



Standard OPS-020

Avionics and Communications

The purpose of this standard is to outline the requirements for avionics and communications equipment on aircraft utilised by NAFC and its Members for fire and emergency operations.

The provision of high quality and reliable avionics and communication systems is fundamental to safe, effective and efficient fire and emergency aircraft operations.

The provision of high quality and reliable communication systems in the aircraft is the responsibility of the aircraft operator.

The installation and maintenance of all radios, avionics, telephones, public address and siren systems, tracking systems and associated equipment and systems is the responsibility of the aircraft operator.

When a contract refers to this standard the term “operator” in this standard also includes the “Contractor” as defined in the contract.

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004	NAFC	Initial draft	

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Operators providing aircraft services must ensure that aircraft provided meet the requirements of this standard.

Requirements of any contract take precedence over requirements of this standard. Any exceptions to this standard will be made at the absolute discretion of NAFC or a Member.

All avionics and communications equipment must meet all the requirements of Australian civil aviation legislation and regulations. Avionics and communications equipment must be used in accordance with legislation and regulations at all times.

In addition:

- The provision of high quality and reliable communication systems in the Aircraft is the responsibility of the aircraft operator.
- Aircraft not meeting required standards at any time immediately prior to or during any period of service may be considered to be not available.
- The installation and maintenance of all radios, avionics, telephones, public address and siren systems, tracking systems and associated equipment and systems is the responsibility of the operator.
- The operator will ensure all necessary approvals and authorisations are obtained for the installation and operation of all radios, avionics, telephones, public address and siren systems, tracking systems, and associated equipment and systems.

All aircraft:

Emergency Position Indicating Radio Beacons

- Aircraft must be equipped with at least one fully installed, impact-activated 406Mhz Emergency Locator Transmitter (ELT) with integrated GPS. This ELT must be located in an accessible position within the Aircraft, clearly indicated by prominent signs on both the inside and outside of the Aircraft.
- Aircraft must carry at least one 406Mhz Personal Locator Beacon (PLB)
- If the Aircraft ELT is not capable of being removed and operated independently from the Aircraft then the pilot must carry on their person an additional 406Mhz PLB, with integrated GPS, This PLB is in addition to the other ELT and PLB requirements listed above.

Transponder

- Aircraft must be equipped with at least one Secondary Surveillance Radar (SSR) transponder with Mode C, or Mode S, operation with the installation approved by CASA. The transponder must be operated in Mode C, or S, at all times when the Aircraft is flying where permitted.
- Where an aircraft is equipped with Automatic Dependent Surveillance-Broadcast (ADS-B) equipment then the operator must ensure that the ADS-B equipment is operated continuously during flight where permitted.

VHF Air band radios

- Aircraft must be equipped with at least two fully installed independent 720 channel, 118 Mhz to 136.5 Mhz VHF-AM "COMM" transceivers (handheld transceivers are not acceptable).

Auxiliary radios

- Where required aircraft must be equipped at the operators expense with two radio transceivers (auxiliary radios) specified by the Member purchasing the Services (handheld transceivers are not acceptable).

Normally the auxiliary radios will be VHF-FM or UHF-FM and will be provided on a loan basis by the relevant Member. Aircraft initially based in NSW will be required to supply one auxiliary transceiver operating on that states' Government Radio Network, at the operators expense

- As far as practicable, auxiliary radios must be installed to provide for rapid, straightforward swapping of auxiliary radios for alternative auxiliary radios (for example when the Aircraft is required to operate in another state or territory).
- The aircraft operator is responsible for the fitting and installation of any auxiliary radios and aerials, including those supplied by a Member, including:

- obtaining approvals required by Australian civil aviation legislation and regulations,
- supplying suitable power (regulated, protected 13.8 Volts of at least 8 Amps to each transceiver),
- supplying any additional wiring, plugs, cabling etc. that may be necessary for any particular installation,
- provision of aerial wiring and bases,
- integration into the aircraft electrical and audio systems, including the provision of sidetone,
- ongoing maintenance of the installation.

Where not otherwise specified the power supply to the radio would normally be supplied via a MS 3102 16 S 4 S socket.

Where not otherwise specified the antenna base for agency radios would normally be a 5/16", 26tpi threaded stub.

- The aircraft operator must ensure that the installation of auxiliary radios conforms to CASA and Member standards. Particular attention is paid to:
 - siting and mounting of control heads to provide optimum visibility, easy accessibility and optimum ergonomics for users,
 - siting of radios and wiring to protect against knocks, abrasion, temperature extremes and weather,
 - mounting of radio hardware to provide protection against vibration,
 - siting of aerials to assure high quality, reliable communications,
 - quality of power supply hardware and quality of power supplied,
 - quality of wiring and connectors,
 - quality of interfacing to audio systems, in particular the use of interfacing that automatically compensates for different microphone and headset characteristics and that reduces acoustic and electrical noise.

Audio selector and Intercom

- Aircraft must be equipped with commercially designed and manufactured audio switching facilities which enable the pilot and co-pilot (if applicable) positions to either selectively or simultaneously monitor received audio and to independently selectively transmit on the following transceivers, without removing or changing helmets or audio plugs:
 - all aeronautical VHF-AM "COMM" transceivers,
 - auxiliary radios,
 - any mobile/satellite telephones required,
 - and provides received audio to the pilot for any other navigational equipment requiring radio reception.

- Any position in the aircraft that has transmit access to any transceiver must be provided with audio sidetone when transmitting.
- Aircraft must be equipped with an intercom system that provides communication between the pilot and co-pilot positions.
- Aircraft required to carry passengers must be equipped with an intercom system that provides communication between the pilot and co-pilot positions and at least two other seating positions in the aircraft.
- Unless otherwise specifically required by the Member, aircraft audio systems should be configured to use headphones and microphones normally used in civilian operations.
- Except in the case of aircraft that are normally flown by two pilots, any push-to-transmit or push-to-talk switch for the co-pilot position must be positioned to be ergonomically accessible to a passenger occupying the co-pilot seat, and must not be positioned on any flight control.
- The operator must ensure that the quality of, and the siting and installation of, radio control heads, audio panels, switches and leads allows for safe, efficient and ergonomic operation by pilots and passengers.

Telephone

- Where required the aircraft must be equipped at the Contractor's expense with at least one terrestrial or satellite mobile telephone service active on a telephone network acceptable to NAFC and fully integrated into the aircraft audio system.
- Acceptable telephone networks include:
 - Telstra 3G / 4G cellular
 - Iridium satellite

Air Attack Supervision Aircraft

In addition to the requirements above for all aircraft, aircraft utilised as AAS platforms must also meet the following requirements:

- Aircraft must be fitted with at least two high quality audio switching panels to independently control receive and transmit access to all radio transceivers and any mobile or satellite telephone required.

The requirement for at least two high quality audio switching panels in Air Attack Supervision Aircraft is stressed.

Where not otherwise specified each panel must be of a standard equivalent to a NAT AA95-210 or King KMA24.

- Aircraft must be equipped with high quality headsets or helmets connected by an intercom system which will provide without changing headsets or helmets:
 - intercom communication between the pilot, the co-pilot position and at least two other positions in the aircraft; in rotary wing aircraft these two other positions must have headset or helmet leads which allow movement around the aircraft cabin,
 - the ability to isolate pilot to co-pilot position communications from the other positions whilst still permitting communication between the other positions, with the isolate switching accessible to pilot, co-pilot and at least one other position.
- Aircraft must be equipped to allow the second row passenger positions to monitor the radios selected on the co-pilot position audio selectors, and the second row left hand seat in rotary wing aircraft or the second row right hand seat in fixed wing aircraft to have the ability to transmit on the installed auxiliary radios.
- Where required aircraft must be equipped with at least one approved high quality flight helmet with built in headsets and noise cancelling boom microphones for use by Air Attack Supervisors and other Agency personnel.
- Rotary wing aircraft must be equipped with a siren system capable of alerting crews on the ground of an impending firebombing drop.
- Rotary wing aircraft must be equipped with a public address system capable of transmitting intelligible messages from the pilot and co-pilot position to the ground from a height of 500 feet (approximately 150 metres) above ground level.
- The public address system and the siren system required under this subheading must be powered by an electrically protected power supply (or power supplies) separate to that used for auxiliary radios.

Winching & Rappel Aircraft

In addition to the requirements above for all aircraft, aircraft used for rappelling or winching must meet the avionics and communications requirements for Air Attack Supervision Aircraft, and also meet the following requirements:

- Aircraft must be equipped with a drop-lead assembly in the cabin, for use by the aircrewman / winch operator, which provides access to the aircraft intercom and either:
 - provides transmit access to the radios selected on the co-pilot position audio selection panel, or
 - is controlled by separate high quality audio selection panel, mounted such that it is easily and ergonomically accessible to the aircrewman / winch operator.
- The drop-lead assembly required by the clause above must provide for radio transmit and intercom operation using a press to talk switch or switches on the drop-lead.

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Summary:

The table below summarises the key avionics and communications requirements see the text above for details for each item listed above and other requirements

Avionics and Communications equipment	All aircraft	AAS Platforms	Winch / Rappel
406Mhz GPS ELT - installed	Required	Required	Required
406Mhz PLB - portable	Required	Required	Required
2 nd 406Mhz PLB- portable	When required	Where required	Where required
Mode C Transponder	Required	Required	Required
Air band radios x 2	Required	Required	Required
Agency radios x 2	Where required	Required	Required
Pilot / Co-pilot intercom	Required	Required	Required
Rear passenger intercom	Where required	Required	Required
Integrated telephone	Required	Required	Required
Headsets x 3	Required	Required	Required
Helmets x 1		Where required	Where required
Siren		Required for RW	Required
PA		Required for RW	Required
Intercom drop lead			Required