NAFC
National Aerial Firefighting Centre

OPS-020
Avionics and Communications

Standard

Version 2023.1.03

June 2023

1 Background

Reliable avionics and communication systems are fundamental to fire and emergency operations.

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.

2 Criteria

High-quality and reliable avionics are the responsibility of Contractors. Equipment must be fitted and operated in accordance with legislation at all times.

2.1 All Aircraft

All aircraft must be equipped with:

a) Emergency Position Indicating Radio Beacons

- at least one 406Mhz Personal Locator Beacon (PLB)
- at least one fully installed, impact-activated 406Mhz Emergency Locator Transmitter (ELT) with integrated GPS, located within the aircraft in an accessible position and clearly indicated by prominent signs on the interior and exterior. If the ELT is not capable of being removed and operated independently from the aircraft, the pilot must carry on their person a second 406Mhz PLB with integrated GPS.

b) GPS/GNSS

- two high quality GPS receivers that are capable of:
    - being powered from aircraft electrical power
    - fixing the aircraft position in three dimensions to a minimum precision of 0.1 nautical miles
    - providing continuous real time readout in latitude and longitude on a visual display
    - storing at least one hundred user-defined waypoints.

Mobile telephone GPS are not normally considered acceptable.

One GPS receiver must be fully installed, with an external aerial positioned for good signal reception.

One GPS receiver must be capable of operating independently of aircraft electrical power for at least eight hours.

Where a second pilot or aircrew participates in service delivery, one GPS receiver must:

- be ergonomically operable from the co-pilot position
- have a large visual display readable under typical operational conditions
- be capable of providing continuous real time readout in Universal Transverse Mercator format using GDA94 datum.

c) Transponder

- at least one Secondary Surveillance Radar (SSR) Mode C or Mode S transponder, operated continuously where permitted.
- By 1 September 2024 - Automatic Dependent Surveillance - Broadcast (ADS-B) equipment, operated continuously. ADS-B OUT is required, ADS-B IN is strongly recommended. Alerts and notifications may be used at the discretion of the pilot.

d) VHF Air band radios

- at least two fully installed independent 720 channel, 118 Mhz to 136.5 Mhz VHF-AM transceivers. Handheld transceivers are not acceptable.

e) Auxiliary radios

- two radio transceivers (auxiliary radios) specified by the Member. Handheld transceivers are not acceptable.

Normally auxiliary radios are VHF-FM or UHF-FM and may be loaned to Contractors by Members.

Radios are to be fitted with consideration to:

- power supply (regulated, protected 13.8 Volts of at least 8 Amps to each transceiver)
- quality of wiring, plugs, and cabling
- siting of aerials for reliability of transmission
- integration of electrical and audio systems
- inclusion of sidetone
- ease of maintenance
- siting and mounting of control heads for optimal visibility, accessibility, and ergonomics
- prevention of knocks, abrasion, temperature extremes, and weather ingress
- protection against vibration
- interfacing that automatically compensates for microphone and headset characteristics and reduces acoustic and electrical noise
- rapid and easy swap, where practicable.

NSW based aircraft must have one Contractor-provided auxiliary transceiver operating on the NSW Government Radio Network.

f) Audio selector and Intercom

- commercially manufactured audio switching facilities for pilot and co-pilot positions. Positioning should be ergonomic and not require the removal of helmets or audio plugs. Audio switching must enable selective receipt and transmission with audio sidetone, and received audio-to-pilot from other navigational equipment, for:
    - aeronautical VHF-AM transceivers
    - auxiliary radios
    - mobile/satellite telephones
- intercom system between the pilot and co-pilot positions. Passenger carrying aircraft must also have intercom for at least two other seating positions.

Switches should not be positioned on any flight control except in aircraft normally flown by two pilots.

g) Telephone

- at least one active terrestrial or satellite telephone integrated into the aircraft audio system. Acceptable telephone networks are Telstra cellular and Iridium satellite.

2.2 Air Attack Supervision Aircraft

All AAS platforms must also have:

- at least two high quality audio switching panels to independently receive and transmit access on all radio transceivers and mobile/satellite telephone, of a standard equivalent to NAT AA95-210 or King KMA24
- 'pilot isolate' capability
- intercom through high quality headsets or helmets between the pilot, co-pilot, and at least two other positions in the aircraft. In rotary wing aircraft these positions must have leads enabling movement around the cabin
- equipment enabling second row passengers to monitor radios at the co-pilot position. The second-row left-hand seat in rotary wing aircraft, and the second-row right-hand seat in fixed wing aircraft, must have the ability to transmit on auxiliary radios.
- at least one additional high quality flight helmet with built-in headset and noise-cancelling microphone for use by Member personnel

Rotary wing AAS aircraft must also have:

- siren system capable of alerting crews on the ground of an impending firebombing drop
- public address system that broadcasts intelligible messages from the pilot and co-pilot position to the ground from a height of 500 feet above ground level

Public address and siren systems must have electrically protected power supplies separate to those used for auxiliary radios.

2.3 Winch and Rappel Aircraft

Aircraft must meet requirements for Air Attack Supervision Aircraft, and have a drop-lead assembly in the cabin with push-to-talk radio and intercom, for use by aircrew that:

- provides transmit access to radios on the co-pilot audio selection panel, or
- is a separate audio selection panel, ergonomically accessible to aircrew.

3 Summary

Avionics and Communications equipment	All aircraft	AAS Platforms	Winch / Rappel
406Mhz GPS ELT - installed	Required	Required	Required
406Mhz PLB - portable	Required	Required	Required
Additional portable 406Mhz PLB	When required	Where required	Where required
Mode C or Mode S Transponder	Required	Required	Required
ADS-B	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 for pax carriage	Required	Required
Helmet x 1		Required	Required
Siren		Required for RW	Required
PA		Required for RW	Required
Intercom drop lead			Required