airservices australia

DELIVERY PLAN

Melbourne ARFFS UHF Radio Performance Improvement Activities

Contents

Executive Summary

Safety is Airservices' greatest priority.

The risk associated with Aviation Rescue Fire Fighting Service (ARFFS) use of Ultra High Frequency (UHF) radios at Melbourne aerodrome is under active management. In accordance with our Safety Management System (SMS), and in consultation with key stakeholders, Airservices has advanced several actions (controls) to improve UHF radio performance. As a result, UHF radio performance has improved, however, Airservices acknowledges the need for additional action.

This delivery plan sets out Airservices' commitment to advancing additional actions, defining an improvement program that includes a clear description of the works, the intended outcome, the schedule for delivery and associated caveats and contingencies. The actions set out in this plan are interconnected and have been designed carefully to ensure performance is measured and assessed as the works progress. This is important as there is complexity associated with radio frequency use in and around aerodromes and associated infrastructure. Where possible, Airservices has sequenced the activities to fast-track implementation, whilst maintaining the required engineering design and control consistent with Technology Management Standards.

Airservices also reaffirms our commitment to ongoing communication and engagement as we work together to improve ARFFS UHF radio communications at Melbourne aerodrome.

1.0 Overview

1.1 Background

Consistent with our SMS, the risk associated with multiple operational safety occurrence reports indicating failure or suboptimal performance of UHF radio communication at Melbourne aerodrome, is currently managed via the Corporate Integrated Reporting and Risk Information System (CIRRIS).

Risk register RSK-0001225 defines key information relating to the operational safety harm associated with the occurrence reports.

The information within this register has been established by relevant specialists and local Melbourne ARFFS staff, capturing the outcome of risk review workshops held on 3-5 September 2024, 11 April 2025 and 11 July 2025.

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3.0 Additional information

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4.0 Ongoing performance

4.1 Airservices commitment post improvement actions

Due to the technical complexity of the UHF system, and the variabilities that interact with the actions set out in this plan, Airservices acknowledges that there may be an ongoing need for further works post the completion of actions set out within. Airservices unreservedly remains committed to working with all required stakeholders to advance such future work to ensure the level of risk associated with the UHF radio performance at Melbourne ARFFS is managed to a level that is as low as reasonably practicable. Such a statement acknowledges that this may require the future implementation of improvements identified from the review set out in section 4 of this plan, and any other reasonable actions that become apparent due to this improvement work. Airservices is committed to ensure safety remains our greatest priority.

In support of this ongoing commitment, Airservices has established regular fortnightly meetings to ensure collaboration, consultation and awareness with local staff, local leadership and the engineering specialists associated with this work.

ENGINEERING

ASA MELBOURNE ARFFS UHF DAS

EXPANSION AND RECONFIGURE

vertel

BUILDING CONNECTIONS
THAT MATTER

TABLE OF CONTENTS

DOCUMENT INFORMATION

Document Title	ASA Melbourne ARFFS UHF DAS
Version	1.1.0
Description	
Author(s)	s47F
Creation Date	27th November 2025

REVISION

Version	Revision Date	Author(s)	Revision Notes
1.0.0	26/11/25	s47F	Initial Release
1.0.1	27/11/25	s47F	Grammatical and styling updates
1.1.0	27/11/25	s47F	Revised cable lengths provided by s47F

1 - INTRODUCTION

1.1 - PURPOSE OF DOCUMENT

The purpose of this Technical Design Document is to present Vertel's detailed engineering design for enhancements to the Melbourne Airport (Tullamarine) Aviation Rescue Fire Fighting Service (ARFFS) UHF communications system. This document expands upon and implements the requirements provided by Airservices Australia in their Statement of Work (SOW) and the Vertel design commitments defined in **Appendix A.1 – ASA Melbourne design** proposal.

Appendix A.1 documents Vertel's confirmation of the scope, deliverables, assumptions, and commercial terms associated with this Design Phase. The technical design contained here is developed in accordance with those agreed boundaries and reflects the information, antenna locations, and leaky feeder connection points supplied by Airservices Australia.

This document includes the revised RF distribution architecture, repeater configuration, leaky feeder integration, engineering rationale, and methodology required to support a future implementation phase.

1.2 - BACKGROUND

Airservices Australia has identified UHF handheld coverage gaps within the Melbourne Airport Terminal and the underground Tunnel network. These requirements were outlined in the SOW provided to Vertel. Airservices supplied annotated terminal floor plans identifying three specific antenna positions requiring improved indoor coverage, including floor levels and intended coverage directions.

Airservices also identified two potential connection points within the existing tunnel leaky feeder system (Location A and Location B) as guidance for where new terminal antenna feeds may be connected. Vertel has assessed the suitability of these points and incorporated them into the proposed design.

Airservices further requested that the existing Satellite Fire Station (SFS) repeater be relocated into Terminal Services Building 2 (TSB2) to serve as the RF source for the unified leaky feeder and terminal antenna network. The existing dual-channel TSB2 repeater will continue to support rooftop antennas independently.

No RF measurement data, tunnel signal plots, or baseline coverage heatmaps were provided. All design work is based solely on the information, drawings, and inputs provided by Airservices Australia.

1.3 - SCOPE OF WORK

The scope of this Design Phase is defined by the requirements provided by Airservices Australia in their Statement of Work (SOW) and the commercial and technical commitments documented in Appendix A.1 – ASA Melbourne Design Proposal. This section summarises the specific design activities Vertel will undertake as part of this engagement.

The design activities included in scope are as follows:

s47G

2 - APPLICABLE STANDARDS AND REFERENCES

This design has been developed in accordance with the standards, regulatory frameworks, and source documents listed below.

2.1 - AUSTRALIAN STANDARDS AND REGULATORY REFERENCES

ARPANSA – RADIOFREQUENCY EXPOSURE STANDARD

- ARPANSA Standard for Limiting Exposure to Radiofrequency Fields – 100 kHz to 300 GHz (RPS S-1) Primary Australian standard governing occupational and general public RF exposure limits applicable to all transmitters in this design. **Appendix F.1 – ARPANSA RPS S-1 (Rev.1)**

2.2 - TECHNICAL REFERENCES

Manufacturer datasheets for all antennas, RF components, and leaky feeder cable.

These datasheets provide verified performance characteristics (e.g., insertion loss, coupling loss, attenuation per metre, gain, power ratings) required for accurate engineering calculations. **Appendix C**

2.3 - PROJECT SOURCE DOCUMENTS

The design documented herein is based solely on the information provided by Airservices Australia, including:

- Four site plan extracts indicating proposed terminal antenna locations and connection points to existing leaky feeder system.
- System information supplied verbally or in written form by Airservices, including repeater arrangements and intended RF distribution topology.
- Existing high-level system descriptions provided by Airservices for reference.

No RF measurement files, coverage heatmaps, tunnel test data, or baseline performance reports have been provided as inputs to this Design Phase. **Appendix A**

s47G

LABELLING AND DOCUMENTATION

- All cables, riser feeds, couplers and termination points shall be labelled in accordance with AS/CA S009 and applicable ASA site standards.
- Labels shall clearly identify the function and termination location of each cable run.
- As-built documentation shall be provided at completion, including cable routes, termination locations, and component identifiers.

s47

8.8 - REQUIRED SIGNAGE OR CONTROLS (IF ANY)

Based on the calculated exposure levels and the extremely low percentages of the ARPANSA RPS-S1 general-public limit s47 **no RF hazard signage, restricted-access zones, or administrative controls are required** for the terminal antennas or the modified tunnel DAS infrastructure.

All antennas are ceiling-mounted and physically inaccessible to the public, further reducing exposure potential. The calculated power densities at the closest accessible points remain orders of magnitude below the ARPANSA general-public reference levels, confirming that RF exposure from the terminal antennas is inherently compliant.

s47

If Airservices Australia chooses to undertake post-installation RF measurements at a future stage, signage or controls would only be considered if measured levels approached or exceeded the ARPANSA general-public reference levels. s47 .

9 - DESIGN DECISIONS AND RATIONALE

s47G

Works Instruction : ML Repeater 2 Relocation and Antenna System Installation

Works Instruction C-TEMP0287

Document No. ORBPE-1242980035-798

Version 1

Effective 01 December 2025

Prepared:	s47F	s47F Digitally signed by s47F Date: 2025.12.02 16:03:38 +11'00'
Endorsed:	s47F	s47F Digitally signed by s47F Date: 2025.12.02 15:06:47 +10'00'
Authorised:	s47F	s47F Digitally signed by s47F Date: 2025.12.08 12:13:55 +11'00'

Change summary

Version	Date	Change description
1	01 Dec 2025	Initial

This document was created using Project Works Instruction Template (C-TEMP0287) Version 6.

Table of contents

Tables

Figures

s47E(d)

s47E(d)

6 Safety

6.1 Workplace Health & Safety

- No Safe Work Method Statement(s) (SWMS) is required for the works contained in this Work Instruction. This is due to works contained herein being considered not of high risk category.
- Where any hazardous plant/equipment is being used by workers as part of this project activity, ensure that Safe Work Instructions (SWIs) are available and followed, and that workers are competent in use of the plant/equipment (high risk work licences are required when operating some types of plant, e.g. forklifts, cranes, erecting scaffolding etc.) Refer to AA-PROC-SAF-0019: Plant Risk Management.
- Where the project activity involves construction or demolition work, a general construction induction card or certification must be held by all workers.
- Conduct a Tool Box meeting with all staff/contractors involved with this work and document, either on the SWMS or a Pre-Start Talk Record. Identify any further hazards associated with this work and confer with Project Manager to ensure risk assessment is undertaken for any new hazards.

- Use AA-TEMP-SAF-0020: Work Health and Safety (WHS) Hazard Identification and AA-FORM-SAF-0013: Workshop and Fire Station Safety Inspection as a guide to identifying WHS hazards.
- Ensure that appropriate Personal Protective Equipment (PPE) PROC-160 is worn or is available at site on standby.
- Clarify requirement for induction of any contractors or visiting staff in accordance with AA-PROC-SAF-0035: Managing Contractor and Visitor Health and Safety Risks:

Induction Required?	Yes ☑	No ☐	Initials: s47F

If so, Induction carried out and evidence attached	Initials:	

- Contact a WHS Specialist for advice or assistance.

7 Works Plans

7.1 Notifications and Works Plans

(Refer to C-PROC-0355: Maintain Facilities)

1.	**Relevant Managers Notified of Commencement of Work?**	Yes ☐	No ☐

This is a function of the Project Manager, and needs to be organised just before the commencement work.

2.	**TOC Notified of Work?**	Yes ☐	No ☐

This is a function of the installer, and needs to be organised before the commencement work and once work has been completed

3.	**Raise Works Plan:**

Works Plan No: 273094 covering all work to be performed on the UHF System

This is a function of the installer, and needs to be organised at least 7 days prior to the commencement of work and finalised once work has been completed.

8 Resources

8.1 Materials Required

Refer to Section 9 Bill of Materials for the detailed material list

8.2 Resources Required

Technical Integrator Staff x 2

Estimated Hours: 22 Hrs (Total)

Estimated Start date: 30th November 2025

Estimated Finish date: 15th December 2025

8.3 Tools & Equipment Required

8.4 Test Equipment Required

9 References

9.1 Drawings

Table 1 – Drawing List

s47E(d)

9.2 Documents

Table 2 – Document List

Title	Number
Site Manifests	Site Manifests
Safety Management System Objectives and Requirements	AA-NOS-SAF-0002
Safe Method Work Statement (SWMS)	C-TEMP0250
Take 5 and Safe Method Work Statement (SWMS)	PROC-253
Implementing Regulation and Safety Requirements for Telecommunication Installations	PROC-138
Personal Protective Equipment and Uniform	PROC-160
Plant Risk Management	AA-PROC-SAF-0019
Pre-Start Talk Record	AA-TEMP-SAF-0025
Work Health and Safety (WHS) Hazard Identification	AA-TEMP-SAF-0020
Workshop and Fire Station Safety Inspection	AA-FORM-SAF-0013
Maintain Facilities	C-PROC-0355
Works Planning	C-PROC-0355
Works Plan User Guide	GUID-215
Communications Network Cable Interface Control Document	ICD/WAN/001

9.3 Airways Engineering Instructions

Table 3 – Airways Engineering Instruction List

Title	Number
ADIN and PABX Equipment and Cabling Naming Standard	AEI-7.3255
Maintenance and Inspection of External Lines Equipment	AEI-4.3000
RF Feeder Installation	AEI-4.3322
Power Distribution and Reticulation: Electrical Performance Inspection	AEI-3.3002
DC Power Supplies Performance Inspection Tasks	AEI-3.4064
Site Earthing and Lightning Protection Systems for Operational Facilities	AEI-3.1504
Site Earthing and Lightning Protection Systems: Performance Inspection and Maintenance Procedure	AEI-3.4061
Standby Satellite Network Alignment for Remote Sites	AEI-7.4328

Title	Number
Bit Error Rate and CAS Bit Testing on E1 and Fractional E1 Bearers using the Sunset E20c Test Set	BEARERS:TP-002

9.4 Contact Information

Table 4 – Contact List

Position	Name	Phone
s47F		

9.5 Site Access Detail

s47E(d)

s47E(d)

10 Works Completion

Table 5 – Works Completion List

Works Completion Checklist		
Item	**Completed (✓/✱)**	**Comment**
-- URGENT – Mark-up all site drawings to 'As Installed'.	✓	
-- URGENT – Submit marked-up drawings, completed Work Instruction and any accompanying documents to Technical Integrator.	✓	
-- URGENT – Photograph site. Take **lots** of detailed photographs of whatever has been changed etc. racks (network including switch and patch panel, PABX connection detail as well as detailed equipment photos of installed equipment, cable entry/exit points.	✓	
Complete Electrical Compliance Certificate and return the form to the Technical Integrator. Not Required ☐ Required ☐	N/A	
Complete Telecommunications Cabling Advice TCA1 and return the form to the Technical Integrator. Not Required ☐ Required ☐	N/A	
Complete a post installation WHS Inspection. AA-PROC-SAF-0008. Not Required ☐ Required ☐	N/A	
List anything else that may be of interest to others on the Notes and Observations form in Section 6.	N/A	
Ensure the Completion Advice on the first page is completed.	N/A	

11 Completion Advice

On Completion of Works:

To be completed by the nominated project installation team leader, and returned to the Project Technical Integrator, along with marked-up copies of drawings, test results, configuration data records from WHS Tool box meetings, and any other commissioning-related paperwork.

The Technical Integrator will then review and distribute these as necessary to the Project Manager and/or Drafting Team.

Name:	s47F	SAP Personnel number:	s47F
Signature:		Work Completion Date:	19/12/2025

In case of a Non-Completion of Works:

Please supply the Project Technical Integrator with marked-up copies of drawings at the time work ceased.

Please also supply a Brief, explaining what changes were completed on the site before work was terminated.

This needs to be completed before the Team Leader leaves the site.

This is to guard against a stoppage of site works, be it for technical or weather related reasons.

A protracted delay could mean a change of field Team Leader, therefore the Planner needs to know the current state of the site conditions.

12 Bill of Materials

Installation Material List	
Item	**Quantity**

Appendix A AEI-7.4339 FIXED VHF & UHF Ant System Performance Inspection

Table B.1 Antenna System Test Sweeps

From (Equipment or Rack)	To (Equipment or Rack)	Cable Type	s47E(d)						

Where a test indicates "On Frequency", the following applies: Carrier frequency s47E(d)

Where a test indicates "Full Band", the following frequency limits apply:
s47E(d)

All SiteMaster results should be provided to the Technical Integrator, who then shall email the results to the SysTA for acceptance.

Subject field of the email to be "SiteMaster xxxx (site) yyyy (location if required for clarity) nnn.nn (list frequency/ies only if not all antennas at site are included) mmm yyyy (month year)".

e.g. "SiteMaster ML ARFFS Antenna System Dec 2025"

Appendix B Radio Test Call Results Sheet

A.1 Technical Equipment Record

s47E(d)

[redacted]

ARFFS Melbourne UHF Comms Test Plan

Test Plan and Procedure

Document Number ORBPE-1242980035-669

Version 1

Effective 03 August 2025

Approved: s47F s47F Digitally signed by s47F Date: 2025.08.03 10:48:03 +10'00'

Approved: s47F Digitally signed by s47F 08:46:59 +10'00'

Controlled Copy Number: .....
Issued to: .....
Date: ...../...../.....

Ensure document is current before use

Change summary

Version	Date	Change description
1	03 August 2025	Initial Release

This document was created using Generic Technical Document Template C-TEMP0156 Version 12.

Table of Contents

1 Purpose

This document defines the test plan, process, test locations and results record sheets required for the RF Spectrum Survey and configuration works on the Melbourne ARFFS UHF Communications system to be conducted in early August 2025.

This work is required to identify any underlying issues with the RF environment in Melbourne and the UHF communications system, as well as implementing configuration changes to improve system performance.

2 Scope

Testing includes the UHF system, VHF Airband System and the Public Address and Siren installed in the WSIA ULFVs.

Activities

1. RF Spectrum Survey and Monitoring
2. Reprogram Training School Radios with new Codeplug (new Training Channels)
3. Trial and Implement New Portable/Mobile/Repeater Configuration Settings
4. Test and Implement New Repeater Frequencies
5. Re-configure Repeater 3 to Connect Command Channel to Tunnel Leaky Feeder instead of Operations
6. Assess suitability and viability of Trialling the installation of a passive repeater at both T2 and T4 locations
7. Assess suitability and viability of relocating Repeater 2 to alternative Airservices facility
8. Final Testing before leaving site

3 Pre-Requisites

The following is a list of pre-requisites in order for the activities to be able to be undertaken.

Activity	Completed?	Reference
Works Plan Raised	✓	TAS_PDTI-2025-267130
ARFFS Firefighter escort arranged for the required days	✓	–
TSBs and Tunnel Permits Acquired	✓	–
ASICs or airside visitor passes arranged for all personnel to be going airside	✓	–
APAM Contact Organised for Assessment of Potential Passive Repeater Locations	✓	s47F
New baseline Codeplug developed with new Repeater 2 frequencies, new Hot Fire training ground frequencies, new WSIA frequencies and new Karratha and Port Hedland frequencies	✓	s47E(d)

4 Equipment Required

The following is a list of equipment required for the activities to be able to be undertaken:

Equipment	Confirmed	
s47E(d)	✓	RADLINK EQUIPMENT TO BE USED
	✓	
	✓	
	✓	
	✓	
	✓	SITE CHARGERS TO BE USED
	✓	
	✓	
	✓	

5 Activities

5.1 System Test – Baseline

s47E(d)

Is task completed?	Yes ☑	No ☐	Initials:	s47F

5.2 RF Spectrum Survey and Monitoring

An RF spectrum survey and monitoring activity is to be performed to look for any potential interference or noise affecting the UHF radio communications.

s47E(d)

Is task completed?	Yes ☑	No ☐	Initials:	s47F

s47E(d)

Is task completed?	Yes ☑	No ☐	Initials:	s47F

5.3 Reprogram Training School Radios with New Codeplug (new Training Channels)

s47E(d)

This activity is to be coordinated with the Training School and performed when the radios can be made available. This has been tentatively scheduled for Monday afternoon, 4th August.

Programming is to conducted as follows:

s47E(d)

Is task completed?	Yes ☑	No ☐	Initials:	s47F

s47E(d)

Is task completed?	Yes ☑	No ☐	Initials:	s47F

s47E(d)

Is task completed?	Yes ☑	No ☐	Initials:	s47F

5.4 Trial and Implement New Portable/Mobile/Repeater Configuration Settings

s47E(d)

s47E(d)

Is task completed?	Yes ☑	No ☐	Initials:	s47F

5.5 Test and Implement New Repeater Frequencies

s47E(d)

Is task completed?	Yes ☑	No ☐	Initials:	s47F

s47E(d)

Is task completed?	Yes ☑	No ☐	Initials:	s47F

s47E(d)

s47E(d)

Is task completed?	Yes ☑	No ☐	Initials:	s47F

s47E(d)

Is task completed?	Yes ☑	No ☐	Initials:	s47F

s47E(d)

Is task completed?	Yes ☑	No ☐	Initials:	s47F

s47E(d)

Is task completed?	Yes ☑	No ☐	Initials:	s47F

s47E(d)

Is task completed?	Yes ☑	No ☐	Initials:	s47F

s47E(d)

Is task completed?	Yes ☑	No ☐	Initials:	s47F

s47E(d)

Is task completed?	Yes ☑	No ☐	Initials:	s47F

s47E(d)

5.6 Re-configure Repeater 3 to Connect Command Channel to Tunnel Leaky Feeder instead of Operations

s47E(d)

[redacted]

Is task completed?	Yes ☑	No ☐	Initials:	s47F [redacted]

5.7 Assess suitability and viability of Trialling the installation of a passive repeater at both T2 and T4 locations

s47E(d)

[redacted]

Is task completed?	Yes ☑	No ☐	Initials:	s47F [redacted]

REFER SUMMARY REPORT.

5.8 Assess suitability and viability of relocating Repeater 2 to alternative Airservices facility

s47E(d)

Is task completed?	Yes ☑	No ☐	Initials:	s47F

REFER

5.9 System Test – Final

s47E(d)

Is task completed?	Yes ☑	No ☐	Initials:	s47F

6 Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday
Morning	• Travel	• Meet with ARFFS crew. Visitor pass from Airservices. • s47E(d)	• Meet with ARFFS crew. Visitor pass from Airservices. • s47E(d) • Meet with APAM to investigate potential for passive repeater	• Meet with ARFFS crew. Visitor pass from Airservices. • s47E(d)	• Meet with ARFFS crew. • Review any events following rollout of final config • Conduct final testing before leaving site • Assess viability of relocating Repeater 2 to alternative Airservices facility
Afternoon	• 1:00pm Meet with ARFFS Team - run through plan for the week • 2:00pm Setup RF Spectrum Monitoring at Satellite Station • 3:00pm Reprogram Training School Radios	• Continue trial of new portable, mobile, repeater configs/settings • Review RF Spectrum Monitoring	s47E(d)	s47E(d)	• Travel

7 Test Call Procedure

7.1 Test Process Briefing

Prior to starting any testing, a briefing shall be held with the test team including the FCC Operator. Provide a copy of the Test Calls Script to the remote team and FCC Operator.

If the FCC operator changes during testing, the test calls should be paused. FCC handover should be completed, and the new FCC operator briefed on the test process before restarting.

s47E(d)

7.2 Basic Check Call – Process:

s47E(d)

7.3 Test Calls - Script:

s47E(d)

7.4 Recording Results

The results are recorded in the tables in the Appendix.

Test sheets are completed by the Test Team and not the FCC Operator.

For Each Check Call - Mark Quality 1-5.

For UHF check calls also record the RSSI in the table.

7.5 Radio Equipment

Radio equipment will be required for check calls. Serial Numbers of the equipment used shall be recorded.

s47E(d)

7.6 Result Scoring

The quality for the radio check calls is scored on a scale of 1 to 5 as detailed in the ARFFS document AFFM-RA:

1. **Unreadable**
2. **Readable now and then**
3. **Readable, but with difficulty**
4. **Readable**
5. **Perfectly readable**

7.7 Test Results - Analysis

Completed test sheets shall be signed off, scanned and sent to the ARFFS Comms SysTA.

For the RSSI values recorded, the following table is for information only;

	RSSI VALUE
GREEN	>= -80 dBm
YELLOW	-80 to -90 dBm
ORANGE	-90 to -100 dBm
RED	<= -100 dBm

8 Definitions

Within this document, the following definitions apply:

Term	Definition
AALL	Aerodrome ARFFS Line Leader
ARFFS	Aviation Rescue Fire Fighting Services
ARCP	ARFFS Radio Communications Project
AROC	Aeronautical Radio Operator Certificate
Codeplug	The Codeplug is the UHF equipment configuration file
FCC	Fire Command Centre
FCCER	FCC Equipment Room
PTT	Push/Press To Talk
SysTA	System Technical Advisor
UAT	User Acceptance Testing
UHF	Ultra High Frequency

9 References

This document contains the following references.

Title	Number
ARFF UHF Repeater No.1 Circuit Diagram	MR72900301_005^011
ARFF UHF Repeater No.2 Circuit Diagram	MR72900050_001^005
ARFF UHF Repeater No.3 Circuit Diagram	MR72900002_003^004
ARFFS - UHF Coverage Mapping - Engineering Report _ V2	RDOC-ARFFS25 / Eng

Appendix A Baseline System Tests

A.1 System Tests – Baseline

System	Pass / Fail	Comments
UHF REPEATER	PASS	
THROUGH SWITCHPLUS	PASS	
REMOTE ACCESS TO RAT	PASS	
OPS VOICE RECORDING	PASS	
CMD VOICE RECORDING	PASS	

A.2 System Tests – Final

System	Pass / Fail	Comments
UHF REPEATER	PASS	
THROUGH SWITCHPLUS	PASS	
REMOTE ACCESS TO RAT	PASS	
OPS VOICE RECORDING	PASS	
CMD VOICE RECORDING	PASS	

Appendix B Training School Radio Programming Record

Radio Type	Serial Number	Confirm Reprogrammed / Version
s47E(d)		
		* (could not reprogram / unserviceable)
		Currently in BN

Completed By: s47F

Date Completed: 4/12/24

Appendix C Trial Configuration Settings Test Results

C.1 Technical Equipment Record Sheet

Category	Equipment	Serial Number
s47E(d)		

C.2 Test Results Sheet

s47E(d)

Configuration	Test Call Location	Baseline Test Call	Post Change Test Call	Comments
Config 3				

Appendix D New Frequencies Test Results

D.1 Technical Equipment Record Sheet

Category	Equipment	Serial Number
s47E(d)		

D.2 Test Results Sheet

Configuration	Test Call Location	Baseline Test Call	Post Change Test Call	Comments
s47E(d)				

Appendix E ML ARFFS Station Radio Programming Record

E.1 Repeater Reprogramming

Details of Configuration Changes to Repeaters Implemented:

s47E(d)

Repeaters Reprogramming:

Radio Type	Reprogrammed	Updated Configuration File Saved
s47E(d)		

E.2 Portables/Mobiles/Off-Air Monitor Reprogramming

Details of Configurations implemented: s47E(d)

Configuration Identifier Implemented Portable: s47E(d)

Configuration Identifier Implemented Mobile:

Configuration Identifier Implemented Off-Air M

Radio Type	Serial Number	Confirm Reprogrammed / Version
s47E(d)		

Radio Type	Serial Number	Confirm Reprogrammed / Version
s47E(d)		

s47E(d)

s47F

8/8/25

Appendix F AEI-7.4339 FIXED VHF & UHF Ant System Performance Inspection

Table B.1 Antenna System Test Sweeps

From (Equipment or Rack)	To (Equipment or Rack)	Cable Type	Test 8 VSWR of AE, Feeder, SPF & CF
			LPL <1.6:1 On frequency VT
CPS 1	DUPLEXER		/
CMD 1	DUPLEXER		/

Where a test indicates "On Frequency", the following applies: Carrier frequency +/- 100 KHz

All SiteMaster results should be provided to the System Technical Advisor for acceptance.
Subject field of the email to be "SiteMaster xxx (site) yyyy (location if required for clarity) nnn.nn (list frequency/ies only if not all antennas at site are included) mmm yyyy (month year)"
e.g. 'SiteMaster RK ARFFS May 2025'

Australian Government | acma Australian Communications and Media Authority

22-August-2025

Airservices Australia
Aviation Rescue and Firefighting
Locked Bag 747 (Attention Spencer Robinson)
EAGLE FARM QLD 4009

CLIENT ID: 1441780

Dear Sir/Madam

ISSUE OF APPARATUS LICENCE(S)

Thank you for your recent application to the Australian Communications and Media Authority (the ACMA) for the issue of an apparatus licence to operate radiocommunications equipment.

The ACMA has now issued your licence and the licence(s) is attached for your records. A Summary of the Licences issued is also attached.

If you have any queries about this advice, please contact the ACMA's Customer Service Centre on 1300 850 115 or info@acma.gov.au.

Yours sincerely

Licence Allocation Section
Australian Communications and Media Authority

Australian Government | acma Australian Communications and Media Authority

LICENCE ISSUE SUMMARY

No.	Licence No.	Service/Subservice	Site/Area/(Ship)	Callsign	Expiry Date
1	12856147/1	Land Mobile/Land Mobile System - > 30MHz	Satellite, Fire Station, MELBOURNE AIRPORT		30/06/2026

Apparatus Licence

Issued by Delegate of the Australian Communications and Media Authority

Licensee details

Customer ID	1441780
Licensee	Airservices Australia
Trading name	Aviation Rescue and Firefighting
Licensee address	Locked Bag 747 (Attention Spencer Robinson), EAGLE FARM, QLD 4009

Licence details

Licence service	Land Mobile
Licence subservice	Land Mobile System - > 30MHz
Licence number	12856147/1
Date of issue	22/08/2025
Date of effect	22/08/2025
Date of expiry	30/06/2026

Licence conditions

Your licence is subject to conditions set out in the *Radiocommunications Act 1992*. Your licence may also be subject to such other licence conditions as determined by the ACMA (in licence condition determinations) from time to time, and is also subject to special conditions as detailed on this licence.

The conditions that are imposed on a licence vary according to the type of licence issued, the service being operated and the section of the *Radiocommunications Act 1992* under which the licence has been issued. For further information about the conditions that apply to your licence, please contact the ACMA (see contact details below).

Rights of appeal

A decision by the ACMA to impose further conditions, revoke or vary the conditions of your licence may be reviewable. If you are affected by, and dissatisfied with, such a decision you may apply to the ACMA to have the ACMA reconsider the decision under section 288 of the *Radiocommunications Act 1992*.

An application for reconsideration must state the reasons for the request, and should be sent to the Customer Service Centre, Australian Communications and Media Authority, PO Box 78, Belconnen, ACT, 2616. Applications for review of decisions can be made using the R051 - Application for review of Decision form, available on the ACMA website.

Important

An application for the ACMA to reconsider a decision to impose or vary licence conditions must be made to the ACMA within 28 days of the day on which you are informed of the decision. An application for reconsideration made after that time may not be accepted.

ACMA contact details

Customer Service Centre
PO Box 78
BELCONNEN ACT 2616

Telephone: 1300 850 115
Email: info@acma.gov.au

ACMA website: www.acma.gov.au

Advisory Notes applying to licence no.: 12856147/1

Conditions applicable to the operation of Land Mobile System station(s) authorised under this licence can be found in the Radiocommunications Licence Conditions (Apparatus Licence) Determination and the Radiocommunications Licence Conditions (Land Mobile Licence) Determination. Copies of these determinations are available from the ACMA and from the ACMA home page (www.acma.gov.au).

Technical characteristics

Below is a summary of the technical characteristics of the licensed service. Further technical details not displayed here may be found on the ACMA website.

Main Station Site — Station 1:

Site details	
Site ID	9003234
Site address	Satellite, Fire Station, MELBOURNE AIRPORT VIC 3045
Co-ordinates (GDA94)	Latitude: -37.677804 Longitude: 144.851983

Transmitter details	
Assigned frequency	415.300000 MHz
Bandwidth	12.5000 kHz
Freq. assign. ID	0004902329
Transmitter power	50.00 W
EIRP	83.00 W
Emission designator	10K1F9W
Antenna details	
Antenna ID	94443
Antenna polarisation	V - Vertical linear
Antenna azimuth	
Antenna height (m)	7
Antenna type	Dipole (2x 4 dipole arrays, 400-520 MHz)

Receiver details	
Assigned frequency	405.850000 MHz
Bandwidth	12.5000 kHz
Freq. assign. ID	0004902330
Transmitter power	N/A
EIRP	N/A
Emission designator	10K1F9W
Antenna details	
Antenna ID	94443
Antenna polarisation	V - Vertical linear
Antenna azimuth	
Antenna height (m)	7
Antenna type	Dipole (2x 4 dipole arrays, 400-520 MHz)

Special Conditions applying to Station 1

The level of power in the adjacent channel must not exceed -16dBm.

The level of all discreet spurious components, measured at the output of the transmitter, must not exceed -30dBm.

Risk Reference No.[1]		**Risk Title**	s47E(d)
Risk Lead[2]	Head of Melbourne Aerodrome Services / Aerodrome Aviation Line Leader	**Risk Type**	Work Health and Safety
Context	s47E(d)		

[1] Create a risk reference from the appropriate risk repository – refer to Risk Management Procedure C-PROC0408 section 4.8 and Appendix B
[2] Ensure the acceptance by the risk lead is documented in the relevant risk repository (*e.g. CIRRIS Simple Risk Assessment register* - REG-0000158)

s47E(d)

	s47E(d) e Airservices has been progressively actioning a range of improvements associated with UHF radio performance at Melbourne. These improvements and actions are collectively documented in: 1. The 'delivery plan document' Melbourne ARFFS UHF Radio Performance Improvement Activities 2. The action plan - 26 September 2025 3. Summary and Recommendations report: Comms Engineering Melbourne ARFFS Visit 4 - 8 August 2025 The risk assessment will consider the risks in both a HOTS and non-HOTS (for e.g. including but not limited to responding to first aid responses) environments.

Identify the risk

Causes *(How could this happen?)*	**Consequences** *(what are the impacts?)*
s47E(d)	

Analyse the risk

Key Controls *(What's in place now?)*	**Control No.**	**Control Owner**	**Control Effectiveness**	**Control Deficiencies** *(What needs to be fixed?)*
Operational competency (initial and ongoing competency attainment and maintenance – OTng-123)	CTRL-0004769	Standards	s47E(d)	s47E(d)
Specific competency in the use of radios	CTRL-0004769	Radio replacement project Standards	s47E(d)	
Radios (UHF and VHF – portable, mobile and fixed) along with supporting communication infrastructure	CTRL-0004781	Radio replacement project Standards	s47E(d)	
Operational procedures relating to the use of radios and operational communications	CTRL-0004772	Standards	s47E(d)	s47E(d)

Key Controls *(What's in place now?)*	Control No.	Control Owner	Control Effectiveness	Control Deficiencies *(What needs to be fixed?)*
Contingency methods of operational communication	CTRL-0004773	Standards	s47E(d)	s47E(d)
Completion of Prepare Response Emergency Plan (PREP) to support response activities		Melbourne ARFFS	s47E(d)	s47E(d)
Aviation Fire Fighting Manual – Radios (AFFM-RA)		ARFFS Standards	s47E(d)	
Incident management by objectives – ability to expand / contract incidents base on operational circumstances		N/A	s47E(d)	s47E(d)
ARFFS Operational Manual (AA-OPSMAN-139H)		Chief Executive Officer	s47E(d)	s47E(d)
Melbourne ARFFS – Local Instructions		Melbourne ARFFS - AALL	s47E(d)	s47E(d)

Key Controls *(What's in place now?)*	Control No.	Control Owner	Control Effectiveness	Control Deficiencies *(What needs to be fixed?)*
Psychological support: • EAP • PAN • Debriefing / Lessons Learnt		Melbourne ARFFS	s47E(d)	

Evaluate the risk

Determine the **Current Risk Classification** and **Target Risk Classification** (Highlight the primary consequence – left hand column)						
	CURRENT RISK CLASSIFICATION			**TARGET RISK CLASSIFICATON**		
Consequence Type	*Current Consequence*	*Current Likelihood*	*Current Risk Classification*	*Target Consequence*	*Target Likelihood*	*Target Risk Classification*
Work Health & Safety	Major	Unlikely	Medium	Major	Rare	Low
Safety – ARFFS	Minor	Expected	Medium	Choose an item.	Choose an item.	Choose an item.
Reputation (WHS)	Minor	Likely	Medium	Choose an item.	Choose an item.	Choose an item.
Financial Sustainability (WHS)	Minor	Unlikely	Low	Choose an item.	Choose an item.	Choose an item.

Additional Comments	Melbourne Radios are currently captured through the Operational Risk Assessment (ORA) for Melbourne under RSK-0001121 where the current risk (Safety – ARFFS) is classified as a Medium. This incorporates but is not limited to ML Radio ARFF issues. s47E(d)

Treat the risk to achieve Target Risk Classification

Identify risk treatments that will achieve the Target Risk Classification:						
Action No.	**Risk Treatment Actions** *(What still needs to be done?)*	**Assigned To**	**Responsible Manager**	**Action Verifier**	**Due Date**	**Commentary / Notes**
s47E(d)		s47F			s47E(d)	s47E(d)
		s47F			s47E(d)	s47E(d)
		s47F			s47E(d)	
		s47F			s47E(d)	s47E(d)

						s47E(d)
s47E(d)		s47F			s47E(d)	
		s47F			s47E(d)	

Risk Workshop Details	
Date and time:	**21 October 2025; 1330-1500hrs**
Location:	**Teams**
Attendees:	s47F

	s47F
Next review date:[3]	**Due January 2026**

Guidance Materials	
Risk Appetite Statement	C-POL0023
Airservices Risk Management Standard	AA-NOS-RISK-0001
Risk Management Procedure	C-PROC0408

Risk Acceptance	
Risk Acceptor	s47F
Signature	s47F Digitally signed by s47F Date: 2026.01.23 16:40:41 +11'00'
Date	23/01/2026

[3] Refer to Risk Management Procedure C-PROC0408 Section 4.7 – Step 7 - Monitoring and Review

From: s47F
To:
Subject: FW: DRV Crewing - 4th Person
Date: Friday, 16 January 2026 12:47:18 PM
Attachments: image001.png
image003.png
image004.png
image005.png
image006.png

OFFICIAL

Hi s47F

Just followed with s47F – only significant change to existing arrangements locally at Melbourne with the s47E(d) have made some additional comments in the Comcare draft response that can be used.

Regards,

s47F
Risk, Noise & Environment - Safety

M: s47F
E: s47F @airservicesaustralia.com
Da Vinci Building 101, 2A Boronia Road,
Brisbane Airport QLD 4008, Australia
www.airservicesaustralia.com

We acknowledge the Traditional Owners of Country throughout Australia and recognise their continuing connection to land, waters and culture. We pay our respects to their Elders past, present and emerging.

OFFICIAL

From s47F AirservicesAustralia.com>
Sent: Friday, 16 January 2026 11:32 AM
To: s47F AirservicesAustralia.com>
Subject: FW: DRV Crewing - 4th Person

OFFICIAL

Regards,

s47F

Melbourne ARFFS
Airservices Australia
M: s47F
E s47F _airservicesaustralia.com

OFFICIAL

From: s47F @AirservicesAustralia.com>
Sent: Wednesday, 5 November 2025 11:12 AM
To: s47E(d) @AirservicesAustralia.com>; s47F s47F @AirservicesAustralia.com>; s47F s47F @AirservicesAustralia.com>; s47F s47F @AirservicesAustralia.com>; s47F s47F @AirservicesAustralia.com>
Subject: DRV Crewing - 4th Person

OFFICIAL

Hi all,

s47E(d)

s47E(d)

s47E(d)

s47E(d)

UFU AND Stn HSRs are supportive of this proactive safety measure.

@ s has been asked to kick of the rostering addition to staffing commencing at 0800 tomorrow.

Please make contact if require further info or a chat.

Regards,

s47F

PO Box 1093, Tullamarine Vic 3043
Airservices
M: s47F
airservicesaustralia.com

Radios

Aviation Fire Fighting Manual

AFFM-RA

Version 13

Effective 22 May 2025

Endorsed: s47F

Approved: s47F

Change summary

Version	Date	Change description
13	**22 May 2025**	CRC 42542 No change bars, more than 50% of document changed • Updated due new radios and their functionality • Radio Communications section updated
12	17 December 2018	NRFC 39044 No change bars, more than 50% of document changed Description of VHF bandwidth use changed – page 5 Heading Push-to-Talk Timeout added – page 7 VHF Marine Radios deleted, information relocated in document New Sections added (information moved to appropriate heading): • Inspections – page 15 • Fault Finding – page 17 • Fault Reporting – pages 19 to 22 Assistance changed to Further Resources – page 31 Non-tracked changes are: • Headings changed for easier search and relevance to information contained • hyperlinks to content in document added • Correction to spelling • ARFF to ARFFS • Fire Commander to Shift OIC, where appropriate QA review completed.
11	16 February 2018	s47E(d) Fault Reporting Section Updated
10	9 November 2017	NRFC 35703 Reporting terms have been standardised as far as practicable within the current scope of both Switchplus and ORS.

This document was created using Generic Document Template C-TEMP0047 Version 11.

Table of contents

1 Radio Communication

Communications are one of the most critical aspects of an emergency response, in achieving successful outcomes. An effective communications plan will be flexible, to allow for scaling up and down according to incident demands and will incorporate features that ensure the safety of responders.

s47E(d)

1.1 ARFFS Radio Frequencies

s47E(d)

1.1.1

s47E(d)

1.9 Radio Battery Chargers

1.9.1

s47E(d)

All portable radio battery charging stations can charge radio with battery attached, or battery only. Charging stations must be indoor, out of the weather and with sufficient ventilation, preferably an air-conditioned environment where possible.

1.9.2 Portable Charging Procedures

For best charging performance, switch off the radio before placing it in the charger.

Charging temperatures

Do not expose a battery to very high or very low temperatures for extended periods of time. Doing so will shorten the usable life (service life) of the battery.

UHF batteries can be charged between 0°C to 40°C.

VHF batteries can be charged between 10˚C to 40˚C.

Leaving the battery on charge

UHF batteries/radios can be left in the in the charger once charging is complete. Leaving a battery in the charger will not overcharge or damage it.

VHF radios/batteries must be removed from the charger once charging is complete.

Low battery warning

Do not allow a radio battery to fully discharge every time you use it, or you will shorten the service life of the battery.

Spare Batteries

Spare batteries cannot be left for long periods without being charged. All spare batteries must be included in the ARFFS station's battery charging regime. All batteries must be fully charged at least every 14 weeks.

New Batteries Received (e.g. after replacement):

When a battery is first received, it should be fully charged immediately.

UHF and VHF Lithium-Ion Battery swelling

Cell Swelling (well known in the battery cell industry as gassing) is not uncommon for a number of reasons and most likely will occur when Li-Ion cells reach the end of their normal Service Life. The following conditions can result in battery cells to swell and potentially pop their cover:

- Li-Ion batteries reaching the end of their service life of 300-400 charge-discharge cycles.
- Batteries being stored for long periods of time, and over discharging.
- Attempting to recharge an over-**dis**charged battery (fully drained battery).

When swelling occurs the battery must not be used and are to be disposed of safely:

- Do not touch a device or lithium-ion battery that is emitting vapor, gas, or is on fire.
- Never touch a swollen or ruptured device or battery with bare hands as the heat and/or chemicals can cause severe burns.
- Always use gloves/hand protection before touching or moving leaking batteries.
- Fire or smoke-damaged batteries should be kept outside in a well-ventilated area and stored away from any other dangerous goods or materials that are combustible or flammable.
- Place leaking or damaged (but not overheated or off-gassing) batteries in a plastic container.
- Check safe disposal options at Recycle Mate, WasteMINZ or B-Cycle to safely dispose of lithium-ion batteries or products or your local council.

2 Inspections

2.1 Daily

All operational Mobile, Portable radios are tested with the FCC at the beginning of each shift.

Note: VHF radios are tested with the FCC on 131.0

All radios are tested for transmit and receive functions using the stated readability scale in *6.1.1 Readability scale*.

The radios are inspected for cleanliness, defects or breakages that could render them unserviceable.

Any defects or faults are reported through the appropriate channels for remedial action.

The FCC operator broadcasts radio test complete over the UHF radio when daily radio tests are completed.

2.2 Weekly

Refer to Maintenance EXpert (MEX) PM127002.

2.3 Annual

Refer to MEX PM127003.

5 Standard Procedures

5.1 Introduction

The use of a standard procedure is essential if full benefit is to be obtained from the radio facility provided. Irrespective of whether the VHF or UHF frequency is being used, the same procedure applies. The correct radio procedures ensure an efficient and professional radio network.

There are uncounted aircraft and fire-service enthusiasts who, with the aid of a radio scanner, can monitor both our VHF and UHF frequencies.

With this in mind, it is of paramount importance that we adopt and maintain a high standard of excellence in all our radio procedures.

5.2 Sensitive or security related information

s47E(d)

5.3 Microphone Technique

5.3.1 Introduction

For satisfactory transmission, the microphone is held close to the mouth and in a vertical position.

This is particularly important when operating in the open, in high wind, or when ambient noise level is high, as it is in a moving vehicle, or near aircraft that have their engines running.

There is no need to shout into a microphone if it is held correctly. If breathing apparatus is being worn and difficulty is being experienced in transmitting intelligible messages, there is an alternative way to use a microphone.

Rather than holding the microphone in front of the speech diaphragm, the microphone can be held against the side of the throat when a message is transmitted.

Voice messages must be spoken in a manner that ensures maximum intelligibility to the receiver. The following factors are therefore very important:

- rhythm
- speed
- volume.

5.3.2 Rhythm

In ordinary conversation most people talk with a natural rhythm, which helps to make what they are saying intelligible.

This rhythm is used when transmitting a message, which must be conveyed in short and complete sentences, not word by word, unless the need dictates otherwise.

The saying of "err" and "ah" before, between and after a word or sentence is also avoided.

5.3.3 Speed

The person transmitting a message must speak at a steady and medium speed. By speaking too fast, the interpretation of what is being conveyed can become a conglomeration of unintelligible words. If the message is spoken too slowly, time is wasted and the recipient could become exasperated.

If messages need to be written down, there is an obvious need to slow down, and pause between phrases.

The alternative to this would be to repeat each phrase being transmitted.

5.3.4 Volume

Care is taken not to shout into a microphone, but to speak in a normal talking voice. Each word is spoken at the same volume, taking care not to stress the more important words and slur over the less important.

5.3.5 Using the radiotelephony spelling alphabet

When it is necessary to spell out words, or when referring to aircraft registrations or call signs, the following international spelling alphabet is used. The pronunciation of each word is stated within the brackets.

5.3.6 Phonetic alphabet

Letter	Phonetic Pronunciation
A	Alpha (AL-fah)
B	Bravo (BRAH-VOH)
C	Charlie (CHAR-lee)
D	Delta (DELL-tah)
E	Echo (ECK-oh)
F	Foxtrot (FOKS-trot)
G	Golf (golf)
H	Hotel (hoh-TELL)
I	India (IN-dee-ah)
J	Juliet (JEW-lee-ETT)
K	Kilo (KEY-loh)
L	Lima (LEE-mah)
M	Mike (mike)
N	November (no-VEM-ber)
O	Oscar (OSS-cah)
P	Papa (pah-PAH)
Q	Quebec (keh-BECK)
R	Romeo (ROW-me-oh)
S	Sierra (see-AIR-rah)
T	Tango (Tang-go)
U	Uniform (YOU-nee-form)
V	Victor (VIK-tah)
W	Whiskey (WISS-key)
X	X ray (ECKS-RAY)
Y	Yankee (YANK-key)
Z	Zulu (ZOO-loo)

5.3.7 Pronouncing numbers

All numbers, except whole thousands, are transmitted by pronouncing each digit separately.

Whole thousands are transmitted by pronouncing each digit in the number of thousands followed by the word THOUSAND.

Number	Number Pronunciation
10	ONE ZERO
65	SIX FIVE
100	ONE HUNDRED
7000	SEVEN THOUSAND
12,000	ONE TWO THOUSAND
37,000	THREE SEVEN THOUSAND

A decimal point in a number are transmitted by designating the decimal point in the sequence as the word DECIMAL.

Note: The number 118.1 is transmitted as 'ONE, ONE, EIGHT, DECIMAL ONE.'

All numbers are transmitted using the following pronunciation.

Number and Phonetic Pronunciation	
0) ZE-RO	1) WUN
2) TOO	3) TREE (or THREE)
4) FOW-er	5) FIFE
6) SIX	7) SEV-en
8) AIT	9) NIN-er

Decimal DAY-SEE-MAL **Thousand** TOU-SAND (or THOU-SAND).

5.3.8 Using Group Form

Group form is the preferred means of transmitting call sign / flight numbers within Australian airspace. This also applies to ground vehicles as per the Aeronautical Information Package.

Group form is the grouping of numbers into pairs, with numbers ending in “00” referenced as hundreds.

Aircraft Callsign / Flight Number	Group Form
Qantas 1479	Qantas Fourteen Seventy Nine
Qlink 702	Qlink Seven Zero Two
Tender 23	Tender Twenty Three
Virgin 031	Virgin Zero Thirty One

Note: This does not apply to referencing of Runways, i.e. Runway 15 is referenced as Runway One Five.

6 Exchange of Communications

6.1 General

Before transmitting, the user of a transceiver listens for a period long enough to be satisfied that the transmission does not cause interference. If there is a likelihood of interference, the caller awaits the first reasonable break in the transmission from the other station.

The exception to this is when there is a matter of extreme urgency, such as an emergency turnout, where there is a possibility of danger to life and property.

When transmitting long messages, the transmission are interrupted for short intervals from time to time to permit other frequency users to transmit a message that might be urgent.

Note:

All units must acknowledge calls directed to them. It is equally important that, when transmitting, the correct terminology and procedural words and phrases are used.

6.1.1 Readability scale

The question '*how do you read?*' which on acknowledgment can be followed with '*how me*' is answered by reference to the following scales.

6.1.1.1 Very High Frequency / Ultra-High Frequency

If operating in environment other than marine.

1. Unreadable
2. Readable now and then.
3. Readable, but with difficulty.
4. Readable.
5. Perfectly readable.

6.1.1.2 Marine

If operating in a marine environment:

- Bad – signal strength one (1) i.e. barely perceptible
- Poor – signal strength two (2) i.e. weak
- Fair– signal strength three (3) i.e. fairly good
- Good – signal strength four (4) i.e. good
- Excellent – signal strength five (5) i.e. very good

6.1.2 Word or phrase meaning

Word	Word or Phrase Meaning
ACKNOWLEDGE	Let me know that you have received and understood this message.
AFFIRM	Yes, or permission granted.
APPROVED	Permission for proposed action granted.
BREAK	I hereby indicate the separation between portions of the message. (Is used where there is no clear distinction between the text and other portions of the message.)
BREAK, BREAK	I hereby indicate the separation between messages transmitted to different aircraft in a very busy environment.
CANCEL	Annul the previously transmitted clearance.
CHECK	Examine a system or procedure (no answer is normally expected).
CLEARED	Authorised to proceed under the conditions specified.
CONFIRM	Have I correctly received the following . . .? or, did you correctly receive this message?

Word	Word or Phrase Meaning
CONTACT	Establish radio contact with…
CORRECT	That is correct.
CORRECTION	An error has been made in this transmission. The correct version is . . .
DISREGARD	Consider that transmission as not sent.
EXPEDITE	With haste.
GO AHEAD	Proceed with your message.
HOLD POSITION	Stop . . . Do not proceed until advised.
HOLD SHORT OF	Stop before a specified location.
HOW DO YOU READ?	What is the readability of my transmission?
I SAY AGAIN	The same phrase, word or message is repeated.
I SPELL	Used when the recipient cannot understand a word / phrase where misunderstanding of the word / phrase exists.
NEGATIVE	No, or Permission not granted. That is not correct.
OBLIQUE	An oblique stroke.
OVER	My transmission is over and I expect a response from you.
OUT	This conversation is ended and no response is expected from you.
RADIO CHECK	I wish to know my readability scale. Please advise your readability of my transmission.
READ BACK	Repeat all, or the specified part, of this message back to me exactly as received.
REPORT	Pass me the following information.
REQUEST	I would like to know . . .? or, I wish to obtain . . .?
ROGER	I have received all of your last transmission.
SAY AGAIN	Repeat all, or the following part of your last transmission.
SPEAK SLOWER	Slow your talking down.
STAND BY	Your call has been received; there will be a pause before I further acknowledge.
THAT IS CORRECT	Confirmation of being right.
VACATE	Move off the runway / taxiway area immediately.

Word	Word or Phrase Meaning
VACATED	I have vacated runway / taxiway area . . .
VERIFY	Check message with originator and send correct version.
WILCO	Your last message was received understood and complied with.
WORDS TWICE	Communication is difficult, please send every word twice.

6.2 Radio identification

s47E(d)

s47E(d)

6.3 Messages

6.3.1 Purpose

The purpose of messages is to inform the FCC of the situation and to aid in the compilation of the ARFFS incident report.

6.3.2 Mobile

s47E(d)

6.3.3 Arrival Time

s47E(d)

6.3.4 Further Resources

s47E(d)

6.3.5 Situation report

s47E(d)

6.3.6 Control Time

s47E(d)

6.3.7 End Time

s47E(d)

6.3.8 Return To Service

s47E(d)

s47E(d)

6.4 131.0 Emergency Radio Frequency

6.4.1 Purpose

s47E(d)

6.4.2 Initiating Communications on 131.0

s47E(d)

6.5 CTAF Radio Frequencies

Note: Stations with Common Traffic Advisory Frequency (CTAF) frequencies must read this section for rules that apply to those locations.

6.5.1 Purpose

s47E(d)

6.5.2 Monitoring CTAF

s47E(d)

6.5.3 Broadcast procedures

s47E(d)

6.5.4 Examples

6.5.4.1 Road test on a runway

s47E(d)

6.5.4.2 Cross runway to apron

s47E(d)

6.5.5 Rules

s47E(d)

6.5.6 Aerodrome Frequency Response Unit

s47E(d)

6.5.7 Pilot Activated Lighting

s47E(d)

6.6 ARFFS Radio Local / Full Emergency

6.6.1 Procedures

s47E(d)

6.6.2 Local standby

s47E(d)

6.6.3 PAN

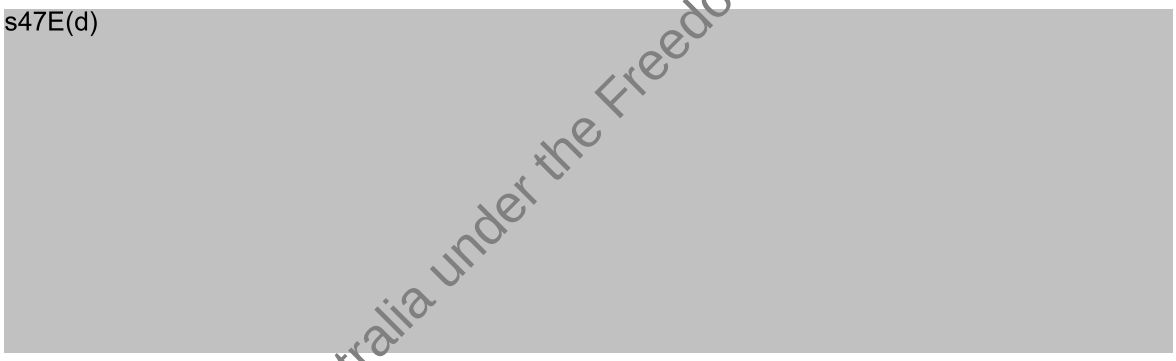
s47E(d)

6.6.4 Full emergency

s47E(d)

6.6.5 Mayday

s47E(d)



7 Definitions

Within this document, the following definitions apply:

Term	Definition
AFRU	Aerodrome Frequency Response Unit
ANS	Air Navigation Services
ARFFS	Aviation Rescue Fire Fighting Service
ATC	Air Traffic Control
BA	Compressed Air Breathing Apparatus
CSM	Cabin Safety Manager
CTAF	Common Traffic Advisory Frequency
FCC	Fire Control Centre
IS	Intrinsically Safe
ISS	Integrated Service System
LMR	Land Mobile Radio
OIC	Officer In Charge
PAL	Pilot Activated Lighting
PTT	Push-to-Talk
RX	Receive
SitRep	Situation Report
SQL	Squelch
SysTA	System Technical Advisor
TX	Transmit
UHF	Ultra-High Frequency
VHF	Very High Frequency

8 References

Title	Number
Aeronautical Information Publication - AIP Book	ATS PROC-0073
ARFFS Technical and Property Support Responsibilities	LoA_3171
Compressed Air Breathing Apparatus	SOP-023
EM-020 MEX Equipment Registration/Movement Form	EM-020-FORM-01
En-Route Supplement Australia - ERSA	ATS-MAN-0038
MEX Requests Maintenance Manual	EM-034

Operational Bulletin

Effective Date:	23 November 2023	Release Date:	Select Date	Version:	3

OB-22-010 Introduction of New UHF Radios

Applicability: All locations, upon commissioning of new UHF radios

Context

ARFFS have installed and commissioned new UHF, VHF and Marine radios at your location. The VHF and Marine frequencies remain unchanged, and these are a simple equipment update.

The UHF radios have been updated with new equipment; however, you will have new and additional channels available. A communications plan that identifies the capability and use of the additional frequencies is being developed.

In the interim, the following provides an overview of the frequencies, potential interoperability capability (where available), communication structure, how to expand and contract the communication structure and redundancy / failure procedures for the UHF radio capability.

All radio communications are recorded.

New UHF Radio Channels

s47E(d)

Assessing Channel Activation

s47E(d)

Communications Structure

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Lifecycle

This Bulletin:

- Replaces any previous advice that specifically relates to the *Applicability* and *Context* of this Bulletin
- Remains effective until it is superseded by a later version of this Bulletin, or
- Is cancelled by the:
  - Relevant aspects of its content being incorporated into a permanent ARFFS's document or
  - Specified actions being completed with no record required in permanent ARFFS's documents

Training Plan and Activity Record – Form 105

Student Name		**SAP ID**	
Training Officer			
Training Activity	**UHF Radio Communications Plan**		
Date Commenced		**Date Completed**	
Signatures recorded upon completion of training			
Training Officer Signature		**Student Signature**	

Details of Training Conducted	**Date**
Student to complete the online ***ARFFS UHF Radio Communications*** course on SuccessFactors covering: • Basic review of UHF radio communications • Application of standard communications structure • Expanding and contracting communications as the situation requires	
Student to review Operational Bulletin OB-22-010	

Student to participate in practical training activities utilising UHF radios covering:
• Initiating/requesting activation of another UHF channel (expanding)
  ○ Communicate initiation/request
  ○ Change radio channels
  ○ Establish communications by conducting radio check
• Initiating/requesting deactivation of a UHF channel (contracting)
  ○ Communicate initiation/request
  ○ Change radio channels
  ○ Establish communications by conducting radio check	

Comments

s47F
Senior Inspector
Comcare
GPO Box 1993
Canberra ACT 2601

Via email: s47F @Comcare.gov.au

Dear s47F

Improvement Notice: MC00036903 – NT01 – C1

I refer to Improvement Notice MC00036903 – NT01-C1, issued on 8 September 2025, which directs Airservices Australia to implement measures to remedy or prevent a contravention, or likely contravention, relating to the radio communication infrastructure at Melbourne Aviation Rescue and Fire Fighting (ARFF).

Prior to the issuance of this notice, an Improvement Delivery Plan (dated 17 July 2025) had been developed and was already in progress. This plan, which was shared with Comcare, established the context for the improvements completed to date and has been included to outline the background and inform subsequent enhancements that have since been designed and implemented.

s47E(d)

Airservices has treated this matter as a priority. Regular progress meetings have been maintained with local representatives, line leadership, technical and engineering specialists, national ARFF standards representatives, and senior management to ensure the safety of our workers and operations is always maintained.

If you wish to discuss any aspect of Airservices' response further, please contact s47F on s47F

Yours sincerely,

s47F

30 January 2026

Response to Improvement Notice

Notice: MC00036903-NT01-C1 issued 8th September 2025

Airservices Australia is directed to remedy the risk to workers and others arising from the radio communication failures by undertaking the following actions:

s47E(d)

Attachment Schedule

Ref	Document	Description
1	Delivery plan Melbourne ARFFS UHF Radio Performance Improvement Activities	Melbourne ARFFS UHF Radio Performance Improvement Delivery Plan – 17 July 2025
2	VHF UHF ARFF-TCP-00010 ML ARFFS UHF DAS v1	Airservices Design Document for the Distributed Antenna System
3	ASA Melbourne ARFFS UHF DAS – Technical Design Document	Vertel Design Document for the Distributed Antenna System
4	Works Instruction: ML Repeater 2 Relocation and Antenna System Installation	Completed Works Instruction for the relocation of the Repeater to s47E building and the installation of the Distributed Antenna System, including radio coverage test results.
5	ARFFS – Melbourne UHF Comms Test Plan V1	Completed works and test plan for Spectrum Monitoring, Reconfiguration of Repeater Settings and Frequencies.
6	ACMA Apparatus Licence	ACMA Apparatus Licence for New Melbourne ARFFS UHF Frequencies
7	WHS Risk Assessment	Assessment of further potential controls
8	DRV Crewing – 4th Person	Confirmation of a 4th person as an interim control on the DRV
9	AFFM-RA	Aviation Fire Fighting Manual - Radios
10	OB-22-010 Bulletin – Introduction of the new radios	Operational Bulletin
11	105-UHF-Comms	Training records – copy of document used to record completion of training