

NARVAL, NARVAL II ... EUREC⁴A



DLR

(German Aerospace Center)



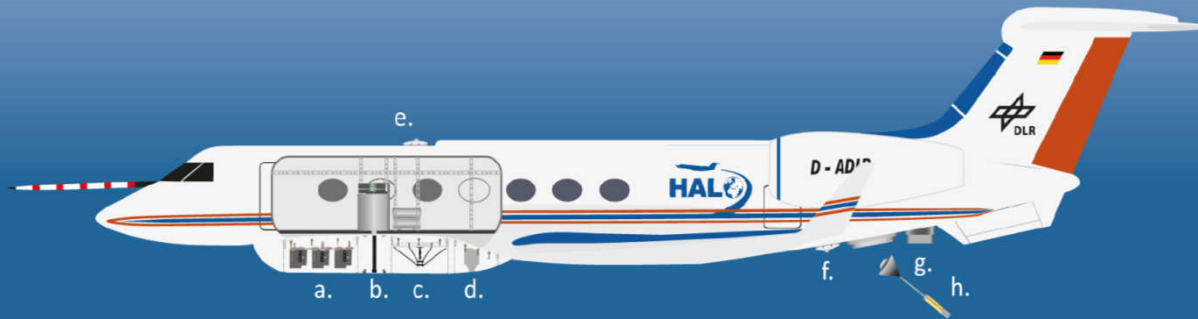
G550, D-ADLR

Basic instrumentation and communication

- 2 VHF (8,33 kHz), 1 UHF, 1 HF
- Iridium (2 channels)
- 1 Turbulence weather radar
- 2 Radio altimeter
- 2 EGPWS
- 2 GPS
- 3 INS
- 2 NDB
- 2 VOR/DME
- Mode-S Transponder
- RVSM-approved
- MNPS-approved
- RNP 1, 4, 5, 10 approved; RNP Approach approved;
- LNAV/VNAV and LPV approved
- CPDLC; ADS-C



EUREC⁴A on HALO



Belly Pod Section

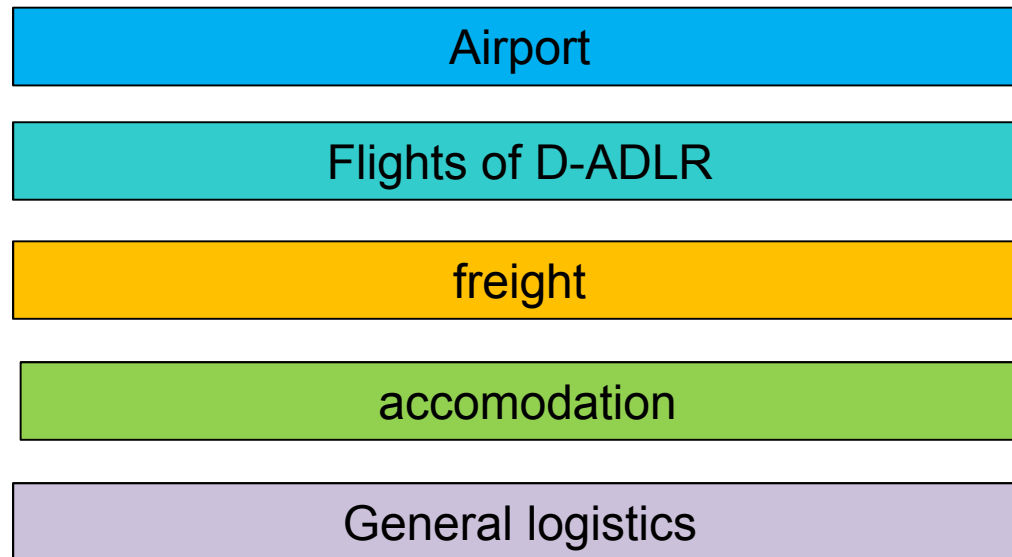
- a. Radiometer Bank
- b. Water Vapour DIAL (WALES)
- c. Cloud and Precipitation Radar
- d. Thermal Imager
- e. SMART

Tail Section

- f. SMART
- g. specMACS
- h. Dropsondes

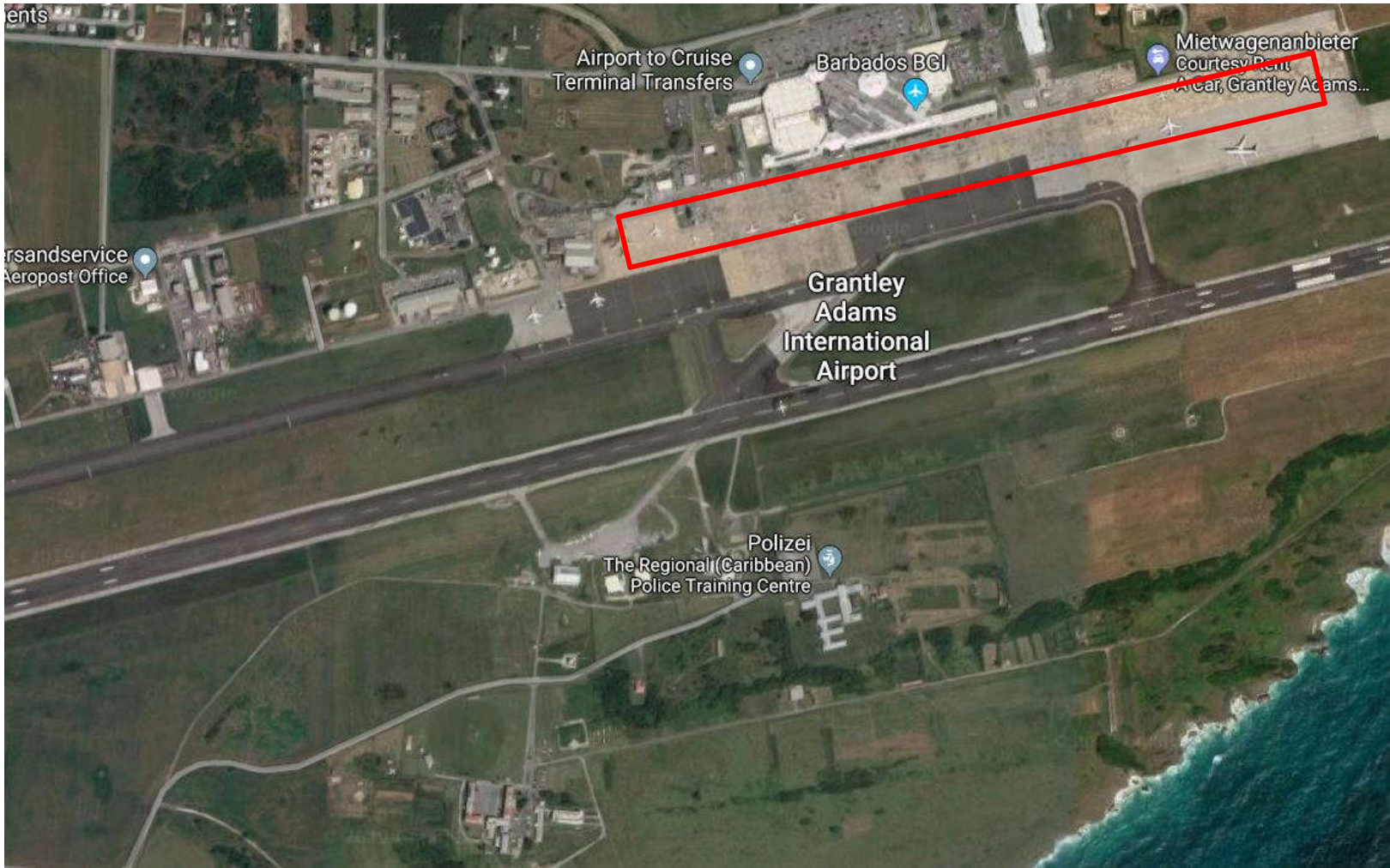
Instrument	Institution	Observable	Derived products	Instrument	Institution	Observable	Derived products
HAMP (HALO Microwave Package) (Mech et al., 2014)	MPI-M Hamburg, Univ. Hamburg, Univ. Cologne, DLR-IPA	<ul style="list-style-type: none"> • Brightness temperature at 26 selected microwave frequencies between 22 and 183 GHz • Profiles of radar reflectivity, depolarization ratio & Doppler velocity 	<ul style="list-style-type: none"> • Integ. water vapor • temperature + humidity profiles • cloud, snow & rain water path • target classification, cloud geometry • rain rate 	Broadband Radiometer Package for HALO (BRPH)	Univ. Leipzig	<ul style="list-style-type: none"> • Broadband down- and upwelling solar- and thermal-infrared irradiance • Cloud Radiative Forcing (CRF) 	• Cloud Radiative Forcing (CRF)
WALES (Wirth et al., 2009)	DLR-IPA	Profiles of <ul style="list-style-type: none"> • Backscatter coefficient (532 nm, 935 nm, 1064 nm), • Color ratio of backscatter, Particle linear depol. Ratio (all at 532/1064 nm), • Particle extinction coefficient (at 532 nm) 	<ul style="list-style-type: none"> • water vapor profile (from 935 nm channels) 	Thermal Imager	Univ. Leipzig	IR camera at 120 Hz with four channels between 7.7 μm to 12.0 μm and $\sim 20^\circ$ opening angle with 640 x 512 pixel resolution	<ul style="list-style-type: none"> • Cloud Mask • Cloud top temperature
SMART (Wendisch et al. 2015)	Univ. Leipzig	<ul style="list-style-type: none"> • Spectral nadir radiance (300-2200 nm), • Spectral upward and downward irradiance (300-2200 nm), cloud top albedo 	Cloud thermodynamic phase Liquid and ice water path <ul style="list-style-type: none"> • Cloud optical thickness, effective radius 	specMACS (Ewald et al. 2016)	LMU Munich	Radiance imagery in VIS/NIR spectral range with 34° (spectral) and 75° (monochromatic and polarized) across-track field-of-view	<ul style="list-style-type: none"> • Cloud Mask • Cloud phase • Optical thickness • Effective particle size • Particle size distribution
				dropsondes	DLR-IPA, MPI-M, Univ. Hamburg	Profiles of <ul style="list-style-type: none"> • relative humidity • temperature • horizontal wind 	-
				BAHAMAS	DLR-FX	In-situ observations of T, q, u, v, w, 100 Hz data, GPS	-

Logistical aspects – status 14 April 2019



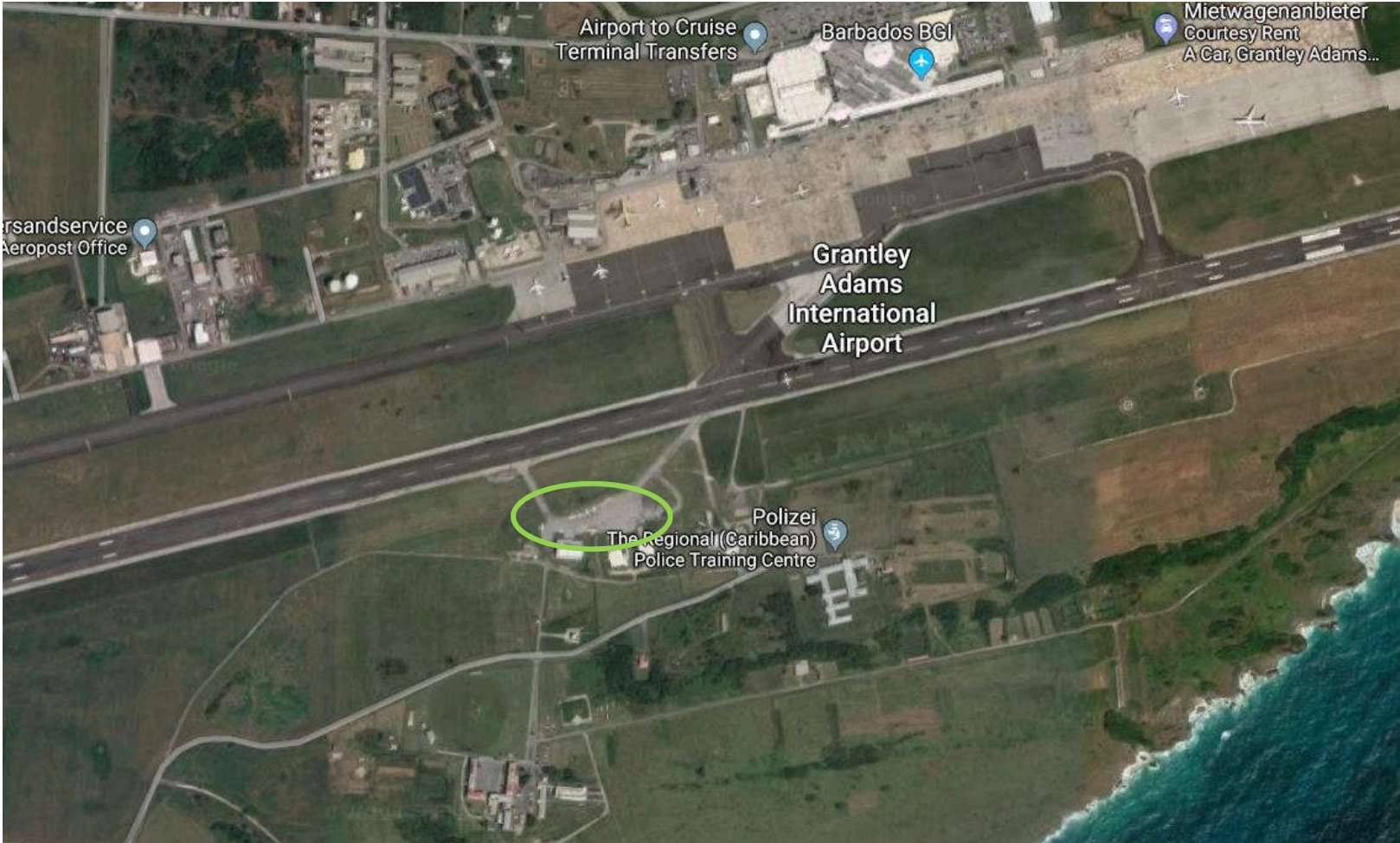
airport

Grantley Adams International Airport, Barbados (TBPB)
As Dec-Feb is high season parking space at the apron is very limited.

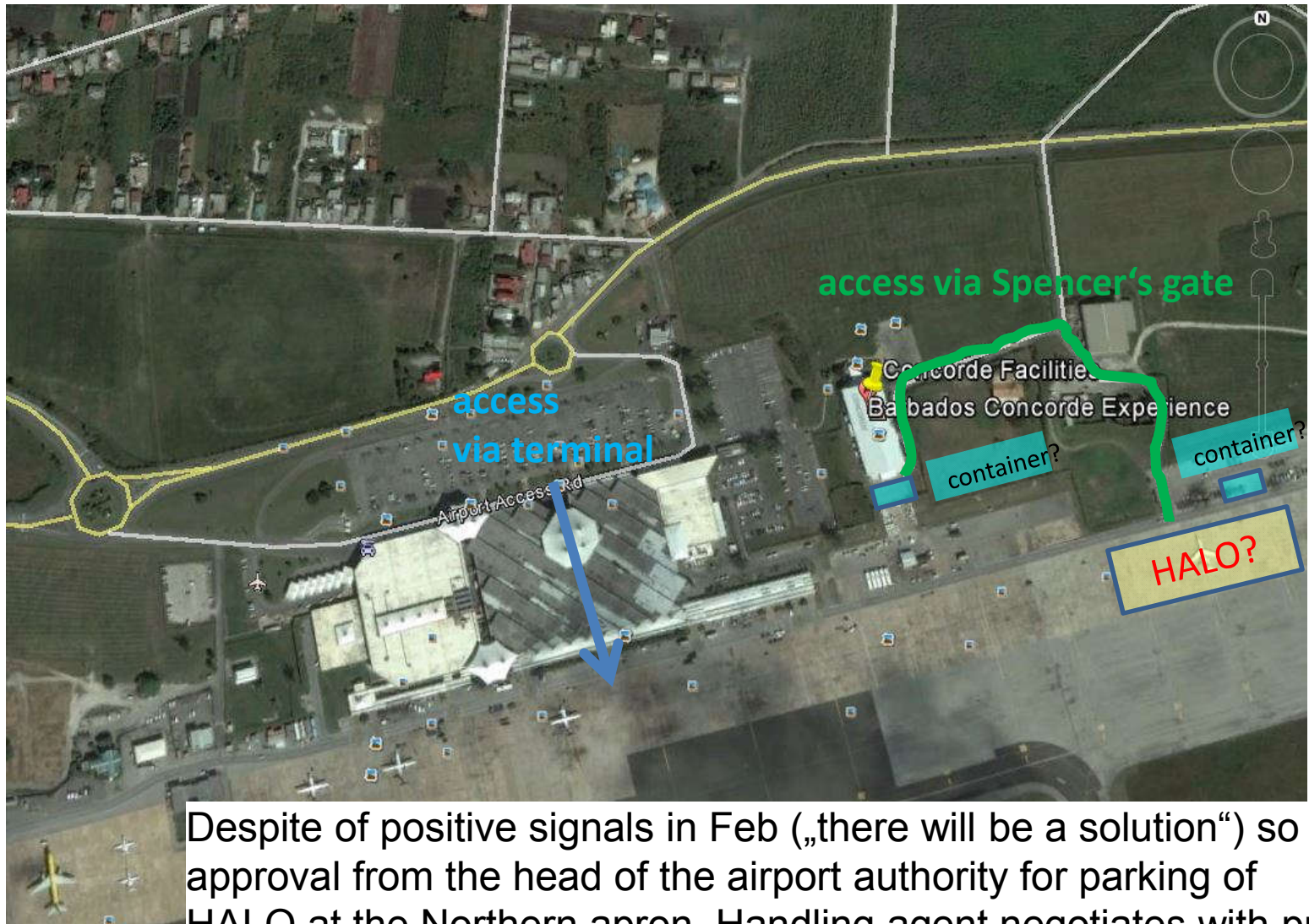


airport

The ATR42 will be parked South of the runway, at the apron of Regional Security Systems (RSS) and the local flying club. Storage of equipment and use of office space at the hangar. Fuelling only at Northern apron.



airport



Despite of positive signals in Feb („there will be a solution“) so far no approval from the head of the airport authority for parking of HALO at the Northern apron. Handling agent negotiates with private owner of hangar at the North side concerning parking there (probably in front of the hangar)



Flights of D-ADLR

In order to minimize the impact on the „normal“ airport operation we intend to fly according to a fixed schedule, 3 flights a week. Which days of the week has to be agreed on with the airport authority, depending on regular traffic. Maximum we could achieve – under perfect conditions – would be 12 local flights.

Fri	17	Transfer
Sat	18	Day-Off
Sun	19	flight planning/ground day
Mon	20	flight 1
Tue	21	flight planning/ground day
Wed	22	flight 2
Thu	23	flight planning/ground day
Fri	24	flight 3
Sat	25	Day-Off
Sun	26	flight planning/ground day
Mon	27	flight 4
Tue	28	flight planning/ground day
Wed	29	flight 5
Thu	30	flight planning/ground day
Fri	31	flight 6
Sat	1	Day-Off

Sun	2	flight planning
Mon	3	flight 7
Tue	4	flight planning/ground day
Wed	5	flight 8
Thu	6	flight planning/ground day
Fri	7	flight 9
Sat	8	Day-Off
Sun	9	flight planning
Mon	10	flight 10
Tue	11	flight planning/ground day
Wed	12	flight 11
Thu	13	flight planning/ground day
Fri	14	flight 12
Sat	15	Day-Off
Sun	16	Packen
Mon	17	Transfer



Flights of D-ADLR

Requested flight times(local time):

13:00 – 22:00

17:00 – 02:00

04:00 – 13:00

Example A)

Mon 13:00 – 22:00

Wed 17:00 – 02:00 (Thu)

Fri 04:00 – 13:00

example B)

Mon 04:00 – 13:00

Wed 17:00 – 02:00 (Thu)

Fri 13:00 – 22:00 (day off has to begin at the latest – earlier take-off?)

C

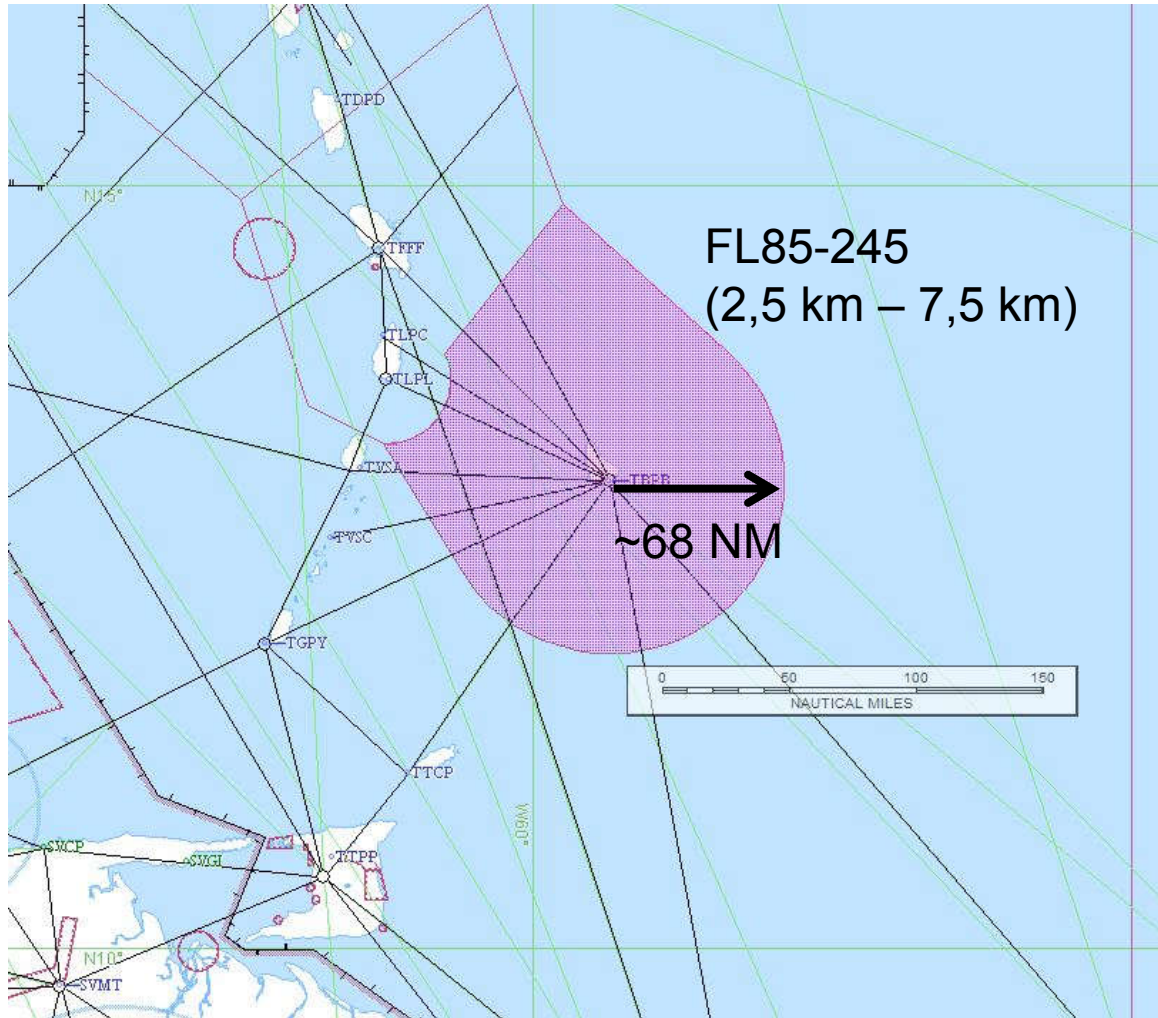
Mo 13:00 – 22:00

Mi 04:00 – 13:00

Fr 17:00 – 02:00 (Sa) Day-Off would start on Saturday evening, Sunday off -> no time for flight planning, eventually split day off for the team – not favorable



Flight region



50km East of Barbados **and** below FL245 -> Barbados TMA, local ATC (N-S extension about 120 NM)

If you leave the area you have to change to Piarco -> change of controller

Maybe both ATC centres agree to keep the aircraft at 1 frequency/control, but **needs to be negotiated**



freight

17.01.2020: D-ADLR arrives at Barbados

due to christmas holidays it would be good if **sea freight** arrived **~11 Dec 2019**
(at the latest)

-> 1 week „working time“ before christmas, 1 after christmas (tbc with CIMH)

Ship transfer: 28-38 days

Lead time in Germany for transport to harbour and customs: ~5 days

-> departure of container(s) at DLR **~24 October, 2019**

Freight lists etc. earlier, detailed schedule will follow

Airfreight: send it as soon as possible, optionally 2 dates for air freight;
expect (3-) 5 days for transport plus customs



accomodation

It is intended to use the **Divi Southwinds Hotel** again.

Currently the contract is being negotiated. As prepayments will be required we intend to have separate contracts with the different institutions. If institutions can group for the contract/payment this is welcome. **One point of contact per group is required** and should be defined as soon as possible.

The offered price is valid if we need at least 45 rooms:

One Bedroom Suites

Single occupancy – US\$ 136.56 inclusive of taxes and room tax levy

Wifi included.

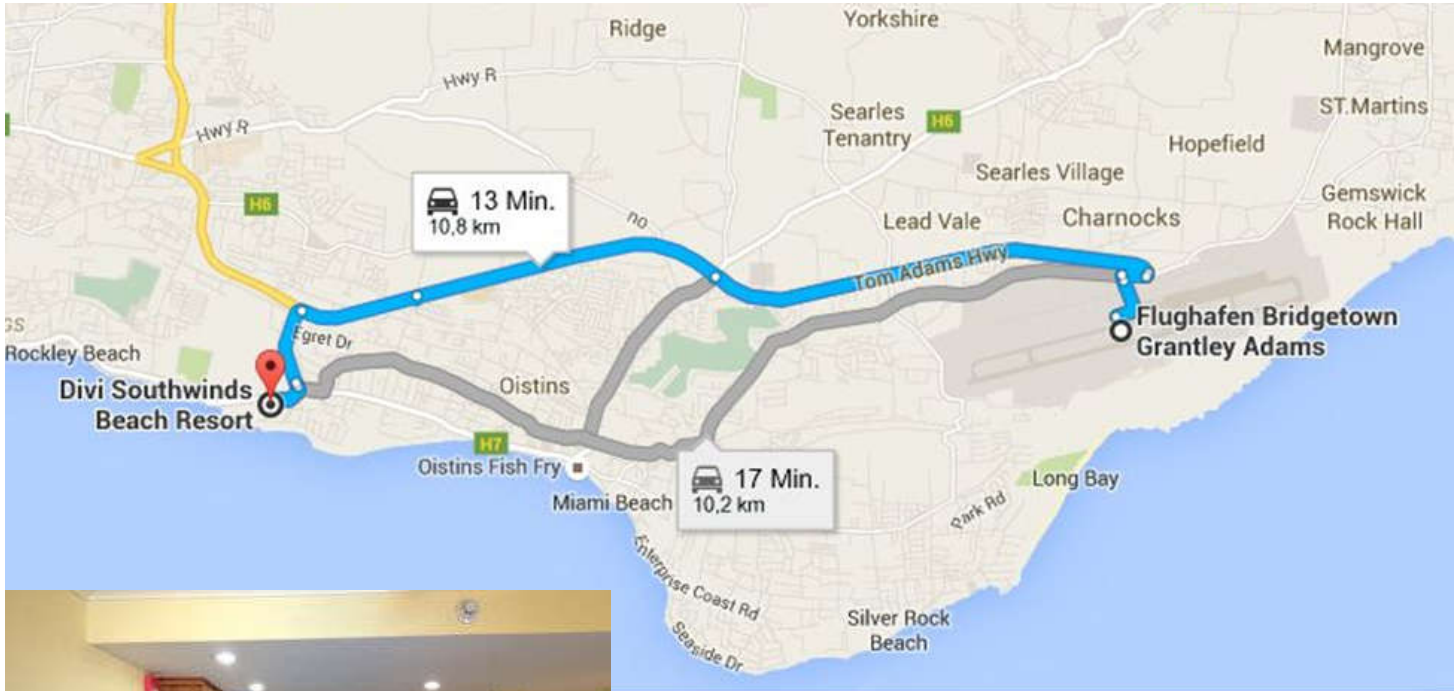
Breakfast not included but all apartments have a fully equipped kitchenette

We have a rough idea how many rooms are needed. Details from those groups who have not yet submitted their expected demand are required **this week** (before Easter).

Hotel has a conference room which will be available for the time of the campaign.



accomodation



Living room with equipped kitchenette, separate bedroom



General logistics

List of participants for airport access badges, probably scan of passport.

Renting/driving a car: you will need a local driving license. You get it at the car rental for ~5 USD.

Driving airside at the airport: requires a written test. Team members who need to drive airside should be announced as soon as possible.

