



Statewide Interoperability Radio Network (SIRN)

Standards, Protocols, Procedures



Document Section	1 - Interoperability	Status: SIEC Sub Committee Approval Date: 7/25/2022 SIEC Approval: 7/25/2022
State Standard Number	1.10.0	
Standard Title	Aircraft-to-Ground Communications	
Date Established		
Replaces Document Dated	NA	
Date Revised/Reviewed	NA	

1. Purpose or Objective

The purpose of this Standard is to provide guidelines and recommendations for radio communications between aircraft (fixed-wing, helicopter, drones, high-altitude deployable balloons) and ground resources over the SIRN platform as well as other radio systems or channels. These guidelines apply for routine intra-agency operations, emergent incidents, landing zone coordination or other mutual aid communications.

2. Technical Background

Capabilities

Public safety practitioners in the State of North Dakota are equipped with various communications solutions to coordinate between aircraft and ground personnel. These tools include repeated trunked talkgroups hosted on the SIRN platform and other line-of-sight communications capabilities such as the national conventional channels (on the VHF, 700 MHz and 800MHz frequency bands).

Constraints

Inconsistent and uncoordinated use of SIRN and conventional communications resources between ground and aircraft can cause lapses in communications. Additionally, improper use and configuration of airborne radios can affect SIRN as radios signals from high altitude aircraft cover large geographies and can cause interference.

3. Operational Context

Public safety agencies own and operate aircraft for various law enforcement, fire-fighting, and emergency medical service functions. Air-to-ground communications may be required for routine communications, to coordinate landing zones, relay vital information to hospitals and various other needs.

This Standard works to facilitate successful air-to-ground communications in each of these scenarios.

4. Recommended Protocol/ Standard

Regulatory Compliance

All aircraft-based communications shall adhere to all applicable FCC, ANSI and NTIA standards and rules.





Statewide Interoperability Radio Network (SIRN) Standards, Protocols, Procedures



Programming, Installation and Maintenance of Radios

- All aircraft equipped with radios that use SIRN as their primary communications network must be programmed with all SIRN statewide and regional talkgroups as well as conventional channels per the *SIRN Standard 1.8.0 Minimum Programming Standard*.
- 700 MHz Air-to-ground conventional channels (described further in the next Section) MUST be programmed to transmit at no more than 2 Watts.
- Aircraft-mounted radios accessing SIRN trunked talkgroups MUST be programmed for low power transmissions; 2 Watts output power is recommended.
- Aircraft-mounted SIRN radios will be aligned to support a Bit-Error-Rate (BER) threshold of 2.5%.
- Additional settings including system-side radio profile parameters (within the SIRN Provisioning Manager) and device-side (codeplug) parameters such as site switching thresholds or control channel lists may be modified but are subject to approval by the SIRN Statewide System Administrator
- Deviations from the above parameters (e.g., higher power) are permissible; however, such deviations shall be approved by the SIRN Statewide System Administrator.
- All aircraft radios are required to undergo and pass an annual preventative maintenance inspection to verify adherence to proper operational specifications and performance as required by this standard.
- The SIRN System Administrators and the SIEC maintain the right to audit and read Aircraft radio codeplugs upon request to ensure proper conformance and alignment with SIRN standards and policies.

Use of Portable Radios from Aircraft

- Aircraft communications should generally use the radio with which the aircraft is equipped for this purpose. The use of *portable radios from airborne aircraft is prohibited* except for short-term, unplanned emergency operations.

Aircraft to Ground Communications Talkgroups and Channels:

- **Intra-Agency Communications on Standard Agency Talkgroups:** Agencies with routine intra-agency communications needs between their aircraft and field personnel within their own jurisdiction may use their internal agency (dispatch and tactical) talkgroups. Examples include communications between a local law enforcement agency aircraft and that agency's officers in the field; or between an air ambulance and a hospital within the same jurisdiction.
- **Interoperable Communications on Shared Resources:** Table 1 highlights the shared trunked and conventional resources that are available on SIRN radios for interagency and interjurisdiction communications *including* air-to-ground communications. These include





Statewide Interoperability Radio Network (SIRN) Standards, Protocols, Procedures



- SIRN Statewide and Regional Trunked Talkgroups
- 700 MHz National Mutual Aid Air-to-Ground Conventional Channels
- 800 MHz Line of Sight

Table 1: SIRN Interoperable Talkgroups and Channels

05 REGIONAL MA1	05 REGIONAL MA2	05 STATE MA1	05 STATE MA2	5 STATE 700 MA	5 NAT'L 700 MA1	5 NAT'L 700 MA2	5 NAT'L 800 MA	5 NAT'L VHF MA
Regional Interop	Regional Interop	Statewide MA	Statewide MA	Local Simplex	National MA (700)	National MA (700)	National MA (800) + AG	National MA (VHF)
ND NW MA HAIL	ND NE MA HAIL	ND MA HAIL	ND MA HAIL	7DIR1E	7CALL50	7CALL50_D	8CALL90	VCALL10
ND NW PRSUIT	ND NE PRSUIT	ND PURSUIT 1	ND MA 16	7DIR2E	7TAC51	7TAC51_D	8TAC91	VTAC11
ND NW MA 01E	ND NE MA 01E	ND PURSUIT 2	ND MA 17	7FIRE DIR1	7TAC52	7TAC52_D	8TAC92	VTAC12
ND NW MA 02	ND NE MA 02	ND MA 03 E	ND MA 18	7FIRE DIR2	7TAC53	7TAC53_D	8TAC93	VTAC13
ND NW MA 03	ND NE MA 03	ND MA 04 E	ND MA 19	7DIR5	7TAC54	7TAC54_D	8TAC94	VTAC14
ND NW MA 04	ND NE MA 04	ND MA 05 E	ND MA 20	7DIR6	7TAC55	7TAC55_D	8CALL90_D	VFIRE21
ND NW MA 05	ND NE MA 05	ND MA 6	ND MA 21	7DIR7	7TAC56	7TAC56_D	8TAC91_D	VFIRE22
ND NW MA 06	ND NE MA 06	ND MA 7	ND MA 22	7DIR8	7GTAC57	7GTAC57_D	8TAC92_D	VFIRE23
ND SW MA HAIL	ND SE MA HAIL	ND MA 8	ND MA 23	7DIR9	7MOB59	7MOB59_D	8TAC93_D	VFIRE24
ND SW PRSUIT	ND SE PRSUIT	ND MA 9	ND MA 24	7DIR10	7LAW61	7LAW61_D	8TAC94_D	VFIRE25
ND SW MA 01E	ND SE MA 01E	ND MA 10	ND MA 25		7LAW62	7LAW62_D	7AG58	VFIRE26
ND SW MA 02	ND SE MA 02	ND MA 11	ND MA 26		7FIRE63	7FIRE63_D	7AG60	VMED28
ND SW MA 03	ND SE MA 03	ND MA 12	ND MA 27		7FIRE64	7FIRE64_D	7AG67	VMED29
ND SW MA 04	ND SE MA 04	ND MA 13	ND MA 28		7MED65	7MED65_D	7AG58_D	VLAW31
ND SW MA 05	ND SE MA 05	ND MA 14	ND MA 29		7MED66	7MED66_D	7AG60_D	VLAW32
ND SW MA 06	ND SE MA 06	ND MA 15	ND MA 30		7DATA69	7DATA69_D	7AG67_D	SAR NFM

5. Recommended Procedure

The following procedures shall be used for air-to-ground communications and coordination as necessary for

- EMS transport and hospital communications,
- Landing zone coordination, or
- Any other communications between aircraft and on-ground personnel.

General Procedures

Public safety aircraft operating within North Dakota shall generally use trunked SIRN talkgroups (agency-specific or interoperable) for their communications needs, particularly for communications requiring continuity across large geographies (e.g., Air Med units communicating with distant hospitals while en route). At landing zones or when line of sight between the two assets is established, it is recommended that





Statewide Interoperability Radio Network (SIRN) Standards, Protocols, Procedures



conventional channels be used if conventional and localized communications is adequate for the purpose. Please refer to the SIRN training library for additional information on the proper use of Aircraft to Ground communication process and procedures.

Aircraft with SIRN Radios (SIRN Statewide and Regional Interoperable Talkgroups): All aircraft equipped with SIRN programmed radios should attempt to establish, as soon as possible, a SIRN Regional (or statewide) Interoperable talkgroup for all inter-agency communications and coordination.

A public safety communication center, in-field public safety personnel or incident commander should be in contact with any aircraft and assign them an appropriate SIRN Statewide or Regional Interoperable talkgroup. Assignment and use of the SIRN Statewide or Regional Interoperable talkgroups must follow the process defined in *SIRN Standard 1.7.0. Status Board*.

Aircraft without SIRN Radios (Conventional Channels): Aircraft without a SIRN-connected radio should use the national mutual aid conventional channels.

- 700 MHz Air-to-ground channels:
 - 7AG58
 - 7AG60
 - 7AG67
 - 7AG58_D
 - 7AG60_D
 - 7AG67_D

- In addition, any VHF, 700 MHz or 800 MHz Direct (or line of sight) channels can be used as assigned by a public safety communication center, in-field public safety personnel or incident commander.

Patches and Gateways: If required, a patch or gateway may be established between a conventional channel and a SIRN Statewide and Regional Interoperable talkgroup by qualified technicians or dispatch personnel. See SIRN Standard *1.16.0. Patching SIRN Talkgroups with Non-SIRN Systems* for additional details.

Internal agency talkgroups: As noted previously agencies with routine intra-agency communications needs between their aircraft and field personnel within their own jurisdiction may use their *internal agency (dispatch and tactical) talkgroups*. Examples include communications between a local law enforcement agency aircraft and that agency's officers in the field; or between an air ambulance and a hospital within the same jurisdiction.

Hospitals: Air-to-ground communications between aircraft and hospitals that have dedicated talkgroups (e.g., Altru Dispatch) may use their internal talkgroups.

Training: All aircraft radio operators shall be sufficiently trained on the use of aircraft radios for air to ground communications and have a working knowledge of the technical capabilities and limitations of aircraft radio communications tools.

Brevity: In-flight transmissions, similar to all SIRN transmissions, should be as brief as possible due to the



Statewide Interoperability Radio Network (SIRN) Standards, Protocols, Procedures



potential for interference.

6. Management

The SIRN Statewide System Administrator is responsible for closely tracking SIRN radio IDs assigned to the aircraft radio and also is responsible for the oversight and compliance of this Standard.

Nothing in this standard shall be construed as a limitation of the use of the SIRN statewide and regional interoperability talkgroups for incidents other than air-to-ground communications.

Adherence to this standard will be guided by the SIRN Request to Participate Agreement. All aircraft-to-ground end users will be required to execute the SIRN Request to Participate Agreement.