

APPENDIX J — PFA TO NORTH ATLANTIC OPERATIONS AND AIRSPACE MANUAL (NAT DOC 007) RELATED TO REMOVAL OF HO NDB, NOROTS AND NCA AND DELETION OF “TURBOJET” IN PANS-ATM WITH REFERENCE TO MACH NUMBER TECHNIQUE

(paragraph 5.4.2 refers)

3.2.1 Routes within the NAT HLA (illustrated in Figure 3-1) are as follows:

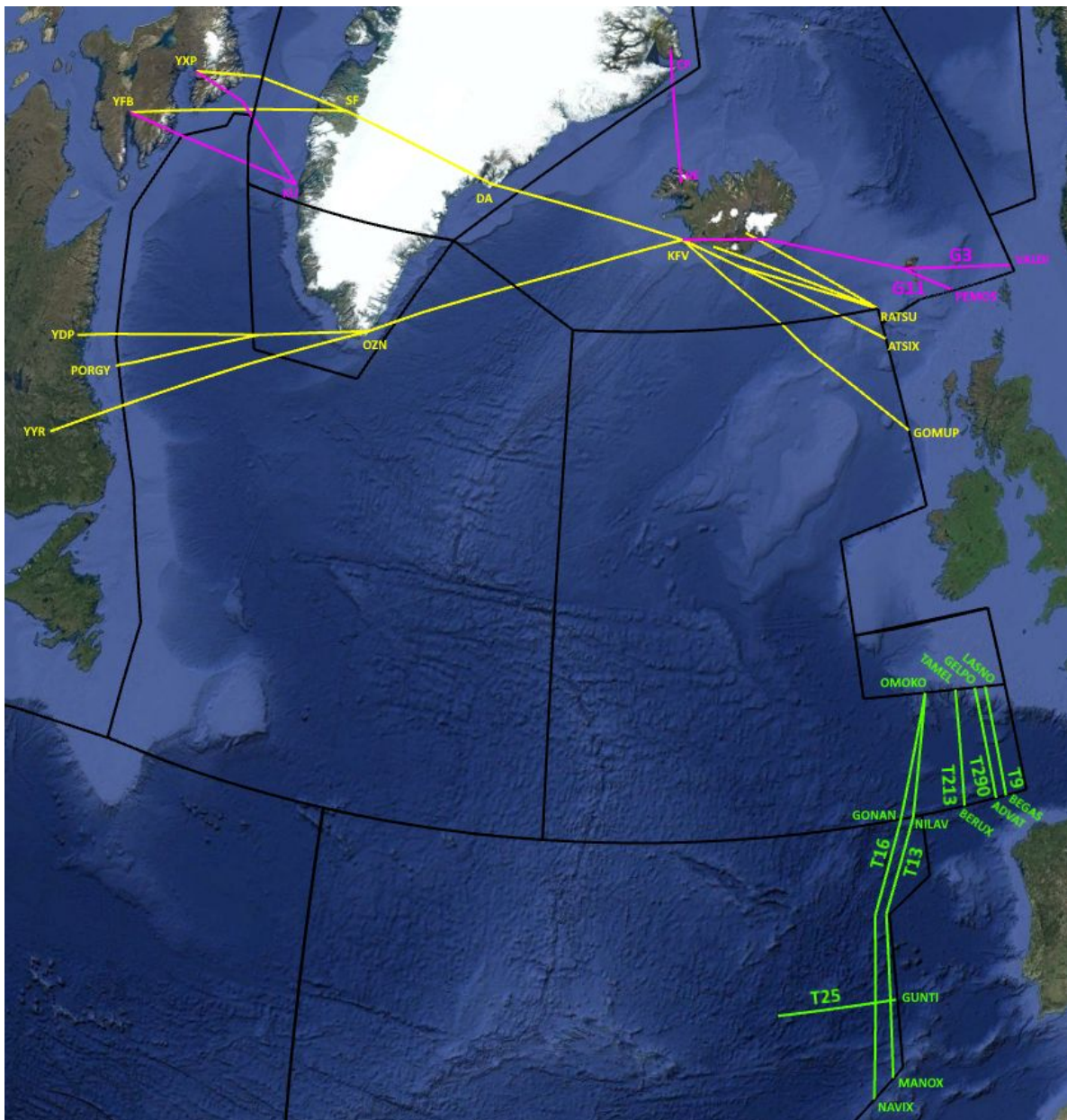
a) *Blue Spruce Routes require state approval for NAT HLA operations, and are listed below:

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-OZN – 59°N 50°W – CUDDY (FL290 to FL600) - PORGY – HO,

FIGURE 3-1 – OTHER ROUTES AND STRUCTURES WITHIN THE NAT HLA

Replace Figure 3-1 with:



4.2.11 Canadian Domestic route schemes and the US East Coast Link Routes are also published. ~~Flights entering the NAM region north of 65N must be planned in accordance with the NCA and/or NOROTS as appropriate.~~ All of these linking structures are referenced in Chapter 3 of this Manual and account must be taken of any such routing restrictions when planning flights in this category.

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16.3.10 A large majority of flights through the NAT HLA enter and/or leave it via the North American region. To facilitate these flows of traffic, various transitional airspaces and linking route structures have been established in and through the adjacent NAM region. These are described in Chapter 3 above. Of particular significance ~~are~~ **is** the NAR ~~and NOROTS~~ structures. Details of these routes and ~~their~~ associated procedures are contained in the AIP of the relevant State authorities and/or via their websites. The necessary Internet Links to obtain this information are listed above in Chapter 3. Account must be taken of these route structures in planning any flight through the NAT region that starts or ends in the North American region.

16.6.6....

- It is important for dispatchers to understand that transition routes specified in the NAT track message are as important as the tracks themselves. The transition route systems in North America – the North American Routes (NARs); ~~the Northern Organised Track System (NOROTS)~~ and the US East Coast routes are described in Chapter 3. Dispatchers should comply with any specified transition route requirements in all regions. Failure to comply may result in rejected flight plans, lengthy delays and operating penalties such as in-flight reroutes and/or the flight not receiving requested altitudes.

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7.1.1 Mach Number Technique (MNT) is a technique whereby ~~turbojet~~ aircraft operating successively along suitable routes are cleared by ATC to maintain a Mach number for a portion of the enroute phase of flight.

7.3.1 Oceanic clearances include assigned Mach numbers (when required) which are to be maintained. ~~Turbojet aircraft~~ **Aircraft capable of maintaining an assigned Mach** ~~intending to fly in NAT oceanic airspace~~ must flight plan their requested Mach number. ATC uses assigned Mach number along with position reports to calculate estimated times along the cleared route. These times are used as the basis for longitudinal separation and for coordination with adjacent units.

**APPENDIX K — PFA TO NORTH ATLANTIC OPERATIONS AND AIRSPACE MANUAL (NAT DOC 007)
TO CLARIFY THE NAT REGION HF REQUIREMENTS**

(paragraph 5.4.4 refers)

CHAPTER 4 FLIGHT PLANNING

Flight Planning to Operate Without Using HF Communications

4.2.12 When operating outside of VHF coverage the carriage of fully functioning HF is mandatory throughout the NAT, however some exceptions may apply, refer to State AIPs for further details. Aircraft with only functioning VHF communications equipment should plan their route according to the information contained in the appropriate State AIPs and ensure that they remain within VHF coverage of appropriate ground stations throughout the flight. VHF coverage charts are shown in Attachment 4. Some may permit the use of SATVOICE to substitute for or supplement HF communications. However, it must also be recognised that the Safety Regulator of the operator may impose its own operational limitations on SATVOICE usage. Any operator intending to fly through the NAT HLA without fully functional HF communications or wishing to use an alternative medium should ensure that it will meet the requirements of its State of Registry and those of all the relevant ATS providers throughout the proposed route.

CHAPTER 6 COMMUNICATIONS AND POSITION REPORTING PROCEDURES

6.1 ATS COMMUNICATIONS

Equipage Requirements

6.1.1 It is important that flight crews appreciate that routine* air/ground ATS voice communications in the NAT region are conducted via aeronautical radio stations (hereafter referred to as radio stations) staffed by radio operators who have no executive ATC authority. Messages are relayed by the ground station to/from the air traffic controllers in the relevant OACC. This is the case, whether communications are via HF, GP/VHF or SATVOICE. Operations in the NAT outside VHF coverage require the carriage of two long range communication systems, one of which must be HF. SATVOICE and CPDLC (appropriate to route of flight) may satisfy the requirement of the second-long range communication system. Due to coverage limitations, an Inmarsat CPDLC or SATVOICE system does not qualify as a long range communication system when operating north of 80N. Aircraft that are equipped with both Inmarsat (J5) and Iridium (J7) data link capability should use Iridium when north of 80N.

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6.1.2 There are six radio stations in the NAT: Bodø Radio (Norway), Gander Radio (Canada), Iceland Radio (Iceland), New York Radio (USA), Santa Maria Radio (Portugal) and Shanwick Radio (Ireland). Flights planning to operate outside VHF coverage may request waivers from the HF requirement provided the flight falls into one of the following categories:

- Air carriers with HF unserviceable wishing to return to base for repairs, or
- Ferry or delivery flights, or
- Special event flights

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6.1.3 Relief from the HF requirement in accordance with 6.1.2 may be granted by the Air Traffic Control Centers serving the route of flight provided the aircraft has at least two other long-range communication systems appropriate for route of flight. *Note: See state AIPs for details*

HF Voice Communications

6.1.4 It is important that flight crews appreciate that routine* air/ground ATS voice communications in the NAT region are conducted via aeronautical radio stations (hereafter referred to as radio stations) staffed by radio operators who have no executive ATC authority. Messages are relayed by the ground station to/from the air traffic controllers in the relevant OACC. This is the case, whether communications are via HF, GP/VHF or SATVOICE.

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6.1.5 There are six radio stations in the NAT: Bodø Radio (Norway), Gander Radio (Canada), Iceland Radio (Iceland), New York Radio (USA), Santa Maria Radio (Portugal) and Shanwick Radio (Ireland).

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6.1.6 Even with the growing use of data link communications a significant volume of NAT air/ground communications are conducted using voice on SSB HF frequencies and GP VHF frequencies. To support air/ground ATC communications in the North Atlantic region, twenty-four HF frequencies have been allocated, in bands ranging from 2.8 to 18 MHz. Additionally, Shanwick Radio, Santa Maria Radio, and Iceland Radio operate a number of Regional and Domestic Air Route Area (RDARA) frequencies in accordance with operating requirements and agreements between the stations.

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| Comment: | <ul style="list-style-type: none"> • Included for renumbering- edits to text are shown as strikethroughs or grey highlights • 6.1.6 up to and including 6.1.28 have no editorial changes except for renumbering |
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6.1.7 There are a number of factors which affect the optimum HF frequency for communications over a specific path. The most significant is the diurnal variation in intensity of the ionisation of the refractive layers of the ionosphere. Hence frequencies from the lower HF bands tend to be used for communications during night-time and those from the higher bands during day-time. Generally in the North Atlantic frequencies of less than 6 MHz are utilised at night and frequencies of greater than 5 MHz during the day.

6.1.8 The 24 NAT frequencies are organized into six groups known as Families. The families are identified as NAT Family A, B, C, D, E and F. Each family contains a range of frequencies from each of the HF frequency bands. A number of stations share families of frequencies and co-operate as a network to provide the required geographical and time of day coverage. A full listing of the frequencies operated by each NAT radio station is contained in the “HF Management Guidance Material for the North Atlantic Region” (NAT Doc 003), available at www.icao.int/EURNAT/, following “EUR & NAT Documents”, then “NAT Documents”, in folder “NAT Doc 003”.

6.1.9 Each individual flight may be allocated a primary and a secondary HF frequency before the oceanic boundary.

6.1.10 Radio operators usually maintain a listening watch on more than one single frequency therefore it is useful for flight crews to state the frequency used when placing the initial call to the radio station.

HF Phraseology applicable when using data link—Flight Crew Procedures Prior to or upon entering each NAT oceanic CTA

6.1.11 The integrity of the ATC service remains wholly dependent on establishing and maintaining HF or VHF voice communications with each ATS unit along the route of flight. The procedures in this section are applicable only in NAT airspace and pertain only to ATS data link operations.

6.1.12 Prior to or upon entering each NAT oceanic CTA, the flight crew should contact the appropriate aeronautical radio station.

6.1.13 If the flight enters an oceanic CTA followed by another oceanic CTA, the flight crew should, on initial contact:

- a) not include a position report;
- b) after the radio operator responds, request a SELCAL check and state the next CTA;
- c) The radio operator will assign primary and secondary frequencies, perform the SELCAL check and designate the position and frequencies to contact the aeronautical radio station serving the next oceanic CTA. If the communications instructions are not issued at this stage, the crew should assume that the frequencies to use prior or upon entering the next CTA will be delivered at a later time by CPDLC or voice.

Example (Initial contact from an eastbound flight entering GANDER Oceanic)

GANDER RADIO, AIRLINE 123, SELCAL CHECK, SHANWICK NEXT

AIRLINE 123, GANDER RADIO, HF PRIMARY 5616 SECONDARY 2899, AT 30 WEST CONTACT SHANWICK RADIO HF PRIMARY 8891 SECONDARY 4675, (SELCAL TRANSMITTED)

GANDER RADIO, AIRLINE 123, SELCAL OKAY, HF PRIMARY 5616 SECONDARY 2899. AT 30 WEST CONTACT SHANWICK RADIO, HF PRIMARY 8891 SECONDARY 4675

6.1.14 If the flight will exit an oceanic CTA into continental airspace or airspace where the primary means of communication is VHF voice and an ATS surveillance service is available, on initial contact with the oceanic CTA, the flight crew should:

- a) not include a position report;
- b) after the radio operator responds, request a SELCAL check;

Example (Initial contact from an eastbound flight about to enter SHANWICK Oceanic)

SHANWICK RADIO, AIRLINE 123, SELCAL CHECK

*AIRLINE 123, HF PRIMARY 2899 SECONDARY 5616 (SELCAL TRANSMITTED)
SHANWICK RADIO, AIRLINE 123, SELCAL OKAY, HF PRIMARY 2899 SECONDARY 5616.*

- c) for flights on T9 and T290, monitor VHF channel 128.360 as advised by Shanwick Radio. Exceptionally, in the event of navigational non-conformance or in an emergency, controllers may communicate directly with the flight. Controllers will use the callsign "Shanwick Control".

6.1.15 Depending on which data link services are offered in the oceanic CTA and the operational status of those services, the aeronautical radio operator will provide appropriate information and instructions to the flight crew.

6.1.16 If a data link connection cannot be established, maintain normal voice communication procedures. In the event of data link connection failure in a NAT CTA after a successful logon revert to voice and notify the appropriate radio station. Inform the OAC in accordance with established problem reporting procedures.

Note: Flights on Tango 9 or Tango 290 should contact Shanwick Radio on HF voice.

6.1.17 To reduce frequency congestion, flight crews of flights using ADS-C should not additionally submit position reports via voice unless requested by aeronautical radio operator.

6.1.18 ADS-C flights are exempt from all routine voice meteorological reporting; however, the flight crew should use voice to report unusual meteorological conditions such as severe turbulence to the aeronautical radio station.

6.1.19 For any enquiries regarding the status of ADS-C connections, flight crew should use CPDLC. Should the ATS unit fail to receive an expected position report, the controller will follow guidelines for late or missing ADS-C reports.

6.1.20 When leaving CPDLC/ADS-C or ADS-C-only airspace, the flight crew should comply with all communication requirements applicable to the airspace being entered.

6.1.21 If the flight crew does not receive its domestic frequency assignment by 10 minutes prior to the flight's entry into the next oceanic CTA, the flight crew should contact the aeronautical radio station and request the frequency, stating the current CTA exit fix or coordinates.

Note: Flights on Tango 9 or Tango 290 should contact Shanwick Radio on HF voice.

SELCAL

6.1.22 When using HF, SATVOICE, or CPDLC, flight crews should maintain a listening watch on the assigned frequency, unless SELCAL equipped, in which case they should ensure the following sequence of actions:

- a) provide the SELCAL code in the flight plan; (any subsequent change of aircraft for a flight will require re-filing of the flight plan or submitting a modification message (CHG) which includes the new registration and SELCAL);
- b) check the operation of the SELCAL equipment, at or prior to entry into oceanic airspace, with the appropriate radio station. (This SELCAL check must be completed prior to commencing SELCAL watch); and
- c) maintain thereafter a SELCAL watch.

6.1.23 It is important to note that it is equally essential to comply with the foregoing SELCAL provisions even if SATVOICE or CPDLC are being used for routine air/ground ATS communications. This will ensure that ATC has a timely means of contacting the aircraft.

6.1.24 Flight management staff and flight crews of aircraft equipped with SELCAL equipment should be made aware that SELCAL code assignment is predicated on the usual geographical area of operation of the aircraft. If the aircraft is later flown in geographical areas other than as originally specified by the aircraft operator, the aircraft may encounter a duplicate SELCAL code situation. Whenever an aircraft is to be flown routinely beyond the area of normal operations or is changed to a new geographic operating area, the aircraft operator should contact the SELCAL Registrar and request a SELCAL code appropriate for use in the new area.

6.1.25 When acquiring a previously owned aircraft equipped with SELCAL, many aircraft operators mistakenly assume that the SELCAL code automatically transfers to the purchaser or lessee. This is not true. As soon as practical, it is the responsibility of the purchaser or lessee to obtain a SELCAL code from the Registrar, or, if allocated a block of codes for a fleet of aircraft, to assign a new code from within the block of allocated codes.

6.1.26 Issues associated with duplicate SELCALs should be made to the SELCAL registrar, Aviation Spectrum Resources, Inc. (ASRI). The SELCAL registrar can be contacted via the AFTN address

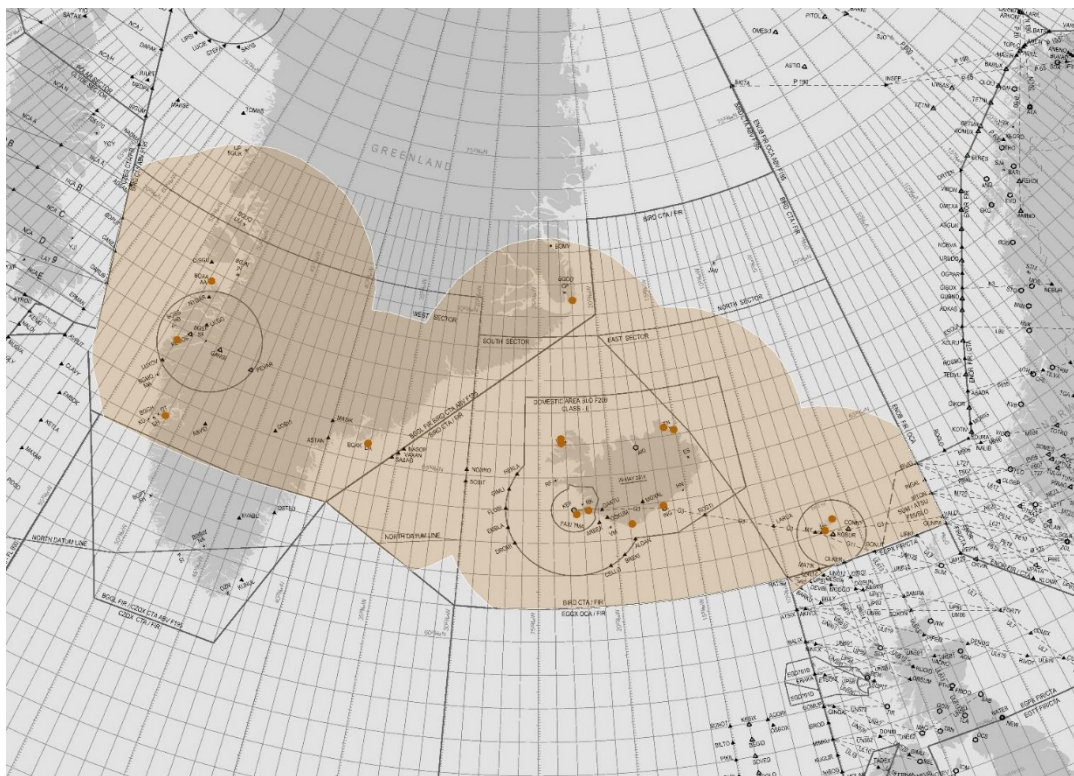
KDCAXAAG, and by including “ATTN. OPS DEPT. (forward to SELCAL Registrar)” as the first line of message text or via online at <https://www.asri.aero/selcal/>.

VHF Voice Communications

6.1.27 Radio stations are also responsible for the operation of General Purpose VHF (GP/VHF) outlets. North Atlantic flights may use these facilities for all regular and emergency communications with relevant OACCs, except that VHF Channel 128.360 may not be used for routine communication on routes Tango 9 and Tango 290. Such facilities are especially valuable in the vicinity of Iceland, Faroes and Greenland since VHF is not as susceptible to sunspot activity as HF. Outlets are situated at Prins Christian Sund, which is operated by Gander Radio, and at Kangerlussuaq (Nuuk), Kulusuk, several locations in Iceland and the Faroes, via Iceland Radio. Theoretical VHF coverage charts are shown at Attachment 4. It is important for the flight crew to recognise that when using GP/VHF, as with HF and SATVOICE, these communications are with a radio station and the flight crew is not normally in direct contact with ATSU. However, contact between the flight crew and ATC can be arranged, for example via patch-through on HF or GP/VHF frequencies by Iceland Radio and Shanwick Radio.

6.1.28 Reykjavik centre operates a number of Direct Controller Pilot Communications (DCPC) VHF stations in Iceland, Faroe Islands and Greenland. At jet flight levels the coverage is approximately 250 NM as indicated in the map below. Those stations are used to provide tactical procedural control and ATS Surveillance services within the South, East and West sectors of the Reykjavik area. The callsign of the Reykjavik centre is “Reykjavik Control” or just “Reykjavik” and indicates that the flight crew is communicating directly with an air traffic controller. The callsign of Iceland radio is “Iceland radio” and indicates that the flight crew is communicating with a radio operator who is relaying messages between the flight crew and the appropriate control facility.

Note: Due to technical data link interoperability requirements, CPDLC uplink messages refer to Iceland Radio as "Iceland Radio Center". This is done to enable the flight crew of capable aircraft to automatically load the specified frequency into the aircraft communication system.



~~6.1.27 Gander OACC operates a number of VHF remote outlets in the southern part of Greenland and in the adjacent eastern seaboard of Canada, providing DCPC service for ADS-B operations in those parts of its airspace. For details of this ADS-B service, participation requirements and coverage charts, operators should consult the Canadian AIP. A brief description of the service is provided in Chapter 10 of this document.~~

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| Comment: | Gander no longer provides separation based on ground based sites. |
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~~6.1.28 The carriage of HF communications equipment is mandatory for flight in the Shanwick OCA. Aircraft with only functioning VHF communications equipment should plan their route outside the Shanwick OCA and ensure that they remain within VHF coverage of appropriate ground stations throughout the flight. Details of communication requirements are published in State AIPs and ICAO publications.~~

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| Comment: | With the new text all ANSPs will be the same |
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SATVOICE Communication

6.1.29 The Aeronautical Mobile Satellite (Route) Service (AMS(R)S), more commonly referred to as SATVOICE, can be used as a supplement to HF & CPDLC communications throughout the NAT region for any routine, non-routine or emergency ATS air/ground communications. NAT ATS provider State AIPs contain the necessary telephone numbers and/or short-codes for air-initiated call access to radio stations and/or direct to OACCs. Since oceanic traffic typically communicates with ATC through radio facilities, routine SATVOICE calls should be made to such a facility rather than the ATC Centre. Only when the urgency of the communication dictates otherwise should SATVOICE calls be made to the ATC Centre. SATVOICE communication initiated due to HF propagation difficulties does not constitute urgency and should be addressed to the air-ground radio facility. The use of SATVOICE is described in The SATVOICE Operations Manual (ICAO Doc 10038).

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| Comment: | Revised numbering picks up here |
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6.1.30 The provisions governing the use of SATVOICE for ATS communications in the NAT region are contained in Doc.7030. These provisions include that even when using SATVOICE, flight crews must simultaneously operate SELCAL or maintain a listening watch on the assigned HF/VHF frequency.

6.1.31 Operators must also recognise that they are bound by their own State of Registry’s regulations regarding carriage and use of any and all long-range ATS communications equipment. Some States do not authorise the carriage of SATVOICE as redundancy for HF equipage. ~~However, in other instances MMEL remarks for HF systems do provide relief for SATVOICE equipped aircraft, thereby making the requirement for the carriage of fully serviceable/redundant HF communications equipment less of an issue (See also Section 6.6 regarding the use of SATVOICE in the event of “HF Communications Failure”).~~

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| Comment: | With the clarity of the new text this is no longer required |
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| Comment: Jump to 6.6.17 | No changes required between 6.1.31 and 6.6.17 |
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On-Board HF Communications Equipment Failure

6.6.17 Due to the potential length of time in oceanic airspace, it is strongly recommended that a flight crew, experiencing an HF communications equipment failure ~~prior to entering the NAT, while still in domestic airspace and still in VHF contact with the domestic ATC Unit, does not enter NAT airspace but adopts the procedure specified in the appropriate domestic AIP and lands at a suitable airport. Should the flight crew, nevertheless, elect to continue the flight then every effort must be made to obtain an oceanic clearance and the routing, initial level and speed contained in that clearance must be maintained throughout the entire oceanic segment. Any level or speed changes required to comply with the oceanic clearance must be completed within the vicinity of the oceanic entry point.~~

- Prior to departure
 - Coordinate with the initial NAT OAC according to flight planned route to determine if eligible for HF relief waiver as outlined in 6.1.1
 - Include any coordinated HF waiver relief details in section 18 of the flight plan
- After departure and prior to entering the NAT
 - Coordinate with the initial NAT OAC according to flight planned route to determine if eligible for HF relief waiver as outlined in 6.1.1

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| Comment: | Suggested new text to address possibility of HF relief |
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CHAPTER 16 GUIDANCE FOR DISPATCHERS

16.2.5 Many NAT air/ground ATC communications are still conducted on single side-band HF frequencies. For ~~unrestricted~~ operations in the NAT region fully functioning HF communications equipment is required ~~when operating outside VHF coverage. While SATVOICE and data link communications are now in widespread use in NAT operations, HF also constitutes a required back up.~~

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| Comment: | Simplified for consistency “unrestricted” removed since “when operating outside VHF coverage” has been added. |
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Communications

16.6.16 ~~———— The availability of functioning HF ATS communications is mandatory for flights through the Shanwick OCA. Many States of Registry insist on two functioning long range communications systems for flights in oceanic or remote areas. Some States of Registry will allow their operators to substitute SATVOICE for one HF system. Dispatchers should ensure that they are fully aware of their State of Registry requirements in this regard. VHF communications (123.450 or 121.5 MHz) can be used as relay air ground ATS communications as backup in case of en route HF failure. Operations in the NAT outside VHF coverage require the carriage of two long range communication systems, one of which must be HF. SATVOICE and CPDLC (appropriate to route of flight) may satisfy the requirement of the second-long range communication system~~

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MEL Compliance

16.6.19 Dispatchers planning flights within the NAT HLA must ensure that the allocated aircraft has the minimum required navigation, communications and altitude alerting/reporting equipment on board. Flight procedures for minimum equipment and standards can be found in **Chapter 8** and **Chapter 11** of this Manual.

Particular attention must be paid to MEL Items that may affect the aircraft. Be aware that the company MEL or Operations Specifications may be more restrictive than general NAT HLA requirements. ~~HF is required for entering the Shanwick OACC. Many airline Operations Specifications require dual HF for operation in remote or oceanic airspace, even when aircraft are SATVOICE equipped. However, some States may permit Dispatch with only one serviceable HF system providing the aircraft is equipped with SATVOICE.~~

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| Comment: | Simplified for consistency and to reflect new text. |
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