



The European Organisation for Civil Aviation Equipment
L'Organisation Européenne pour l'Équipement de l'Aviation Civile

INTEROPERABILITY STANDARDS FOR VOIP ATM COMPONENTS

ADDENDUM 3 TO VOLUME 2: INSTANTANEOUS ACCESS CALL

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ED-137/2C-3

March 2019

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FOREWORD

1. This document forms Addendum 3 “Interoperability Standards for VoIP ATM Components – Volume 2 Addendum 3: Instantaneous Access Call” to ED-137C Volume 2: Telephone, and was prepared by EUROCAE Working Group 67 and was accepted by the Council of EUROCAE on 23 March 2019.
2. EUROCAE is an international non-profit making organisation. Membership is open to manufacturers and users in Europe of equipment for aeronautics, trade associations, national civil aviation administrations and non-European organisations. Its work programme is principally directed to the preparation of performance specifications and guidance documents for civil aviation equipment, for adoption and use at European and world-wide levels.
3. The findings of EUROCAE are resolved after discussion among its members and, where appropriate, in collaboration with RTCA Inc, Washington D.C. USA and/or the Society of Automotive Engineers (SAE), Warrendale, PA, USA through their appropriate committee.
4. This version of the document represents “the minimum European specification required for Manufacturers and Users to assure Interoperability from/to VoIP ATM Telephone Components to/from Legacy systems”.
5. This document supersedes Chapter 4.3 of ED-137B Volume 2.
6. This version is taking into account the EUROCONTROL VoIP in ATM Test Case Specification.
7. EUROCAE performance specifications are recommendations only. EUROCAE is not an official body of the European governments; its recommendations are valid statements of official policy only when adopted by a particular government or conference of governments.
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TABLE OF CONTENTS

FOREWORD	I
CHAPTER 1 INTRODUCTION.....	1
1.1 BACKGROUND.....	1
1.2 ED-137 VOL 2 ADD 3 PRESENTATION	3
1.3 TERMINOLOGY FOR REQUIREMENTS, RECOMMENDATIONS AND OPTIONS	3
1.4 VERSION TRACKING.....	3
CHAPTER 2 COMMUNICATION MODEL.....	4
2.1 DEFINITIONS.....	4
2.2 PROTOCOL STACK	4
2.2.1 SIGNALLING IN AN IP AGVN.....	4
2.2.2 AUDIO SPECIFICATIONS	5
CHAPTER 3 PROFILE STANDARD FOR THE USE OF SIP IN AN AGVN.....	6
3.1 LOGICAL SIP ENTITIES.....	6
3.2 SUPPORTED REQUESTS	6
3.3 SUPPORTED RESPONSES.....	6
3.4 SUPPORTED HEADER FIELDS	6
3.4.1 PRIORITY.....	6
3.4.2 SUBJECT	6
3.4.3 WG67-CALLTYPE.....	6
3.5 MESSAGE BODY.....	6
CHAPTER 4 INSTANTANEOUS ACCESS CALL.....	7
4.1 APPLICATION.....	7
4.2 ESTABLISHMENT CONDITIONS.....	7
4.3 AUDIO	7
4.4 TIMING CONSTRAINTS	7
4.5 IA CALL SIGNALLING PROCEDURES	7
4.5.1 ACTIONS AT THE CALLING-PARTY USER AGENT	8
4.5.2 ACTIONS AT A PROXY.....	8
4.5.3 ACTIONS AT THE CALLED-PARTY USER AGENT	8
4.6 IA CALL PARAMETER VALUES (TIMERS)	9
4.7 INTERACTION WITH OTHER ATS SUPPLEMENTARY SERVICES.....	9
4.7.1 INTERACTION WITH THE CALL PRIORITY INTERRUPTION SUPPLEMENTARY SERVICE.....	9
4.7.2 INTERACTION WITH THE CALL HOLD SUPPLEMENTARY SERVICE.....	9
4.7.3 INTERACTION WITH THE CALL TRANSFER SUPPLEMENTARY SERVICE.....	9

4.7.4	INTERACTION WITH THE CALL INTRUSION SUPPLEMENTARY SERVICE.....	9
4.8	IA CALL MESSAGE SEQUENCE CHARTS	9
ANNEX A REFERENCES		14
ANNEX B ACRONYMS		16
ANNEX C LIST OF EUROCAE WG-67 MEMBERS		18
IMPROVEMENT SUGGESTION FORM.....		21

LIST OF FIGURES

FIGURE 1.1: VIENNA AGREEMENT	2
FIGURE 3.1: PRIORITY HEADER VALUES	6
FIGURE 3.2: WG67-CALLTYPE HEADER VALUES	6
FIGURE 4.1: IA CALL FROM A-PARTY TO B-PARTY. IA CALL ESTABLISHED AND A-PARTY CLEARS CALL.....	10
FIGURE 4.2: IA CALL FROM A-PARTY TO B-PARTY. IA CALL ESTABLISHED, B-PARTY RESPONDS	10
FIGURE 4.3: IA CALL FROM A-PARTY TO B-PARTY. IA CALL ESTABLISHED, B-PARTY RESPONDS, THEN A-PARTY DE-ACTIVATES IA KEY	11
FIGURE 4.4: MONITORING NOT CONFIGURED ON A-PARTY'S VCS. IA CALL FROM A-PARTY TO B-PARTY. IA CALL ESTABLISHED, B-PARTY RESPONDS, THEN B-PARTY DE-ACTIVATES IA KEY	11
FIGURE 4.5: MONITORING NOT CONFIGURED ON BOTH VCSS. IA CALL FROM A-PARTY TO B-PARTY. IA CALL ESTABLISHED, A → B: TALKING & B → A: TALKING, A-PARTY DE-ACTIVATES IA KEY AND THEN RE-ACTIVATES IA KEY	12
FIGURE 4.6: IA CALL FROM A-PARTY TO B-PARTY. IA CALL ESTABLISHED, A → B: TALKING & B → A: TALKING, A-PARTY DE-ACTIVATES IA KEY AND B-PARTY DE-ACTIVATES IA KEY	12
FIGURE 4.7: IA CALL FROM A-PARTY TO B-PARTY. IA CALL IS REJECTED	13

LIST OF TABLES

TABLE 3.1: PRIORITY HEADER VALUES	6
TABLE 3.2: WG67-CALLTYPE HEADER VALUES	6

CHAPTER 1

INTRODUCTION

1.1

BACKGROUND

Ground-Ground (G-G) ATM voice systems have been based upon analogue and more recently, digital Time Division Multiplexing / Pulsed Code Modulation (TDM/PCM) technologies for many years.

Nowadays, however, convergence of voice and data into one multimedia network is a popular trend with a variety of technical solutions available on the market. Following in this direction ATM communication networks are adopting, by a process of gradual evolution, a common infrastructure for voice and data services.

As the technology has developed IP Technology has now the true potential to fulfil operational and technical ATM communication requirements - including those of voice / data convergence, Quality of Services (QoS), security and safety. There is also the possibility that IP may deliver solutions that will, over time, bring about true savings in investment and operating costs.

EUROCAE Working Group 67 (WG-67) undertook the mission to assess the feasibility of using Voice over Internet Protocol (VoIP) for providing ATM voice services. The group defined criteria, requirements and guidelines based upon the following operational needs and constraints:

- Operational and Technical Air-Ground (A-G) and Ground-Ground (G-G) ATM Voice system requirements;
- Existing IP Voice protocols and signalling standards;
- IP network capabilities for Voice services;
- Security, Quality of Service (QoS), and Convergence (infrastructure, protocol, applications);
- Existing IP Voice ATM system capabilities and service interfaces.

The following tasks were identified to fulfil the WG-67 mission:

- Define ATM Systems and identify their components (Voice Communication System / VCS, Ground-based Radio Station / GRS)
- Determine possible additional operational and technical ATM requirements for new ATM voice systems, also taking into consideration A-G communications.
- Make recommendations to upgrade current standardisation documents.
- Develop a Technical Specification for a VoIP Voice ATM System including:
 - Minimum performance and safety/security requirements for the system and, if appropriate, for components;
 - Interoperability requirements between IP components of the VoIP ATM system;
 - Minimum performance requirements of an IP Network to support ATM Voice services.

Consequently, the following three documents were delivered:

ED-136 - VoIP ATM System Operational and Technical Requirements

ED-137 - Interoperability Standards for VoIP ATM Components

ED-138 - Network Requirements and Performances for VoIP ATM Systems

The contents of all three documents are premised on the “**Vienna Agreement**” which defines the different components of a VoIP ATM system and their mutual interfaces as depicted in FIGURE 1.1.

VIENNA AGREEMENT

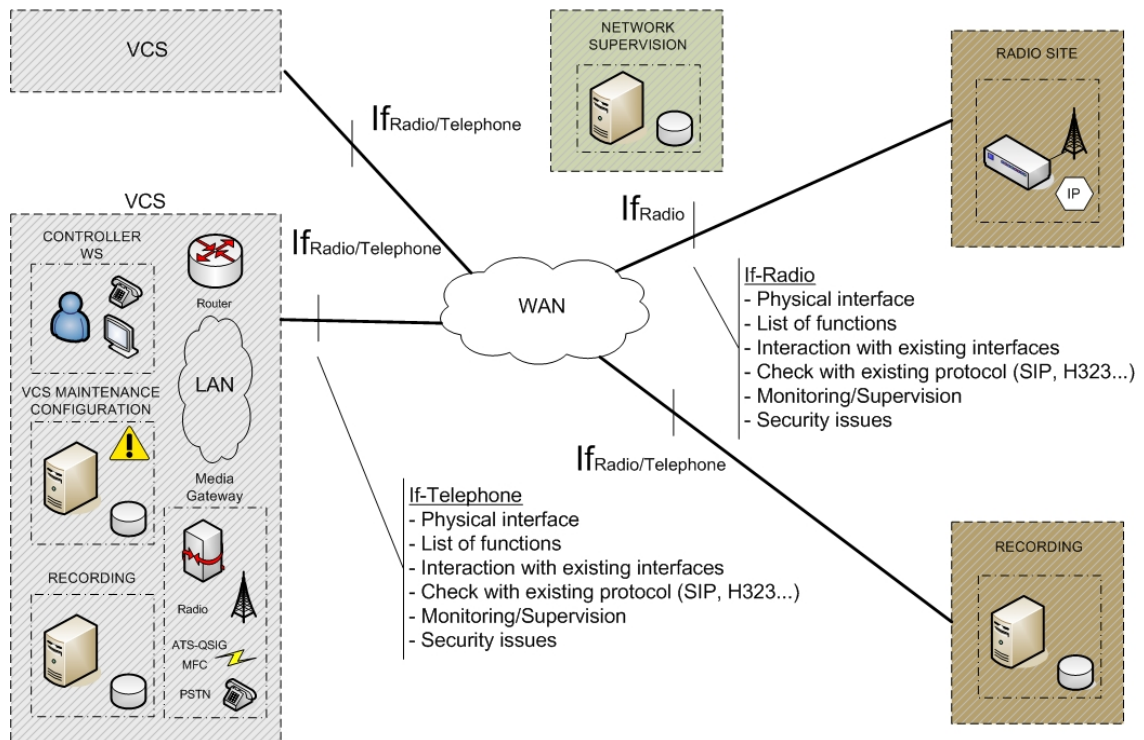


FIGURE 1.1: VIENNA AGREEMENT

VoIP components are interconnected through an IP network and suppliers are free to define their internal architecture (IP/Ethernet, TDM/PCM - Time Division Multiplexing/Pulsed Code Modulation, etc.) Between VoIP components, required interfaces are defined to guarantee their functional and technical interoperability.

Therefore, VoIP ATM Systems are composed of:

- **VoIP VCS Components** performing Radio and / or Telephone functions, including:
 1. Controller Working Positions, assuring HMI including voice devices (microphone and loudspeaker);
 2. Possible local VCS Maintenance and Configuration stations;
 3. Possible local Recording devices;
 4. Possible LAN for local interconnection;
 5. Possible Media Gateways to legacy systems (ATS-QSIG, ATS-R2, ATS-No.5, PSTN, Radio analogue lines, etc.)
- **VoIP Ground Radio Station Components** performing DSB-AM VHF and UHF Radio functions.
- **VoIP Supervision System Components** performing monitoring and control functions.
- **VoIP Recording Components** performing recording functions.
- **IP WAN Components** performing interconnection services between two or more different physical components.

1.2 ED-137 VOL 2 ADD 3 PRESENTATION

The scope of the WG-67 ED-137 Documents is to define the rules for VoIP implementations to support ATM communications:

- Radio for the Volume 1
- Telephone for the Volume 2
- Recording for the Volume 4
- Supervision for the Volume 5

This includes the performances requested for the related communications.

The present document, ED-137 Volume 2 Addendum 3, proposes a profile standard for the use of SIP to establish, terminate and modify speech media sessions of the Override Call Facility in an Air Traffic Services Ground Voice Network (AGVN).

SIP is an application layer protocol for establishing, terminating and modifying multimedia sessions. It is typically carried over the Internet Protocol (IP) (RFC 791 [2] and RFC 2460 [6]). Telephone calls are considered as a type of multimedia session where just audio is exchanged. SIP is defined in RFC 3261 [8].

This document specifies the signalling profile both for basic services that provide a bi-directional transfer capability for speech media between VCS endpoints in an IP AGVN employing SIP, and for call-related signalling in support of ATS supplementary services.

Interworking between an IP AGVN and a public IP network is out of scope of this document.

1.3 TERMINOLOGY FOR REQUIREMENTS, RECOMMENDATIONS AND OPTIONS

The terminology for requirements, recommendations and options in this document is based on RFC 2119 [5], which specifies Best Current Practice regarding the use of Key Words for the Internet Community. As such, the following terminology is applied:

- The word **SHALL** denotes a mandatory requirement;
- The word **SHOULD** denotes a recommendation;
- The word **MAY** denotes an option.

To avoid confusion with their natural meanings in the English language, the words **SHALL**, **SHOULD**, and **MAY** take on the meaning stated above only where printed in boldface. When printed in normal (Arial) typeface, the natural English meaning is meant.

Detailed description of terminology:

1. **SHALL**: This word has the same meaning as the phrase "REQUIRED" and means that the definition is an absolute requirement of the specification.
2. **SHALL NOT**: This phrase means that the definition is an absolute prohibition of the specification.
3. **SHOULD**: This word, or the adjective "RECOMMENDED", means that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course.
4. **SHOULD NOT**: This phrase, or the phrase "NOT RECOMMENDED" mean that there may exist valid reasons in particular circumstances when the particular behaviour is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behaviour described with this label.
5. **MAY**: This word, or the adjective „OPTIONAL“, means that an item is truly optional.

1.4 VERSION TRACKING

The present document, ED-137C: Volume 2 Addendum 3, **SHALL** be referenced as **phone.add03.02,phone.01** in the WG67-Version SIP header field described in ED-137 Volume 2 [36].