

Appendix A

NSF/NCAR GV Intercommunications System (ICS) Operating Instructions

Overview

The Intercommunications System (ICS) installed on N677F consists of eight Audio Control Panels (ACP) and four Interphone Control Panels (ICP). The ACP units are used to select desired audio sources to be coupled to either the headphones or speaker (cockpit only), and adjust incoming audio signal and outgoing audio side tone levels. The ICP units are provided as intercom/call station to station only via headset/boom mike inputs.

The ICS COM system has three nets: (1) Cabin Common, (2) Cockpit Local, and (3) Cabin Local.

Station Locations

ACP 1 / ICP 1 – Pilot LH 301

ACP 2 / ICP 2 – Copilot LH 388

ACP 3 / ICP 3 – Observer LH 546

ACP 4 / ICP 4 – Cabin Station LH 497 and LH 738 (Baggage Compartment)

ACP 5 – Cabin Station RH 301

ACP 6 – Cabin Station RH 399

ACP 7 – Cabin Station RH 497

ACP 8 – Cabin Station RH 546 (ADS)

Normal ICS Operations

In order to communicate in the main cabin with the ACP and ICP units, use the Cabin Common Net. The following buttons should be illuminated:

- HOT MIC
- ICS Common

ICS Local provides two nets, one for the cockpit only and one for the cabin. This provides a second net for the cabin for ACP communication only. The ICP units cannot listen or talk on the Local Net. To use the Local Net, the following buttons should be illuminated:

HOT MIC
ICS LOCAL

The ICP unit can only transmit on the ICS Common Net.

In order to communicate with the cockpit, use the ICS Common Net. To call the cockpit, push and release the CALL button (an audio signal will be sent to the cockpit ICS Local Net). The cockpit will then switch over to the ICS Common Net for the communication.

The Cabin ACP unit cannot monitor the cockpit communications over the cockpit ICS Local Net.

Other ICS Operations

Communication over the VHF radio is available through the ACP units only. In order to communicate outside the aircraft on the VHF radio, the cockpit must first select the desired frequency. Select both VHF2 Audio and VHF2 Microphone. To use the VHF radio, the following buttons should be illuminated:

VHF2 Audio
VHF2 Microphone

To listen to VHF communication, select only the VHF2 Audio button. (WARNING: If both VHF2 Audio and Microphone are selected, the operator will be able to transmit outside the aircraft and any other station that has the VHF2 selected will be able to transmit as well, creating the ability to cause walkover communications.)

Communication over the SATCOM is available through the ACP units only. INMARSAT (SAT 1) or IRIDIUM (SAT 2) phone calls via the cockpit are available to all the ACP locations. Dialing is only available in the cockpit. To use the INMARSAT, the cockpit must dial the desired number and the following buttons should be illuminated:

SATCOM Audio
SATCOM Microphone

A quick push of the SATCOM Microphone button selects SAT 1 or the INMARSAT for communication. To speak, press the PTT switch on the fuselage ICS headset hanger to the down position.

To use the IRIDIUM, the cockpit must dial the desired number and the following buttons should be illuminated:

SATCOM Audio
SATCOM Microphone

An extended push (of approximately 4 seconds) of the SATCOM Microphone button selects SAT 2 or the IRIDIUM for communication. To speak, press the PTT switch on the fuselage ICS headset hanger to the down position.

Appendix B

Research Aviation Facility (RAF)

Medical Information for Airborne Research

Prepared with the assistance of Dr. Warren Jensen, FAA Senior Medical Examiner, Director of Aeromedical Research, University of North Dakota, (UCAR OGC Review August 03)

The following information should assist you in identifying potential problems that could interfere with your ability to participate in research in NCAR/NSF aircraft. The information contained herein is in no way designed to be comprehensive. If you have any concerns about your ability to fly on NCAR/NSF aircraft, please consult your physician.

There is a possibility that you may be in situations that would require you to take care of yourself including such activities as evacuating the aircraft, dealing with turbulence, opening doors, and wearing an oxygen mask. It is important to identify conditions that may interfere with your performance of such duties. If you feel you cannot perform any duty or feel there may be an issue that could affect any aspect of your participation, do not continue without first consulting your physician.

The following medical conditions and policies could affect your safety and ability to participate in research in NCAR/NSF aircraft. Should you feel that you possess any of the conditions listed below or if you are unable to comply with any of the policies listed, you should NOT participate in NCAR/NSF aircraft at this time.

1. Any medical condition that would not allow you to continuously walk for 10 minutes or up two flights of stairs.
2. Any medical condition that would inhibit your ability to be able to lift 40 pounds.
3. Interruption of your normal activities because of difficulty breathing, conditions such as asthma, or other lung/heart problems that interrupt your normal activities.
4. Ear or sinus problems when flying.
5. Motion sickness when flying.
6. Problems with hearing and speech that would interfere with the ability give and receive instructions in a room with moderate background noise.
7. Taking any medication that gives side effects of drowsiness or difficulty in maintaining alertness.
8. Any condition, illnesses or injuries that would interfere with the ability to perform duties on research flights and to evacuate the aircraft if necessary.
9. Any condition, illnesses or injuries that might require the assistance of a RAF crewmember.
10. RAF policy limits flying for 24 hours after immunizations, dental work, and SCUBA diving.
11. Pregnancy beyond the 20th week as well as any other concerns related to the health of a pregnant mother or baby.
12. RAF policy prohibits carrying any person suffering effects from alcohol consumption on a flight, regardless of when it was consumed, and also restricts flight if alcohol has been consumed within 8 hours prior to flight.

13. Symptoms of upset stomach, gas, or diarrhea prior to flight

Appendix C

Approved wiring and non wire materials

August 10, 2012

RAF recommends using MIL-W-22759 wire for all Single Conductor Wire applications as listed in Advisory Circular AC 43.13-1B Table 11-11 “Open Wiring”, specifically MIL-W-22759/16. These wire types meet FAA flammability requirements. Wires listed in Table 11-12 “Protected Wiring” of the same Advisory Circular are NOT acceptable for use outside of a metal enclosure.

Multiconductor Cable

Type	Part Number	Manufacturer	ID	Supplier
STP-12	12-TE-1925(2)STJ	Thermax	677F-1	All Cable
STP-12	CA 1888	Cal Wire	57449	California Wire
STT-12	12-TE-1925(3)STJ	Thermax	677F-1C	All Cable
STT-12	CME4-03-STW-1219	Astro Ind	75866	Electrospec
STT-14	14-TE-1927(3)STJ	Thermax	677F-2	All Cable
STT-14	CME4-03-STW-1419	Astro Ind	75867	Electrospec
STP-16	16-TE-1929(2)STJ	Thermax	59633	ElectroSpec
STP-16	CME4-02-STW-1619	Astro Ind	58575	ElectroSpec
STT-16	16-TE-1929(3)STJ	Thermax	677F-3	All Cable
STT-16	CME4-03-STW-1619	Astro Ind	75860	Electrospec
STT-18	18-TE-1930(3) STJ	Thermax	677F-9B	All Cable
STT-18	CME4-03-STW-1819	Astro Ind	75868	Electrospec
STP-18	CME4-02-STW-1819	Astro Ind	75857	Electrospec
STP-18	18-TE-1930(2)STJ	Thermax	81173	Electrospec
STP-20	20-TE-1932(2)STJ	Thermax	677F-4	All Cable
STP-20	CME4-02-STW-2019	Astro Ind	75858	Electrospec
STT-20	20-TE-1932(3)STJ	Thermax	90408	All Cable
STT-20	CME4-03-STW-2019	Astro Ind	90408	Electrospec
STP-22	22-TE-1934(2)STJ	Thermax	89728	All Cable
STP-22	CME4-02-STW-2219	Astro Ind	75859	Electrospec
STT-22	22-TE-1934(3)STJ	Thermax	57449	All Cable
STT-22	CME4-03-STW-2219	Astro Ind	75862	Electrospec
STT-24	24-TE-1936(3)SXE	Thermax	677F-6	All Cable
STT-24	24-TE-1936(3)STJ	Thermax	75865	All Cable
STT-24	CME4-03-STW-2419	Astro Ind	75861	Electrospec
STQ-24	24-TE-1936(4)STJ	Thermax	677F-7	All Cable
STQ-24	CME4-04-STW-2419	Astro Ind	75863	Electrospec
ST5-24	24-TE-1936(5)STJ	Thermax	81173	Electrospec
STQ-26	26-TE-1938(4)STJ	Thermax	677F-2C	All Cable
STQ-26	CME4-04-STW-2619	Astro Ind	75864	Electrospec
TWX	M17/176-00002	Thermax	677F-14	All Cable
HEAD1	YQ-27540	Belden	677F-16	Buck Research
HSDQ	89728	Belden	677F-17	Belden
Multi conductor	342239-39/C	Electronics cable	87901	Electronics cable

cable		Specialist		Specialist
PMS Cable	6548PA	Belden	90355	Electrospec

Special Wire

Type	Part Number	Manufacturer	ID	Supplier
C50	S44191	PIC	6870	PIC
C50	COAX316SON #RL0458338	Thermax	57436	All Wire
C50	S44193	PIC	6753	PIC
C50	S33141	PIC	2831	PIC
C50	S22089	PIC	7404	PIC
NET	E50824	PIC	6753	PIC
USB	USB2422	PIC	7161	PIC
FW(Fire-wire)	FAWM226C-008	Northwire	91904	Northwire
FW(Fire-wire)	FAWM226C-003	Northwire	91905	Northwire
Firewire	912406	Electronic Cable Spec	9972	Electro Spec
Fiber optic	S696T-02F-62X	DRAKA	9710	Glenair
Fiber optic	S696T-01-62X	DRAKA	9710	Glenair
Fiber optic	S696T-16-62X	DRAKA	9710	Glenair
Thermocouple	5TC-TT-T-24-36	Omega Engineering	87819	Omega Engineering
Thermocouple	WTT-6-60-TT	Omega Engineering	88169	Omega Engineering
Thermocouple	EI1110202/SA1-T-72	Omega Engineering	88169	Omega Engineering
Arinc Cable	422202	Carlisle	92196	ECS

Flat Ribbon Cable (Used in DSM)

Type	Part Number	Manufacturer	ID	Supplier
10 Pin conductors	F2807S-10-050-55	TEMP-FLEX Cable	677F-3C	Electro Spec.
20 Pin conductors	F2807S-20-050-55	TEMP-FLEX Cable	57449	Electro Spec.
26 Pin conductors	F3007S-26-025-85	TEMP-FLEX Cable	72286	Electro Spec
40 Pin conductors	F2807S-40-050-55	TEMP-FLEX Cable	57449	Electro Spec.
44 Pin conductors	F2807S-44-0394-55	TEMP-FLEX Cable	72286	Electro Spec
50 Pin conductors	F2807S-50-050-55	TEMP-FLEX Cable	677F-30B	Electro Spec.

Coaxial Cable

Gauge	Type	Part Number	Manufacturer	ID	Supplier
18 AWG	RG-142 B/U	M17/158/00001	BELDEN	677F-31	BELDEN
20 AWG		S88207	PIC WIRE	9668	PIC WIRE & CABLE
26 AWG	75-OHM	Part#V76261	PIC WIRE	9626	PIC WIRE&CABLE

Approved and Tested Non-Wire Materials

Tubing	Part Number	Manufacturer	ID	Supplier
1/4" Comp	SYNFLEX 1300-04403	SAINT-GOBAIN	677F-5C	SAINT-GOBIN
3/8" Comp	SYNFLEX 1300-06603	SAINT GOBAIN	677F-6C	SAINT-GOBIN
3/8" OD Conductive Silicone	3001788 #1851 (TSI #) VC-781 Solid Carbon- filled	VANGUARD	677F-7C	TSI
1/2" OD Conductive Silicone	3001789 (TSI #) VC-781 Solid Carbon- filled	VANGUARD	9800	TSI
1/8" OD Clear	22UHP .063X .125	AMETEK	677F-10C	AMETEK
1/8" OD Black	104-0125031-OTC	Parker Hannifin Corp	77918	Metron Tech. Central
1/4" OD Clear	TSFP5 .250125	SAINT-GOBAIN	677F-9C	SAINT-GOBIN
1/4" OD TEFLON, 22P	22P.156X.250	AMETEK	56210	AMETEK
1/4" OD Black	104-0250047-OTC	Parker Hannifin Corp	77919	Metron Tech. Central
3/8" OD TEFLON	UHP22.250X.375F	AMETEK	59056	AMETEK
3/8" OD Clear	UHP22.313X.375	AMETEK	91060	AMETEK
3/8" OD Clear	UHP22.250X.375H	AMETEK	72509	AMETEK
3/16" OD Clear	22P.125X.187	AMETEK	84286	VQS
3/16" OD Semi- Clear	5239K11	McMaster-Carr	89761	McMaster-Carr
5/16" OD Clear	AAC000012-CP	SAINT-GOBAIN	9800	SAINT-GOBAIN
5/16" OD Clear	AAC00025	SAINT-GOBAIN	151937-06	SAINT-GOBAIN
1/2" OD Clear	UAT500-062	AZTECH	72889	AZTECH CONTROL
ARMAFLEX Foam Insulator	APT03834	ARMACELL	75233	EJ Bartells or Armacell
DEGUSSA Foam Insulator	½" ROHACELL-110S	N/A	10032	SCION CORE SYS.
Insulation material OffWhite	207-782-7011	InsulSAFE Textiles, Inc	89308	InsulSAFE Textiles

Wire Protection	Part Number	Manufacturer	ID	Supplier
3/8" Black Sleeve	HTN0.38TB	TECHFLEX	677F-8C	TECHFLEX
1/2" Black Sleeve	HTN0.50TB	TECHFLEX	57449	TECHFLEX
1/4" Left Cut, Spiral Wrap	TSWTF-1/4-NT-L	PARKER	91785	PORT PLASTIC, INC.
1/4" Right Cut, Spiral Wrap	TSWTF-1/4-NT-R	PARKER	91786	PORT PLASTIC, INC.
3/8" Right Cut, Spiral Wrap	TSWTF-3/8-NT-R	PARKER	91784	PORT PLASTIC, INC.

3/8" Left Cut, Spiral Wrap	TSWTF-3/8-NT-L	PARKER	91787	PORT PLASTIC, INC.
1/2" Left Cut, Spiral Wrap	TSWTF-1/2-NT-L	PARKER	91783	PORT PLASTIC, INC.
1/2" Right Cut, Spiral Wrap	TSWTF-1/2-NT-R	PARKER	91788	PORT PLASTIC, INC.

Other	Part Number	Manufacturer	ID	Supplier
.125" Plastic Phenolic	FBGS.125N	ACCURATE	72813	ACCURATE PLAST.
Phenolic Insulator strip	8796K42	ARAMID	76178	McMaster Carr
Insulated Duo-Tape Low Watt Density	AWH-WWW-XXXDL	Amptek Company	V220288	Amptek Company
Insulated Duo-Tape Medium Watt Density	AWH-WWW-XXXDM	Amptek Company	V220287	Amptek Company
Insulated Duo-tape Low Watt Density	A401-NCAR0311-20	Amptek Company	90775	Amptek Company
Insulated Duo-tape Low Watt Density	A401-NCAR0311-21	Amptek Company	90775	Amptek Company
InsulSAFE Textiles	P-100	ARAMID	V220289	Mc Master Carr
Aramid Strip 1" Wide	8796K72	Mc Master Carr	V219907	Mc Master Carr
Aerogel Pyrogel XT Insulation	PG XT 5MM-5	Pacor Inc	V219907	Pacor Inc
Spaceloft White Insulation	SL 5MM-XX	Pacor Inc	90859	Pacor Inc
Ultem 1000 Aramid Strip	Ultem 1000	Colorado Plastic	H219907	Colorado Plastic Prod
MP Graphite/Poly Foam 45 ILD 1/2"	Lot #Z574-595-MP45	Skandia Inc	91237	Skandia, Inc
MP Graphite/Poly Foam 65 ILD 1/2"	Lot #12660-MP65	Skandia Inc	91237	Skandia, Inc
MP Graphite/Poly Foam 45 ILD 1/2"	Lot #W1132-1142-MP45	Skandia Inc	91237	Skandia, Inc
Clear Plastic .125"	PCBFRCLSH00125 PALSUN FR	Professional Plastic	92077	Professional Plastics, Inc

Single Conductor Wire

Type	Part Number	Manufacturer	ID	Supplier
10 AWG RED	M16878/4 BMG-9	Thermax	677F-3B	All Cable
10 AWG WHT	M16878/4 BMG-2	Thermax	677F-11B	All Cable
10 AWG BLK	M16878/4 BMG-0	Thermax	677F-21B	All Cable
12 AWG WHT	M16878/4 BLE-2	Thermax	677F-12 B	All Cable
12 AWG RED	M16878/4 BLE-9	Thermax	677F-4 B	All Cable

12 GAW BLK	M16878/4 BLE-0	Thermax	677F-22 B	All Cable
14 AWG WHT	M16878/4 BKE-2	Thermax	677F-13 B	All Cable
14 AWG RED	M16878/4 BKE-9	Thermax	677F-2B	All Cable
14 AWG BLK	M16878/4 BKE-0	Thermax	677F-23 B	All Cable
16 AWG WHT	M16878/4 BJE-9	Thermax	677F-8	All Cable
16 AWG BLK	M16878/4 BJE-0	Thermax	677F-9	All Cable
16 AWG RED	M16878/4 BJE-2	Thermax	677F-14 B	All Cable
18 AWG RED	M16878/4 BHE-9	Thermax	677F-1B	All Cable
18 AWG WHT	M16878/4 BHE-2	Thermax	677F-15 B	All Cable
18 AWG BLK	M16878/4 BHE-0	Thermax	677F-24 B	All Cable
20 AWG WHT	M16878/4 BGE-9	Thermax	677F-10	All Cable
20 AWG BLK	M16878/4 BGE-0	Thermax	677F-11	All Cable
20 AWG RED	M16878/4 BGE-2	Thermax	677F-16 B	All Cable
22 AWG WHT	M16878/4 BFE-9	Thermax	677F-12	All Cable
22 AWG BLK	M16878/4 BFE-0	Thermax	677F-13	All Cable
22 AWG BLUE	M16878/4 BFE-6	Thermax	677F-28 B	All Cable
22 AWG RED	M16878/4-BFE-2	Thermax	57401	All Cable
22 AWG ORG	M16878/4-BFE-3	Thermax	57401	All Cable
22 AWG YEL	M16878/4 BFE-4	Thermax	57401	All Cable
22 AWG BRWN	M16878/4 BFE-1	Thermax	677F-29 B	All Cable
24 AWG WHT	M16878/4 BEE-9	Thermax	677F-5B	All Cable
24 AWG RED	M16878/4 BEE-2	Thermax	677F-17 B	All Cable
24 AWG BLK	M16878/4 BEE-0	Thermax	677F-25 B	All Cable
26 AWG WHT	M16878/4 BDE-9	Thermax	677F-6B	All Cable
26 AWG RED	M16878/4 BDB-2	Thermax	677F-18 B	All Cable
26 AWG BLK	M16878/4 BDB-0	Thermax	677F-26 B	All Cable
28 AWG RED	M16878/4 BCB-2	Thermax	677F-19 B	All Cable
30 AWG WHT	M16878/4 BBB-9	Thermax	677F-8B	All Cable
30 AWG RED	M16878/4 BBB-2	Thermax	677F-20 B	All Cable
30 AWG BLK	M16878/4 BBB-0	Thermax	677F-27 B	All Cable
22 AWG BLK	178-8679	Teledyne Reynolds	73141	

Obsolete Part Numbers

wire protection	part number	manufacturer	id	supplier
1/4" Left Cut, Spiral Wrap	401-025030-N00000L	PARKER	677F-11C	PORT PLASTIC, INC.
1/4" Right Cut, Spiral Wrap	401-0250030-N00000R	PARKER	90710	PORT PLASTIC, INC.
3/8" Right Cut, Spiral Wrap	401-0375030-N00000R	PARKER	677F-12C	PORT PLASTIC, INC.
3/8" Left Cut, Spiral Wrap	401-0375030-N00000L	PARKER	677F-13C	PORT PLASTIC, INC.
1/2" Left Cut, Spiral	401-0500030-	PARKER	677F-	PORT PLASTIC, INC.

Wrap	N00000L		14C	
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Wire Type Abbreviations:

STP	- Shielded Twisted Pair
STT	- Shielded Twisted Triple
STQ	- Shielded Twisted Quad
TWX	- Twinax Cable
HEAD1	- Special Dew Point Cable
HSDQ	- High-Speed Data Quad
C50	- 50-Ohm Coaxial Cable
NET	- GigaBit Network Cable