

ARINC Voice Services Operating Procedures Handbook

ARINC

**2551 Riva Road
Annapolis, MD
21401-7435
U.S.A.**


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NOTICE: *Questions regarding the contents of this document or the use of ARINC voice services should be directed to the ARINC Service Desk at (800) 633-6882 or (703) 637-6360. A current copy of this manual can also be obtained from the ARINC web site (www.arinc.com).*

 Note: Jeppesen maps are not provided in this document, but may be downloaded separately.

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Table of Contents

1	SCOPE	1-1
1.1	IDENTIFICATION.....	1-1
1.2	DESCRIPTION OF SERVICE.....	1-1
1.3	COMMUNICATIONS CENTERS.....	1-2
1.4	MESSAGE FORMATS	1-2
1.5	CHARGING CONTACTS.....	1-3
1.6	DOCUMENT OVERVIEW	1-3
1.7	DEFINITIONS OF TERMS AND ACRONYMS	1-5
2	AIR/GROUND COMMUNICATIONS PROCEDURES.....	2-1
2.1	GENERAL DESCRIPTION.....	2-1
2.1.1	International Service.....	2-1
2.1.2	Domestic Service	2-1
2.2	INTERNATIONAL AND DOMESTIC OPERATIONS.....	2-2
2.2.1	International Operations.....	2-2
2.2.2	Domestic Operations.....	2-4
2.3	INTERNATIONAL AND DOMESTIC PROCEDURES	2-5
2.4	VHF DIRECT ACCESS SERVICE.....	2-6
2.4.1	VHF Direct Access Procedures.....	2-6
2.4.2	When Direct Access Login Sequence Is Complete.....	2-7
2.4.3	Standards for Use.....	2-7
2.5	ARINC VHF DIRECT DIAL PRESS TO TALK (PRESTO) SERVICE	2-7
2.5.1	Direct Dial PRESTO Procedures	2-8
2.6	SATCOM VOICE PROCEDURES.....	2-9
2.6.1	Air/Ground Calling Procedures.....	2-9
2.6.2	Ground/Air Calling Procedures.....	2-9
2.7	COMMUNICATIONS TROUBLE REPORTING	2-10
3	PHONE PATCH PROCEDURES	3-1
3.1	GENERAL.....	3-1
3.2	PHONE PATCH CONNECTIONS.....	3-1
3.3	PHONE PATCH AUTHORIZATION	3-1
3.4	PHONE PATCH AUTHORIZATION—VERIFICATION AND CHANGES	3-2
3.5	OPERATION.....	3-2
3.5.1	Background Noise.....	3-2
3.6	GROUND/AIR CONNECTION PROCEDURES	3-3
4	LONG DISTANCE OPERATIONAL CONTROL FACILITY.....	4-1
4.1	GENERAL.....	4-1
4.2	LDOCF OPERATION.....	4-1
4.2.1	Service Areas	4-2
5	SELCAL.....	5-3
5.1	DESCRIPTION OF SERVICE.....	5-3
5.2	OPERATION.....	5-3
5.3	SELCAL TONES.....	5-3
5.3.1	12-Tone Codes.....	5-3
5.3.2	16-Tone Codes.....	5-3
6	PERMISSIBLE COMMUNICATIONS.....	6-1
7	ARINC COMMUNICATIONS RECORDS.....	7-1

APPENDIX A STANDARD MESSAGE TEXT IDENTIFIERS.....A-1

A.1 STANDARD MESSAGE IDENTIFIER (SMI).....A-1

A.2 TEXT ELEMENT IDENTIFIER (TEI).....A-1

A.3 MESSAGE EXAMPLESA-3

APPENDIX B ARINC COMMUNICATIONS CENTERS CONTACT INFORMATIONA-1

B.1 ARINC COMMUNICATIONS CENTERS..... B-1

APPENDIX C ARINC CONTACT INFORMATIONB-1

C.1 ARINC COMMUNICATIONS CENTERS’ ADMINISTRATIVE INFORMATION C-1

C.1.1 New York (NYC) C-1

C.1.2 San Francisco (SFO)..... C-1

C.1.3 ARINC Service Desk..... C-1

C.1.4 World Wide Web Site..... C-2

APPENDIX D NORTH ATLANTIC HF SSB FAMILIESC-1

APPENDIX E JEPPESEN ARINC SERVICES COVERAGE CHARTSD-1

List of Figures

Figure D-1. North Atlantic Flight Information Region Boundaries D-3

List of Tables

Table 2-1. Access Codes 2-6

Table B-1. HF SSB LDOCF Frequencies Guarded (kHz). **Error! Bookmark not defined.**

Table D-1. North Atlantic HF Radiotelephone Families D-1

Table D-2. North Atlantic HF Radiotelephone Networks D-2

1 SCOPE

1.1 Identification

This document provides a brief description of the Air/Ground Voice communication services offered by Aeronautical Radio, Inc. (ARINC) and includes operational procedures for their use. Operational communications services have been provided to aviation by ARINC since 1929. Formed by a consortium of airlines, the company is still privately owned by airlines and aviation industry companies. ARINC is headquartered in Annapolis, Maryland.

1.2 Description of Service

International Air/Ground Voice Service

The Air/Ground International Voice Service is comprised of Air Traffic Control (ATC) communication services for the Federal Aviation Administration (FAA) and Aeronautical Operational Control (AOC) communication services for the airlines and other aircraft operators. These services are provided by the ARINC Communications Centers located at New York (Long Island MacArthur Airport), and San Francisco (near Livermore), California. HF and VHF voice radio are the primary means of air/ground communications. There is limited data link capability for some aircraft. ARINC Communications Centers also have telephone facilities to accommodate Satellite Communications (SATCOM) voice. Besides communications services, both ARINC Communications Centers can provide weather reports and forecasts on request.

Oceanic ATC services are provided for the FAA in the Anchorage, Houston, Miami, New York, Oakland, and San Juan Flight Information Regions (FIRs). ATC messages, known as flight safety messages in International Civil Aviation Organization (ICAO) terminology, are handled on Major World Air Route Area (MWARA) HF radio frequencies. VHF radio installations are used along the coastal areas to supplement HF coverage. For aircraft communicating directly with the FAA via Controller Pilot Data Link Communications (CPDLC), ARINC Communications Centers provide backup voice communication services, including HF radio and SATCOM voice, to aircraft so equipped.

AOC services, known as flight regularity messages in ICAO, are handled on HF Long Distance Operational Control Facility (LDOCF) frequencies or on VHF networks covering coastal areas within the Gulf of Mexico and Caribbean, and throughout the domestic U.S. Both ARINC Communications Centers are equipped to connect Air/Ground HF and VHF radio channels and SATCOM voice to telephone lines to permit flight crews to talk directly with offices on the ground. Up to six parties can be conferenced simultaneously. Connecting a radio circuit to a telephone line is known as a Phone Patch.

Domestic Air/Ground Voice Service

ARINC operates a system of over 100 ground radio stations within the 50 US States, which are interconnected using Voice-Over-Frame (VoF) lines to form 15 networks. In addition, ARINC maintains a VHF network between Seattle (SEA) and Anchorage (ANC) for use by aircraft flying this route. The networks are situated along major air routes to provide continuous coverage above 20,000 feet. Below 20,000 feet, coverage is available but not guaranteed to be continuous. On-ground coverage is provided at most major airports. The advantage of this service is that stations are networked to provide coverage over long distances, well beyond single station line-of-sight coverage. These 16 networks are controlled from the ARINC San Francisco (SFO) Communications Center. The ARINC domestic VHF networks are used primarily for handling AOC communications.

The ARINC San Francisco (SFO) Communications Center also controls and operates a “Domestic” VHF network, the “MexNet” with 15 sites in Mexico. The MexNet provides enroute coverage over most of Mexico and on the ground coverage at 15 airport sites.

☞ Note: See Jeppesen ARINC-1 for VHF enroute coverage above F200
See Jeppesen ARINC-2 for VHF airport on-ground coverage
See Jeppesen ARINC-5 for MexNet enroute coverage above F200
See Jeppesen ARINC-6 for MexNet on-ground coverage


1.3 Communications Centers

ARINC Communications Centers are interconnected to customer data communication circuits through the ARINC AviNetsm. It is an electronic switching system that handles the entire data message switching requirements for many airlines and airline-associated industries, such as car rental agencies, ground handling agencies, and hotel chains that have contracted with ARINC for this service. AviNet also interconnects to other telecommunications networks, such as the FAA/ICAO Aeronautical Fixed Telecommunications Network (AFTN) and Société Internationale de Télécommunications Aéronautiques (SITA), affording AviNet customers a worldwide data communications capability.

1.4 Message Formats

All Air/Ground messages received by ARINC Radio Operators on HF/VHF circuits are transcribed into the ARINC Air/Ground Terminal System (AGS) computers for relay to ATC and/or company operational control offices.

Air/Ground messages transmitted from ARINC Centers are in a Standard Message Text (SMT) format. A message is identified by a Standard Message Identifier (SMI) on the first line of message text. Each element of message text is identified by a Text Element Identifier (TEI). An element of message text that cannot be associated with a TEI is entered as Free Talk. The Free Talk portion of the message is identified by a dash symbol followed by a space. The SMT format was developed by ARINC primarily for airline use within their computerized flight management systems. Definitions of the commonly used SMIs and TEIs, along with message examples, can be found in Appendix A.

 Note: The ARINC Air/Ground Voice Message Format Specification is described in ARINC Document #20932.

1.5 Charging Contacts

ARINC Voice Services are available to all aircraft operators—airline, corporate, private, and State (U.S. and foreign) without discrimination. A service contract with ARINC is required for company delivery of AOC messages.

In the Air/Ground Services, each contact and/or required intercept is counted as a charge unit. A contact is defined as the completed exchange of information between an aircraft and an ARINC Communications Center and may consist of more than one transmission from the aircraft and/or the ARINC Communications Center. A contact begins with a call-up (by the aircraft or the ARINC Communications Center) and ends with an acknowledgment of receipt of the transmission or transmissions made between the call-up and the acknowledgment. For example, an Air/Ground call from an aircraft, ARINC Communications Center response, position reported by the flight, and ARINC Communications Center acknowledgment constitutes one contact.

Intercepted readbacks of partial reports and confirmations furnished by adjacent ARINC Communications Centers are considered good circuit coordination and are not counted as additional contacts by the assisting center.

An Air/Ground message relayed to another ground station for the information of that center's operating personnel only, and not for onward relay to ATC, company, or other offices, is also considered an assist given to a primary center by an adjacent center and is not counted as a contact. Likewise, an assist given to a primary center by an adjacent center is not a completed exchange of information and is not counted as a contact by the intercepting center.

1.6 Document Overview

This document provides a basic description of radio and voice services provided by ARINC HF and VHF Communications Center facilities. It is intended for distribution to users of the ARINC Air/Ground voice services as well as ARINC radio operations personnel.

Below is a brief summary of the sections in this document:

Section 1, Scope

Introduces the system and describes the purpose and contents of this document.

Section 2, Air/Ground Communications Procedures

Provides a description of radio procedures for international and domestic Air/Ground radio communications and SATCOM voice.

Section 3, Phone Patch Procedures

Phone Patch direct-voice connections between a flight crew and company operational offices.

Section 4, Long Distance Operational Control Facility

Explains the radio telephone voice communication to aircraft operating outside the ARINC VHF range.

Section 5, SELCAL

Describes the signaling method used to alert aircraft that a ground station wishes to communicate with it.

Section 6, Permissible Communications

Describes acceptable and unacceptable communications.

Section 7, ARINC Communications Records

Describes communications records retention practices of ARINC Communications Centers.

Appendix A, Standard Message Text Identifiers

Lists the definitions for the most commonly used identifiers used in message transcription by radio operators.

Appendix B, ARINC Center Contact Information

Lists contact phone numbers and teletype addresses for ARINC Communications Centers.

Appendix C, ARINC Contact Information

Lists information relating to ARINC Communications Centers and Headquarters administration.

Appendix D, North Atlantic HF SSB Families

Lists the North Atlantic radio telephone networks and associated NAT routes.

Appendix E, Jeppesen ARINC Services Coverage Charts

Contains information pertaining to International, Domestic, and ACARS/AFIS coverage charts produced for ARINC by Jeppesen. (These maps are not provided within this document but may be downloaded separately.)

1.7 Definitions of Terms and Acronyms

The following abbreviations, acronyms, and mnemonics are used in this document.

<i>Item</i>	<i>Meaning</i>
A/G	Air/Ground
ACARS	Aircraft Communications Addressing and Reporting System
AES	Aeronautical Earth Station
AFIS	Aircraft Flight Information System
AFTN	Aeronautical Fixed Telecommunications Network
AGS	Air/Ground Terminal System
AOC	Aeronautical Operational Control
APRL	ARINC Phone Patch and Routing Guide List
ARINC	Aeronautical Radio, Inc.
ARTCC	Air Route Traffic Control Center
ASRI	Aviation Spectrum Resources, Inc.
ATC	Air Traffic Control
ATIS	Automatic Terminal Information Service
ATOP	Advanced Technologies and Oceanic Procedures (aka Ocean21)
AviNet	An integrated network of message processing and switching processors operated by ARINC. AviNet provides interairline message switching, including a universal intercomputer exchange for rapid data transfer between many U.S. and foreign airline computer systems.
CAR	Caribbean
CEP	Central East Pacific
CFR	Code of Federal Regulations
CPDLC	Controller Pilot Data Link Communication
CTA	Control Area
CWP	Central West Pacific
DTMF	Dual Tone Multi-Frequency
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FIR	Flight Information Region
GES	Ground Earth Station

<i>Item</i>	<i>Meaning</i>
GOM	Gulf of Mexico
HF	High Frequency
ICAO	International Civil Aviation Organization
ID	Identification
INMARSAT	International Maritime Satellite Telecommunications Company
LDOCF	Long Distance Operational Control Facility
MNPS	Minimum Navigation Performance Specifications
MWARA	Major World Air Route Area
NAT	North Atlantic
NP	North Pacific
ODL	Oceanic Data Link
OTS	Organized Track System
PRESTO	“Press to Talk” Direct Dial Service
PST	Public Switched Telephone Network
SATCOM	Satellite Communicaitons
SELCAL	Selective Calling System
SITA	Société Iternationale de Télécommunications Aéronautiques
SMI	Standard Message Identifier
SMT	Standard Message Text
SP	South Pacific
SSB	Single Sideband
TEI	Text Element Identifiedr
VERN	VHF Extended Range Network
VHF	Very High Frequency

2 AIR/GROUND COMMUNICATIONS PROCEDURES

2.1 General Description

This section describes the procedures for International and Domestic Services associated with ATC and AOC voice communications. It addresses the use of HF, VHF, and SATCOM voice for ATC and AOC for flights through U.S. controlled FIRs and the use of VHF for AOC within U.S. domestic airspace.

2.1.1 International Service

In areas beyond the coverage of ATC VHF or UHF radios, ARINC provides ATC communication services on HF frequencies comprised of the relay of ATC clearances, requests, advisories, and position reports between the FAA and aircraft. ARINC Communications Centers are staffed with radio operators who act as the intermediary between controllers and pilots. Radio operator positions are equipped with computer workstations consisting primarily of a terminal and keyboard as part of the Air/Ground System (AGS), and a radio and telephone communications system. The latter is comprised of radio and frequency selection, SELCAL, antenna selection, telephone, and various other communications features. Nearly 80 percent of international services are conducted in support of the FAA. ARINC Communications Centers handle over two million ATC messages and position reports per year. The remaining 20 percent (over 500,000 messages) are AOC in nature.

2.1.2 Domestic Service

The Air/Ground Domestic Service is provided by the ARINC Communications Center at San Francisco. Only AOC traffic is handled by this service, consisting of company information relay and weather-related product delivery and phone patches. The radio operators dedicated to this service also use the AGS and communications equipment. This service meets FAR 121.99 communication requirements for dispatch and is complementary to the Aircraft Communications Addressing and Reporting System (ACARS), which is a data link communications system.

2.2 International and Domestic Operations

2.2.1 International Operations

International A/G radio procedures apply to the following oceanic regions:

North Atlantic/Maritime Canada
Caribbean/Gulf of Mexico
Pacific

☞ Note: Jeppesen ARINC-3 and ARINC-4 charts list all HF and International VHF frequencies in use at ARINC aeronautical stations. In addition, ARINC frequencies are published on Jeppesen Oceanic Charts and in the DoD Flight Information Handbook.

2.2.1.1 North Atlantic/Maritime Canada

Aircraft operating over the North Atlantic (NAT) on routes within the New York and Miami oceanic FIRs will be under the radio guard of the ARINC New York Communications Center. Communications concerning air traffic control in these areas are conducted on the NAT Family A and E MWARA high frequencies.

☞ Note: The *International Notices to Airmen*, published by the FAA, states that it is mandatory to have HF radio equipment installed and operational in aircraft operating anywhere in the New York Oceanic FIR airspace. This includes the oceanic airspace between the United States and Bermuda.

Flights operating over the Canadian Maritime Region and then via oceanic routes to Europe will be in direct contact with, and under the control of, the Canadian domestic ARTCCs until leaving the North American coastline, after which they will be under HF radio guard of the Canadian aeronautical station at Gander, Newfoundland.

Aircraft operators who desire to have their A/G messages relayed to their company offices may make prior arrangements with Gander aeronautical station for this service. Flight crews may also transmit *company* information to ARINC New York via the ARINC VHF network covering the Canadian Maritime Region that operates on 129.90 MHz; the ARINC LDOCF frequencies may be used for company messages and phone patches while on oceanic routes. (See Section 4 for additional information on LDOCF.)

2.2.1.2 Caribbean/Gulf of Mexico (GulfNet)

Flights operating to and from the Caribbean (CAR) and over the Gulf of Mexico (GOM) will be under the radio guard of the New York ARINC Communications Center while operating within the New York, Miami, and Houston oceanic FIRs. If not instructed by Houston ARTCC to maintain guard of the VHF Extended Range Network (VERN), the Caribbean Families A and B MWARA high frequencies will be used when beyond range of VHF facilities while operating in these FIRs.

☞ Note: See the Jeppesen ARINC-3 chart.

NYC VHF GulfNet frequency 130.70 MHz (KA) should be used while operating in the GOM and Caribbean areas covered by this frequency, as depicted on the Jeppesen ARINC-1 and ARINC-3 charts.

2.2.1.3 Mexico Network (MexNet)

Flights operating over middle and northern Mexico will be under the Radio Guard of the San Francisco ARINC Communications Center on frequency 130.7 MHz (MX). The MexNet is available only for AOC type traffic and can be used for both message delivery and phone patches. See the Jeppesen ARINC-5/6 Chart for enroute and on-the-ground coverage of this network.

☞ Note: MID and CUN will continue to be covered by New York ARINC on the GulfNet, 130.7 MHz (KA).

2.2.1.4 Pacific

Aircraft operating in the Pacific Ocean on routes within the Oakland FIR—between the U. S. West Coast, Honolulu, and south on routes toward Tahiti (CEP), in the South Pacific (SP), Central West Pacific (CWP), and North Pacific (NP) regions, and within the Anchorage Oceanic FIR in the North Pacific will be under radio guard of the ARINC San Francisco Communications Center.

Radio coverage in these regions is provided on the CEP, SP, CWP, and NP HF MWARA frequency families, respectively.

☞ Note: See the Jeppesen ARINC-4 chart for a listing of frequencies. Frequencies are also published on Jeppesen Oceanic Charts and in the DoD Flight Information Handbook.

2.2.1.5 HF Radio Checks

An HF radio check should be made with an ARINC Communications Center prior to departure or while airborne prior to entering U. S. oceanic airspace. An HF ramp check at selected airports may be arranged by calling an ARINC Communications Center on an international VHF network or a domestic VHF network. The radio operator responding to the call will provide the appropriate frequency for the HF communication check.

HF frequencies for ramp/SELCAL checks may also be coordinated by calling the NYC or SFO duty manager (24 X 7). When calling, state the aircraft location, callsign, SELCAL, and destination; request a primary and secondary frequency for an HF check.

SFO: 800-621-0140 or 925-294-8297

NYC: 631-589-7272 or 631-244-2483

FCC regulations relating to the use of HF aeronautical enroute frequencies forbid the regular use of high frequencies for communications in domestic airspace within the

continental United States (except in Alaska). Use of HF must be limited to radio and equipment checks or for emergency purposes only while operating in domestic airspace.

HF radio checks and/or SELCAL checks on international HF or international VHF frequencies are completed free of charge by ARINC Communications Centers. SELCAL checks and radio checks on domestic VHF networks are chargeable at prevailing rates.

☞ Note: Public correspondence (personal message traffic) to or from passengers (or crew members) is not permitted on aeronautical mobile frequencies.

2.2.2 Domestic Operations

The Domestic VHF Voice Network System is controlled from the ARINC San Francisco Communications Center. Aircraft operating over the contiguous United States shall direct calls to San Francisco on a VHF network serving the area over which the aircraft is operating. See the Jeppesen ARINC-1 and ARINC-2 charts for appropriate enroute and on-ground frequencies.

It must be understood that ARINC Radio Operators do not guard each network on this service. Calls are switched to a radio operator through an electronic call distribution system. If there is a radio operator that is not busy, the call will be switched to that position immediately. If all radio operators are busy with other customers, the call will be placed in a first-in, first-out distribution system awaiting a free operating position. If the call goes into the distribution system, the calling aircraft will hear a recording, "Flight calling San Francisco, please stand by," telling the caller to wait for the next available operator.

This distribution system enables a small number of radio operators to control numerous VHF radio networks from the San Francisco Communications Center. For this reason, it is imperative that flight crews provide ample time for their initial call to be answered. When making an initial call on a domestic VHF network, if the call is not answered by a radio operator or a recording in a reasonable amount of time (15-30 seconds), another call should be made before changing the frequency. Changing to another frequency too quickly will increase the delay if the Radio Operators are all busy on other networks. To initiate calls on a domestic VHF network, complete the following:

1. Call "ARINC" on an area frequency relative to the aircraft position shown on the Jeppesen ARINC-1 and ARINC-2 charts. San Francisco ARINC (SFO) controls all networks except 130.70/KA (GulfNet) and 129.90/JW—NE U.S. and Maritime Canada, all of which are controlled by New York ARINC (NYC). Only the NYC networks are guarded by a dedicated radio operator. All SFO networks are routed through a call distribution system; this allows control of all networks with only one or two radio operators and provides a visual indication of calls waiting for radio operator service. During busy periods, initial calls may be answered by a recording. If not answered within 1 minute, call again on the same frequency. ***Do not change frequencies. This may cause further delays. Stay on the frequency at least 3 minutes.***

☞ Note: Coverage depicted on the Jeppesen ARINC-1 and ARINC-2 charts is for aircraft operating at and above FL 200. Coverage below FL 200 *cannot* be assured. Gaps in coverage exist when operating below FL 200.

2. If not answered within 3 minutes, call on an adjacent area frequency using the above procedures. In many locations, overlapping coverage exists.

2.3 International and Domestic Procedures

Flight crews should be prepared to include the following information when transmitting a company message to an ARINC Communications Center by voice in either the international or domestic environment.

1. Aircraft flight identification as filed in the flight plan and currently being used in communications with air traffic control facilities.
2. HF transmitting frequency—in the initial call, announce the first and second numeral of the frequency on which you are transmitting, such as “San Francisco, this is N28V on 88.”¹
3. Message delivery instructions and ARINC Service Agreement number.²

If the ARINC Service Agreement number is not readily available in the aircraft, the name of the company operating the aircraft should suffice. However, in this case, the ARINC Radio Operator may also request the company mailing address.

4. Aircraft SELCAL code or SATCOM voice octal code, if applicable.

ARINC Radio Operators copy all Air/Ground messages directly into a computer for immediate transmission through AviNet to customer offices. If a message can only be delivered by telephone, the message is routed to a local printer at the ARINC Communications Center for telephone delivery by the Team Leader.

The flight crews should transmit their messages at a moderate speed to prevent unnecessary repeating. During transmission of a lengthy message, the flight crew should pause at intervals to ensure that the radio operator has the message complete to that point.

☞ Note: See Appendix A (page A-1) for explanation and examples of ARINC Standard Message Text formats used by ARINC Communications Centers.

¹ This procedure is applicable to HF frequencies only and is necessary because the radio operators use a split/stereo headset.

² Contact the ARINC Service Desk at 800-633-6882 or 703-637-6360 to coordinate delivery or to obtain service agreement number and/or customer code if not known.

2.4 VHF Direct Access Service

The domestic voice service has the capability for customers to directly access ARINC VHF networks using standard phone equipment and an ARINC authorized access code. This allows operations and dispatch offices to make direct ground-to-air contact their aircraft without ARINC Radio Operator (RO) intervention. Prior authorization and configuration by ARINC is required to use Direct Access.

2.4.1 VHF Direct Access Procedures

Our VHF Direct Access customers gain access to the ARINC networks using these specific procedures. From any properly equipped touch-tone phone, perform the following:

1. Determine the location of your aircraft and identify the nearest ARINC VHF network using WebASDsm or an ARINC VHF Flight Check Map.
2. Dial the ARINC access number (925) 371-1299.
3. After the ringing, a "chirp" and single "beep" will be heard.
4. After the beep, enter the ARINC-provided 10-digit access code and a 2-digit network code (see Table 2-1).
5. If the correct access and network codes have been entered, a low-high acknowledgment will be heard and the call will be connected.
6. If an incorrect access code or network code has been entered, three beeps will be heard and the call will be disconnected.
7. To change networks, you must hang up and redial.

Table 2-1. Access Codes

<i>Frequency</i>	<i>Network</i>	<i>Access Code</i>
129.35	IH	01
129.4 West	II	02
129.45 East	IJ	03
130.2 East	IX	04
130.4	JD	05
131.3	KB	06
130.8	KK	07
131.65	KW	08
131.8	KY	09
131.175	MZ	11
129.4 East	YN	12

<i>Frequency</i>	<i>Network</i>	<i>Access Code</i>
130.2 West	ZQ	13
129.45 West	ZR	14
129.85	IP	16
128.9	JN	17
130.7	MX	19

2.4.2 When Direct Access Login Sequence Is Complete

1. Remain silent for several seconds and monitor the network to see if it is in use.
2. Contact your aircraft.
3. Terminate the connection by hanging up the phone.

2.4.3 Standards for Use

1. Use only accepted phraseology and strict radio discipline.
2. Limit distribution of your access code to a small number of users.
3. For security purposes, it is not possible to change networks without hanging up and dialing back into the system.
4. Never use a speakerphone when using VHF Direct Access.
5. Keep background noise (e.g., typing, nearby conversations) to an absolute minimum when using this system.
6. Failure to comply with these standards will result in termination of Direct Access use.

 Note: Please note that SELCAL is not supported over Direct Access and aircrews must guard ARINC VHF frequencies to receive Dial Access calls.

2.5 ARINC VHF Direct Dial Press to Talk (PRESTO) Service

Dual-Tone Multi Frequency (DTMF) automates the connection of Air-to-Ground calls from DTMF microphone-equipped aircraft. The domestic voice service provides the capability for customers to use DTMF on all networks managed by San Francisco ARINC (SFO), including the MexNet, 130.70 MHz (MX). Prior coordination with ARINC is necessary to set up customer office phone numbers in the PRESTO ground equipment and authorize use by Domestic Voice Service customers. Contact the ARINC Service Desk at 800-633-6882 or 703-637-6360, to establish PRESTO call capability.

2.5.1 Direct Dial PRESTO Procedures

To initiate a DTMF call on the ARINC Domestic VHF networks, complete the following:


1. Setup and Dial Procedure
 - Tune VHF radio to area frequency relative to the aircraft position shown on the Jeppesen ARINC-1 and ARINC-2 charts. Monitor the network for several seconds to see if it is already in use.
 - Each dial stroke is made by holding the key pressed for at least one-half second and leaving a one-half second pause interval between each key entry.
2. Five-Digit Calling Procedure
 - Push and hold the "Push to Talk" button.
 - Carefully key in the three-digit airline code followed by the two-digit "call to" location number.
 - Press the # key within 20 seconds of the last digit entered to "launch" the call.
 - Release the "Push to Talk" button after the five-digit and # tone sequence is transmitted.
 - Press 0 # at the end of all calls to terminate the call and release the network.
3. Assistance Notes
 - If an error is made while dialing, press * to clear all previous digits entered.
 - Call setup takes approximately 5-10 seconds.
 - A three tone signal is heard when the dialing sequence is unsuccessful.
 - Press 0 # to disconnect all calls.
 - The ground party may disconnect the call by "hanging up."
 - Nose numbers, flight ID numbers, or any other DTMF digits will not be accepted by the system after the call is established.
4. Radio Operator Assistance
 - Operator assistance is available at all times by pressing the 0 # keys to terminate the existing call. Then initiate standard ARINC Domestic Voice Operations procedures to reach an ARINC Radio Operator.

5. Emergency Situation

- If using the direct dial feature on the Domestic VHF networks for an emergency situation, the message will not be logged by an ARINC radio operator. However, all radio traffic will be recorded and held for 45 days.

2.6 SATCOM Voice Procedures


ARINC Communications Centers are equipped to receive and originate SATCOM Voice calls from or to suitably equipped aircraft. It is recognized that these systems, due to cost and other requirements, are still not available to a large number of aircraft; however, ARINC has the capability to use SATCOM Voice as an alternative means of communications for either ATC or AOC communications with those aircraft that have been equipped. The medium used for communications is transparent to the end user. All ARINC services using HF/VHF are available, and SATCOM Voice messages either can be relayed by the ARINC Radio Operator or the call-in progress can be connected to other phone lines (conferenced) through the telephone control system at each ARINC Communications Center.

 Note: When using SATCOM voice, continue to use radio discipline procedures. Using the SATCOM phone like a regular telephone can cause misunderstandings and confusion.

2.6.1 Air/Ground Calling Procedures

Satellite Voice-equipped aircraft should direct calls to the appropriate ARINC Communications Center using either INMARSAT-assigned security phone numbers (ICAO short codes) or direct dial using the 10-digit PSTN phone number:

<i>Pacific Flights</i>	<i>Atlantic Flights</i>
SFO 436625	NYC 436623
1-925-371-3920	1-631-244-2492

 Note: These six-digit numbers are converted by the Ground Earth Station (GES) receiving the aircraft call announcement to the respective PSTN dial number for connection to the appropriate ARINC Center. This **only** works on the INMARSAT satellite system.

After an answer by the ARINC Radio Operator, the parties should complete the exchange of information using the same procedures as would be used on other voice (HF/VHF) communications mediums.

2.6.2 Ground/Air Calling Procedures

ARINC Centers can originate calls to SATCOM Voice-equipped aircraft. The unique 8-digit Aeronautical Earth Station (AES) aircraft ID (OCTAL) code or phone number must be known to originate calls. The ARINC Centers have a list of known codes


and phone numbers available for reference; however, operators desiring callbacks using SATCOM Voice should provide the ARINC Radio Operator with the OCTAL code and/or phone number on initial call.

2.7 Communications Trouble Reporting

ARINC strives to maintain full availability of all communications facilities to provide optimum performance and service; however, the facilities involved, such as remote transmitters and receivers, are subject to degradation for various reasons. Any problems experienced, including failure to answer initial calls, inability to complete communications exchanges, noisy VHF networks, or any other problems deemed less than satisfactory by the flight crew, should be reported as soon as possible to the ARINC Communications Center or Centers involved. This should be reported by radio on the next successful call or via telephone after landing, time permitting. The nonpublished telephone numbers listed on page B-1 should be used for trouble reporting via telephone.

Each trouble report should include, if applicable:


- Radio frequency and nature of problem encountered
- Aircraft position, altitude, and direction of flight at time of occurrence
- Time of occurrence

 Note: ARINC customers will not be charged for contacts that are made solely to report communications problems.

3 PHONE PATCH PROCEDURES

3.1 General

Phone patches are designed to provide direct voice communications between a flight crew and their company operational offices. Patches should only be used in cases of great urgency concerning nonroutine matters related to the operation of the aircraft, including the crew, passengers, and cargo.

 Note: Public correspondence (personal message traffic) to/from passengers or crew members is not permitted.

3.2 Phone Patch Connections

Phone patch connections to company operational offices to and from aircraft operating over the continental United States, Hawaii, Mexico and coastal areas of Alaska are made through VHF voice networks. Patches to and from aircraft operating on oceanic routes are accommodated on the HF Single Sideband (SSB) LDOCF frequencies. Each ARINC Communications Center is equipped to switch telephone calls, placed through the Center's nonpublished telephone number, to applicable radio station equipment so that two-way communications can be exchanged between the aircraft and ground personnel.

Long distance calls to ARINC Communications Centers' phone patch numbers must be placed on a *station-to-station* basis prepaid; a collect call will not be accepted. The same procedure applies for calls made from the ARINC Communications Center to aircraft operators, except the associated toll charge is included in the Air/Ground message charge.

ARINC Communications Center (24 X 7) Phone Patch Numbers:

NYC 631-589-7224 or 631-589-7272

SFO 925-294-8297 or 800-621-0140

3.3 Phone Patch Authorization

A list of personnel authorized to originate or receive phone patch calls is maintained by ARINC Headquarters in the ARINC Phone Patch and Routing Guide List (APRL). This database is available to the NYC and SFO Communications Centers as a full-time reference through the ARINC Intranet. Communications Center personnel refer to this database to verify the authenticity of the office and telephone number when a request is

received from an aircraft operator's ground personnel. A request for a ground-to-air connection that cannot be authenticated will be politely refused.

Communications Center personnel will honor a request for a phone patch to any telephone number provided by the flight crew, unless otherwise previously advised by the aircraft operator that phone patches are to be limited to numbers coordinated and listed on the operator's ARINC Phone Patch Page.

3.4 Phone Patch Authorization—Verification and Changes

In the interest of safety, and to prevent unnecessary delays in completing a phone patch, it is imperative that the ARINC Communications Centers have current information for those aircraft operators that use this service. Changes, deletions, or additions to an authorized user's phone patch list should be directed to ARINC Headquarters, Aviation Voice Services Support:

Pat Guido 410-266-4264 hpg@arinc.com
or
ARINC Service Desk 800-633-6882 helpdesk@arinc.com
or
703-637-6360

For those with access to IATA/AviNet send to mnemonic address HDQXGXA, via FAX to (410) 266-4729, Attention: Aviation Voice Services Support. Those customers that wish to verify their current phone patch authorization or message addressing/delivery procedures, or point-of-contact information may request a copy by phone, email, teletype, or fax by using the above information.

3.5 Operation

The Air/Ground radio channel is *one way* (send or receive) only; break-ins and interruptions are not possible. In the normal "at rest" condition, the ground talker receives the aircraft transmission. When the ground talker speaks, a voice-operated relay switches the radio channel from receive to send and the aircraft receives the transmission. If the ground talker and aircraft transmit simultaneously, neither will receive the other.³ The ground talker should maintain a firm, even level of speech and avoid shouting. Each transmission by the ground talker should be preceded with an "err" or "uhh" to allow the voice-operated relay to complete its switching function.

3.5.1 Background Noise

A high background noise level in the office of the originating call may cause the voice-operated relay to close, preventing reception from the aircraft. A noisy telephone line will also close the voice-operated relay and prevent reception from the aircraft. Speaker

³ Each speaking party should indicate the end of a transmission with the words "over" or "go ahead."

phones used for phone patches will only magnify background noise; therefore, use of speaker phones is not recommended.

The radio operator monitoring a phone patch will ensure that the voice level of the telephone line is sufficient to operate the voice-operated relay. If it is too low to operate the relay or is too noisy and is keeping the relay closed, the radio operator may request that the caller hang up and place the call again. The operator may also manually key the transmitter enabling the ground party to be received by the aircraft.

3.6 Ground/Air Connection Procedures

Ground personnel wishing to contact airborne aircraft should call the ARINC Communications Center (24 X 7) closest to the proximity of the aircraft by calling:

NYC 631-589-7224 or 631-589-7272
SFO 925-294-8297 or 800-621-0140

For contacting aircraft utilizing the ARINC VHF domestic service, contact the SFO Communications Center. Communications Center personnel will answer the call by identifying themselves, for example, "ARINC San Francisco." In response, the caller will supply the following information:

- SELCAL-Equipped Aircraft
 - Company ID/Job Title
 - Authorized telephone number
 - Flight identification of the aircraft as filed in the ATC flight plan and SELCAL code (if equipped); if not SELCAL equipped, state "Negative SELCAL"
 - Departure point, destination and approximate present location of the aircraft
- ACARS/AFIS-Equipped Aircraft (operating within the contiguous U. S.)
 - Company ID/Job Title
 - Authorized telephone number
 - Flight identification and/or aircraft tail number
 - Approximate geographic location of the aircraft

After authentication of the request, a radio operator will establish communications with the aircraft and inform the caller "Your flight is standing by, go ahead." At the conclusion of this phrase, the connection between the telephone facilities and ARINC radio equipment will be activated and the conversation can proceed.

At the conclusion of the conversation, the radio operator will deactivate the telephone and radio connection. The ground party should be familiar with and maintain proper radio discipline during phone patch connections.

4 LONG DISTANCE OPERATIONAL CONTROL FACILITY

4.1 General

The HF SSB LDOCF frequencies are designated to provide AOC voice communications via high frequencies to aircraft operating over oceanic areas beyond the coverage range of ARINC VHF facilities. Flight crews wishing to send a message to their operational offices using these facilities may call the ARINC Communications Center in the proximity of the aircraft.⁴ The time of day and distance from the station will determine the most appropriate frequency to be used.⁵ Some trial and error may be necessary to find the best frequency for the time, distance, and propagation conditions existing at a given moment.

☞ Note: When an aircraft is operating on an ICAO MWARA enroute family of frequencies guarded by an ARINC Communications Center, the flight crew should request the optimum LDOCF frequency from the ARINC Radio Operator guarding the MWARA frequencies to expedite the intended communications on LDOCF.

4.2 LDOCF Operation

Flight crews operating in the European, North Atlantic, South/Central American, Caribbean, and Pacific areas will be expected to continue to pass routine Air/Ground messages on the ICAO MWARA enroute radio telephone HF or VHF networks. Therefore, aircraft operating on international routes in these areas of the world should maintain a listening watch or SELCAL guard on the appropriate ICAO MWARA frequencies.

Aircraft equipped with dual HF transceivers may wish to maintain watch on both ICAO MWARA and ARINC HF SSB LDOCF frequencies. Aircraft equipped with only one HF transceiver, and beyond the range of VHF communications, will be expected to maintain watch on ICAO MWARA frequencies and to switch to ARINC HF SSB LDOCF frequencies only after coordination with the ICAO aeronautical station providing radio guard for the FIR/CTA in which the aircraft is operating.

⁴ See Section 6 for a list of permissible communications.

⁵ Based on the rule of thumb that states: "The higher the sun, the higher the frequency." See the ARINC-3/4 chart in Attachment E for LDOCF frequencies.

4.2.1 Service Areas

The New York and San Francisco ARINC Communications Centers staffed by ARINC Radio Operators guard dedicated LDOCF frequencies in addition to ICAO MWARA frequencies. LDOCF assignments, as well as general service areas, are shown in Table B-1 in Appendix B and on the Jeppesen ARINC-3/4 charts.

Contact telephone numbers and mnemonic Teletype addresses for the LDOCF stations are listed in Appendix B, page B-1.

4.2.1.1 Polar Route Communications

Aircraft operating on Polar Routes can contact San Francisco ARINC on their LDOCF frequencies through the Barrow, Alaska remote site. Barrow LDOC frequencies are shown in Appendix B, Table B-1 and on the Jeppesen ARINC-4 chart.

4.2.1.2 South America Communications

Aircraft operating in the South American and Central American areas can contact New York ARINC on their LDOCF frequencies through the Santa Cruz, Bolivia remote site. LDOC frequencies are shown in Appendix B, Table B-1 and on the Jeppesen ARINC-3 chart.

4.2.1.3 Pacific Area Communications

Aircraft operating in the Western Pacific, South China Sea and Southeast Asia Regions can contact the San Francisco Communications Center on their LDOCF frequencies through the Guam LDOC and/or Hat Yai, Thailand LDOC remote sites. Frequencies for the Guam and Thailand LDOC are shown in Appendix B, Table B-1.

5 SELCAL

5.1 Description of Service

The Selective Calling System, known as SELCAL, is a signaling method to alert an individual aircraft that a ground station wishes to communicate with it. SELCAL signals can be transmitted over HF or VHF radio telephone channels. A SELCAL transmission consists of a combination of four pre-selected audio tones whose transmission requires approximately two seconds. The tones are generated in the ARINC Communications Center SELCAL encoder and are received by a decoder connected to the audio output of the aircraft receiver. Properly working SELCAL relieves the flight crew from maintaining a listening watch on assigned frequencies, which is especially useful on noisy HF channels.

5.2 Operation

Receipt of the assigned SELCAL code activates a cockpit call system in the form of light, chime signals, or both. On aircraft equipped with SELCAL, the flight crew has the capability to also maintain a conventional listening watch using headsets or cockpit speaker.

Due to technical incompatibilities, the HF SSB suppressed carrier mode of operation will not be used to transmit SELCAL signals. Many aircraft HF SSB transceivers are designed to detect SELCAL signals transmitted in the full carrier mode even though the transceiver mode selector switch is in the suppressed carrier mode. Those transceivers *not* designed with this feature must have the selector switch in the full carrier mode of operation to reliably detect a SELCAL signal.

➤ **Caution:** The mode selector switch must be restored to the suppressed carrier mode before making voice transmissions.

☞ **Note:** SELCAL codes are assigned to aircraft operators and not to individual aircraft. Aviation Spectrum Resources (ASRI) is the registrar of SELCAL codes worldwide. Contact ASRI for SELCAL code issuance or code changes of any nature by calling (410) 266-4109 or 410-266-4800.

5.3 SELCAL Tones

5.3.1 12-Tone Codes

Older SELCAL units are based on 12 tones and are shared with other aircraft. ASRI, as the SELCAL registrar, attempts to minimize assignment of duplicate SELCAL codes.

This is accomplished by tracking SELCAL code assignment to the geographical area of operation. However, with jet aircraft, it is not uncommon to have more than one aircraft with the same SELCAL operating in the same geographical area at the same time. Owners of older aircraft should notify the ASRI SELCAL registrar of any change in geographical areas of operation.

5.3.2 16-Tone Codes

Newer SELCAL units installed in aircraft are predicated on 16 tones and are also assigned on a shared basis. Very few SELCAL codes remain unassigned and sharing codes is also required with this equipment. There are currently no plans by ICAO to increase the number of available tones.

☞ Note: Flight crews of aircraft with SELCAL equipment should be alert for possible duplication of SELCAL codes and listen closely to the Flight Identification (ID), as well as SELCAL, to avoid taking a clearance meant for another flight.

6 PERMISSIBLE COMMUNICATIONS

ARINC is licensed by the FCC to operate aviation radio stations in the aeronautical enroute band. These frequencies provide AOC communications to aircraft operators. It is through these radio stations that the aforementioned services are provided. ICAO defines AOC communications as those “required for the exercise of authority over the initiation, continuation, diversion, or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of a flight.” The operation of these stations is governed by rules contained in CFR part 87 (Aviation Services). Allowable communications on these stations is strictly enforced as outlined in the Scope of Service section contained in CFR 87.261(a), which states, “Aeronautical enroute stations provide operational control communications to aircraft along domestic or international air routes. Operational control communications include the safe, efficient and economical operation of aircraft, such as fuel, weather, position reports, aircraft performance and essential services and supplies. Public correspondence is prohibited.”

Specific types of permissible communications include those pertaining to the following:

- Communications relating to the initiation, continuation, diversion, or termination of a flight
- Performance of the aircraft, including its components
- Aircraft servicing, including fueling, deicing, and maintenance
- Information of value to a flight crew that will enable the safe and efficient completion of a flight
- Information of value to ground personnel concerned with the safe and efficient operation of a flight
- Information of value to other flights in the same area
- Information and corrections pertaining to weight, balance, and passenger/cargo counts
- Urgent medical information
- Connections with other transportation (including ground transportation) and ongoing air transportation

- Provisioning of essential supplies and services

The following types of communications are unacceptable, except in an emergency situation:

- Public correspondence
- Personal messages to or from crew members or passengers
- All other communications that do not fall into the permissible communications category

ARINC Radio Operators monitor all Air/Ground/Air phone patches and will ensure that only permissible traffic is handled on the ARINC channels. They are instructed to discontinue phone patches that contain unacceptable communications, and concerned users will be contacted by ARINC as follow-up to these procedures.

7 ARINC COMMUNICATIONS RECORDS

To ensure that ARINC Domestic and flag air carriers comply with FAR 121.711, all ARINC radio frequencies and facilities (including VHF enroute networks and all incoming phone lines) are continuously recorded at each ARINC Communications Center. Where two ARINC Communications Centers are on the same frequency or frequencies, recordings are made at each. The following apply to the recording and retention of such records:

1. Automatic backup and reassignment are provided if the main recording unit fails.
2. When a 24-hour day recording is complete at the end of the UTC day, it is placed into a cabinet/archive and retained for a minimum period of 45 days. Digital files relating to an accident or emergency (if requested by the FAA, air carrier, or both) are retained for a longer period, as necessary, until released by ARINC Headquarters.
3. An air carrier's or aircraft operator's authorized representative may request an audio recording and/or message files of their aircraft's communications with an ARINC Communications Center.
4. In the event of an emergency, potential emergency or unusual situation involving an aircraft, Communications Center personnel take additional steps to ensure satisfactory recorder coverage.
5. A full communications master log of messages is retained with the audio file for 45 days.

Appendix A Standard Message Text Identifiers

A.1 Standard Message Identifier (SMI)

AEP	Position Report with Weather Information
AGM	Miscellaneous A/G Message
ALR	Alert Message
ARR	Arrival Report
DEP	Departure Report
DLA	Flight Delay
ETA	Estimated Time of Arrival
GVR	Ground-Originated Voice Request
POS	Position Report without Weather Information

A.2 Text Element Identifier (TEI)

AD	Aerodrome of Concern or Arrival
AF	Able Flight Level AL Altitude or Flight Level
AN	Aircraft Number
BF	Boarded Fuel (in gallons unless otherwise indicated)
CP	Cargo Payload
CZ	Cruising Speed
DA	Aerodrome of Departure
DC	Delay Code
DS	Destination Station
DT	Communication Service Information

Standard Message Text Identifiers: A

ED	Estimated Time of Departure
EN	Endurance
EO	Estimated Time Over
FB	Fuel on Board (in lbs. unless otherwise indicated)
FI	Flight Identification
IC	Icing
IN	In Time
LP	Logbook Page
MN	Maintenance
NP	Next Report Point
OF	Off Time
ON	On Time
OS	Other Supplementary Information
OT	Out Time
OV	Present Position Over
PB	Persons on Board
PL	Payload Fuel
RF	Request Flight Level
RI	Return In Time
RO	Return On Time
RT	Route Information
SK	Sky Conditions
SL	SELCAL Code
TA	Static Air Temperature
TB	Turbulence
WV	Wind Information (Direction xxx, Speed xxx)

WX	Weather with no Assigned TEI
ZW	Zero Fuel Weight (in lbs. unless otherwise indicated)

A.3 Message Examples

The following are examples of Air/Ground messages copied by ARINC Radio Operators along with decoded explanations.

Example— Departure Report:

```
QU JFKOOXX
SFOXGXA 121937
DEP
FI N1234/DA JFK/OT 1934/OF 1936/DS ORD 2145
DT SFO IH 121936 02
```

Decoded:

```
DEPARTURE REPORT FOR N1234, DEPARTED
KENNEDY (JFK) OUT OF BLOCKS 1934Z, OFF
1936, ESTIMATING DESTINATION STATION
O'HARE (ORD) AT 2145Z
```

Example—Int'l Position Report with Weather:

```
QU SFOOOXX FAAOOXA
SFOXGXA 122020
AEP
FI N1234/OV ALCOA 2016 F290/EO ABNER 2105/NP ADENI
TA MS40/WV 260010/SK CLR/TB SMTH
DT SFO VE A 122020 06
```

Decoded:

```
INTERNATIONAL POSITION REPORT FOR N1234, OVER FIX
ALCOA AT 2016Z, AT FL290, ESTIMATING OVER FIX ABNER
AT 2105Z, NEXT FIX ADENI, TEMPERATURE MINUS FORTY
DEGREES CELSIUS, WIND VELOCITY 260°AT 010 KNOTS, SKY
CLEAR, TURBULENCE SMOOTH.
```


Appendix B ARINC Communications Centers Contact Information

This appendix lists contact phone numbers and teletype addresses for ARINC Communications Centers.

B.1 ARINC Communications Centers

ARINC telephone numbers and radio room teletype addresses for relay of messages through ARINC Radio Operators or for ground-originated phone patch requests are provided below. Ground parties desiring phone patch connections or other message services through ARINC should call the appropriate Communications Center for service.

Center	Phone Number	IATA/ Teletype	ICAO/AFTN	Email	Call Sign
NYC	(631) 589-7272	NYCXGXA	KNYCXAAG	nycradio@arinc.com	New York
SFO	(925) 294-8297 or (800) 621-0140	SFOXGXA	KSFOXAAG	sforadio@arinc.com	San Francisco

Table B-1 lists the HF LDOCF frequencies available and guarded at each of the ARINC Communications Centers.

Table B-1. HF SSB LDOCF Frequencies Guarded (kHz)

HF LDOC Facility	3494	6640	8933	11342	13348	17925	21964
San Francisco	✓	✓	✓	✓	✓	✓	✓
New York	✓	✓	✓	✓	✓	✓	✓
Santa Cruz, Bolivia (Remote)	✓	✓	✓	✓	✓	✓	✓
Pacific-Guam (Remote)	✓	✓	✓	✓	✓	✓	✓
Barrow, AK (Remote)	✓	✓	✓	✓	✓	✓	✓
Hat Yai, Thailand (Remote)	✓	✓		✓	✓	✓	✓

☞ Note: ARINC stations transmitting SELCAL signals on these frequencies will utilize SSB full carrier mode.

Appendix C ARINC Contact Information

C.1 ARINC Communications Centers' Administrative Information

Information relating to ARINC Communications Centers and Headquarters administrative offices is provided in the following sections. Business hours for these offices are 0730 to 1630 local time. These numbers should not be used for contacting ARINC Radio Room Operations. Nonpublished radio room telephone numbers are listed in Appendix B. These telephone lines are available 24 hours a day.

C.1.1 New York (NYC)

To contact the ARINC Communications Center in New York:

613 Johnson Avenue
Bohemia, Long Island, NY 11716-2969
Telephone: (631) 244-2480
AviNet: NYCXGXA

C.1.2 San Francisco (SFO)

To contact the ARINC Communications Center in San Francisco:

6011 Industrial Way
Livermore, CA 94550
Telephone: (925) 294-8400
(800) 799-7847
AviNet: SFOXGXA

C.1.3 ARINC Service Desk

To contact the ARINC Service Desk:

2551 Riva Road
Annapolis, MD 21401-7435
Telephone: (800) 633-6882 or (703) 637-6360

FAX: (410) 573-3300

ARINC Contact Information: C

AVS Operating Procedures Handbook

AviNet: HDQHDXA
e-mail: Helpdesk@arinc.com

C.1.4 World Wide Web Site

World Wide Web at <http://www.arinc.com>

To download a copy of the current ARINC Voice Operating Procedures Handbook and copies of the referenced Jeppesen Charts use the following link:

<http://www.arinc.com/downloads>

Appendix D North Atlantic HF SSB Families

Table D-1 and D-2 provide a guide for the operational use for North Atlantic HF radio telephone networks. The following is a description of NAT routes for use with Table D-1.

- Northern NAT Routes
Generally the international air routes extending between North America and Europe, lying north of 60° N latitude.
- Central NAT Routes
Generally the international air routes extending between North American and Europe, lying between 60° N and about 45° N latitude.
- Southern NAT Routes
Those routes that enter the New York and Santa Maria FIRs below about 20° N.

Table D-1. North Atlantic HF Radiotelephone Families

<i>Aircraft Registered West of 30 W</i>		<i>Aircraft Registered East of 30 W</i>	
NAT-A	Southern routes	NAT-A	Southern routes
NAT-B	Central and Northern routes	NAT-C	Central and Northern routes
NAT-D	Northern routes while flying outside the NAT OTS	NAT-D	Northern routes while flying outside the NAT OTS
NAT-E	Southern routes	NAT-E	Southern routes
NAT-F	Central Routes	NAT-F	Central routes

Note: Aircraft registered in Australia will use NAT HF families designated for use by aircraft registered east of 30° W.

The use of SSB (upper sideband) is compulsory for all communications on the civil aeronautical mobile Air/Ground high frequency channels as of February 1, 1982. See Figure D-1 for graphical presentation of NAT HF usage.

Table D-2. North Atlantic HF Radiotelephone Networks

<i>Networks North Atlantic HF Radiotelephone</i>	<i>NAT Routes Served by NAT Family Indicated</i>	<i>Availability of NAT HF Families Versus Hemisphere of Aircraft Registration</i>
NAT Family A	Southern NAT routes	Available for use by all aircraft
NAT Family B*	Northern and Central NAT routes	Available for use by aircraft registered in the hemisphere west of 30° W longitude
NAT Family C*	Northern and Central NAT routes	Available for use by aircraft registered in the hemisphere east of 30° W longitude
NAT Family D*	Northern NAT routes outside the NAT Organized Track System (OTS)	Available for use by all aircraft
NAT Family E	Southern NAT routes	Available for use by all aircraft
NAT Family F*	Central NAT routes	Available for use by all aircraft

*NAT family B, C, D, and F not implemented at New York.

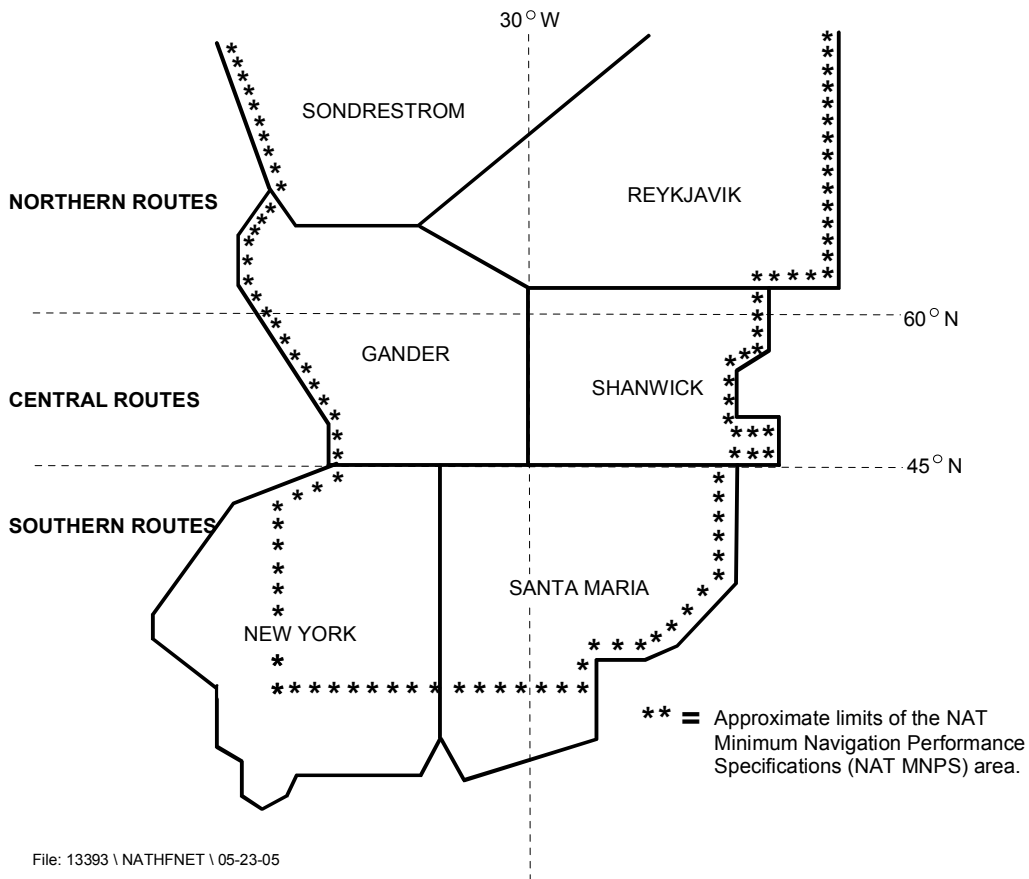


Figure D-1. North Atlantic Flight Information Region Boundaries

Appendix E Jeppesen ARINC Services Coverage Charts

The charts mentioned in this document are produced and supplied by the Jeppesen Company and are copyright-protected. Requests for additional copies of the ARINC-1/2 (Domestic VHF/Intl VHF coverage), the ARINC-3/4 (International HF and VHF coverage), the ARINC-5/6 (MexNet), the ARINC-7 (HF LDOC Coverage: Asia Area) charts should be directed to the ARINC Service Desk (800) 633-6882 or (703) 637-6360. Requests for large numbers of each, or for a chart subscription, should be referred directly to Jeppesen.

Jeppesen has created a subscription service to provide updated charts and information on ARINC services direct to ARINC customers. The “ARINC Service” consists of an initial order setup containing all the pages depicting ARINC services coverage and the automatic distribution of changed pages as they occur.

Currently, the initial subscription is sold by Jeppesen for \$39.00 per service. Yearly renewal costs \$22.00 per service per year. These prices were in effect at the time this publication was printed, and are subject to change without notice. This service can be ordered alone or added to any Jeppesen service you may already have. It may be ordered direct from Jeppesen by calling toll free 1-800-621-JEPP (5377).

These charts depict approximate coverage of the described services; however, actual coverage may vary depending on the time of day, aircraft altitude, and aircraft avionics. Specific questions or comments regarding these charts or ARINC radio coverage should be referred to the ARINC Service Desk (800) 633-6882 or (703) 637-6360.

Because the coverage areas, frequencies, and other information on these charts change frequently, it is recommended that Jeppesen be contacted in reference to the chart subscription mentioned above. This will ensure that current information is always available to flight crews.

☞ Note: These charts may also be downloaded from the ARINC website at <http://www.arinc.com/downloads/index.html>.