



# SITTI AT FAA VOIP-IE

## SITTI performance at FAA VoIP Interoperability Event

### Abstract

SITTI participated in the VoIP-in-ATM Interoperability Event hosted by FAA in May 2019 with its MULTIFONO® M800IP® VCS system. A selected set of tests was run to prove the compliance of the supplied system to the latest provisions of the EUROCAE ED137C standard. The result was extremely positive, proving SITTI VCS system being fully compliant concerning all mandatory VoIP-in-ATM services and the majority of the optional features. These latter have been developed by SITTI since the event, by also anticipating modifications resulting from formal change requests to the standard.

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15 January 2020

## 1. PREFACE

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The present white paper aims at giving readers knowledge on SITTI's performance during the VoIP-in-ATM (Voice over IP in Air Traffic Management) Interoperability Event hosted and organised by FAA (Federal Aviation Administration) at Atlantic City (USA) for 2 weeks from the end of April to the beginning of May 2019. SITTI participated in this event with its MULTIFONO® M800IP® VCS system.

Prior to the participation at the FAA Interoperability event, all companies signed a NDA (Non-Disclosure Agreement) in order to protect their own implementations and results from possible misuse. This document acknowledges such NDA. It will therefore not disclose any information related to other companies in any form. Only details related to SITTI's implementation and progress is given.

The purpose is to show that the VCS (Voice Communication System) implementation by SITTI successfully passed a selected set of ED137 version C interoperability test scenarios with other vendors of ED137C systems. SITTI did pass all the selected mandatory requirements of ED137C and has passed a majority of the selected subset of ED-137C optional features. Those features that were not ready to be tested within the SITTI system at the Interoperability Event have since been developed or are under development by SITTI.

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## 2. FINAL REPORT FROM FAA

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The FAA VoIP interoperability event took place from April 29 to May 10, 2019, at Atlantic City, New Jersey, USA. A significant number of vendors participated:

- 5 VCS vendors
- 4 GRS vendors
- 10 REC vendors

Prior to the event, a set of test scenarios has been defined in order to verify the mutual interoperability concerning specific ED137 version C features. Participating companies formed pairs, so that e.g. all VCS vendors could interface to all other vendors of VCS, GRS (radio) and REC (recorder).

On September 27, 2019, FAA issued an official document (named “*FAA VoIP Interoperability Event Final Report*”) stating a high level overview of the overall results of the test scenarios performed.

## 3. SITTI PERFORMANCE

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The following tables show the results of the above mentioned pairings with all other vendors of different kinds of equipment (VCS, GRS, REC). Such results are given in the following form:

- OK Test passed
- NOK Test failed
- OT Out Of Time (test could not be run because of time constraints)
- NAS Not Applicable because SITTI had not implemented the feature
- NAP Not Applicable because the paired company had not implemented the feature
- IMPL Feature implemented by SITTI after the tests

### 3.1 SITTI VERSUS GRS

A total of 60 test scenarios have been run with GRS vendors:

Test	Description
1	Session establishment/clearing
2	Session pre-emption
3	Coupling session
4	Linked session
5	Multicast session
6	PTT keying, lockout, override, summation
7	Coupling PTT interruption/summation
8	KEY-IN event package
9	Maintenance mode
10	Dynamic delay compensation (TX climax)
11	Dynamic delay compensation (RX voting)
12	SELCAL
13	BSS
14	Simultaneous transmission
15	Version negotiation

The following table shows the results:

Test ID	OK	NOK	OT	NAP	NAS	IMPL
1	4	0	0	0	0	-
2	4	0	0	0	0	-
3	4	0	0	0	0	-
4	4	0	0	0	0	-
5	3	0	1	0	0	-
6	3	0	1	0	0	-
7	3	0	1	0	0	-
8	4	0	0	0	0	-
9	4	0	0	0	0	-
10	4	0	0	0	0	-
11	0	0	0	0	4	u.d.
12	4	0	0	0	0	-
13	4	0	0	0	0	-
14	4	0	0	0	0	-
15	4	0	0	0	0	-
<b>TOTAL</b>	<b>53</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>4</b>	<b>60</b>

At the time of the Interoperability Event, there was only one feature that had not yet been implemented by SITTI: it is currently under development (u.d.).

### 3.2 SITTI VERSUS REC

A total of 150 test scenarios have been run with REC vendors.

Test	Description
1	DA call answered
2	IA call
3	DA call unanswered/rejected
4	DA unattended transfer
5	Broadcast conference call
6	PTT keying on 2 frequencies
7	Aircraft call on 2 frequencies
8	SQI for RX voting
9	Radio session rejected
10	Multicast session
11	Linked session
12	SCT, PTTS, PM
13	Session timeout
14	G/G and A/G combined
15	G/G and A/G split

The following table shows the results:

Test ID	OK	NOK	OT	NAP	NAS	IMPL
1	10	0	0	0	0	-
2	10	0	0	0	0	-
3	10	0	0	0	0	-
4	10	0	0	0	0	-
5	0	0	0	0	10	u.d.
6	10	0	0	0	0	-
7	10	0	0	0	0	-
8	10	0	0	0	0	-
9	10	0	0	0	0	-
10	10	0	0	0	0	-
11	10	0	0	0	0	-
12	0	0	0	0	10	done
13	10	0	0	0	0	-
14	10	0	0	0	0	-
15	10	0	0	0	0	-
<b>TOTAL</b>	<b>130</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>150</b>

At the time of the Interoperability Event, there were only two features that had not yet been implemented by SITTI: one of them has been meantime completed (done), while the other one is currently under development (u.d.).

### 3.3 SITTI VERSUS VCS

A total of 120 test scenarios have been run with VCS vendors.

Test	Description
1a	Routine DA/IDA call
1b	Priority DA/IDA call
1c	Multi-destination DA/IDA call
2	IA call
3	Position Monitoring
4	Position Monitoring with echo detection
5a	Single destination voice call
5b	Multi destination voice call
6	Broadcast conference call
7	Preset conference call
8	Call intrusion
9a	Call hold, transfer, pickup
9b	Call hold, transfer, pickup
9c	Call hold, transfer, pickup
9d	Call hold, transfer, pickup
9e	Call hold, transfer, pickup
10a	Basic call forwarding
10b	Basic call forwarding
11	Audio loop detection
12	Version negotiation

The following table shows the results:

Test ID	OK	NOK	OT	NAP	NAS	IMPL
1a	6	0	0	0	0	-
1b	6	0	0	0	0	-
1c	6	0	0	0	0	-
2	6	0	0	0	0	-
3	6	0	0	0	0	-
4	0	0	0	4	2	done
5a	2	0	0	4	0	-
5b	2	0	0	4	0	-
6	0	0	0	3	3	u.d.
7	1	0	0	0	5	u.d.
8	4	0	0	2	0	-
9a	6	0	0	0	0	-
9b	4	0	0	2	0	-
9c	4	0	0	2	0	-
9d	0	0	0	4	2	done
9e	0	0	0	6	0	-
10a	0	0	4	2	0	-
10b	0	0	4	2	0	-

11	1	0	1	3	1	done
12	5	0	1	0	0	-
<b>TOTAL</b>	<b>59</b>	<b>0</b>	<b>10</b>	<b>38</b>	<b>13</b>	<b>120</b>

At the time of the Interoperability Event, there were only five features that had not yet been implemented by SITTI: three of them have been developed in the meantime (done), while the other two are currently under development (u.d.).

#### 4. CHANGE REQUESTS

The interoperability test scenarios performed at the FAA VoIP event allowed demonstration of the robustness and correctness of the provisions set by version C of the EUROCAE ED137 standard. It also allowed the pinpointing of some aspects requiring revision because they were either not sufficiently clearly defined in the standard or in some way ambiguous.

This led to the definition of some formal Change Requests to be applied on the current ED137 version C ultimate volumes regarding radio, telephone and recording (volumes 1,2,4). These change requests are currently in the process of being submitted to the EUROCAE working group 67 for formal approval.

#### 5. CONCLUSION

By looking at the above tables, it is possible to see how SITTI MULTIFONO® M800IP® VCS system is 100% fully compliant to version C of the EUROCAE ED-137C concerning all mandatory VoIP-in-ATM services and is also compliant with the majority of the ED-137C optional features. Further optional features have been developed by SITTI since the FAA VoIP interoperability event, while development is still ongoing for completion of the remaining features (at the time this white paper is defined). SITTI is also anticipating the introduction of changes into their implementation following the formal approval of the changes to the standard by EUROCAE WG67.

## ABOUT SITTI

### Expertise

Established in 1946, SITTI is a private, world leading company meeting the challenges linked to the study and development of integrated Voice Communication Systems (VCS), ancillary Equipment and Services. SITTI is a world primary system supplier and integrator of Operational and Technical solutions for Civil and Military, Public and Private Agencies and Organisations, active in Air Traffic Control (ATC), Strategic and Emergency Services (SES).



The company has got extensive experience and expertise in the integration of analogue, digital, VOIP radio and telephone communications. This makes SITTI a primary reference point worldwide, widely confirmed by its continued successful presence and constant growth in the evolving Voice Communication Systems (VCS) market.

The constant increasing integration of user services, technologies and functionalities into a common platform is the main focus of SITTI's Research and Development activities.

Confirming the company's solid leadership in communication systems, SITTI is today present in most countries in the world with a very large base of installed systems and services. The high level of scalability and modularity of SITTI systems and the large integration capabilities allow our products to fulfil the operational, technical and support requirements for all Air Traffic Control needs, ranging from small air field towers to large ACC centres.

Operational and technical training, on site Customer assistance, qualified, skilled personnel and remote maintenance connection facilities provide our customers with outstanding long term system support.

**THE VOICE THAT GUIDES YOU. ALWAYS.®**

### Technology and User Friendliness

Today's applications require different technologies to be integrated into one system to meet Customer specifications for highly flexible solutions. These shall be capable of dealing with both standard and legacy radio and telephone communication devices and protocols at the same time, including VoIP.

Full membership in international standardisation workgroups, attention to the evolving Customer needs, commitment to the development and implementation of the most advanced technological and operational capabilities, extensive integration features, are SITTI's valued assets.

The introduction of Voice Over IP (VoIP) in the Air Traffic Control context has seen SITTI been proactively involved with decisive contributions to the definition and finalisation of the EUROCAE ED137 standard.



SITTI pays particular attention in providing operators with an easy-to-use, ergonomic and customisable Human-Machine Interface (HMI) for safe, easy, effective operations in Air-Ground and Ground-Ground communications. The constant R&D effort for integration of different functionalities into Controller Working Positions (CWP) is a remarkable added value of SITTI products.

Highly configurable CWP touch screen keyboards provide operators controlled access to their role functionalities to assist them in carrying out their duties in the safest and most efficient manner.

**ALWAYS ONE STEP AHEAD.**