

NATO UNCLASSIFIED
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4 August 1995

To : See MAS Distribution List No. 2

Subject : STANAG 4209 EL (EDITION 2) - THE NATO MULTI-CHANNEL TACTICAL DIGITAL GATEWAY - STANDARDS FOR ANALOGUE TO DIGITAL CONVERSION OF SPEECH SIGNALS

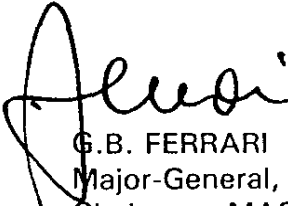
References : a. MAS/403-EL/4209 dated 9 December 1983 (Edition 1)
b. AC/302(SG/11)D/116 dated 16 August 1994 (Edition 2)(1st Draft)

Enclosure : STANAG 4209 (Edition 2)

1. The enclosed NATO Standardization Agreement which has been ratified by nations as reflected in page iii is promulgated herewith.
2. The references listed above are to be destroyed in accordance with local document destruction procedures.
3. AAP-4 should be amended to reflect the latest status of the STANAG.

ACTION BY NATIONAL STAFFS

4. National staffs are requested to examine page iii of the STANAG and if they have not already done so, to advise the Defence Support Division, IS, through their national delegation as appropriate of their intention regarding its ratification and implementation.


G.B. FERRARI
Major-General, ITAF
Chairman, MAS

NORTH ATLANTIC TREATY ORGANIZATION
(NATO)



MILITARY AGENCY FOR STANDARDIZATION
(MAS)

STANDARDIZATION AGREEMENT

SUBJECT: THE NATO MULTI-CHANNEL TACTICAL DIGITAL GATEWAY-
STANDARDS FOR ANALOGUE TO DIGITAL CONVERSION OF
SPEECH SIGNALS

Promulgated on 4 August 1995

A handwritten signature in black ink, appearing to read 'G. B. Ferrari', written over a circular stamp or mark.

G. B. FERRARI
Major-General, ITAF
Chairman, MAS

STANAG 4209

(ii)

(Edition 2)

RECORD OF AMENDMENTS

No.	Reference/date of amendment	Date entered	Signature

EXPLANATORY NOTES

AGREEMENT

1. This NATO Standardization Agreement (STANAG) is promulgated by the Chairman MAS under the authority vested in him by the NATO Military Committee.
2. No departure may be made from the agreement without consultation with the tasking authority. Nations may propose changes at any time to the tasking authority where they will be processed in the same manner as the original agreement.
3. Ratifying nations have agreed that national orders, manuals and instructions implementing this STANAG will include a reference to the STANAG number for purposes of identification.

DEFINITIONS

4. Ratification is "The declaration by which a nation formally accepts the content of this Standardization Agreement".
5. Implementation is "The fulfilment by a nation of its obligations under this Standardization Agreement".
6. Reservation is "The stated qualification by a nation which describes that part of this Standardization Agreement which it cannot implement or can implement only with limitations".

RATIFICATION, IMPLEMENTATION AND RESERVATIONS

7. Page iii gives the details of ratification and implementation of this agreement. If no details are shown, it signifies that the nation has not yet notified the tasking authority of its intentions. Page iv (and subsequent) gives details of reservations and proprietary rights that have been stated.

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Agreed English/French texts

STANAG 4209
Edition 2

NAVY/ARMY/AIR

NATO STANDARDIZATION AGREEMENT
(STANAG)

The NATO Multi-Channel Tactical Digital Gateway - Standards for Analogue to Digital Conversion of Speech Signals.

Related Documents

1. STANAG 4380 Technical Standards for Analogue - Digital Conversion of Voice Signals

AIM

1. The aim of this NATO profile STANAG is to promote interoperability within NATO by specifying the details of voice coding requirements for the NATO Tactical Digital Gateway as a profile of the generic Codec STANAG 4380.

BACKGROUND

2. This document, produced by TSGCE SG/11, is required to complete the specification of the NATO Tactical Digital Gateway.

AGREEMENT

3. Participating nations agree to use the specification in the profile in this STANAG where the requirements are within its scope.

GENERAL

4. This is one of the series of STANAGs that define and specify the services, protocols and profiles that shall be used for implementing the NATO Tactical Digital Gateway.
5. This STANAG 4209 consists of a main body and an Attachment constituting the profile material. The profile is based on the generic codec STANAG, i.e. STANAG 4380.

DETAILS OF THE AGREEMENT

6. The profile material in the Attachment to this STANAG 4209 constitutes the details of the agreement.

IMPLEMENTATION OF THE AGREEMENT

7. This STANAG 4209 is implemented when a ratifying nation has issued instructions that all relevant future communication systems for its Forces will be procured in accordance with the specifications detailed in the Attachment to this STANAG which contains the profile material.

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-NSP 1-

ATTACHMENT to
STANAG 4209
Edition 2

Document Title: The NATO Multi-Channel Tactical Digital Gateway -
Standards for Analog to Digital Conversion of Speech
Signals.

Document Reference Number: AC/302(SG/11)WG/1....

Document version: Version 1.0

Date: 21. June 1993

Origin: TSGCE SG/11

Security Classification: NATO UNCLASSIFIED.

-NSP 1-

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-NSP 3-

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(i) Foreword

This NATO profile is produced by NATO TSGCE SG/11 WG/1. The profile is based on the generic codec STANAG 4380.

This document replaces previous unpublished draft versions.

Annex A is normative.

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(ii) Introduction

A profile refers to one or a combination of base standards that collectively perform a specific well-defined Information Technology function. Profiles standardize the use of options and other variations in the base standards to promote system interoperability.

The Base Standard of this profile is the STANAG 4380: Technical Standards for Analogue - Digital Conversion of Speech Signals.

The NATO Multi-Channel Tactical Digital Gateway - Standards for Analog to Digital Conversion of Speech Signals.

1. SCOPE

1.1 General

This profile STANAG 4209 is applicable to voice encoding across the NATO Tactical Digital Gateway.

The objective of this profile is to maximise voice codec interoperability within NATO. The profile may not necessarily optimise support for one particular environment.

1.2 Position within the Taxonomy

This profile is not defined in any ISO or NATO taxonomy.

2. NORMATIVE REFERENCES

The following documents contain provisions which, through reference in this text, constitute provisions of this profile. At the time of publication, the editions indicated were valid. All documents are subject to revision, and parties to agreements based on this profile are warned against automatically applying any more recent editions of the documents listed below, since the nature of references made by profiles to such documents is that they may be specific to a particular edition. The standards referenced by a base standard are applicable to the profile only to the extent that they are applicable to that base standard and to the extent that the profile allows.

2.1 Base Standards

- A. STANAG 4380 Edition 1 Technical Standards for Analogue - Digital Conversion of Voice Signals.

3. DEFINITIONS

For the purposes of this NSP, the following terms are defined:

3.1 Terms defined in this Profile

- (a) **Base Standard**
An approved NATO Standard, International Standard, Technical Report or CCITT Recommendation which is used in the definition of a Profile.
- (b) **Profile**
A set of one or more base standards, and, where applicable, the identification of chosen classes, subsets, options and parameters of those base standards, necessary for accomplishing a particular function.

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NOTE - A NATO Standardized Profile includes the specification of one or more Profiles.

- (c) NATO Protocol Implementation Conformance Statement (NPICS)
A statement made by a NATO nation or supplier of a system which claims conformance to a base standard, stating the capabilities and options which have been implemented, and all optional features which have been omitted.
- (d) NATO Standardized Profile (NSP)
A harmonized document, agreed to within NATO (i.e. a STANAG), which identifies a standard or a group of standards, together with options and parameters, necessary to accomplish a function or set of functions.
- (e) NATO Standardized Profile Implementation Conformance Statement (NSPICS)
A statement made by a NATO nation or supplier of a system which claims conformance to an NSP, stating the capabilities and options which have been implemented, and all optional features which have been omitted.
- (f) NSPICS Requirements List (NPRL)
The NPRL is the part of an NSP which specifies the Profile's constraints on what may appear in the "Support" and "Supported" (values etc.) columns in the relevant PICS proformas.

3.2 Terms defined in ISO 9646-1

This Profile uses the following terms defined in ISO 9646-1:

- (a) Conforming implementation

4. SYMBOLS AND ABBREVIATIONS

NPICS	NATO Protocol Implementation Conformance Statement
NPRL	NSPICS Requirements List
NSP	NATO Standardized Profile
NSPICS	NSP Implementation Conformance Statement

The other symbols and abbreviations are defined in the referenced base standards.

5. REQUIREMENTS

This clause specifies the requirements for the profile, i.e requirements for voice coding at the NATO tactical digital gateway.

A conforming implementation shall satisfy

- all mandatory requirements of the base standards referenced by this profile,
- all the constraints specified in Annex A (normative) NSPICS Requirments List (NPRL).

ANNEX A (normative)

NSPICS REQUIREMENTS LIST (NPRL)

Contents

1	Introduction	NSP A.2	
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	1.2	Footnotes	NSP A.2
	1.3	Instructions for completing the NPRL	NSP A.2
2	Standards referenced	NSP A.3	
3	Profile Requirements List	NSP A.3	
	3.1	General statement of conformance	NSP A.3
	3.2	General Characteristics	NSP A.3
	3.3	Four Wire to Four Wire Audio Frequency Characteristics	NSP A.4
	3.4	Coder and Decoder Circuits	NSP A.4
	3.5	Electrical Performance	NSP A.4

1. Introduction

This document provides the NSPICS Requirements List (NPRL) for voice codec characteristics on the NATO tactical digital gateway, as a profile of the generic STANAG 4380. The NSPICS for an implementation is generated by completing the NPRL in accordance with the instructions given below.

The proformas in this document are based on those accompanying the referenced base standards.

A conformant implementation shall satisfy the mandatory conformance requirements of the base standards referenced in this profile.

1.1 Notation

The following notations are used in the NPRL to indicate the status of features:

- m - mandatory
- o - optional
- c - conditional
- - not applicable (ie, logically impossible in the scope of the profile)
- x - excluded

In addition, the symbol 'i' is used to indicate an option which it is possible to implement, but whose status is not within the scope of the profile.

The status given shall be interpreted as: "is the stated functionality provided?" and not to imply that a facility or parameter is included in all packets sent.

The following predicate notation is used:

<predicate>: introduces a single item which is conditional on <predicate>.

The predicate may be the identifier of a profile feature, or a boolean combination of predicates.

Finally, the *o.n* notation is used to show a set of selectable options (ie, one or more of the set must be implemented) with the same identifier *n*.

1.2 Footnotes

Footnotes to the proformas are indicated by superscript numerals in brackets[¹]. The notes so indicated are collected at the bottom of the page.

1.3 Instructions for completing the NPRL

The NPICS proformas for the referenced base standards shall be completed in addition to the proformas provided in this Annex.

Where this profile refines the features of the base standards, the requirements expressed in this NPRL shall be applied (as indicated in NPRLs with no 'Profile Support' column) to constrain the allowable responses in the base standard NPICS proformas.

Where this profile makes additional requirements, the 'Profile Status' column for such

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NPRLs shall be completed.

Each response shall either be selected from the indicated set of responses, or comprise one or more parameter values as requested. For an inapplicable conditional requirement, a Not Applicable (NA) check-box is provided. If a mandatory requirement is not satisfied, exception information must be supplied, by entering a reference *X_i*, where *i* is a unique identifier, to an accompanying rationale for the non-compliance.

2 Standards referenced

This profile specifies the coding of voice signals across the NATO Tactical Digital Gateway, by reference to the following STANAG:

4380 Technical Standards for Analog - Digital Conversion of Voice Signals.

3 Profile Requirements List

3.1 General statement of conformance

Implementation details	
Nation/Supplier:	
Implementation name/version:	
Machine name/version:	
Operating system name/version:	
Other hardware and operating systems claimed:	
System name (if different):	
Are all mandatory features implemented?	Yes[] No[] (The answer No means that the implementation does not conform to the STANAG)
Defect/problem reports implemented:	
Date of statement:	

3.2 General Characteristics

Base Standard Features				Profile Features
Item	Protocol feature	References	Status	Status
GC1	16 kbit/s bit rate	A/1.1	O.1	m
GC2	32 kbit/s bit rate	A/1.1	O.1	o
GC3	Single Integration	A/3.2	O.2	o.2
GC4	Double Integration	A/3.2	O.2	o.2
GC5	Block Schematic	Fig.1 & Fig.2	M	m

3.3 Four Wire to Four Wire Audio Frequency Characteristics

Base Standard Features				Profile Features
Item	Protocol feature	References	Status	Status
FA1	Relative Level at Points A & B of Figures 1 & 2	A/2.1	M	m
FA2	Impedance at Points A & B	A/2.3	M	m
FA3	Return Loss at Points A & B against 600 ohms	A/2.4	M	m
FA4	Symmetry at Points A & B	A/2.5	M	m

3.4 Coder and Decoder Circuits

Base Standard Features				Profile Features
Item	Protocol feature	References	Status	Status
CD1	Input and Output Audio Filters	A/3.1	M	m
CD2	Frequency of the Principal Integrator, f1	A/3.2, Fig.3	M	m
CD3	Frequency of the Principal Integrator, f2, f3	A/3.2, Fig. 3	GC4:M	GC4:m
CD4	Modulation Level	A/3.3	M	m
CD5	Compression and Expansion	A/3.4	M	m
CD6	Companding Speed	A/3.5	M	m
CD7	Procedure for Testing the Decoder	A/3.6	M	m

3.5 Electrical Performance

3.5.1 Remarks

Base Standard Features				Profile Features
Item	Protocol feature	References	Status	Status
ER1	Connection	A/4.1.1	M	m
ER2	Termination	A/4.1.2	M	m
ER3	Measurements	A/4.1.3	M	m

3.5.2 16 kbit/s operation

if 16 kbit/s operation is not supported, item GC1, mark N/A and continue at subclause 3.5.3

Base Standard Features				Profile Features
Item	Protocol feature	References	Status	Status
EP1	Insertion Loss Between Points A & B	A/4.2	M	m
EP2	Attenuation Distortion with Frequency	A/4.3.1	M	m
EP3	Variation of Gain with Input Level	A/4.4.1	M	m
EP4	Idle Channel Noise	A/4.5.1	M	m
EP5	Variation of Quantizing and Harmonic Distortion with Input Level	A/4.6.1	M	m
EP6	Variation of Quantizing and Harmonic Distortion with Frequency	A/4.7.1	M	m

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3.5.3 32 kbit/s operation

If 32 kbit/s operation is not supported, item GC2, mark N/A and skip the rest of the table.

Base Standard Features			
Item	Protocol feature	References	Status
EP7	Insertion Loss Between Points A & B	A/4.2	M
EP8	Attenuation Distortion with Frequency	A/4.3.2	M
EP9	Variation of Gain with Input Level	A/4.4.2	M
EP10	Idle Channel Noise	A/4.5.2	M
EP11	Variation of Quantizing and Harmonic Distortion with Input Level	A/4.6.2	M
EP12	Variation of Quantizing and Harmonic Distortion with Frequency	A/4.7.2	M

N/A[]

Profile Features
Status
m
m
m
m
m
m