL
3333	PASS / FAIL
4444	PASS / FAIL
5555	PASS / FAIL
6666	PASS / FAIL
7777	PASS / FAIL

Mode 2 Code	Result
0000	PASS / FAIL
1111	PASS / FAIL
2222	PASS / FAIL
3333	PASS / FAIL
4444	PASS / FAIL
5555	PASS / FAIL
6666	PASS / FAIL
7777	PASS / FAIL

Mode 3/A Code	Result
0000	PASS / FAIL
1111	PASS / FAIL
2222	PASS / FAIL
3333	PASS / FAIL
4444	PASS / FAIL
5555	PASS / FAIL
6666	PASS / FAIL
7777	PASS / FAIL

Mode C Altitude (ft)	Result
Framing Brackets Only*	PASS / FAIL
-1000	PASS / FAIL
0	PASS / FAIL
10000	PASS / FAIL
25000	PASS / FAIL
45000	PASS / FAIL
60000	PASS / FAIL
85000	PASS / FAIL
100000	PASS / FAIL

\* Should give a "No Data" indication

USA Specific Requirement - Verify that Mode C data is displayed in feet.

PASS / FAIL / NA

USA Specific Requirement - Verify that Mode 1, 2, and 3/A codes are not truncated. PASS / FAIL / NA

### 12.2 Mode 4

Using a test set, simulate a Mode 4 target and verify that it is properly displayed in accordance with system requirements.

PASS / FAIL / NA

USA Specific Requirement - Verify that a Mode 4 target can be differentiated from a Mode 5 or non-secure target.

PASS / FAIL / NA

### 12.3 Mode S

Record each UF supported by the interrogator: \_\_\_\_\_

Provide a list of all data which can be acquired and displayed to the operator via Mode S (interrogations or squitter reception). For each piece of data, vary the setting on the test set and verify that the interrogator system properly updates. USA Specific Requirement - Verify that there are documented mission requirements for each piece of data requested.

Data Field	Result	Data Supports Mission Requirements
	PASS / FAIL	PASS / FAIL / NA
	PASS / FAIL	PASS / FAIL / NA
	PASS / FAIL	PASS / FAIL / NA
	PASS / FAIL	PASS / FAIL / NA
	PASS / FAIL	PASS / FAIL / NA
	PASS / FAIL	PASS / FAIL / NA
	PASS / FAIL	PASS / FAIL / NA
	PASS / FAIL	PASS / FAIL / NA

USA Specific Requirement - Verify that no data can be requested which is not displayed to the operator or otherwise used in support of mission requirements.

PASS / FAIL / NA

USA Specific Requirement - Verify that if barometric altitude is displayed from Mode S, it is displayed in feet.

PASS / FAIL / NA

### 12.4 ADS-B

If ADS-B testing is required (not in STANAG 4193 Edition 3), provide a list of all data which can be acquired and displayed to the operator via ADS-B. For each piece of data, vary the setting on the test set and verify that the interrogator system properly updates.

Data Field	Result
	PASS / FAIL
	PASS / FAIL
	PASS / FAIL
	PASS / FAIL
	PASS / FAIL
	PASS / FAIL
	PASS / FAIL

Data Field	Result
	PASS / FAIL

USA Specific Requirement - Verify that if barometric altitude is displayed from ADS-B, it is displayed in feet.

PASS / FAIL / NA

## 12.5 Mode 5

STANAG 4193 Ed 3: Part III Annex A 2.3.2; Part III Annex A 2.4.2; Part III Annex A 2.5.2

Using a test set, simulate and verify proper Mode 5 decoding on the display unit. For Level 2 interrogations, verify proper decoding of both Level 1 and Level 2 responses.

Information	Entered Values
Mode 1	
Mode 2	
Mode 3	
Mode C	
Barometric altitude (25 ft)	
Barometric altitude (100 ft)	
Global Navigation Satellite System (GNSS) Altitude	
Platform Identification Number (PIN)	
National Origin (NO)	
Figure of Merit (FOM)	

Interrogation Format	Response Type	Data	Results
0	ID Reply		PASS / FAIL
1	Mode 1/2 Data Reply	Mode 1 Code: Mode 2 Code:	PASS / FAIL
2	Mode 3/C Data Reply	Mode 3/A Code: Mode C Altitude:	PASS / FAIL
3	ID Reply		PASS / FAIL
4	PIN Data Reply	PIN: NO:	PASS / FAIL
8	ID Reply		PASS / FAIL
9	ID Reply		PASS / FAIL
16	PIN Report (0000)	GNSS Altitude: PIN: NO:	PASS / FAIL
*16	ID Reply		PASS / FAIL
17	Mode 1/Mode 2 Report (0001)	GNSS Altitude: Mode 1 Code: Mode 2 Code:	PASS / FAIL
*17	Mode 1/2 Data Reply	Mode 1 Code: Mode 2 Code:	PASS / FAIL
18	Mode 3/Altitude Report (0010) with 25 ft altitude encoding	GNSS Altitude: Mode 3/A Code: Baro Altitude:	PASS / FAIL
18	Mode 3/Altitude Report (0010) with 100 ft altitude encoding	GNSS Altitude: Mode 3/A Code: Baro Altitude:	PASS / FAIL

Interrogation Format	Response Type	Data	Results
*18	Mode 3/C Data Reply	Mode 3/A Code: Mode C Altitude:	PASS / FAIL
19	PIN Report (0000)	GNSS Altitude: PIN: NO:	PASS / FAIL
*19	ID Reply		PASS / FAIL
20	High-Resolution PIN Report (0100)	GNSS Altitude: PIN: FOM (if displayed):	PASS / FAIL
*20	PIN Data Reply	PIN: NO:	PASS / FAIL
None – Mode 5 Squitter	High-Resolution PIN Report (0100)	GNSS Altitude: PIN: FOM (if displayed):	PASS / FAIL

\* Indicates a Level 1 response to a Level 2 interrogation

USA Specific Requirement - Verify that all barometric altitudes displayed from Mode 5 are displayed in feet.

PASS / FAIL / NA

USA Specific Requirement - Verify that NO and PIN codes are not truncated.

PASS / FAIL / NA

USA Specific Requirement - Verify that a Mode 5 target can be differentiated from a Mode 4 or non-secure target.

PASS / FAIL / NA

## 12.6 Identification of Position

Using the test set, simulate Identification of Position (I/P) for each mode indicated below. Verify that I/P is correctly displayed to the operator, in accordance with platform requirements.

Interrogation	Result
Mode 1	PASS / FAIL / NA
Mode 2	PASS / FAIL / NA
Mode 3	PASS / FAIL / NA
Mode S UF=04	PASS / FAIL / NA
Mode 5 Format 1	PASS / FAIL / NA
Mode 5 Format 20	PASS / FAIL / NA
None – Mode 5 Squitter	PASS / FAIL / NA

## 12.7 X Pulse Bit

Using the test set, include an X Pulse bit in each reply for each mode indicated below. Verify that the X Pulse bit is correctly displayed to the operator, in accordance with platform requirements.

Interrogation	Result
Mode 1	PASS / FAIL / NA
Mode 2	PASS / FAIL / NA
Mode 3	PASS / FAIL / NA
Mode 5 Format 2	PASS / FAIL / NA
Mode 5 Format 19	PASS / FAIL / NA

Interrogation	Result
None – Mode 5 Squitter	PASS / FAIL / NA

Verify that the interrogator does not discard targets with the X Pulse bit set.

PASS / FAIL

## 12.8 Emergency

Using the test set, simulate military emergency as indicated in the table below. Verify that emergency is correctly displayed to the operator, in accordance with platform requirements.

**NOTE: MUST BE A DIRECT CONNECT TEST**

Interrogation	Result
Mode 1	PASS / FAIL / NA
Mode 2	PASS / FAIL / NA
Mode 3	PASS / FAIL / NA
Mode S UF=05	PASS / FAIL / NA
Mode 5 Format 4	PASS / FAIL / NA
Mode 5 Format 16	PASS / FAIL / NA
None – Mode 5 Squitter	PASS / FAIL / NA

Input the following Mode 3/A codes and verify that the proper messages are displayed to the operator, in accordance with platform requirements.

Mode 3/A Code	Result
7500	PASS / FAIL / NA
7600	PASS / FAIL / NA

## 12.9 Code Filter

*STANAG 4193 Ed 3: Part I Annex B 3.8.2.2*

If the platform's implementation allows, configure the interrogator to filter a specific code. Using a test set, simulate a reply of this code in the following modes while verifying correct indication on the platform's IFF display unit.

Interrogation	Result
Mode 1	PASS / FAIL / NA
Mode 2	PASS / FAIL / NA
Mode 3	PASS / FAIL / NA
Mode S UF=04	PASS / FAIL / NA
Mode 5 Format 1	PASS / FAIL / NA
Mode 5 Format 18	PASS / FAIL / NA

## 12.10 Range and Azimuth Accuracy

*STANAG 4193 Ed 3: Part I Annex A 3.6.3; Part III Annex A 2.2.3.2*

USA Specific Requirement - Verify that there is a capability to eliminate range bias errors and that the system has been properly calibrated.

PASS / FAIL

Using a test set, simulate a reply in each of the following modes with the test set at different ranges and azimuths. On the platform's IFF display, verify correct operation and display updates. Record the platform range and azimuth accuracy requirements:

Range accuracy requirement: \_\_\_\_\_ (if the platform does not have one specified, use no greater than a one sigma error of 100 ft)

Azimuth accuracy requirement: \_\_\_\_\_ (if the platform does not have one specified, use no greater than 25% of the 3 dB beamwidth for at least 95% of targets)

1% of maximum range:

Mode	Range Entered	Range Displayed	Azimuth Entered	Azimuth Displayed	PASS / FAIL
3/A					PASS / FAIL / NA
4					PASS / FAIL / NA
S					PASS / FAIL / NA
5 Level 1					PASS / FAIL / NA
5 Level 2					PASS / FAIL / NA
ADS-B					PASS / FAIL / NA

5% of maximum range:

Mode	Range Entered	Range Displayed	Azimuth Entered	Azimuth Displayed	PASS / FAIL
3/A					PASS / FAIL / NA
4					PASS / FAIL / NA
S					PASS / FAIL / NA
5 Level 1					PASS / FAIL / NA
5 Level 2					PASS / FAIL / NA
ADS-B					PASS / FAIL / NA

25% of maximum range:

Mode	Range Entered	Range Displayed	Azimuth Entered	Azimuth Displayed	PASS / FAIL
3/A					PASS / FAIL / NA
4					PASS / FAIL / NA
S					PASS / FAIL / NA
5 Level 1					PASS / FAIL / NA
5 Level 2					PASS / FAIL / NA
ADS-B					PASS / FAIL / NA

50% of maximum range:

Mode	Range Entered	Range Displayed	Azimuth Entered	Azimuth Displayed	PASS / FAIL
3/A					PASS / FAIL / NA
4					PASS / FAIL / NA
S					PASS / FAIL / NA
5 Level 1					PASS / FAIL / NA
5 Level 2					PASS / FAIL / NA
ADS-B					PASS / FAIL / NA

100% of maximum range:

Mode	Range Entered	Range Displayed	Azimuth Entered	Azimuth Displayed	PASS / FAIL
3/A					PASS / FAIL / NA
4					PASS / FAIL / NA
S					PASS / FAIL / NA
5 Level 1					PASS / FAIL / NA

Mode	Range Entered	Range Displayed	Azimuth Entered	Azimuth Displayed	PASS / FAIL
5 Level 2					PASS / FAIL / NA
ADS-B					PASS / FAIL / NA

### 13 CRYPTO DIRECT CONNECT

#### 13.1 Zeroize

*STANAG 4193 Ed 3: Part I Annex A 3.8.1.7*

Verify that when the crypto control zeroize function is selected, the cryptographic computer erases at least all red keys.

PASS / FAIL

Verify that means are provided to prevent inadvertent selection of the zeroize function. PASS / FAIL

USA Specific Requirement - Verify that the zeroize function is available at the interrogator.

PASS / FAIL

USA Specific Requirement - Verify that the zeroize function is accessible by the operator if remote from the interrogator.

PASS / FAIL / NA

#### 13.2 Code Hold (Key Hold / Refuel Hold) - Airborne Platforms Only

*STANAG 4193 Ed 3: Part I Annex A 3.8.1.8*

If Code Hold is implemented, verify that the control cannot be continuously selected. Note that USA does not have this requirement.

PASS / FAIL / NA

USA Specific Requirement - Complete only one of the following two subsections depending on whether or not key hold is implemented.

##### 13.2.1 USA Specific Requirements -Key Hold Implemented

Set the platform to the ground state. Load Mode 4 and Mode 5 keys. Remove power to the platform for at least 3 minutes. Turn the interrogator back on. Verify that the Mode 4 and Mode 5 keys were retained.

PASS / FAIL / NA

Simulate an airborne state. Return the platform to the ground state. Activate Key Hold. Remove power to the interrogator for at least 3 minutes. Turn the interrogator back on. Verify that the Mode 4 and Mode 5 keys were retained.

PASS / FAIL / NA

Simulate an airborne state. Return the platform to the ground state. Do not activate Key Hold. Remove power to the interrogator for at least 3 minutes. Turn the interrogator back on. Verify that the Mode 4 and Mode 5 keys were not retained.

PASS / FAIL / NA



### 13.2.2 USA Specific Requirements - Key Hold Not Implemented

Load Mode 4 and Mode 5 keys. Simulate an airborne state followed by a ground state. Remove power to the interrogator for at least 3 minutes. Turn the interrogator back on. Verify that the Mode 4 and Mode 5 keys were retained.

PASS / FAIL / NA

### 13.3 USA Specific Requirements - Power Loss - Airborne Platforms Only

Simulate landing gear up and remove primary power for 8 seconds. Verify that the red cryptographic components are retained.

PASS / FAIL / NA

Simulate landing gear up and remove primary power for at least 3 minutes. Verify that the red cryptographic components are erased.

PASS / FAIL / NA

### 13.4 Code A/B Control

*STANAG 4193 Ed 3: Part I Annex J 3.2*

Verify that there is a way to initiate Mode 4 key variable changeover at the beginning of each new crypto period. This may be accomplished automatically (preferred) or via a Code A/B control.

PASS / FAIL

USA Specific Requirement - Complete only one of the following two subsections depending on whether or not a Code A/B control is implemented.

#### 13.4.1 USA Specific Requirements - Code A/B Control Provided

With TOD in the interrogator, verify that the operator cannot select between Code A and Code B.

PASS / FAIL / NA

If the Code A/B control is provided, complete only one of the following two subsections depending on implementation of the A/B control.

##### 13.4.1.1 A/B Control Active around “Roll-Over”

If the interrogator supports a “Roll-Over” period where the A/B control becomes active (generally 5 minutes prior to and 5 minutes after “Roll-Over”), load the test set and interrogator with a TOD that is within the “Roll-Over” period, but prior to the actual “Roll-Over” to enable A/B functionality. Verify that Code A is selected on both the platform and the test set. Interrogate the test set.

Verify that Mode 4 replies are decoded.

PASS / FAIL / NA

Switch both the platform and the test set to Code B.

Verify that Mode 4 replies are decoded.

PASS / FAIL / NA

Switch only the platform to code A.

Verify that Mode 4 replies are not decoded.

PASS / FAIL / NA

#### 13.4.1.2 A/B Control not Active around “Roll-Over”

If the interrogator does not support a “Roll-Over” period, disable TOD in the interrogator. Verify that Code A is selected and interrogate the test set with Code A from the test set. (Note: May need to be done by analysis.)

Verify that Mode 4 replies are decoded.

PASS / FAIL / NA

Switch both the platform and the test set to Code B.

Verify that Mode 4 replies are decoded.

PASS / FAIL / NA

#### 13.4.2 USA Specific Requirement - Code A/B Control Not Provided

If a control for A/B is not provided, verify that the interrogator zeroes all Mode 4 and Mode 5 Traffic Encryption Keys (TEKs) when TOD is lost (see AEtP-12.5, NATO IFF Test Requirements – Interrogator Box Mark XIIA and Mode S, 5.6.1.1.3).

PASS / FAIL / NA

## 14 CONTROLS AND INDICATORS DIRECT CONNECT

### 14.1 USA Specific Requirement - Time of Day

Verify that TOD is displayed or an indicator shows that TOD is or is not within tolerance.

PASS / FAIL

### 14.2 Suppression of Unnecessary Replies Control

*STANAG 4193 Ed 3: Part I Annex B, C, D 3.3.4.3; Part I Annex A 3.8.1.9*

If the interrogator has Suppression of Unnecessary Replies (SUR) pulse capability, verify that the SUR pulse is radiated when the corresponding control is enabled.

PASS / FAIL / NA

If the interrogator has SUR pulse capability, verify that the SUR pulse is not radiated when the corresponding control is disabled.

PASS / FAIL / NA

### 14.3 Mode S

Verify that the assigned II code can be entered into the interrogator.

Assigned II Code (1–15): \_\_\_\_\_ PASS / FAIL

Verify that the assigned SI code can be entered into the interrogator.

Assigned SI Code (1–63): \_\_\_\_\_ PASS / FAIL

### 14.4 Mode 5 Flight Line Test / Mode 4 Verification Bit 1

*STANAG 4193 Ed 3: Part I Annex J 3.5; Part I Annex J 4.1.5; Part I Annex J 4.11.3*

Note that flight line test is not required, but if it is present, it must be verified.

Load the test equipment with Mode 4 and Mode 5 keys. Enable the Mode 5 Flight Line Test on the interrogator. Set the test set to reply in Mode 5 Flight Line Test mode. Repeat the test for Mode 4 Verification Bit 1.

	<b>Reply Present</b>
<b>Mode 5 Flight Line Test</b>	PASS / FAIL
<b>Mode 4 Verify Bit 1</b>	PASS / FAIL

Verify that enabling Mode 5 Flight Line Test also enables Mode 4 Verification Bit 1. PASS / FAIL

Verify that disabling Mode 5 Flight Line Test also disable Mode 4 Verification Bit 1. PASS / FAIL

### 14.5 Built-In-Test Failure

*STANAG 4193 Ed 3: Part I Annex A 3.8.3.4; Part I Annex A 3.9.4; Part III Annex A 2.2.5*

Induce a BIT failure on the interrogator system. Verify that an alarm is provided (may be audible and/or visual).

PASS / FAIL

Place the interrogator in the “Off” state and attempt to start a test of the system. Verify that no signals are radiated.

PASS / FAIL

If supported, place the interrogator in the “Standby” state and attempt to start a test of the system. Verify that no signals are radiated.

PASS / FAIL / NA

Record the length of the BIT sequence: \_\_\_\_\_

Verify that the duration of the BIT sequence is minimised.

PASS / FAIL

## **14.6 On / Standby / Off**

*STANAG 4193 Ed 3: Part I Annex B, C, D, E, F 3.2.2; Part I Annex A 3.8.1.1*

Verify that there is an On/Off control.

PASS / FAIL

Verify that when the interrogator is Off, no interrogations are sent.

PASS / FAIL

Verify that when the interrogator is Off, no replies or reports are decoded (including squitters).

PASS / FAIL

If the interrogator has a Standby control, verify that no interrogations are sent when in Standby.

PASS / FAIL / NA

## 15 RADIATED TESTING

### 15.1 Power Out

Interrogate using an operationally representative interrogation scheme. Measure the power out in at least 2 modes.

Mode	Power	Expected Power*	Results
			PASS / FAIL
			PASS / FAIL

\* Ensure antenna gain and path losses are entered into the test set or otherwise accounted for

### 15.2 Target Display

Interrogate using an operationally representative interrogation scheme. Verify that the test set target is properly displayed on the platform's IFF display, with the correct position, codes and symbology.

PASS / FAIL

**AEtP-12.8(A)(1)**