VMM-261
Operations Duty Officer Log
FOR OFFICIAL USE ONLY
18 March 2022

COMMANDING OFFICER
OPERATIONS OFFICER
OPERATIONS DUTY OFFICER

(b)(3), (b)(6), (b)(7)c

0900	I, (b)(3), (b)(6), (b)(7)c HAVE ASSUMED THE DUTIES AND RESPONSILBILTIES OF VMM-261 ODO. I HAVE IN MY POSSESSION (5) BRICKS AND (1) STICKS.	MLM
1015	GT 30 OUTBOUND FOR E CARD.	MLM
1045	GT 30 SOD ENBO.	MLM
1100	GT 31 OB NORTHERN ROUTE.	MLM
1410	GT 31 SOD ENBO.	MLM
1430	GT 31 OB.	MLM

(b)(3), (b)(6), (b)(7)c

OPERATION KILLING TIME / CALS

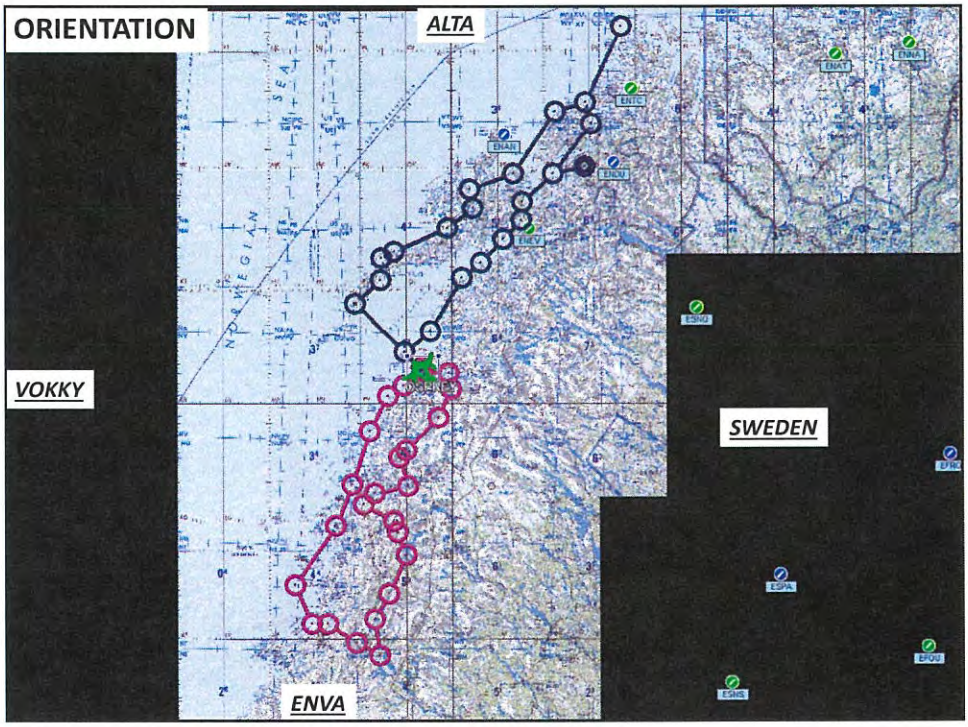
GHOST 3-1 Flight

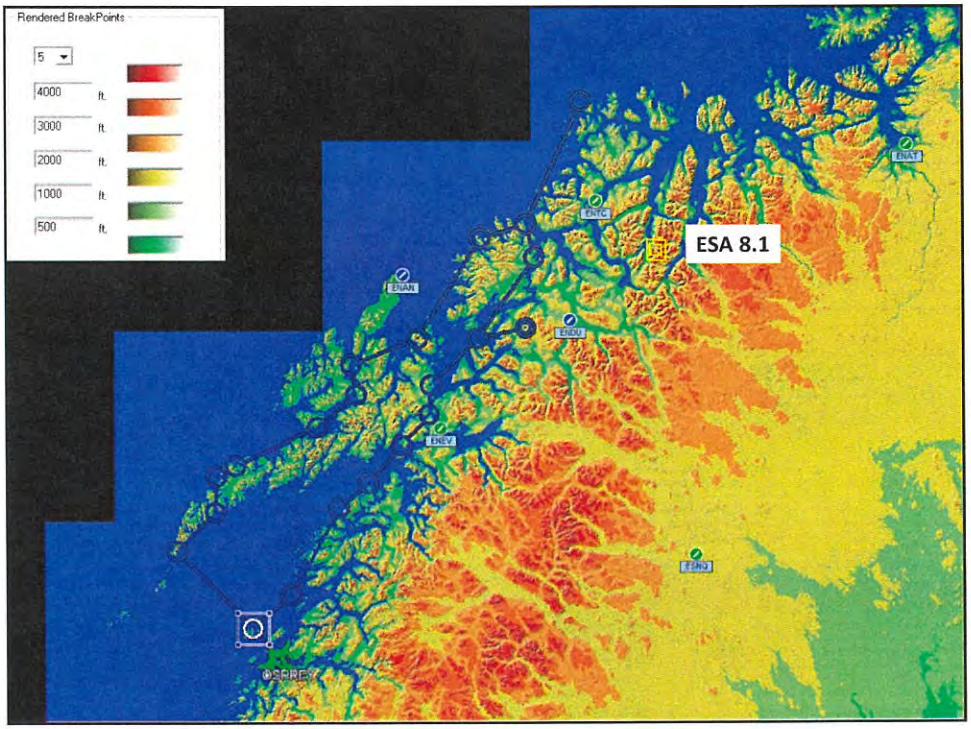
CAPT "PYRO" TOMKIEWICZ

18 March 2022

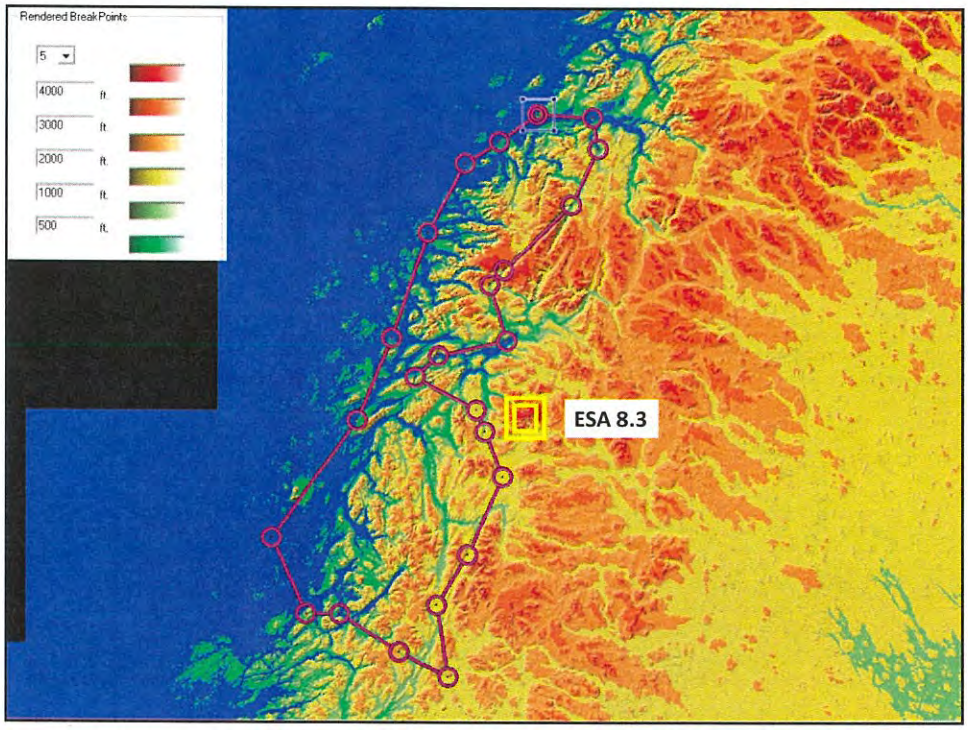
ORIENTATION

- TIME HACK
- ROLL CALL
- SMARTPACK INVENTORY / PEN CHANGES
- MAPS/CHARTS/PUBLICATIONS
- BRICKLOAD (2xROUTE, LOCAL COMM PLAN, WAYPOINTS, OVRLAY)





ENCLOSURE (25 2)

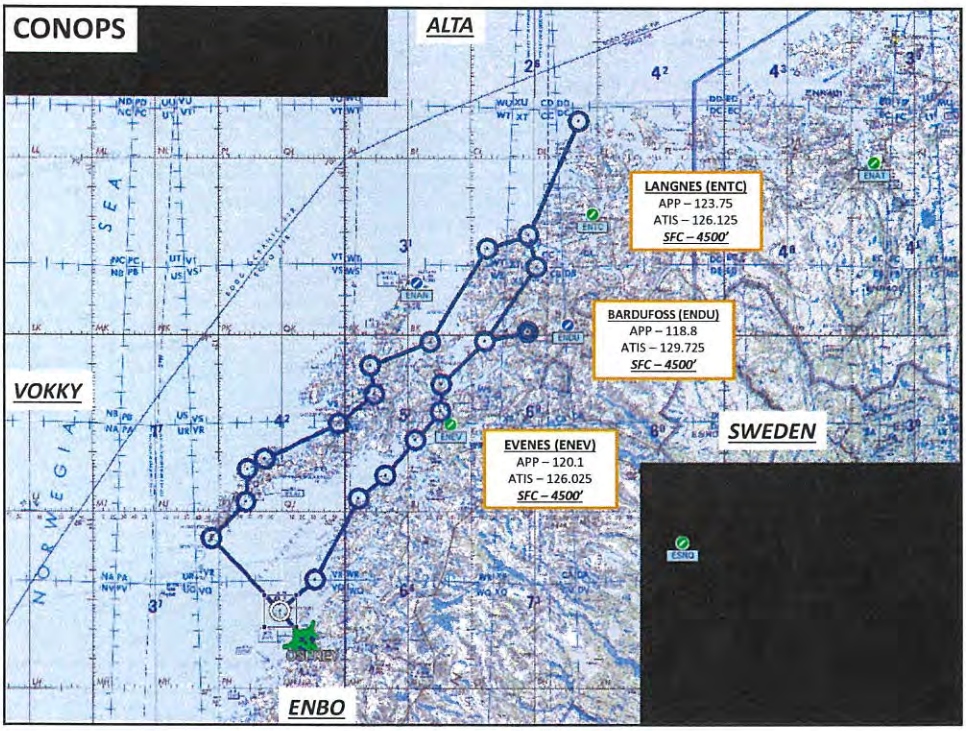


SITUATION

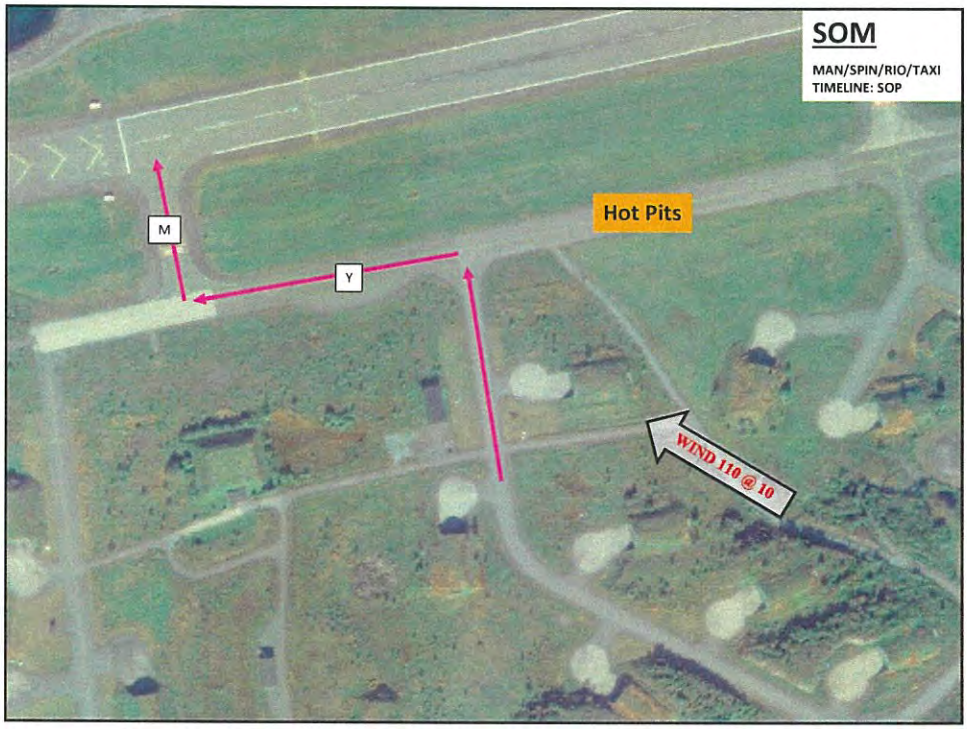
- Enemy: None
- Friendly
  - Higher: II MEF / 2d MAW
  - Adjacent: MAG 26/29, CR22 Allied Aircraft
  - Supported: II MEF, 2d MAW
  - Mission assets:
  - 1 x MV-22 "Ghost 3-1 flight"

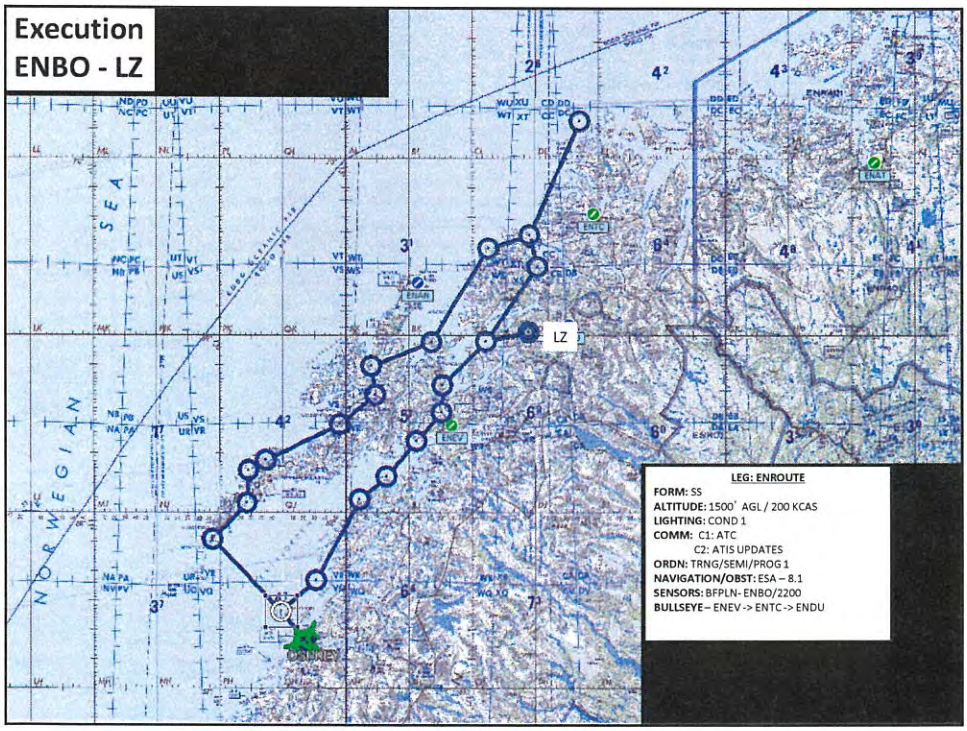
MISSION

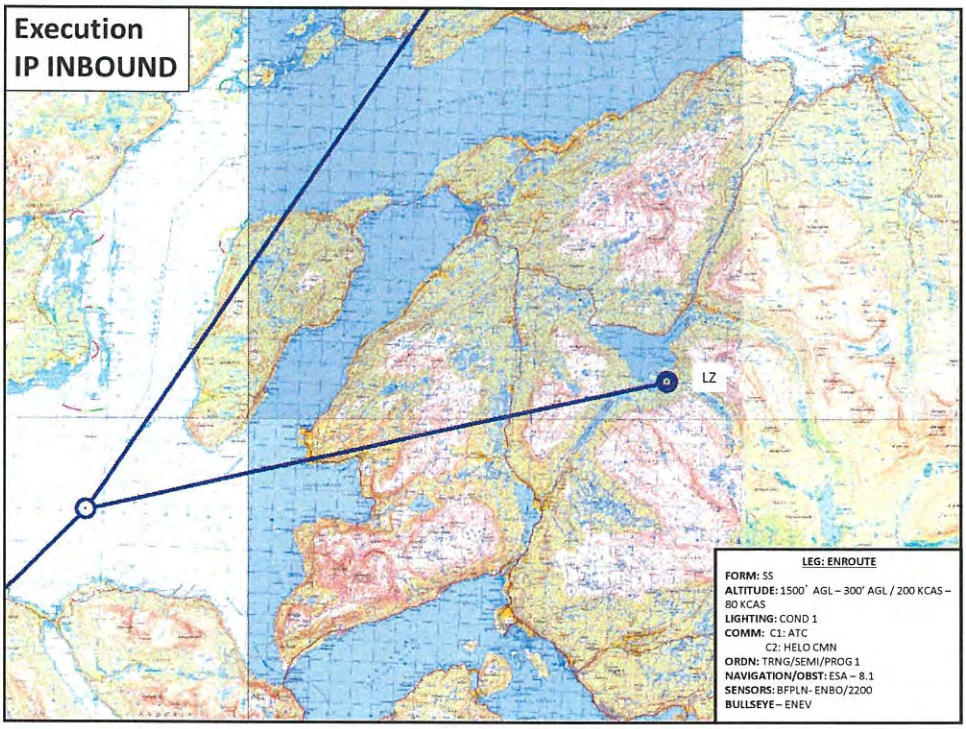
- Mission Statement: At 1000Z GHOST 3-1 displaces from ENBO to conduct CALs in order to increase squadron proficiency.
  - Mission Precedence: Routine
  - Specified Tasks: CALs
  - Implied Task: None
- Commander's Intent
  - Purpose: Increase squadron proficiency
  - Endstate: Ghost 31 SOD at ENBO

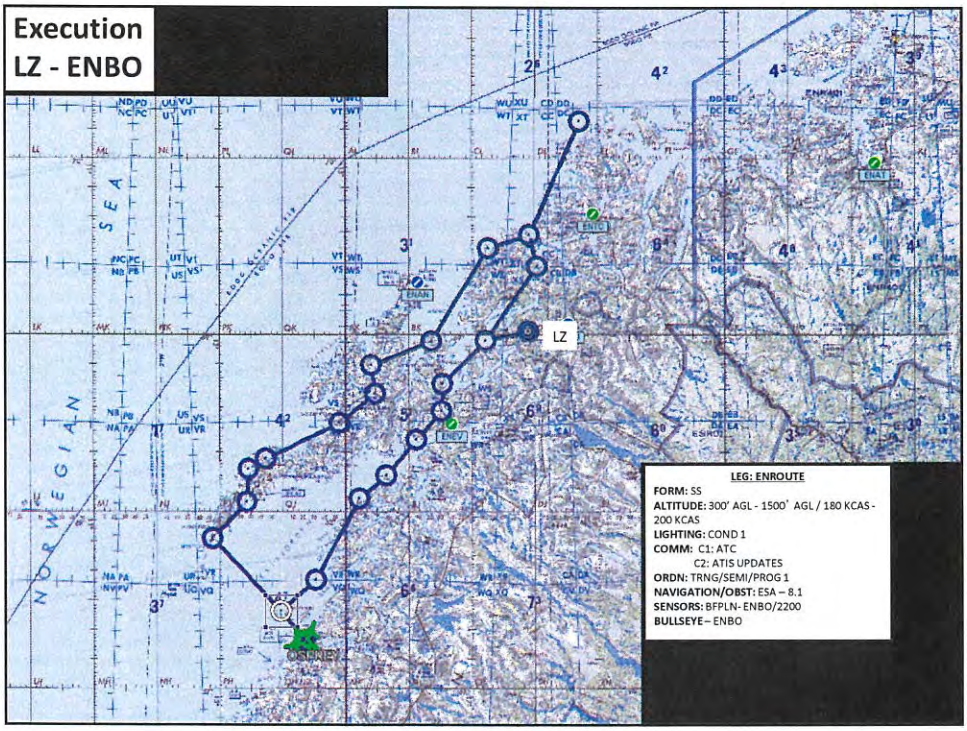


ENCLOSURE (254)

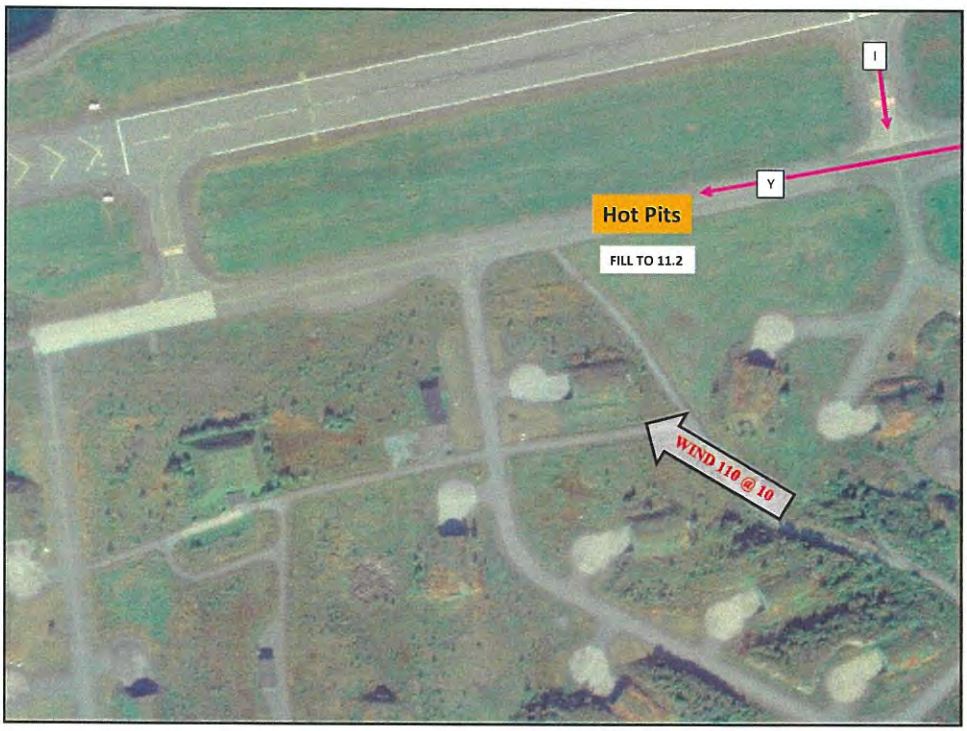

SOM
MAN/SPIN/RIO/TAXI
TIMELINE: SOP
Hot Pits
M
Y
WIND 110 @ 10

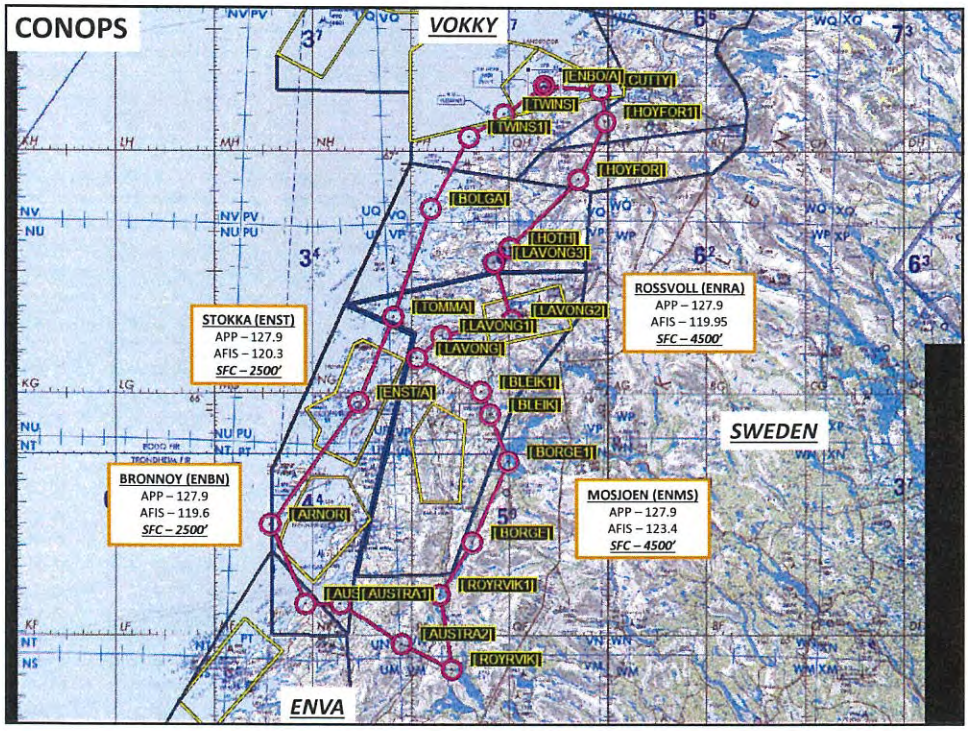

Execution
ENBO - LZ
[redacted]
LZ
NORWEGIAN SEA
LEG: ENROUTE
FORM: SS
ALTITUDE: 1500' AGL / 200 KCAS
LIGHTING: COND 1
COMM: C1: ATC
C2: ATIS UPDATES
ORDN: TRNG/SEMI/PROG 1
NAVIGATION/OBST: ESA – 8.1
SENSORS: BFPLN- ENBO/2200
BULLSEYE – ENEV -> ENTC -> ENDU



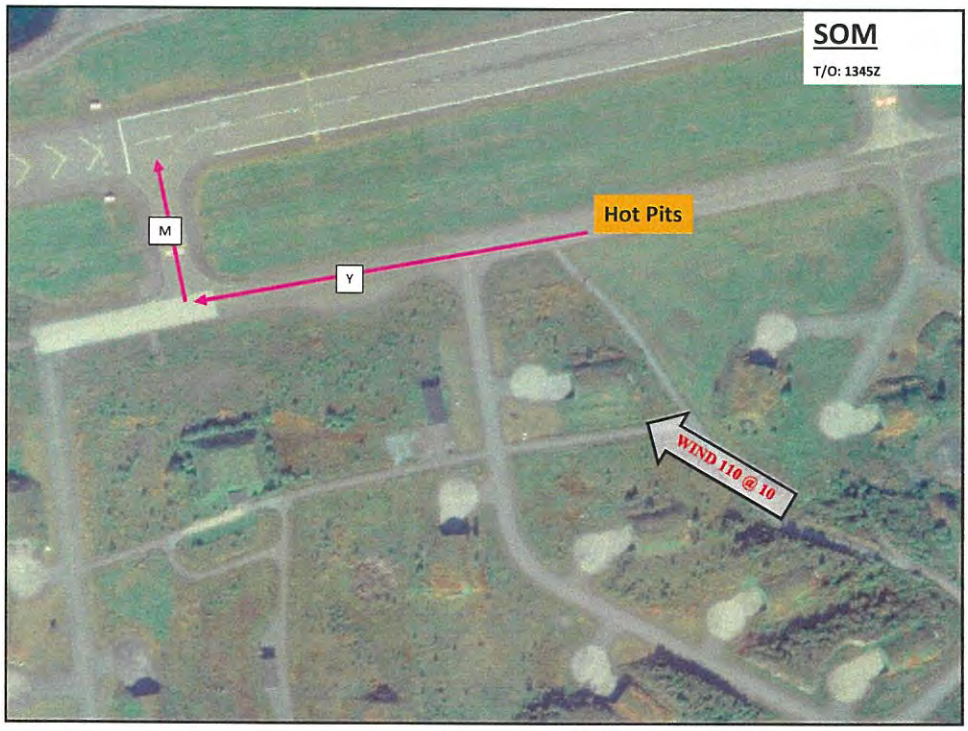


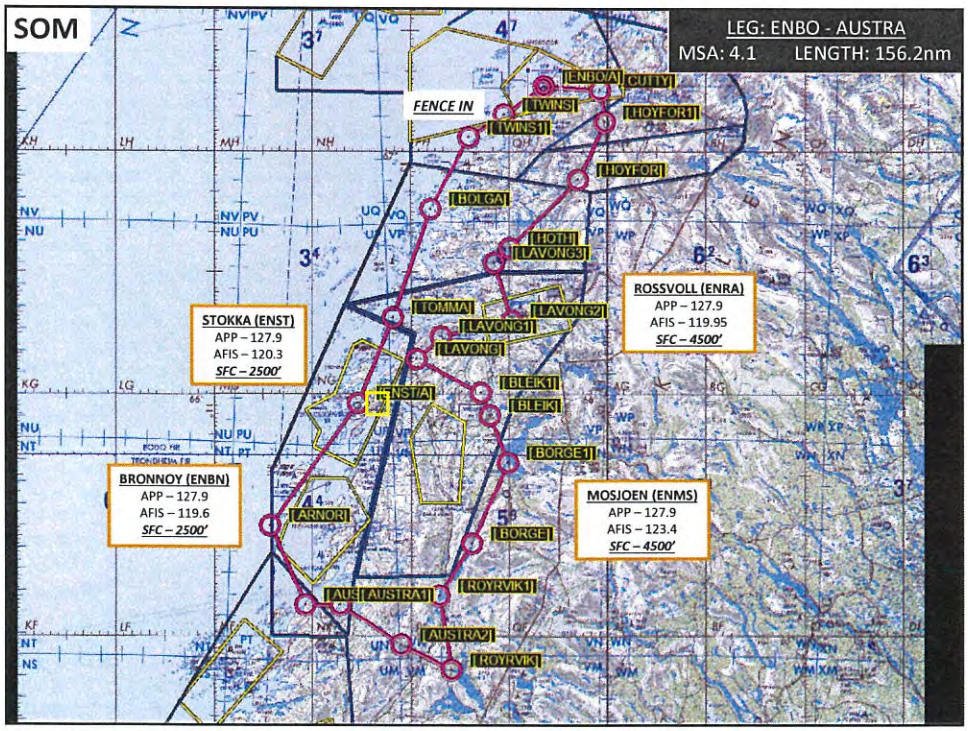
ENCLOSURE (256)



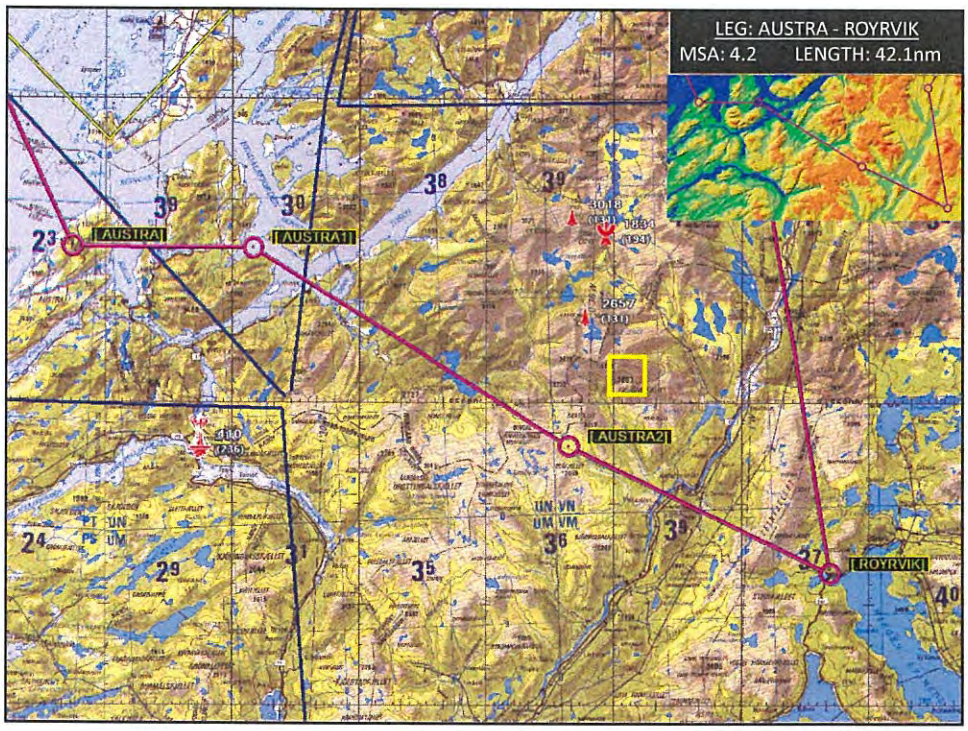


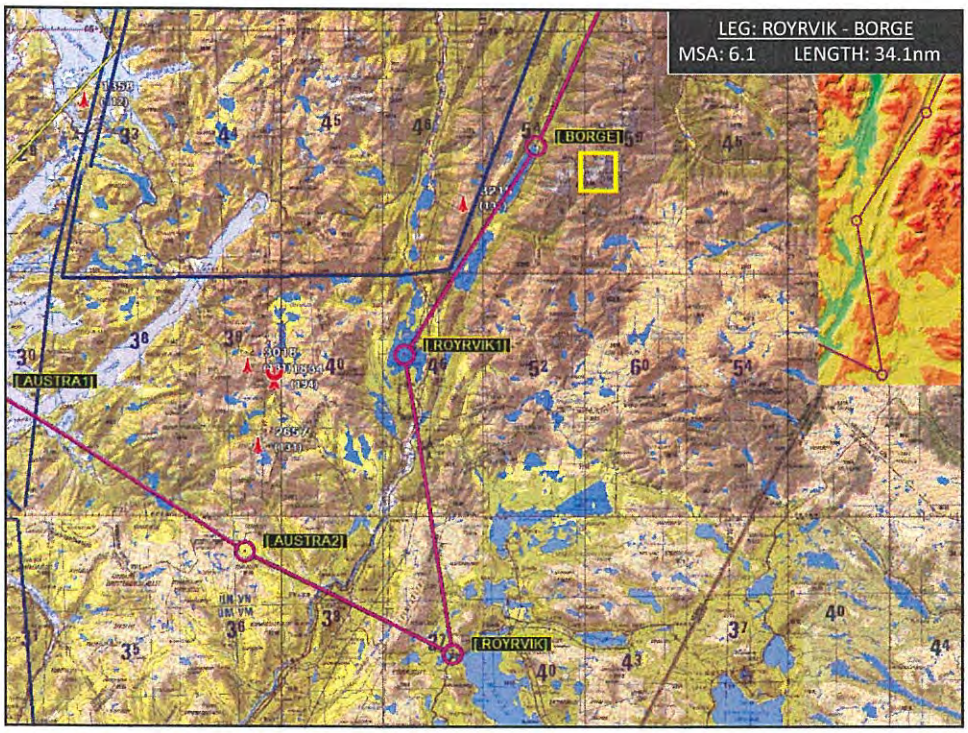
ENCLOSURE (25)



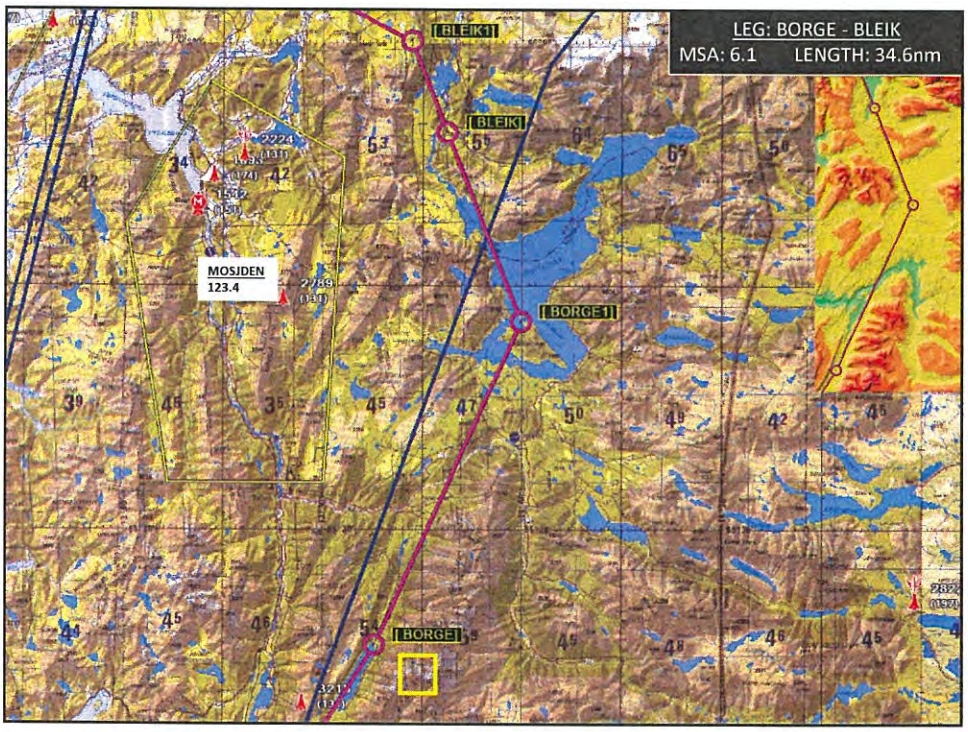


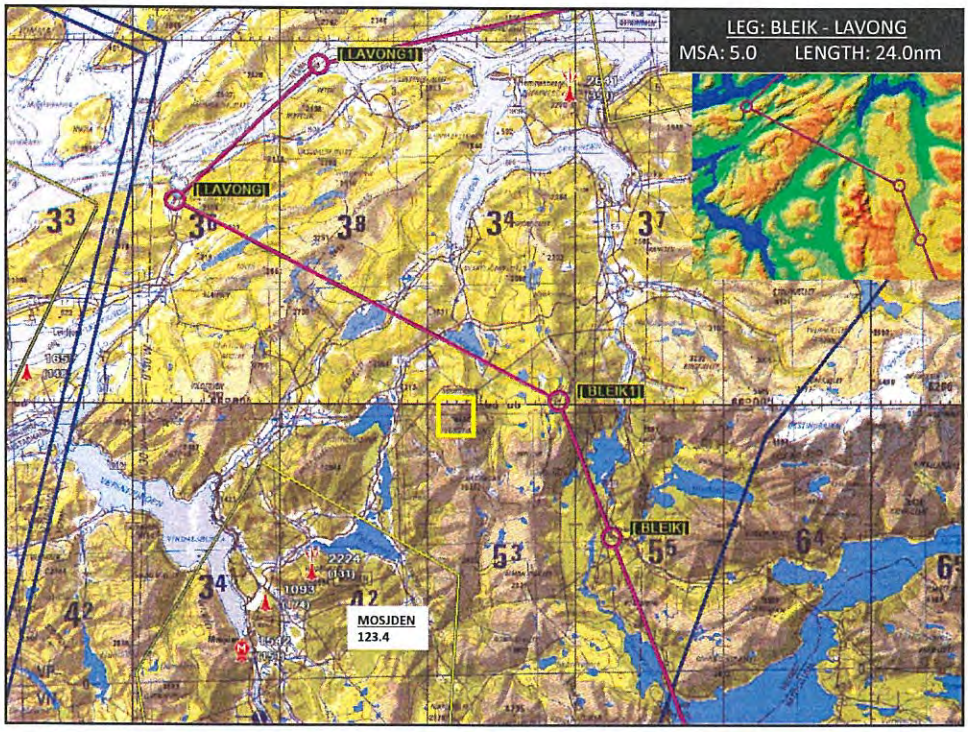
ENCLOSURE (25[8])

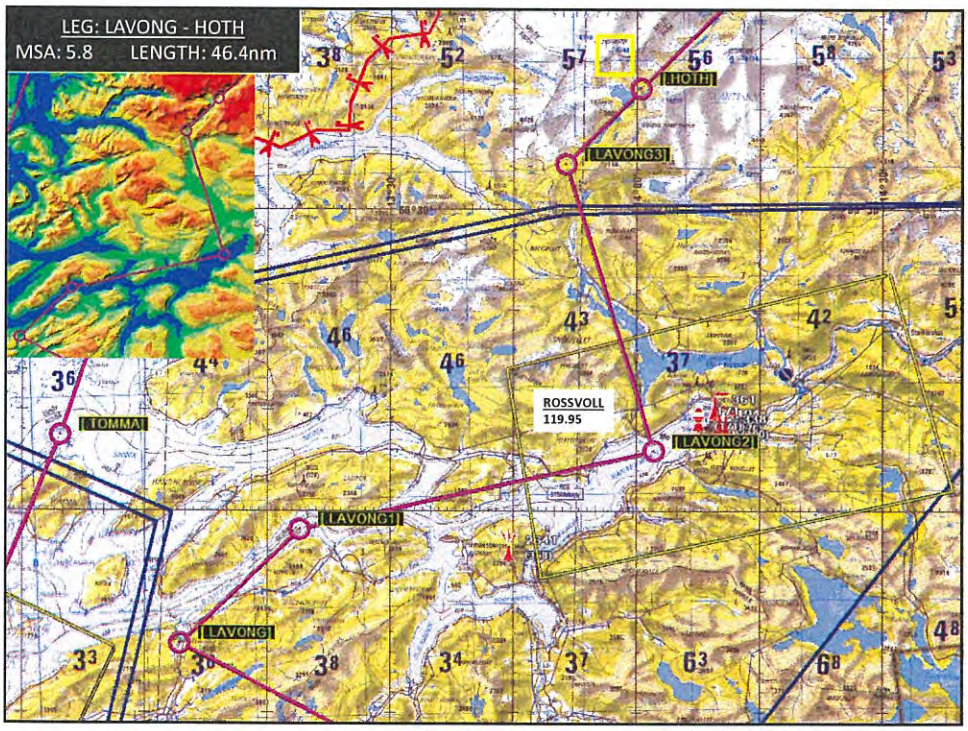


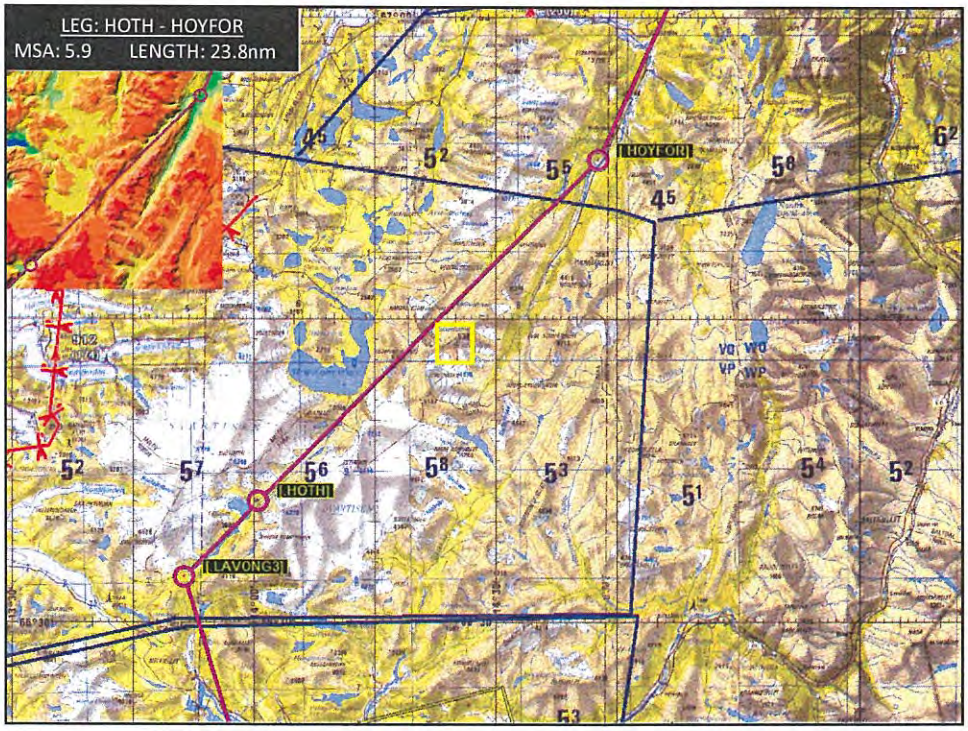


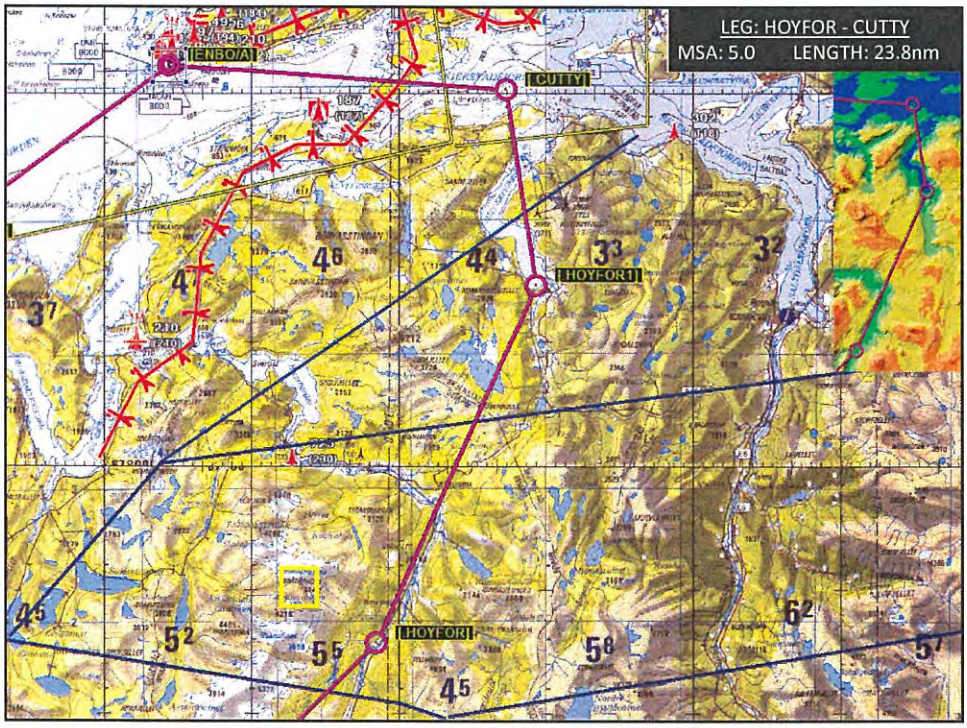
ENCLOSURE (25 9)

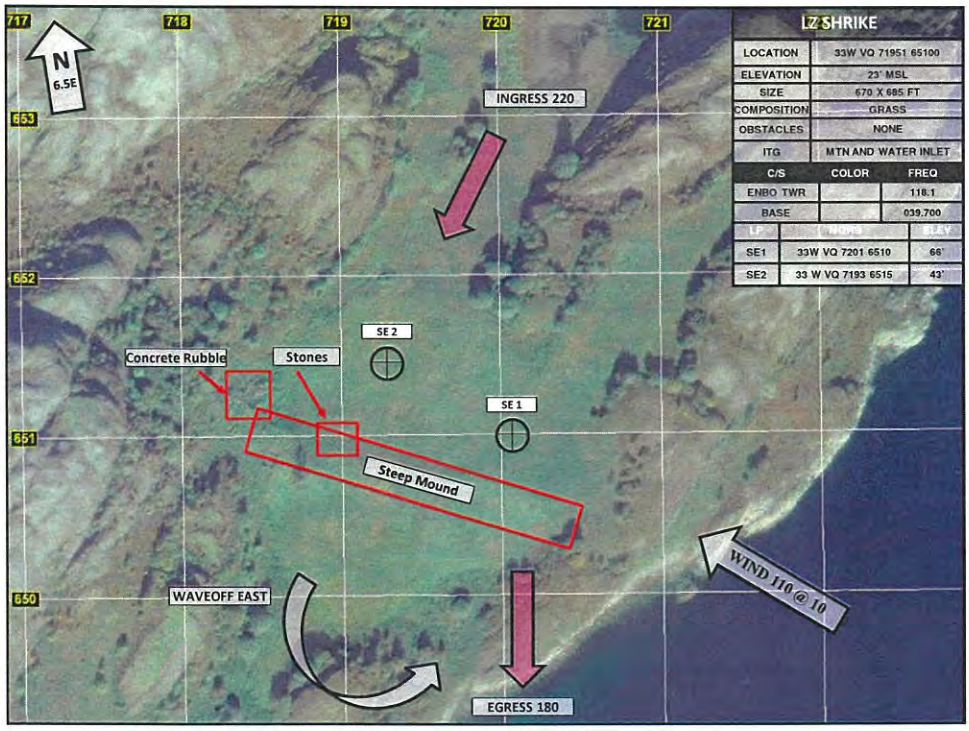

LEG: BORGE - BLEIK
MSA: 6.1 LENGTH: 34.6nm
BLEIK1
BLEIK
BORGE1
BORGE
MOSJDEN
123.4


LEG: BLEIK - LAVONG
MSA: 5.0 LENGTH: 24.0nm
LAVONG1
LAVONG
BLEIK1
BLEIK
MOSJDEN
123.4


LEG: LAVONG - HOTH
MSA: 5.8 LENGTH: 46.4nm
HOTH
LAVONG3
TOMMA
ROSSVOLL
119.95
LAVONG2
LAVONG1
LAVONG


LEG: HOTH - HOYFOR
MSA: 5.9 LENGTH: 23.8nm
HOYFOR
HOTH
LAVONG3





ENCLOSURE (12 25)

EXECUTION
Coordinating Instructions

- Mission-Essential Equipment
  - Aircraft: DTED / EAPS
  - Personal: Food/Water for 6.6 hrs of flight
- GO
  - 1 x MV-22
- No-Go
  - 500/1
- Aborts/Waveoffs - SOP

EXECUTION
Coordinating Instructions

- Emergency/System Failures
- IIMC - Reversal
- Terminate / Knock-it-off
- Downed AC

ADMIN AND LOGISTICS

- Delay/Straggle Plan/Drop Dead
  - Delay: 6 hours
  - Drop Dead
    - 1600z for 1+00 of flight time

ADMIN AND LOGISTICS

- Fuel Plan / Fuel required
  - T/O: 10.5
  - Mission: 21.0
  - Joker: 4.2 / 4.5
  - Bingo: 3.4 / 3.7 (LZ – ENBO) / (Royrvik - ENBO)
    - Available: ENBO/ENDU/ENVA
  - BINGO NO FLPN: ENBO/2200#/4500'/200KTS
- LOS/Bullseye: ENBO/ENEV/ENST/ENDU reverse on the way back
- Ordnance: TNG/SEMI/PROG-1
- Debrief Location/Time

COMMAND AND SIGNAL

- Chain of Responsibility
  - Authority to change route, LZs – TAC
  - Extension/Schedule change: SOP
- Frequencies
  - Assigned calls:
    - ATC, WX, BASE, AIRSPACE COORD
- Lost Comm / Single Radio Plan
- Chattermark = 21S – 20 – 1
- IFF Procedures/Codes

RM

- Risk to Forces
  - Blue: Poor weather calls with confining terrain and icing.
    - WX < 5000'/5sm at coastal airports = No Inland LAT
    - WX < 1000'/3sm = Conversion Mode
    - WX < 500' / 1sm = No Go
  - Red: Terrain / Icing / Turbulence
- Risk to Mission
  - Blue: Getting behind fuel ladder due to CONV mode Ops.
  - Red: WX

CLEAN UP

QUESTIONS?

UNITED STATES MARINE CORPS

MARINE MEDIUM TILTROTOR SQUADRON 261 (-) REINFORCED, COLD RESPONSE DETACHMENT
MARINE AIRCRAFT GROUP 26, 2D MARINE AIRCRAFT WING, FMF
POSTAL SERVICE CENTER BOX 21016
JACKSONVILLE, NC 28545-1016

MISSION: *SUPPORT THE MAGTF COMMANDER BY PROVIDING ASSAULT SUPPORT TRANSPORT OF COMBAT TROOPS, SUPPLIES AND EQUIPMENT, DAY OR NIGHT, UNDER ALL WEATHER CONDITIONS DURING EXPEDITIONARY, JOINT, OR COMBINED OPERATIONS.*

FLIGHT SCHEDULE TUESDAY, 01 MARCH 2022 (2060)

ODO: 0630-1245
ODO: 1245-LPOD
DNCO (OPS 5): (b)(3), (b)(6), (b)(7)c
ADNCO (OPS 5):
SCHEUDLE 24:
SCHEDULE 48: CAPT REYNOLDS, R.

SCHEDULED HOURS
13.2

MAR(GOAL/SCHEDULED/EXECUTED)
240.0 / 0.0 / 0.0
QTR
600.3 / 274.5 / 215.8
FY
2426.0 / 581.0 / 510.8

ENBO	FIELD HOURS: 24 HRS QUIET HOURS: NONE	BMNT / SR: 0523 / 0720	SS / EENT: 1711 / 1909	MR / MS: 0852 / 1400	ILLUM: 4%	LLL: 1938-0451* HLL: 0455-0523, 1909-1938

EVENT	TMR	BRF	ETD	ETR	HRS	AIRCREW	TRAINING CODES	MISSION	NOTES	CONFIG
GHOST 3-1 MV-22B	1A1	0700	0900	1215	3.3	(b)(3), (b)(6), (b)(7)c	2031, 2242, 2280, 2281, 2282, 2641, 6240, 6900R 2031, 2242, 2280, 2281P, 2282, 2641, 6900R 2242, 2282, 2641, 6900R 2242, 2270X, 2282X, 2641, 6900X	AREA FAM / LAT CERT / SEC CALS	1, 2	
GHOST 3-2 MV-22B	1A1	0700	0900	1215	3.3	CAPT TOMKIEWICZ, M. (b)(3), (b)(6), (b)(7)c	2031, 2242, 2280, 2281, 2282, 2641, 6900R 2031, 2242, 2280, 2281, 2282, 2641, 6900R 2242, 2282, 2641, 6900R 2242, 2270X, 2282X, 2641, 6900X	AREA FAM / LAT CERT / SEC CALS	1	
GHOST 3-3 MV-22B	1A1	1015	1315	1630	3.3	(b)(3), (b)(6), (b)(7)c	2031, 2242, 2280, 2281, 2282, 2641, 6240, 6900R 2031, 2242, 2280P, 2281P, 2282R, 2641, 6900X 2242, 2282, 2641, 6900X 2242, 2282, 2641, 6900X	AREA FAM / LAT CERT / SEC CALS	1, 2	
GHOST 3-4 MV-22B	1A1	1015	1315	1630	3.3	(b)(3), (b)(6), (b)(7)c CPL MOORE, J.	2031, 2242, 2280, 2281, 2282, 2641, 6900R 2031, 2242, 2280, 2281, 2282, 2641, 6900R 2242, 2282, 2641, 6900R 2242, 2282, 2641, 6900R	AREA FAM / LAT CERT / SEC CALS	1	

@ AIR MISSION COMMANDER / # FLIGHT LEAD / ** DIVISION LEAD / * SECTION LEAD / X ATF REQUIRED / R NOT PROFICIENT / P PROFICIENCY EXPIRES W/I 90 DAYS
** UNLESS OTHERWISE INDICATED, ALL FLIGHTS WILL ORIGINATE AND TERMINATE AT BODØ AIR BASE (ENBO) **

FLIGHT NOTES:

1. HOUND DOG ROUTE 0910-0955 AND 1325-1410 AND BODO AREA LZ CERTIFICATIONS
2. CREW AUTHORIZED TO FCF AS REQUIRED.

ADMIN NOTES:

START	END	LOCATION	REMARKS	NOTES	POC
0730	0800	OPS 5	MAINTENANCE MEETING	ALL DESIGNATED PERSONNEL TO ATTEND	(b)(3), (b)(6), (b)(7)c
NLT	0800	INDIVIDUAL SPACES	ATO INPUTS FOR NEXT DAY DUE TO MAW	S-3T TO INPUT	
NLT	0800	OPS 5	MIDRATS FOR AIRCREW	S-4 COORDINATE 8 LUNCH MIDRATS FOR MARCH 2 CREW	
NLT	1500	INDIVIDUAL SPACES	SITREP INPUTS DUE TO S-3	ALL SHOPS TO SUBMIT	
NLT	1600	OPS 5	SITREP DUE TO MAW G3	S-3 TO SUBMIT	
1700	1730	OPS 5	MAINTENANCE MEETING	ALL DESIGNATED PERSONNEL TO ATTEND	
1900	2000	BARRACKS G	KEY LEADERS SYNC	(b)(3), (b)(6), (b)(7)c TO ATTEND	
ALL	DAY	BARDUFOSS	FORCE ON FORCE FTX PLANNNING	(b)(6), (b)(7)c TO ATTEND	

OPS: /S/
DSSN: /S/
MAINT: /S/

(b)(3), (b)(6), (b)(7)c
COMMANDING OFFICER

ENCLOSURE (26)

UNITED STATES MARINE CORPS

MARINE MEDIUM TILTROTOR SQUADRON 261 (-) REINFORCED, COLD RESPONSE DETACHMENT
MARINE AIRCRAFT GROUP 26, 2D MARINE AIRCRAFT WING, FMF
POSTAL SERVICE CENTER BOX 21016
JACKSONVILLE, NC 28545-1016

MISSION: *SUPPORT THE MAGTF COMMANDER BY PROVIDING ASSAULT SUPPORT TRANSPORT OF COMBAT TROOPS, SUPPLIES AND EQUIPMENT, DAY OR NIGHT, UNDER ALL WEATHER CONDITIONS DURING EXPEDITIONARY, JOINT, OR COMBINED OPERATIONS.*

FLIGHT SCHEDULE SATURDAY, 05 MARCH 2022 (2064)

ODO: (b)(3), (b)(6), (b)(7)c 0600-1200
ODO: CAPT REYNOLDS, R. 1200-LPOD
DNCO (OPS 5):
ADNCO (OPS 5): (b)(3), (b)(6), (b)(7)c

SCHEDULED HOURS
19.8

MAR(GOAL/SCHEDULED/EXECUTED)
200.1 / 24.8 / 20.0
QTR
600.3 / 335.2 / 261.2
FY
2426.0 / 641.7 / 556.2

ENBO	FIELD HOURS: 24 HRS QUIET HOURS: NONE	BMNT / SR: 0507/0704	SS / EENT: 1726/1923	MR / MS: 0743/2147	ILLUM: 7%	LLL: 1955-0435* HLL: 0439-0507, 1923-1955

EVENT	TMR	BRF	ETD	ETR	HRS	AIRCREW	TRAINING CODES	MISSION	NOTES	CONFIG
GHOST 3-1 MV-22B	2K2	0830	TBD	TBD	TBD	(b)(3), (b)(6), (b)(7)c		FCF		
GHOST 3-2 MV-22B	2M4 1A1	0630	0915	1615	6.6		2280, 2281, 2282, 2440P, 2781, 2784R, 3040, 3440, 3441, 6330X 2280, 2281, 2282, 2440P, 2781, 2784, 3040P, 3440X, 3441 2282, 2781, 2784, 3040, 3440, 3441 2282, 2780X, 2784X, 3040X	CAT/ DIV LAT / DIV CALS	1, 2, 3, 5	
GHOST 3-3 MV-22B	2M4 1A1	0630	0915	1615	6.6		2280P, 2281P, 2282, 2440P, 2781, 2784, 3040, 3440R, 3441, 6240 2280P, 2281P, 2282, 2440, 2781, 2784R, 3040, 3440R, 3441R 2440R 2282, 2781, 2784, 3040, 3440, 3441 2282, 2781, 2784, 3040, 3440X, 3441X	CAT/ DIV LAT / DIV CALS	1, 2, 3, 4	
GHOST 3-4 MV-22B	2M4 1A1	0630	0915	1615	6.6	CAPT TOMKIEWICZ, M. (b)(3), (b)(6), (b)(7)c CPL MOORE, J.	2280, 2281, 2282, 2440, 2781, 2784R, 3040, 3440,3441, 6340 2280P, 2281, 2282, 2440P, 2781, 2784R, 3040R, 3440X, 3441P 2440R 2282P, 2781, 2784P, 3040, 3440P, 3441X 2282, 2781, 2784, 3040, 3440P, 3441P	CAT/ DIV LAT / DIV CALS	1, 2, 3, 4	

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** UNLESS OTHERWISE INDICATED, ALL FLIGHTS WILL ORIGINATE AND TERMINATE AT BODØ AIR BASE (ENBO) **

FLIGHT NOTES:

1. BARDUFOSS FUEL COORDINATED AT 1300L. ODO TO CONTACT HMH/HMLA ODO: SIPR 302-750-3983 PRIOR TO DEPARTURE. POC (b)(3), (b)(6), (b)(7)c
2. PAX AUTHORIZED. COMMSTRAT PAX TO MANIFEST WITH ODO. POC (b)(3), (b)(6), (b)(7)c
3. AERIAL REFUELING WITH VMGR 252. POC (b)(3), (b)(6), (b)(7)c.
4. IN AIR HOTSEAT AUTHORIZED.
5. (b)(3), (b)(6), (b)(7)c LOG 3011X FOR (b)(3), (b)(6), (b)(7)c AND (b)(3), (b)(6), (b)(7)c PRIOR TO FLIGHT.

ADMIN NOTES:

START	END	LOCATION	REMARKS	NOTES	POC
0730	0800	OPS 5	MAINTENANCE MEETING	ALL DESIGNATED PERSONNEL TO ATTEND	(b)(3), (b)(7)c
NLT	0800	INDIVIDUAL SPACES	ATO INPUTS FOR NEXT DAY DUE TO MAW	S-3T TO INPUT	
NLT	1300	OPS 5	MIDRATS FOR AIRCREW	S-4 COORDINATE 15 LUNCH MIDRATS FOR MARCH 5 CREW	
NLT	1500	INDIVIDUAL SPACES	SITREP INPUTS DUE TO S-3	ALL SHOPS TO SUBMIT	
NLT	1600	OPS 5	SITREP DUE TO MAW G3	S-3 TO SUBMIT	
1700	1730	OPS 5	MAINTENANCE MEETING	ALL DESIGNATED PERSONNEL TO ATTEND	

UNITED STATES MARINE CORPS

MARINE MEDIUM TILTROTOR SQUADRON 261 (-) REINFORCED, COLD RESPONSE DETACHMENT
MARINE AIRCRAFT GROUP 26, 2D MARINE AIRCRAFT WING, FMF
POSTAL SERVICE CENTER BOX 21016
JACKSONVILLE, NC 28545-1016

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FLIGHT SCHEDULE THURSDAY, 17 MARCH 2022 (2076)

ODO: (b)(3), (b)(6), (b)(7)c 0900-1630
ODO: 1615-LPOD
DO (OPS 5):
AD (OPS 5): (b)(3), (b)(6), (b)(7)c
SCHEDULE (24): (b)(3), (b)(6), (b)(7)c (FRI - SAT)

SCHEDULED HOURS
15.2

MAR (GOAL/SCHEDULED/EXECUTED)
210.1 / 114.0 / 89.9
QTR
600.3 / 467.2 / 348.7
FY
2426.0 / 773.7 / 643.7

ENBO	FIELD HOURS: 24 HRS QUIET HOURS: NONE	BMNT / SR: 0416 / 0615	SS / EENT: 1808 / 2008	MR / MS: 1624 / 0718	ILLUM: 98%	LLL: NONE HLL: 2008-0412*

EVENT	TMR	BRF	ETD	ETR	HRS	AIRCREW	TRAINING CODES	MISSION	NOTES	CONFIG
GHOST 3-0 MV-22B	2K2	0930	TBD	TBD	TBD	(b)(3), (b)(6), (b)(7)c		FCF		
GHOST 3-1 MV-22B	1A1	1200	1500	1815	3.3	CPL MOORE, J. (b)(3), (b)(6), (b)(7)c CAPT TOMKIEWICZ, M.	2242, 2280, 2281, 2282, 2641, 6240 2242, 2280P, 2281P, 2282R, 2641 2242, 2282, 2641 2242, 2282, 2641	SEC LAT / CALS	1	
GHOST 3-2 MV-22B	1A1	1200	1500	1815	3.3	(b)(3), (b)(6), (b)(7)c	2242, 2280, 2281, 2282, 2641 2242, 2280, 2281, 2282, 2641 2242, 2282, 2641 2242, 2282X, 2641	SEC LAT / CALS	1	
GHOST 3-3 MV-22B	2L5 1A9	1645	1945	0000	4.3		2280, 2281, 2282, 2341, 2441, 3340, 6240 2280, 2281, 2282, 2341, 2441R, 3340R, 5340X 2282, 2341, 3340P 2282, 2341, 3340X	NS TAAR / TRAP	2	
MV-22B	1A9	1645	1945	0000	4.3		2280, 2281, 2282, 2341, 2441P, 3340 2280, 2281, 2282, 2341, 2441X, 3340 2282, 2341, 3340R 2282, 2341, 3340P	NS TAAR / TRAP	2	

@ AIR MISSION COMMANDER / # FLIGHT LEAD / ** DIVISION LEAD / * SECTION LEAD / X ATF REQUIRED / R NOT PROFICIENT / P PROFICIENCY EXPIRES W/I 90 DAYS
** UNLESS OTHERWISE INDICATED, ALL FLIGHTS WILL ORIGINATE AND TERMINATE AT BODØ AIR BASE (ENBO) **

FLIGHT NOTES:

1. TO FLY LAT ROUTE A AND B.
2. D522 RESERVED FOR NS TAAR WITH VMGR-252.

ADMIN NOTES:

START	END	LOCATION	REMARKS	NOTES	POC
0630	TBD	CHOW HALL	NARVIK PORT PDSS	(b)(3), (b)(6), (b)(7)c AND (b)(3), (b)(6), (b)(7)c TO ATTEND	(b)(3), (b)(6), (b)(7)c
0900	0930	OPS 5	MAINTENANCE MEETING	ALL DESIGNATED PERSONNEL TO ATTEND	
1000	1030	CAVES	INTEL BRIEF	S-2 PERSONNEL TO ATTEND	
1100	1200	CAVES	RETROGRADE MEETING	ALL DESIGNATED PERSONNEL TO ATTEND	
1330	1400	MS TEAMS	APB	ASRs FOR FOLLOWING DAYS VERIFICATION	
1500	1600	OPS NORTH	SAFETY MEETING	(b)(3), (b)(6), (b)(7)c AND (b)(3), (b)(6), (b)(7)c ATTEND	
NLT	1500	INDIVIDUAL SPACES	SITREP INPUTS DUE TO S-3	ALL SHOPS TO SUBMIT	
NLT	1600	OPS 5	SITREP DUE TO MAW G-3	S-3 TO SUBMIT	
NLT	1600	OPS 5	ATO INPUTS DUE TO MAW G-3	OPS CLERKS TO SEND TO (b)(3), (b)(6), (b)(7)c (b)(3), (b)(6), (b)(7)c	
1900	1930	OPS 5	MAINTENANCE MEETING	ALL DESIGNATED PERSONNEL TO ATTEND	

OPS: /S/
DSSN: /S/
MAINT: /S/

(b)(3), (b)(6), (b)(7)c
COMMANDING OFFICER

ENCLOSURE (26)

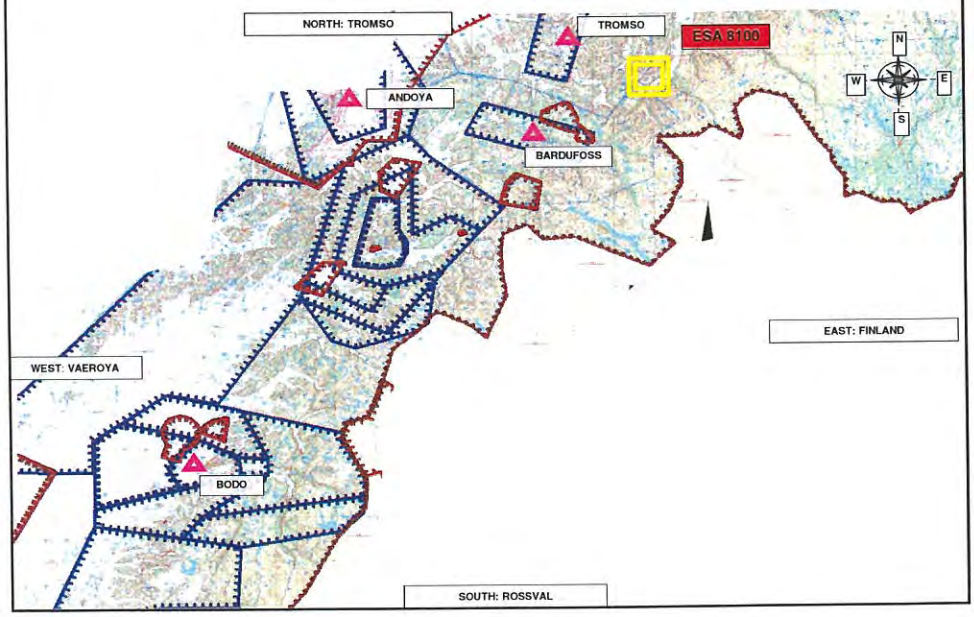
ALS / SEC LAT / CAL

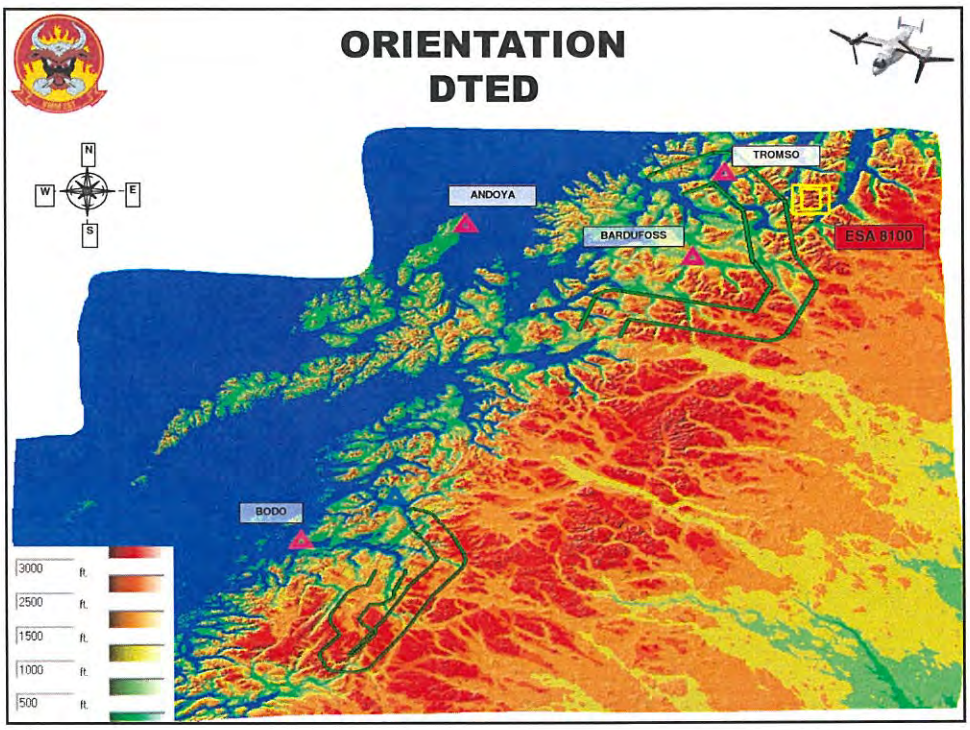
GHOST 3-1 Flight

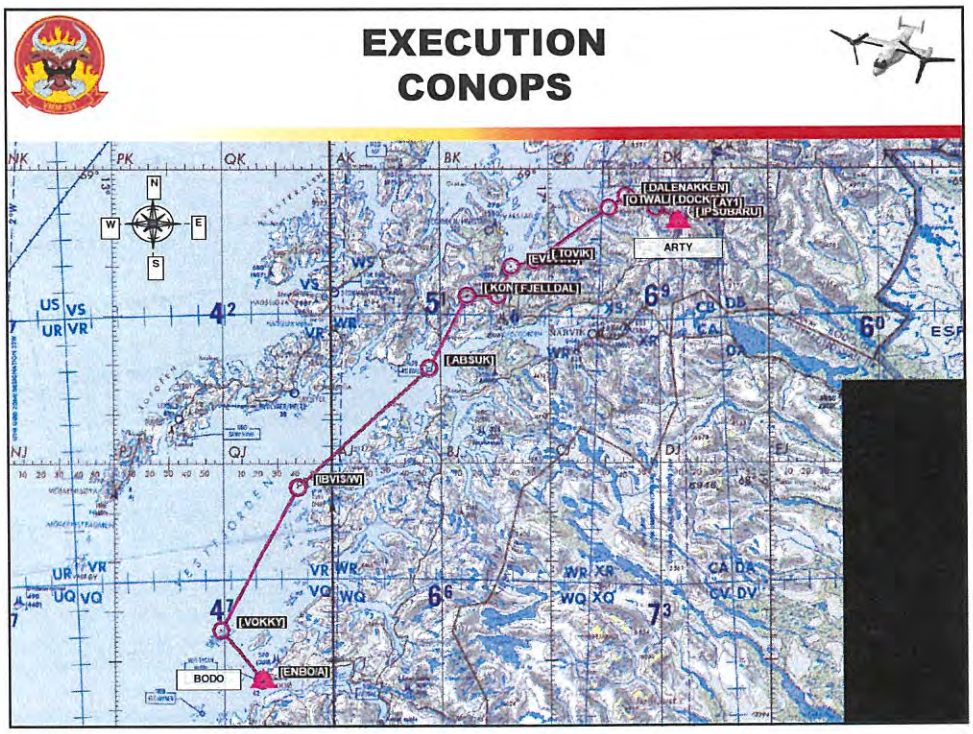
31Y/94Y

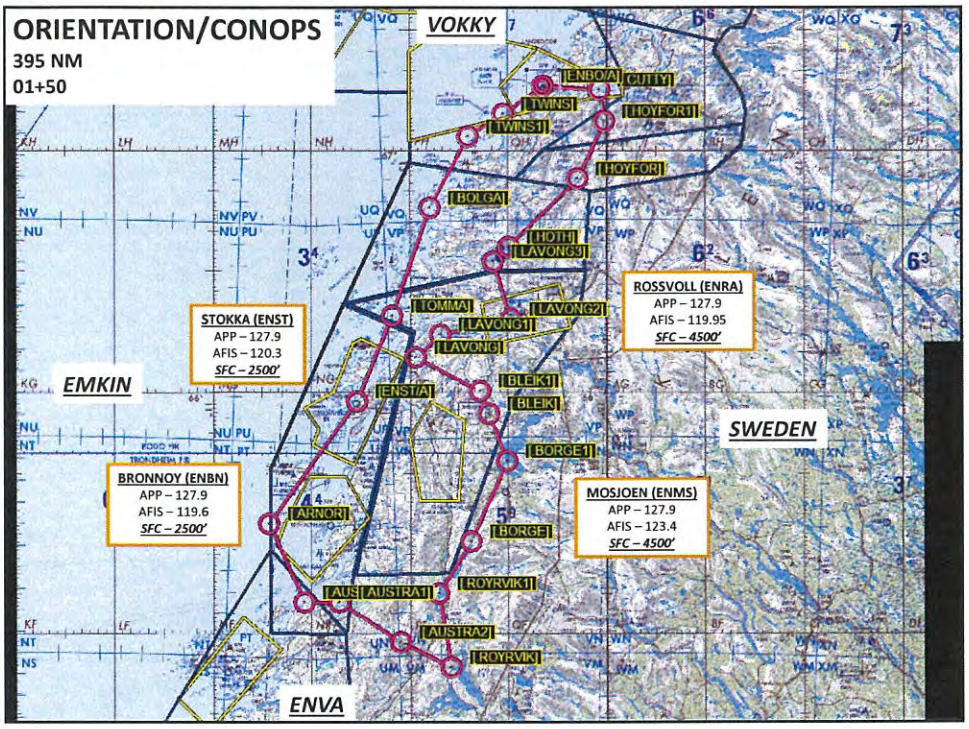
TAC 1(Btn 21S): 280.275
17 March 2022

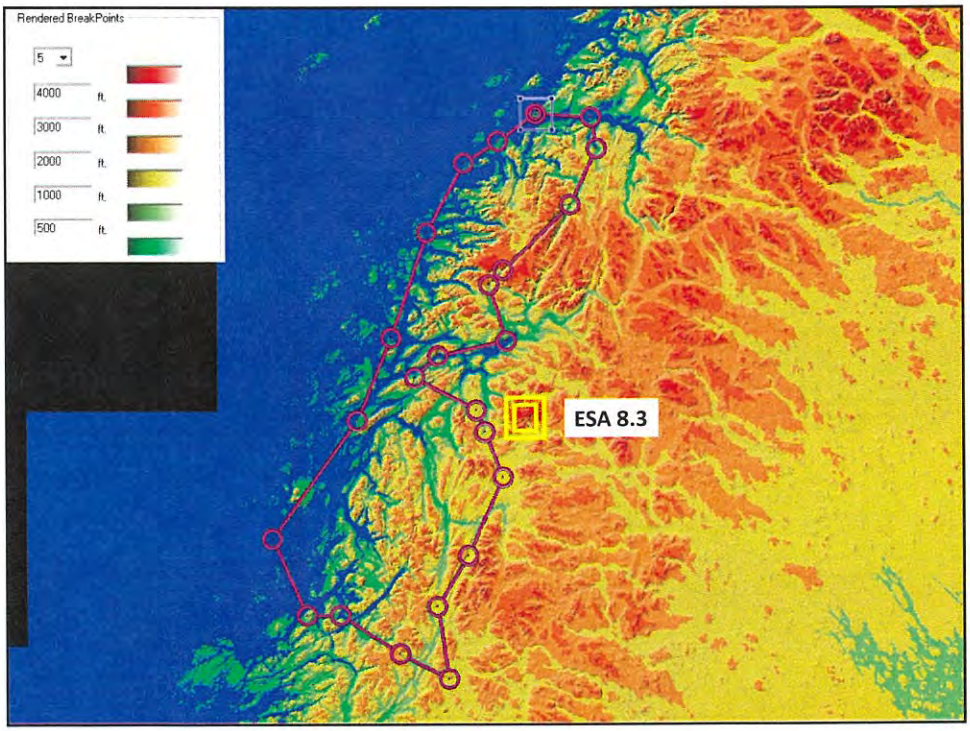
ORIENTATION
Area of Operation

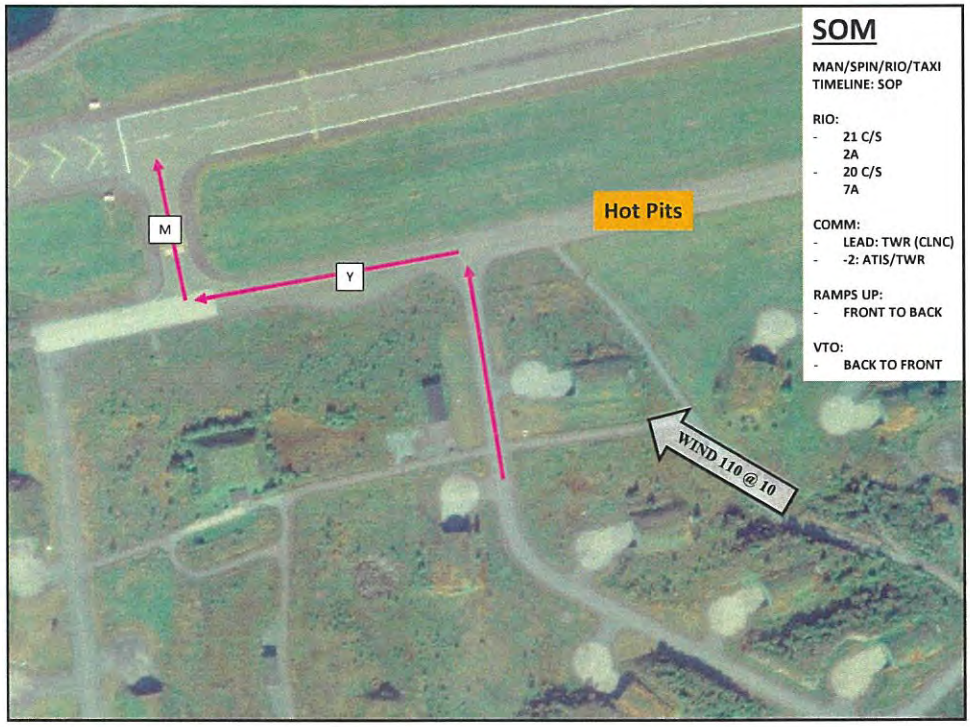


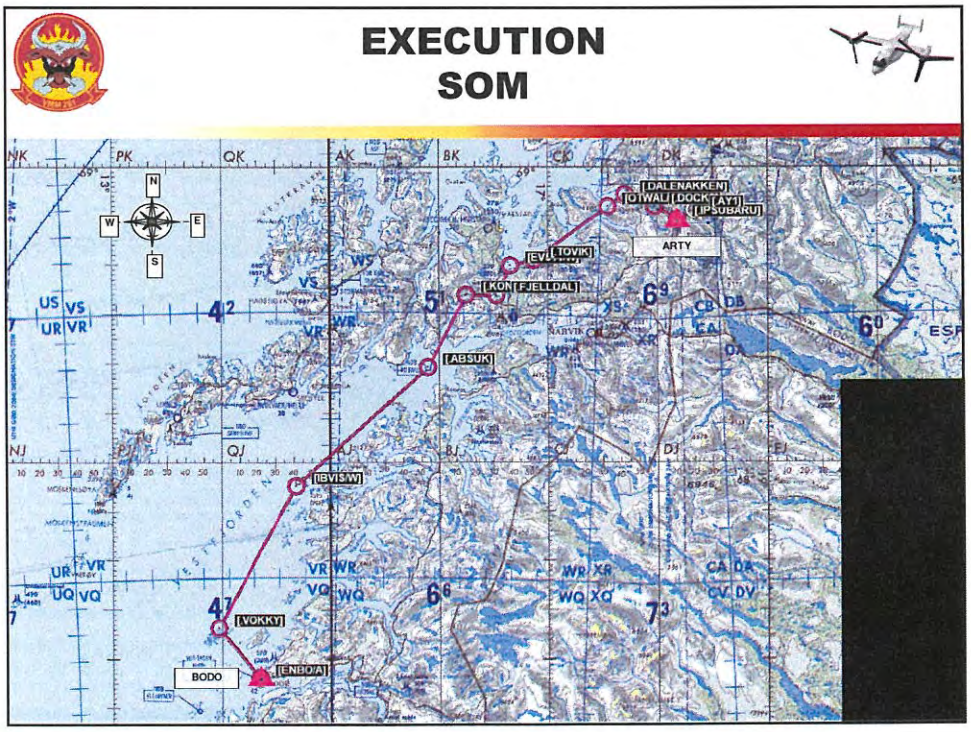

ORIENTATION
DTED
N
W
E
S
TROMSO
ANDOYA
BARDUFOSS
ESA 8100
BODO
3000 ft.
2500 ft.
1500 ft.
1000 ft.
500 ft.


EXECUTION
CONOPS
N
W
E
S
[DALENAKKEN]
[OTWALI]
[DOCK]
[AY1]
[IPSUBARU]
ARTY
[EVI]
[TOVIK]
[KON]
[FJELLDAL]
[ABSUK]
[BVISW]
[VOKKY]
[ENBOA]
BODO

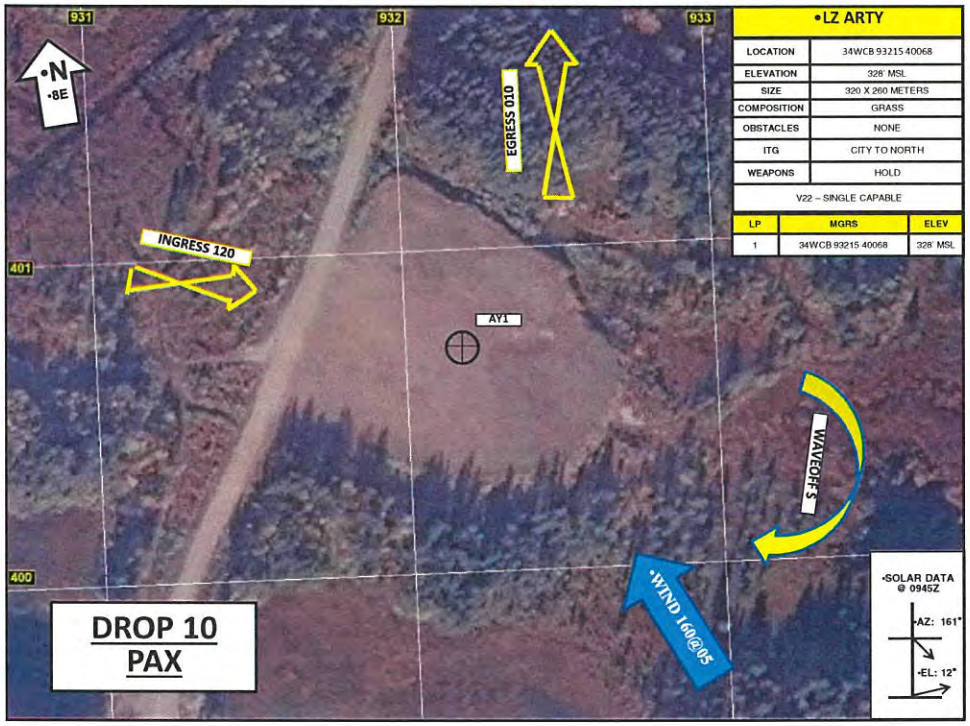

ORIENTATION/CONOPS
395 NM
01+50
VOKKY
EMKIN
SWEDEN
ENVA
STOKKA (ENST)
APP – 127.9
AFIS – 120.3
SFC – 2500'
ROSSVOLL (ENRA)
APP – 127.9
AFIS – 119.95
SFC – 4500'
BRONNOY (ENBN)
APP – 127.9
AFIS – 119.6
SFC – 2500'
MOSJOEN (ENMS)
APP – 127.9
AFIS – 123.4
SFC – 4500'
ENBO/A
CUTTY
TWINS
TWINS1
HOYFOR1
HOYFOR
BOLGA
HOTH
LAVONG3
TOMMA
LAVONG2
LAVONG1
LAVONG
ENSTA
BLEIK1
BLEIK
BORGE1
ARNOR
BORGE
ROYRVIK1
AUS
AUSTRA1
AUSTRA2
ROYRVIK


Rendered BreakPoints
5
4000 ft.
3000 ft.
2000 ft.
1000 ft.
500 ft.
ESA 8.3



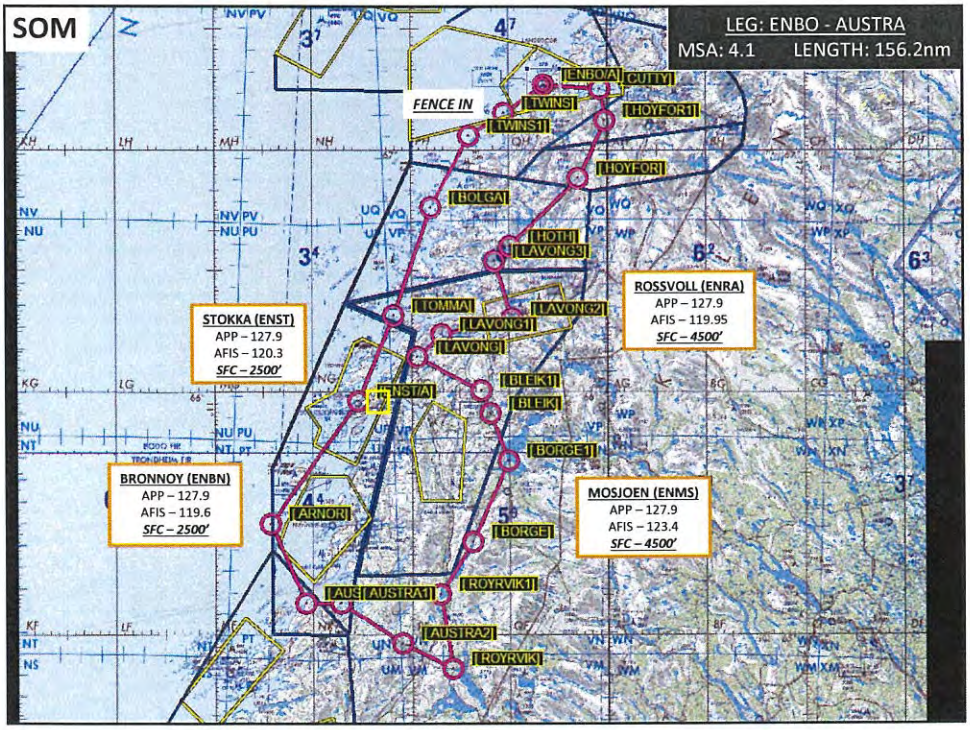


ENCLOSURE (27 4)

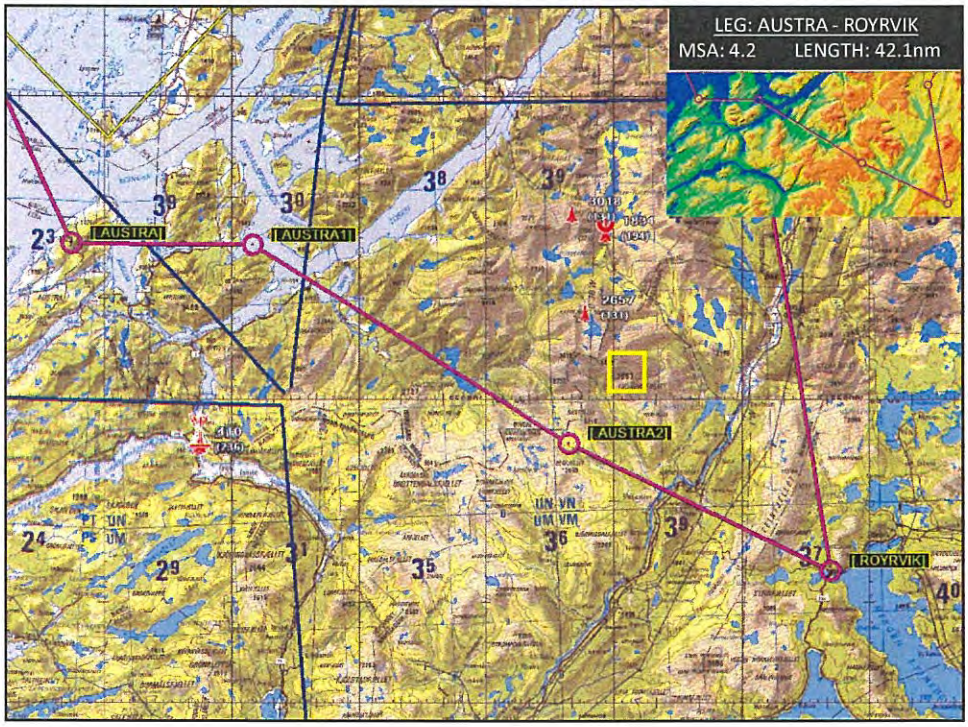


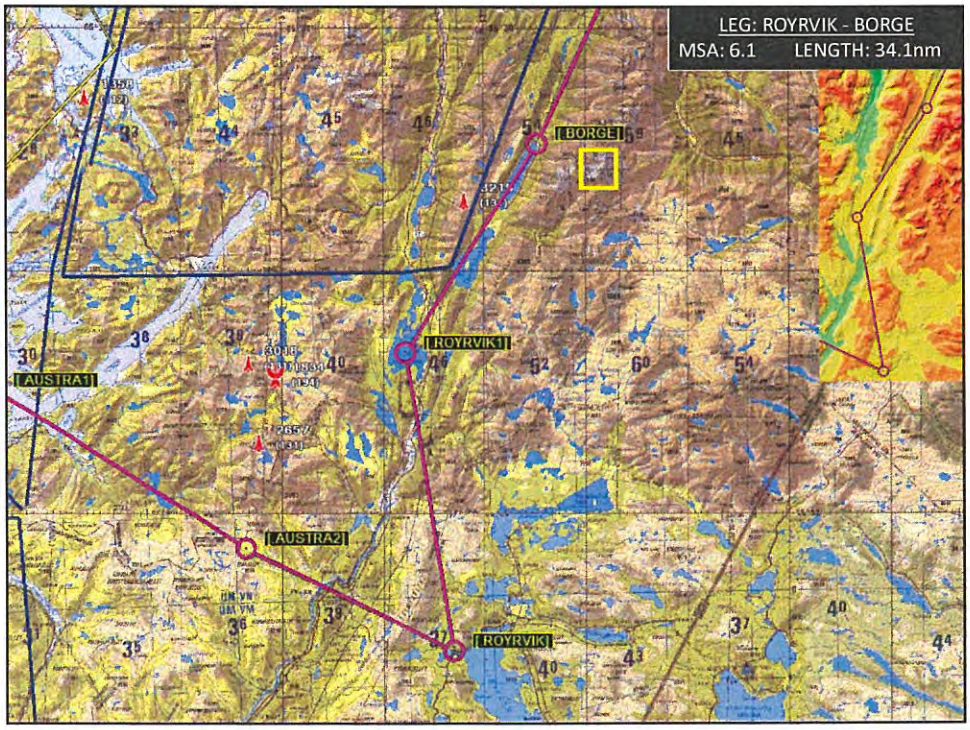
•LZ ARTY	
LOCATION	34WCB 93215 40068
ELEVATION	328' MSL
SIZE	320 X 260 METERS
COMPOSITION	GRASS
OBSTACLES	NONE
ITG	CITY TO NORTH
WEAPONS	HOLD
V22 – SINGLE CAPABLE	

LP	MGRS	ELEV
1	34WCB 93215 40068	328' MSL

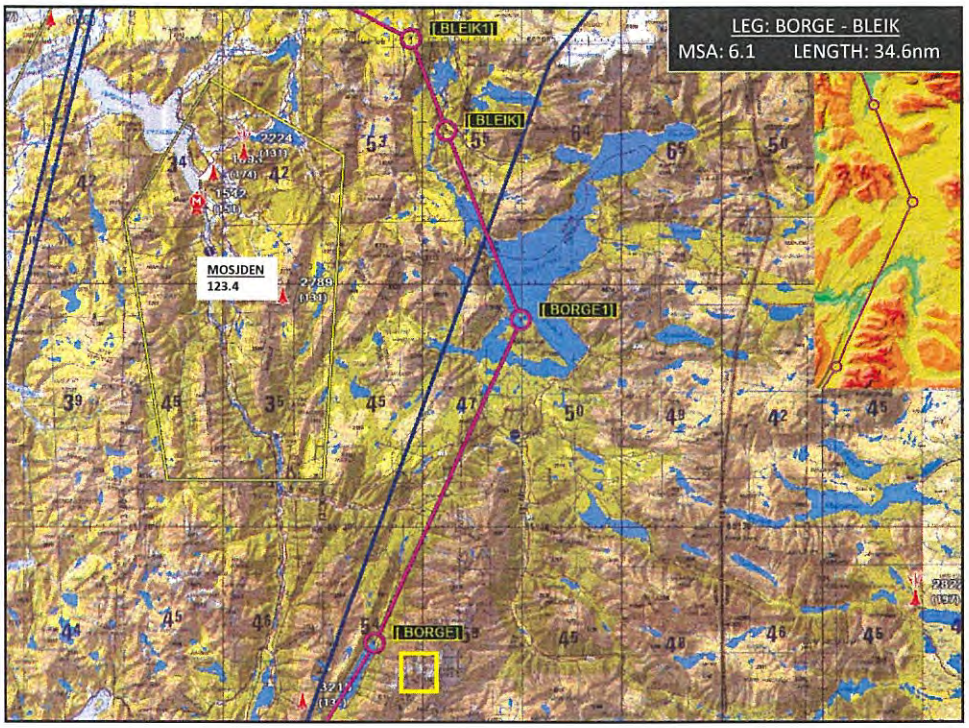


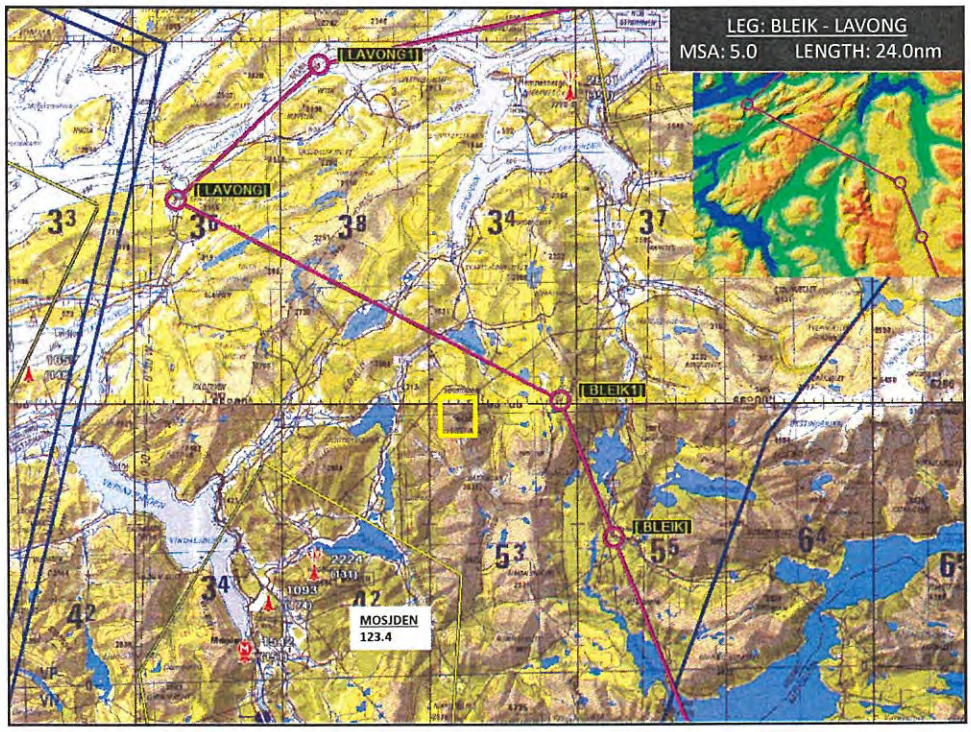
ENCLOSURE (27)



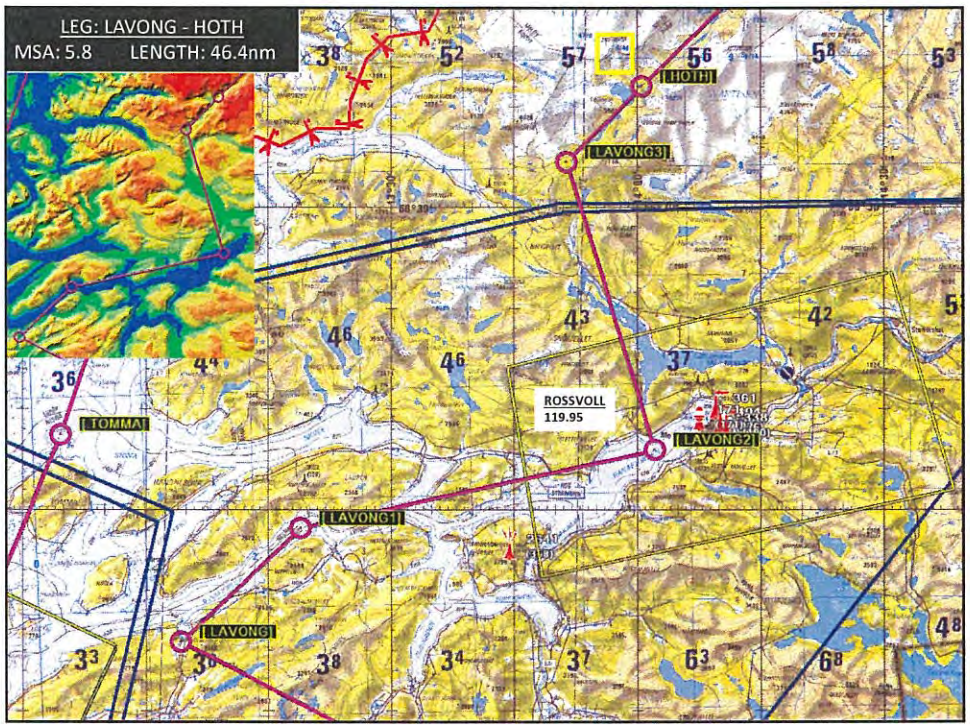


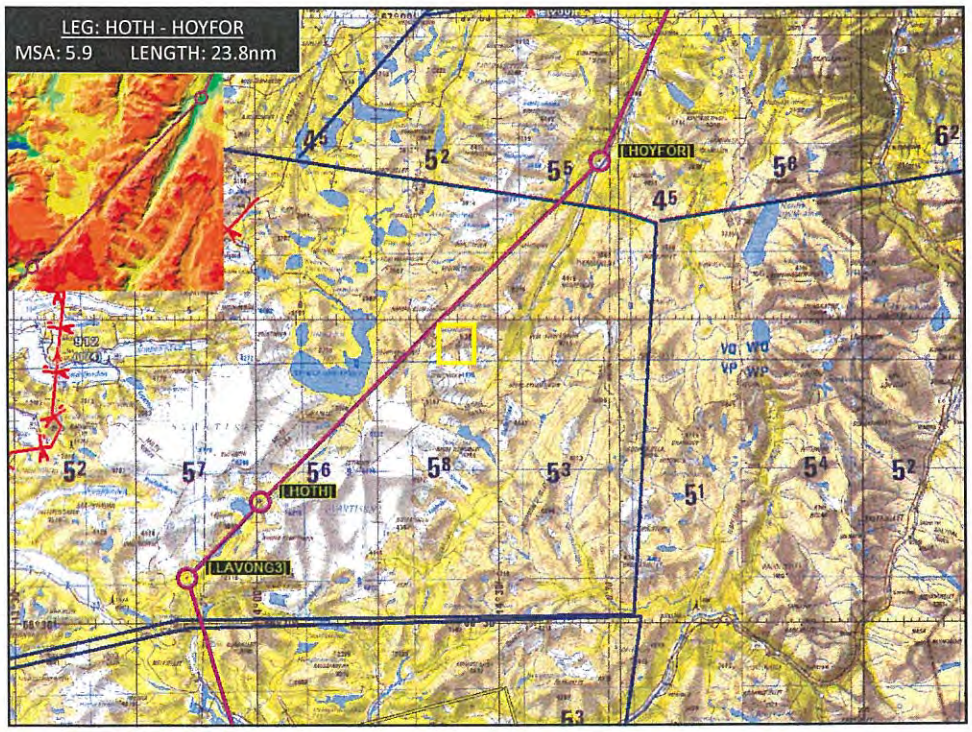
ENCLOSURE (275)



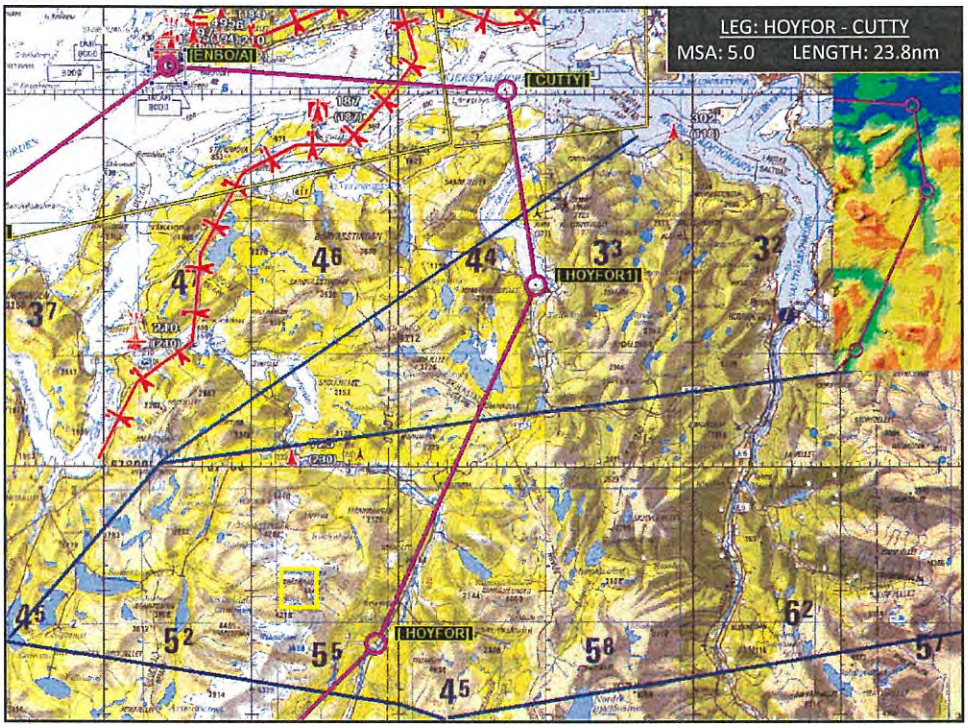


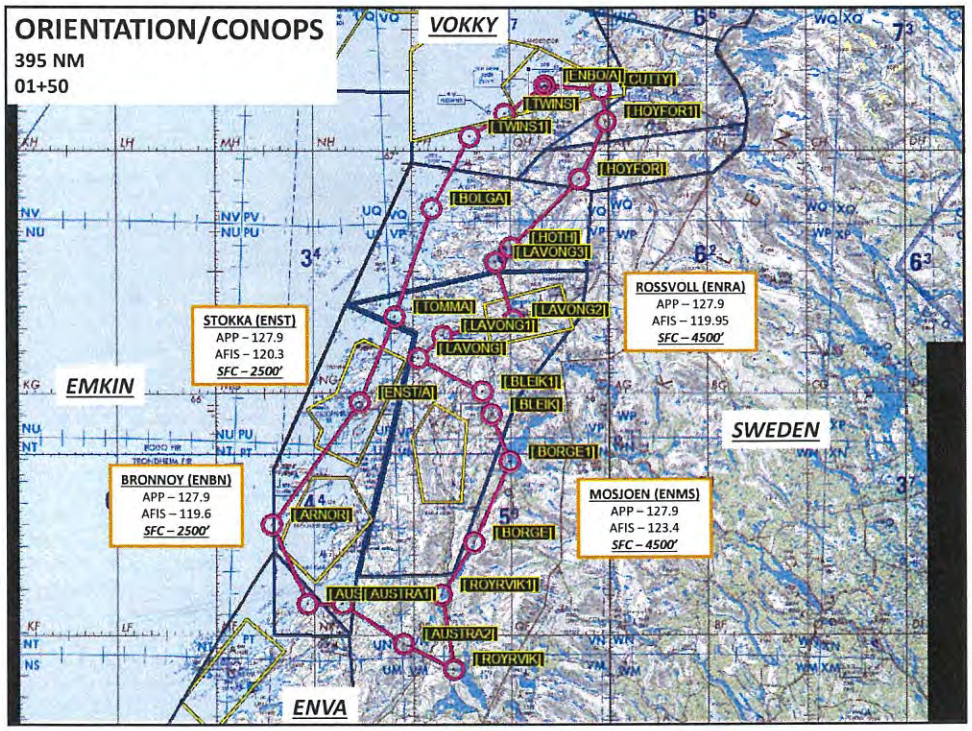
ENCLOSURE (27)



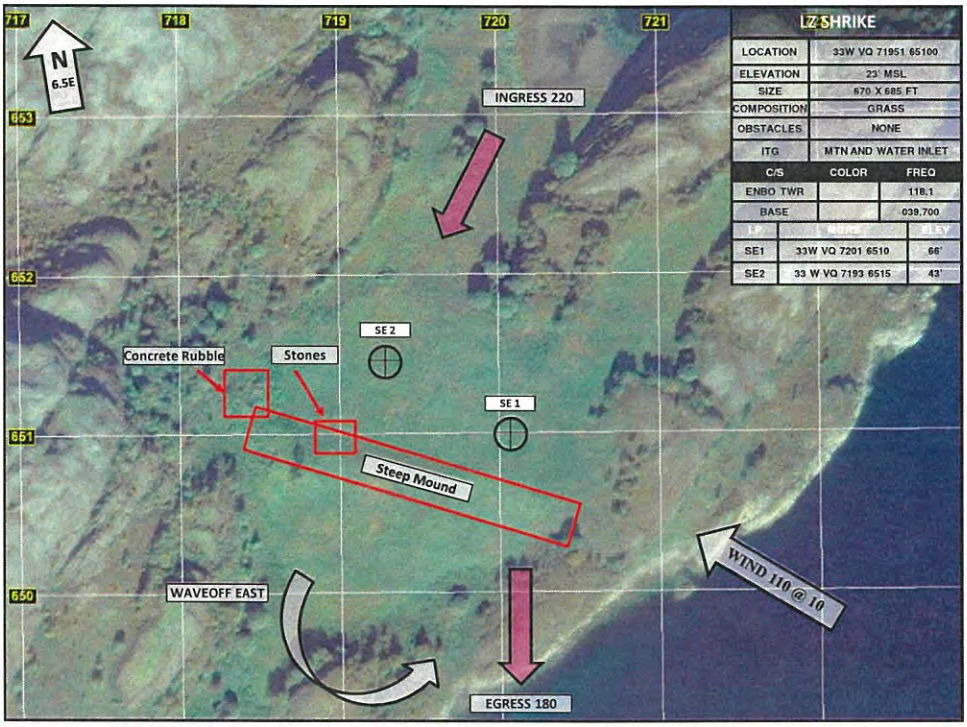


ENCLOSURE (278)





ENCLOSURE (279)



EXECUTION
Coordinating Instructions

- Mission-Essential Equipment
  - Aircraft: DTED
  - Personal: Food/Water for 3.3 hrs of flight
- GO
  - 1 x MV-22
- No-Go
  - 500/1
- Aborts - SOP
- Wave Offs (C1)
  - Single – Use C/S, maint lane, turn DW land w/ visual
  - Flight – Use flight C/S, maint lane, A/C furthest upwind priority to turn, land w/ visual

EXECUTION
Coordinating Instructions

- Emergency/System Failures
- IIMC
  - Bodo Reversal
  - Wx < 1000' AGL / degraded visibility below terrain = CONV mode
  - Loss of 3 ground references = "Knock it off"
- Loss of Visual Contact
  - Over water: ASTACSOP
  - In Terrain: talk-on → Bodo reversal
- Terminate / Knock-it-off
- Downed AC
  - Internal / External

ADMIN AND LOGISTICS

- Bump Plan:
  - 3-2 takes good A/C with Capt Brao
- Delay/Straggle Plan/Drop Dead
  - Delay: 15 mins for section; Good A/C takes Ghost 3-1 call sign and pax
  - Straggle:
    - Straggle A/C Stay local for CALs
    - Stay up TAC-1
    - Rejoin on deck in Shrike
  - Drop Dead
    - 1645L: PAX movement
    - 1715L (training)

ADMIN AND LOGISTICS

- Fuel Plan / Fuel required
  - T/O: 10.5
  - Mission: 10.5
  - Joker: 4.5
  - Bingo: 3.7 (Arty - ENBO)
    - Available: ENBO/ENDU
  - BINGO NO FLPN: ENBO/2200#/4500'/200KTS
- LOS/Bullseye: ENBO/ENEV/ENDU
- Ordnance: TNG/SEMI/PROG-1
- Debrief Location/Time

COMMAND AND SIGNAL

- Chain of Responsibility
  - Authority to change route, LZs – SL
  - Extension/Schedule change: SOP
- Frequencies
  - Assigned calls:
    - LD = ATC, COMM3
    - -2 = WX, BASE, AIRSPACE COORD
- Lost Comm / Single Radio Plan
  - ASTACSOP Day Method 2
  - Maintain Ch2, Good Comm A/C assume Ch1 calls
- Chattermark = 21S – 20 – 1
- Golden = 1
- IFF Procedures/Codes
  - 3-1 carries squawk

RM

- Risk to Forces
  - Blue: Poor weather calls with confining terrain and icing.
    - WX < 5000'/5sm at coastal airports = No Inland LAT
    - WX < 1000'/3sm = Conversion Mode
    - WX < 500' / 1sm = No Go
  - Red: Terrain / Icing / Turbulence
- Risk to Mission
  - Blue: Getting behind fuel ladder due to CONV mode Ops.
  - Red: WX

CLEAN UP

QUESTIONS?

From:
To:

(b)(3), (b)(6), (b)(7)c

Subject: [Non-DoD Source] Monday information - Please read
Date: Monday, March 14, 2022 4:14:50 PM
Attachments: LL Routes NEW - Part 1 of 2.pdf
LL Routes NEW - Part 2 of 2.pdf

Hey, all!

Some information, please read all and distribute to all pilots!

We realize at Lion Ops that certain things that have been briefed and informed via e-mails and Signal messages haven't come across to everyone. Please make sure your squadron has a way of letting ALL pilots in on the info routed from us to you.

- Low Level

o We have finally gotten a standing approval for TWO low level routes down to an altitude of 500'.

o They are attached and are NOT the same ones you received earlier. Please shred the previous route and plan for this one any time you want to go flying lower than 1000'.

o For ATO requests, requesting "Low level route Alpha" should be sufficient for NAOC to know. Any time you go off this route, please climb back to 1000'.

o AGAIN: You still have to plan these routes properly with regards to towers, power lines, etc. They are not recently chummed.

- IFG

o You have all received this. The presets on the front page are possible (and encouraged) to use by tower here in Bodø. They prefer UHF frequencies for ground, tower, departure/approach and arrival. VHF only for Polaris (Preset 8 and 9.)

o "Lion 69, push Departure channel 6." Etc.

o This is just a recommendation, ATC is aware that this might not be the standard for you all.

- FARP

o You HAVE to contact tower to operate on Yankee.

o Today there was an incident (again) where Tower suddenly realized that FARPing(?) was going on, but the pilots had not informed Tower that this would take place.

- Flight Plans

o Bodø TWR now wants you to ALWAYS file a VFR flight plan, this is due to some sort of system limitations.

o Apparently it is 6-9 times easier for them to accommodate you when the FPL has "VFR" in it compared to when it says "IFR."

o When you contact tower, this is where you state your actual request. ("Vokky VFR 1000'"or "XXXX IFR departure.")

o In the remarks/free text of your FPL, this is where you will put WHERE you're going, or what area, and also the remark "CR22".

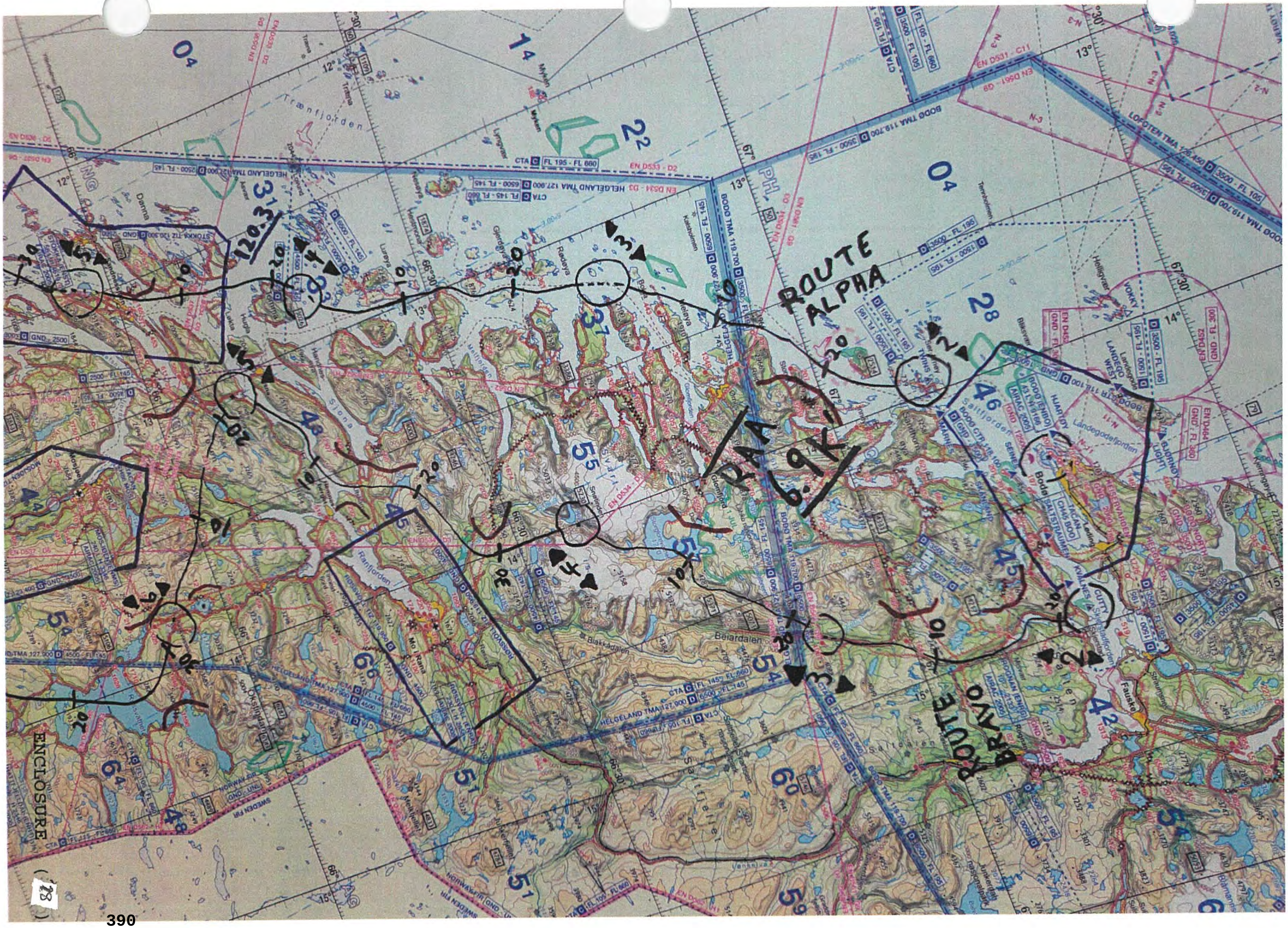
Thanks guys.

ARC

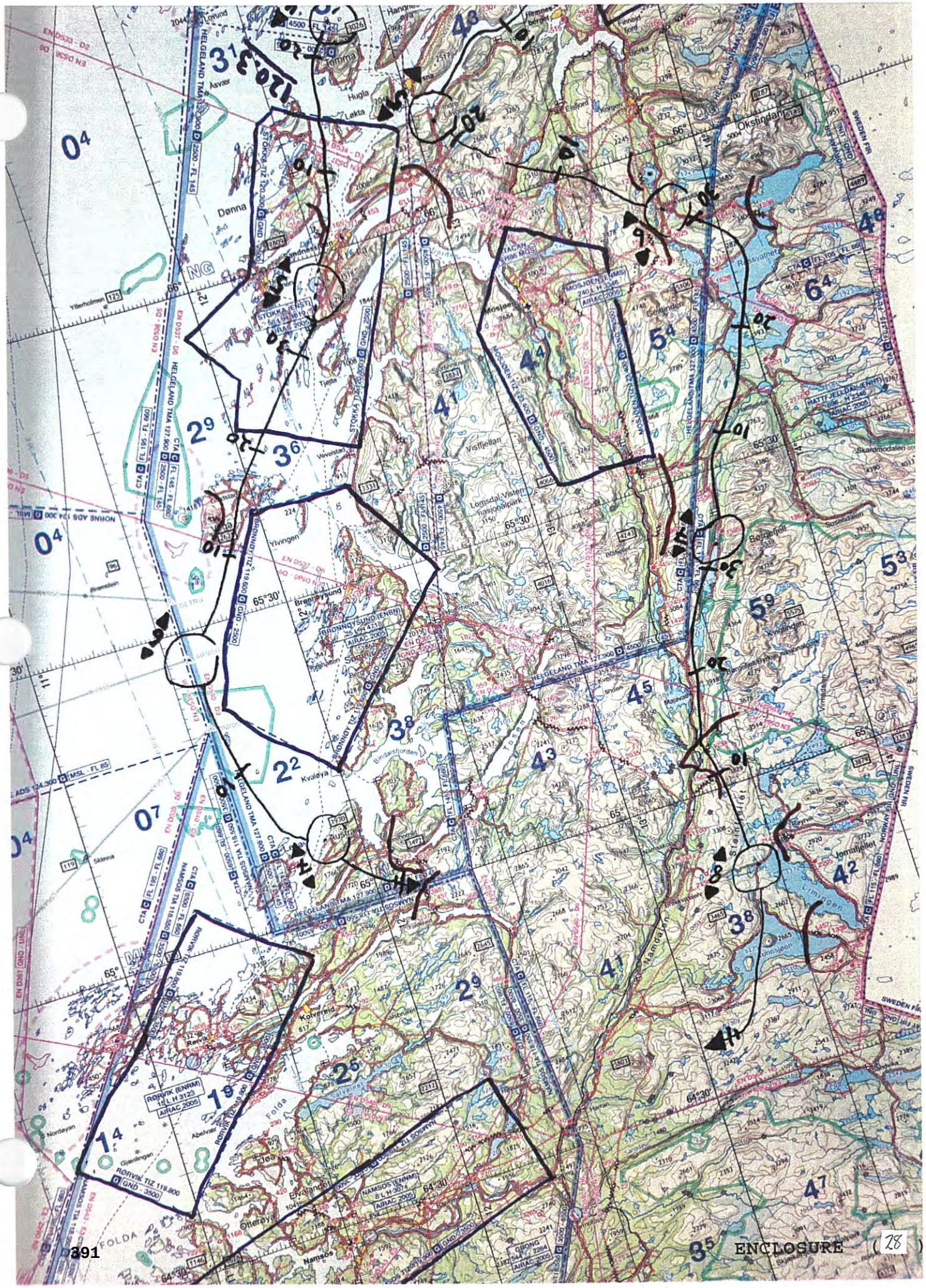
(b)(3), (b)(6), (b)(7)c

Royal Norwegian Air Force

(b)(3), (b)(6), (b)(7)c



ENCLOSURE (28)


HELGELAND TMA
STOKKA (ENST)
MOSJOEN (ENMS)
BRONNOYSUND (ENBN)
RØRVIK (ENRM)
NAMSOS (ENNM)
Okstindan
Mosjøen
Visfjellan
Lomsdal-Visten nasjonalpark
Bronnøysund
Rørvik
Namsos
Kolvereid
Kvaløya
Dønna
Tjøtta
Hugla
Tomma
Asvær
Yttersholmen
Bremstein
Sklinna
Nordøyan
Gjesdingen
Abelvær
Folda
Otterøya
Jomfjellet
Limingen
Hamdalen
Tosen
Bindalsfjorden
Ytvingen
Vevelstad
Tjøtta
Elsfjord
Kjøpsvik
Finnbyfjord
Hemnesberget
Skandmodalen
Susendalen
Bergefjell
Svartisen
Rossvatnet
Gjelmindal
Sjøfjellet
Sjøvatnet
Ingmyrfjellet
Vimnesjøen
Ytterholmen
Sørfjorden
Bjørnfjellet
Bjørnfjellet

Flightplan Id's
458995 - 0 -

x Aircraft Id
GHOST31

x Flight Rules
V: VFR

x Type of Flight
M: Military

Number of Aircraft(s)
1

x Type of Aircraft
V22

x Wake Turbulence Category
M: Medium

x Equipment (NAV/COM)
SDITUY

(SSR/ADS)
CS

x Date of Flight (yymmdd)
220318

x ADEP
ENBO

x EOBT (UTC-time)
1000

x Cruising Speed
N 0200

x Cruising Level
A 015

x ADES
ENBO

x Total EET (HHMM)
0315

1. Altn. Aerodrome

2. Altn. Aerodrome

x Route. Visualize Route: Convert Route Coordinates:

DCT VOKKY DCT TUVLA DCT GIRUX DCT UNSOR DCT EVANI DCT KEGAX DCT DITEB DCT MOVAB DCT DITEB DCT GIBMO DCT ELDUR DCT UBABA DCT ARDUX DCT VOKKY

Other Information

RMK/SSR A1631 OAT IN CR22 AREA

Supplementary Information

x Endurance(HHMM)
0330

x Persons on board
4

Emergency Radio
☑ UHF ☑ VHF ☐ ELT ☐ PLB

Information on Survival Equipment
☑ Survival ☑ Polar ☐ Desert ☑ Maritime ☐ Jungle

Information on Jackets
☑ Jackets ☐ Light ☐ Fluores ☑ UHF ☑ VHF

Information on Dinghies

Number of Dinghies	Capacity	Cover	Colour
1	28	☐	YELLOW

x Aircraft Colour and Markings
GREY

ENCLOSURE (29)

Flightplan Id's
458994 - 0 -

x Aircraft Id
GHOST31

x Flight Rules
V: VFR

x Type of Flight
M: Military

Number of Aircraft(s)
1

x Type of Aircraft
V22

x Wake Turbulence Category
M: Medium

x Equipment (NAV/COM)
SDITUY

(SSR/ADS)
CS

x Date of Flight (yymmdd)
220318

x ADEP
ENBO

x EOBT (UTC-time)
1345

x Cruising Speed
N 0200

x Cruising Level
A 015

x ADES
ENBO

x Total EET (HHMM)
0315

1. Altn. Aerodrome

2. Altn. Aerodrome

x Route. Visualize Route: Convert Route Coordinates:

DCT TWINS DCT STO DCT ARNOR DCT RORIK DCT DETMU DCT GUBAV DCT LORDO DCT RA501 DCT DISMU DCT CUTTY DCT

Other Information

RMK/OAT IN CR22 AREA SSR 1631

Supplementary Information

x Endurance(HHMM)
0330

x Persons on board
4

Emergency Radio
- [x] UHF
- [x] VHF
- [ ] ELT
- [ ] PLB

Information on Survival Equipment
- [x] Survival
- [x] Polar
- [ ] Desert
- [x] Maritime
- [ ] Jungle

Information on Jackets
- [x] Jackets
- [ ] Light
- [ ] Fluores
- [x] UHF
- [x] VHF

Information on Dinghies

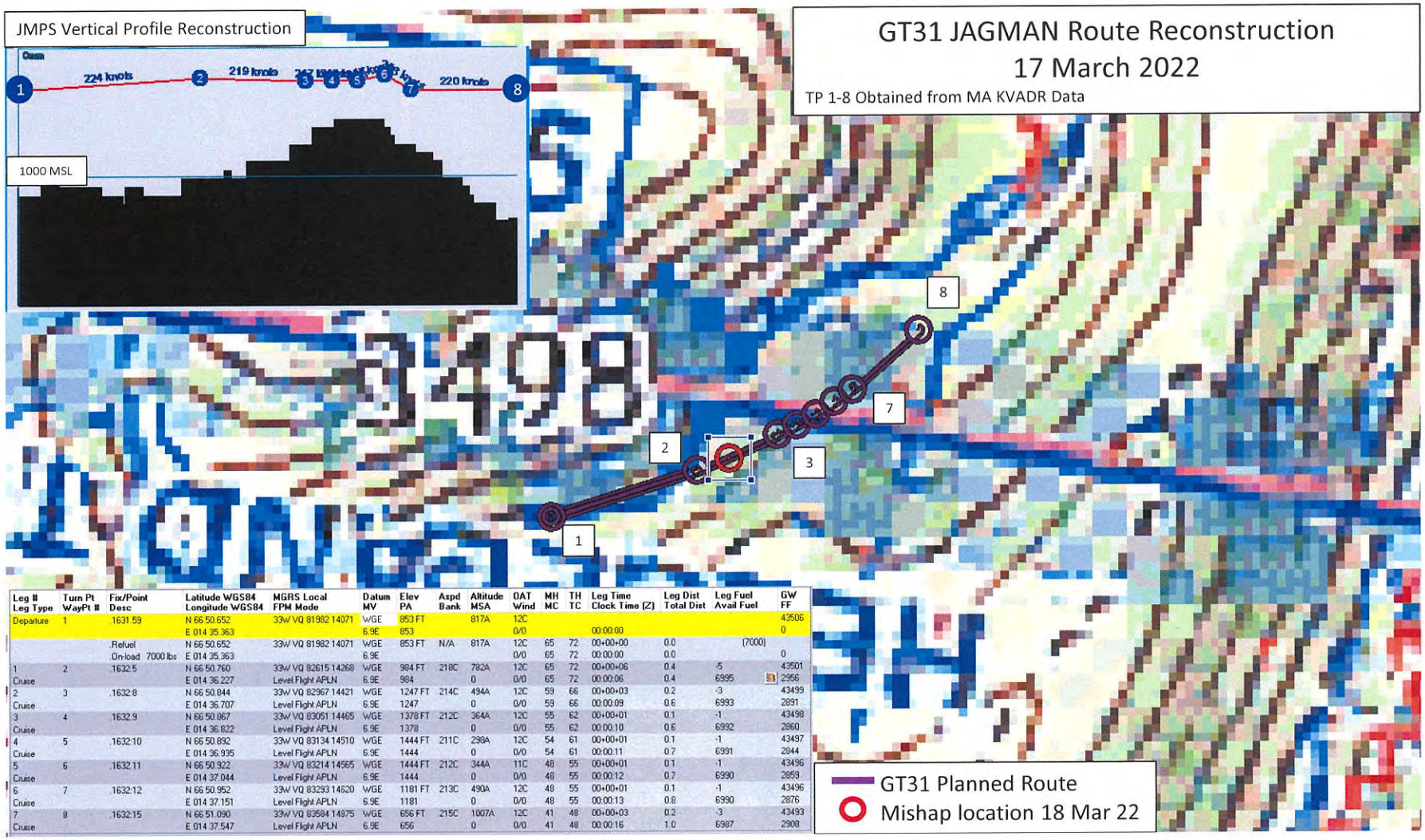
Number of Dinghies	Capacity	Cover	Colour
1	28	[ ]	YELLOW

x Aircraft Colour and Markings
GREY

ENCLOSURE (29)

JAGMAN LAT Flight Reconstruction
17 March 22

- Depiction created from MA recovered KVADR data for flight that occurred day prior to mishap
- Created by JAGMAN team to validate squadron flying tendencies through terrain IVO mishap location
- Low-level profile flown IAW TTPs and commensurate with terrain



Leg # Leg Type	Turn Pt WayPt #	Fix/Point Desc	Latitude WGS84 Longitude WGS84	MGRS Local FPM Mode	Datum MV	Elev PA	Aspd Bank	Altitude MSA	OAT Wind	MH MC	TH TC	Leg Time Clock Time (Z)	Leg Dist Total Dist	Leg Fuel Avail Fuel	GW FF
Departure	1	.1631.59	N 66 50.652	33W VQ 81982 14071	WGE	853 FT		817A	12C						43506
			E 014 35.363		6.9E	853			0/0			00:00:00			0
		.Refuel	N 66 50.652	33W VQ 81982 14071	WGE	853 FT	N/A	817A	12C	65	72	00+00+00	0.0	(7000)	
		.On-load 7000 lbs	E 014 35.363		6.9E				0/0	65	72	00:00:00	0.0		0
1	2	.1632.5	N 66 50.760	33W VQ 82615 14268	WGE	984 FT	218C	782A	12C	65	72	00+00+06	0.4	-5	43501
Cruise			E 014 36.227	Level Flight APLN	6.9E	984		0	0/0	65	72	00:00:06	0.4	6995	2966
2	3	.1632.8	N 66 50.844	33W VQ 82967 14421	WGE	1247 FT	214C	494A	12C	59	66	00+00+03	0.2	-3	43499
Cruise			E 014 36.707	Level Flight APLN	6.9E	1247		0	0/0	59	66	00:00:09	0.6	6993	2891
3	4	.1632.9	N 66 50.867	33W VQ 83051 14465	WGE	1378 FT	212C	364A	12C	55	62	00+00+01	0.1	-1	43498
Cruise			E 014 36.822	Level Flight APLN	6.9E	1378		0	0/0	55	62	00:00:10	0.6	6992	2860
4	5	.1632.10	N 66 50.892	33W VQ 83134 14510	WGE	1444 FT	211C	298A	12C	54	61	00+00+01	0.1	-1	43497
Cruise			E 014 36.935	Level Flight APLN	6.9E	1444		0	0/0	54	61	00:00:11	0.7	6991	2844
5	6	.1632.11	N 66 50.922	33W VQ 83214 14565	WGE	1444 FT	212C	344A	11C	48	55	00+00+01	0.1	-1	43496
Cruise			E 014 37.044	Level Flight APLN	6.9E	1444		0	0/0	48	55	00:00:12	0.7	6990	2859
6	7	.1632.12	N 66 50.952	33W VQ 83293 14620	WGE	1181 FT	213C	490A	12C	48	55	00+00+01	0.1	-1	43496
Cruise			E 014 37.151	Level Flight APLN	6.9E	1181		0	0/0	48	55	00:00:13	0.8	6990	2876
7	8	.1632.15	N 66 51.090	33W VQ 83584 14875	WGE	656 FT	215C	1007A	12C	41	48	00+00+03	0.2	-3	43493
Cruise			E 014 37.547	Level Flight APLN	6.9E	656		0	0/0	41	48	00:00:16	1.0	6987	2908

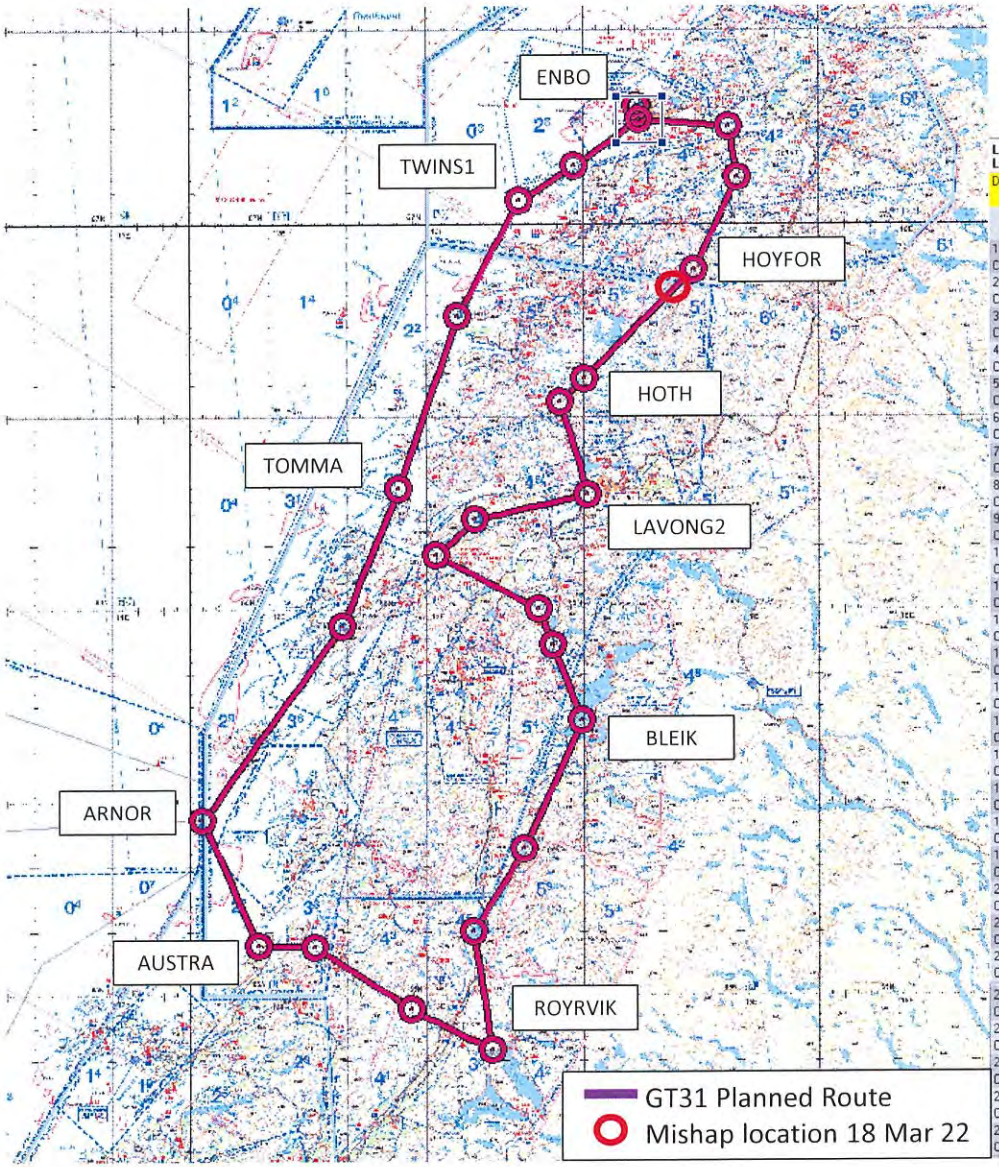
JAGMAN Mishap Flight Reconstruction
18 March 22

- Depiction created from MC Mission Binder in VMM-261 JMPS Server
  - Original planned mission route was updated with mishap location during squadron post-mishap actions, this checkpoint has been removed.
- Checkpoints along reconstruction route were obtained from Norwegian ATC track and MA KVADR Data
- Low-level profile flown IAW TTPs and commensurate with terrain

Enclosure (30)

GT 31 PLANNED MISSION ROUTE

18 March 2022

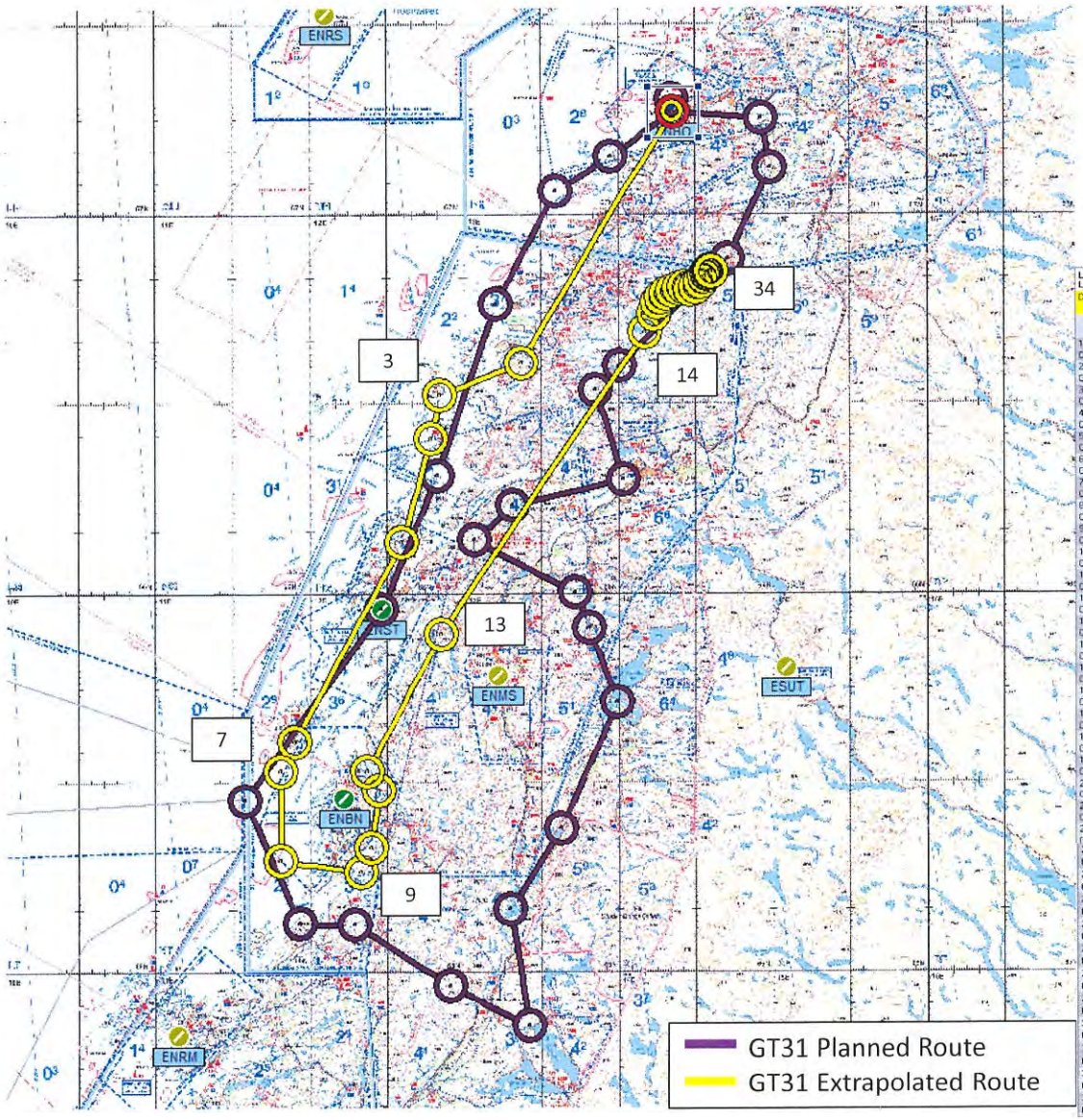


Leg # Leg Type	Turn Pt WayPt #	Fix/Point Desc	Latitude WGS84 Longitude WGS84	MGRS Local FPM Mode	Datum MV	Elev PA	Aspd Bank	Altitude MSA	OAT Wind	MH MC	TH TC	Leg Time Clock Time (Z)	Leg Dist Total Dist	Leg Fuel Avail Fuel	GW FF
Departure	1	ENBO/A	N 67 16.120	33W VQ 72351 61473	WGE	43 FT		0A	7C						46812
		BODO	E 014 21.529		6.9E	43			110/10			00:00:00			0
		.Refuel	N 67 16.120	33W VQ 72351 61473	WGE	43 FT	N/A	0A	7C	224	231	00+00+00	0.0	(10500)	
		.Onload 10500 lbs	E 014 21.529		6.9E				110/10	226	233	00:00:00	0.0		0
1	2	.TWINS	N 67 08.979	33W VQ 54646 48444	WGE	0 FT	220C	1500A	4C	224	231	00+03+08	11.9	-157	46655
Cruise			E 013 57.202	Level Flight APLN	6.6E	0		3800	110/10	226	233	00:03:08	11.9	10343	3005
2	3	.TWINS1	N 67 03.478	33W VQ 38963 38531	WGE	0 FT	220C	1500A	4C	228	235	00+02+39	10.0	-132	46522
Cruise			E 013 35.803	Level Flight APLN	6.4E	0		3500	110/10	230	237	00:05:47	21.9	10210	3002
3	4	.BOLGA	N 66 45.636	33W VQ 21027 05828	WGE	0 FT	220C	1500A	4C	198	205	00+05+26	20.1	-271	46251
Cruise			E 013 12.373	Level Flight APLN	6.2E	0		3500	110/10	201	207	00:11:13	42.0	9939	2999
4	5	.TOMMA	N 66 18.692	33W VP 02578 56327	WGE	10 FT	220C	1500A	4C	190	196	00+07+44	28.5	-386	45865
Cruise			E 012 49.598	Level Flight APLN	5.9E	10		3700	110/10	193	199	00:18:57	70.6	9553	2992
5	6	ENST/A	N 65 57.489	33W UP 85029 17564	WGE	57 FT	220C	1500A	4C	194	200	00+06+13	23.0	-309	45556
Cruise		STOKKA	E 012 28.227	Level Flight APLN	5.7E	57		4100	110/10	196	202	00:25:10	93.6	9244	2985
6	7	.ARNOR	N 65 27.245	32W PT 19664 61516	WGE	0 FT	220C	1500A	4C	208	214	00+10+02	37.5	-498	45058
Cruise			E 011 34.924	Level Flight APLN	5.1E	0		4100	110/10	211	216	00:35:12	131.1	8746	2978
7	8	.AUSTRA	N 65 07.663	32W PT 37746 25890	WGE	1903 FT	220C	1500A	0C	149	154	00+05+52	21.6	-288	44769
Cruise			E 011 56.153	Level Flight APLN	5.3E	1903		2700	110/10	150	155	00:41:04	152.6	8457	2949
8	9	.AUSTRA1	N 65 07.603	33W UN 72346 25300	WGE	0 FT	220C	1000A	5C	86	91	00+02+34	9.0	-128	44642
Cruise			E 012 17.534	Level Flight APLN	5.4E	0		4200	110/10	85	90	00:43:39	161.7	8330	2973
9	10	.AUSTRA2	N 64 57.801	33W VN 01362 06000	WGE	1772 FT	220C	1000A	2C	116	121	00+05+09	18.6	-254	44388
Cruise			E 012 54.652	Level Flight APLN	5.7E	1772		4200	110/10	116	122	00:48:48	180.2	8076	2950
10	11	.ROYRVIK	N 64 51.501	33W VM 25230 93599	WGE	1444 FT	220C	1000A	2C	110	115	00+04+04	14.5	-200	44189
Cruise			E 013 25.360	Level Flight APLN	6.0E	1444		4200	110/10	110	116	00:52:52	194.7	7877	2950
11	12	.ROYRVIK1	N 65 09.883	33W VN 20535 27879	WGE	1017 FT	220C	1000A	3C	347	353	00+04+55	18.7	-242	43947
Cruise			E 013 18.257	Level Flight APLN	5.9E	1017		6100	110/10	345	351	00:57:47	213.4	7635	2951
12	13	.BORGE	N 65 22.825	33W VN 36302 51544	WGE	1194 FT	220C	1000A	3C	29	35	00+04+10	15.4	-204	43742
Cruise			E 013 37.777	Level Flight APLN	6.1E	1194		6100	110/10	26	32	01:01:57	228.8	7430	2945
13	14	.BORGE1	N 65 42.747	33W VN 53988 88227	WGE	1260 FT	220C	1000A	3C	21	27	00+05+55	22.0	-290	43452
Cruise			E 013 59.849	Level Flight APLN	6.4E	1260		6100	110/10	18	24	01:07:52	250.8	7140	2941
14	15	.BLEIK	N 65 54.449	33W VP 45848 10110	WGE	1050 FT	220C	1000A	3C	334	341	00+03+18	12.6	-161	43291
Cruise			E 013 48.667	Level Flight APLN	6.3E	1050		6100	110/10	332	339	01:11:09	263.4	6979	2939
15	16	.BLEIK1	N 66 00.110	33W VP 41984 20705	WGE	1870 FT	220C	1000A	1C	334	341	00+01+34	6.1	-77	43214
Cruise			E 013 43.295	Level Flight APLN	6.3E	1870		5000	110/10	333	339	01:12:44	269.5	6902	2928
16	17	.LAVONG	N 66 08.391	33W VP 12949 36838	WGE	66 FT	220C	1000A	5C	292	298	00+04+41	17.9	-230	42985
Cruise			E 013 04.272	Level Flight APLN	6.0E	66		5000	110/10	292	298	01:17:24	287.4	6673	2947
17	18	.LAVONG1	N 66 14.032	33W VP 24232 46996	WGE	0 FT	220C	1000A	5C	43	49	00+02+17	8.2	-112	42872
Cruise			E 013 18.900	Level Flight APLN	6.1E	0		5800	110/10	40	46	01:19:41	295.6	6560	2945
18	19	.LAVONG2	N 66 17.912	33W VP 56708 53520	WGE	0 FT	220C	1000A	5C	72	79	00+05+04	17.9	-249	42624
Cruise			E 014 02.090	Level Flight APLN	6.5E	0		5800	110/10	71	77	01:24:46	313.5	6312	2942
19	20	.LAVONG3	N 66 32.214	33W VP 49140 80222	WGE	984 FT	220C	1000A	3C	339	345	00+03+56	15.0	-192	42432
Cruise			E 013 51.315	Level Flight APLN	6.5E	984		5800	110/10	337	343	01:28:41	328.5	6120	2927
20	21	.HOTH	N 66 35.955	33W VP 56066 87054	WGE	1444 FT	220C	1000A	2C	40	47	00+01+26	5.3	-70	42362
Cruise			E 014 00.520	Level Flight APLN	6.6E	1444		5800	110/10	38	44	01:30:07	333.8	6050	2919
21	22	.HOYFOR	N 66 52.817	33W VQ 87301 18063	WGE	394 FT	220C	1000A	4C	40	47	00+06+34	23.8	-321	42042
Cruise			E 014 42.611	Level Flight APLN	7.0E	394		5900	110/10	38	44	01:36:42	357.6	5730	2929
22	23	.HOYFOR1	N 67 07.256	33W VQ 99258 44862	WGE	0 FT	220C	1000A	5C	19	26	00+04+20	15.9	-212	41830
Cruise			E 014 58.975	Level Flight APLN	7.2E	0		5900	110/10	17	24	01:41:02	373.4	5518	2929
23	24	.CUTTY	N 67 15.140	33W VQ 97028 59511	WGE	10 FT	220C	1000A	5C	346	354	00+02+08	8.0	-104	41725
Cruise			E 014 55.868	Level Flight APLN	7.2E	10		5900	110/10	344	351	01:43:10	381.4	5413	2927
24	25	ENBO/A	N 67 16.120	33W VQ 72351 61473	WGE	43 FT	220C	0A	7C	267	274	00+03+32	13.4	-173	41552
Cruise		BODO	E 014 21.529	Level Flight APLN	6.9E	43		5000	110/10	267	274	01:46:43	394.8	5240	2937
25	26	.SE1	N 67 18.070	33W VQ 72010 65100	WGE	66 FT	220C	0A	7C	349	356	00+00+32	2.0	-26	41526
Cruise			E 014 21.000	Level Flight APLN	6.9E	66		5000	110/10	347	354	01:47:15	396.7	5214	2935
26	27	.SE2	N 67 18.096	33W VQ 71930 65150	WGE	43 FT	220C	0A	7C	295	302	00+00+01	0.1	-1	41525
Cruise			E 014 20.888	Level Flight APLN	6.9E	43		5000	110/10	295	301	01:47:16	396.8	5213	2935
27	28	ENBO/A	N 67 16.120	33W VQ 72351 61473	WGE	43 FT	220C	0A	7C	164	171	00+00+34	2.0	-28	41498
Cruise		BODO	E 014 21.529	Level Flight APLN	6.9E	43		5000	110/10	166	173	01:47:49	398.8	5186	2935

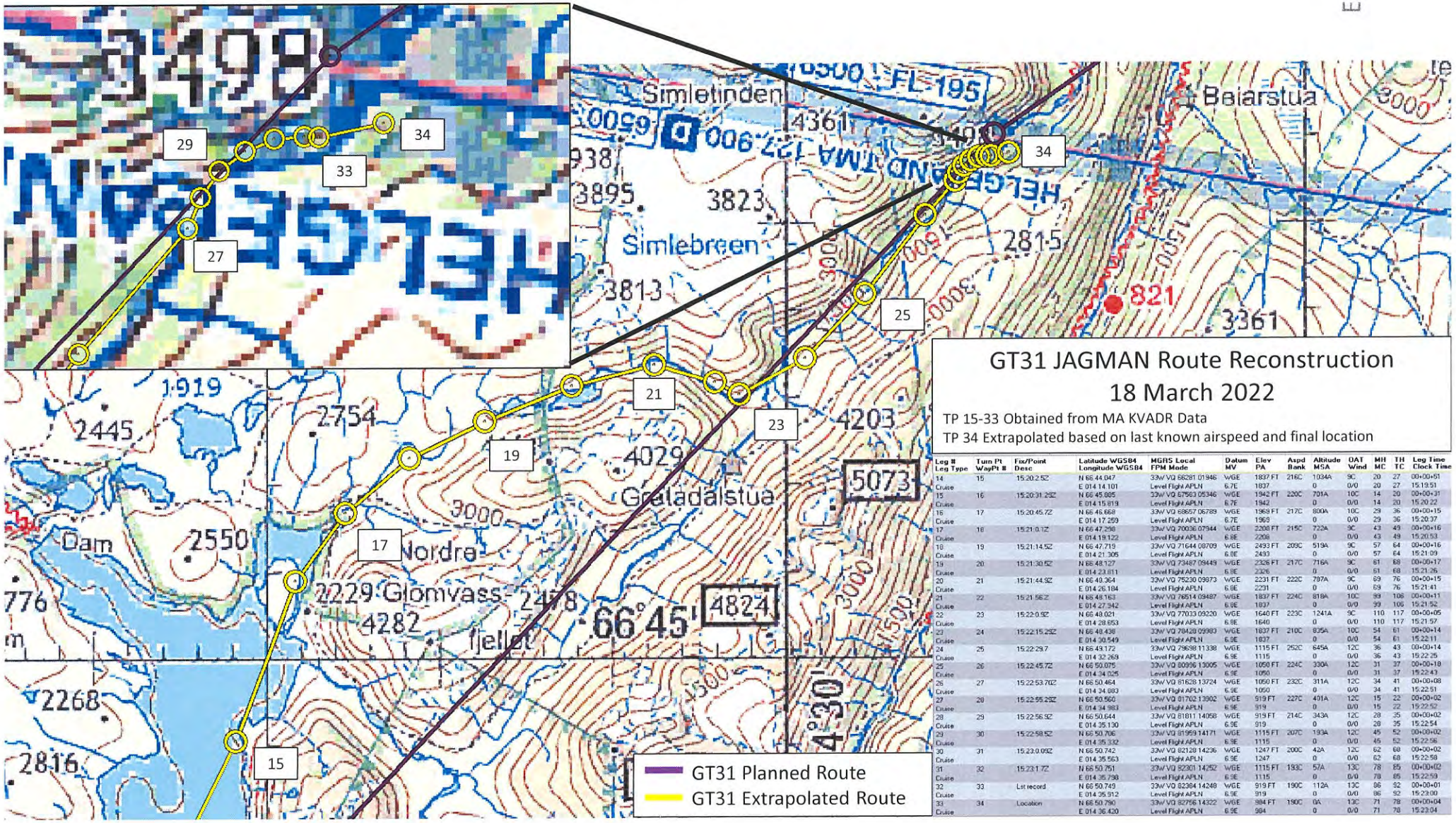
Enclosure (30)

GT31 JAGMAN Route Reconstruction
18 March 2022

TP 2-14 Obtained from Norwegian ATC tracking
TP 15-33 Obtained from MA KVADR Data
TP 34 Extrapolated based on last known airspeed and impact location



Leg II Leg Type	Turn Pt WayPt II	Fix/Point Desc	Latitude WGS84 Longitude WGS84	MGRS Local FPM Mode	Datum MV	Elev PA	Aspd Bank	Altitude MSA	OAT Wind	MH MC	TH TC	Leg Time Clock Time [Z]	Leg Dist Total Dist	Leg Fuel Avail Fuel	GW FF
Departure	1	ENBO/A	N 67 16.120	33V VQ 72351 61473	WGE	43 FT		500A	14C						47648
		BODO	E 014 21.529		6.9E	43			0/0			13:32:00			0
		Refuel	N 67 16.120	33V VQ 72351 61473	WGE	43 FT	N/A	500A	14C	204	211	00+00+00	0.0	(11142)	
		On-load 11142 lbs	E 014 21.529		6.9E				0/0	204	211	13:32:00	0.0		0
1	2	BOD/T211046	N 68 36.499	33V VP 27870 89858	WGE	919 FT	101C	1000M	5C	204	211	00+27+26	46.1	-1345	46303
Cruise		BODO	E 013 22.306	Level Flight Nac 60	6.1E	919		0	0/0	204	211	13:59:26	46.1	9797	2943
2	3	STO/E015035	N 66 31.287	33V VP 04281 79684	WGE	10 FT	177C	1000M	13C	242	248	00+04+34	13.6	-190	46112
Cruise		STOKKA	E 012 50.799	Level Flight APLN	6.0E	10		0	0/0	242	248	14:04:00	59.7	9606	2499
3	4	STO/E016028	N 66 24.427	33V VP 01285 67035	WGE	10 FT	139C	500A	14C	185	191	00+03+00	7.0	-113	45998
Cruise		STOKKA	E 012 47.361	Level Flight APLN	5.9E	10		0	0/0	185	191	14:07:00	66.7	9493	2266
4	5	STO/E017011	N 66 08.105	33V UP 91729 37039	WGE	10 FT	253C	500A	14C	190	196	00+04+00	17.0	-248	45751
Cruise		STOKKA	E 012 36.079	Level Flight APLN	5.8E	10		0	0/0	190	196	14:11:00	83.7	9245	3728
5	6	BNN/E320012	N 65 36.565	32V PT 33798 79465	WGE	66 FT	153C	500A	14C	203	209	00+14+00	36.0	-539	45212
Cruise		BRONNOY	E 011 54.267	Level Flight APLN	5.3E	66		0	0/0	203	209	14:25:00	119.8	8706	2310
6	7	BNN/E294011	N 65 31.850	32V PT 29925 70519	WGE	0 FT	181C	500A	14C	201	206	00+01+44	5.3	-73	45139
Cruise		BRONNOY	E 011 48.710	Level Flight APLN	5.3E	0		0	0/0	201	206	14:26:44	125.0	8633	2525
7	8	BNN/E226014	N 65 17.699	32V PT 31226 44259	WGE	0 FT	116C	500A	14C	174	180	00+07+16	14.2	-390	44749
Cruise		BRONNOY	E 011 46.874	Level Flight Nac 60	5.2E	0		0	0/0	174	180	14:34:00	139.2	8243	2219
8	9	BNN/E165012	N 65 15.869	33V UN 75716 40553	WGE	394 FT	105C	500A	13C	92	98	00+04+16	13.3	-161	44568
Cruise		BRONNOY	E 012 20.249	Level Flight APLN	5.5E	394		0	0/0	92	98	14:38:16	152.5	8062	2549
9	10	BNN/E149009	N 65 19.728	33V UN 78862 47599	WGE	0 FT	143C	500A	14C	16	22	00+01+44	4.2	-65	44503
Cruise		BRONNOY	E 012 23.915	Level Flight APLN	5.5E	0		0	0/0	16	22	14:40:00	156.7	7997	2235
10	11	BNN/E077006	N 65 28.757	33V UN 81844 64266	WGE	66 FT	109C	500A	14C	2	8	00+05+00	9.1	-253	44250
Cruise		BRONNOY	E 012 26.883	Level Flight Nac 60	5.6E	66		0	0/0	2	8	14:45:00	165.8	7744	3040
11	12	BNN/E042006	N 65 31.862	33V UN 78711 70168	WGE	0 FT	107C	500A	14C	324	330	00+02+00	3.6	-100	44150
Cruise		BRONNOY	E 012 22.509	Level Flight Nac 60	5.5E	0		0	0/0	324	330	14:47:00	169.4	7644	3008
12	13	Last Radar	N 65 53.600	33V VP 02140 09694	WGE	1444 FT	180C	900A	10C	23	28	00+08+00	24.0	-328	43822
Cruise			E 012 51.160	Level Flight APLN	5.8E	1444		0	0/0	23	28	14:55:00	194.3	7316	2458
13	14	IFF Return	N 66 41.230	33V VP 63589 96747	WGE	1709 FT	139C	900A	10C	27	33	00+24+00	57.6	-857	42965
Cruise			E 014 10.530	Level Flight APLN	6.7E	1709		0	0/0	27	33	15:19:00	251.8	6459	2141
14	15	15:20:2.5Z	N 66 44.047	33V VQ 66281 01946	WGE	1837 FT	216C	1034A	9C	20	27	00+00+51	3.2	-41	42925
Cruise			E 014 14.101	Level Flight APLN	6.7E	1837		0	0/0	20	27	15:19:51	256.0	6418	2900
15	16	15:20:31.2SZ	N 66 45.885	33V VQ 67593 05346	WGE	1942 FT	220C	701A	10C	14	20	00+00+31	2.0	-26	42899
Cruise			E 014 15.818	Level Flight APLN	6.7E	1942		0	0/0	14	20	15:20:22	256.9	6393	2969
16	17	15:20:45.7Z	N 66 46.668	33V VQ 68657 06709	WGE	1969 FT	217C	600A	10C	29	36	00+00+15	1.0	-13	42886
Cruise			E 014 17.259	Level Flight APLN	6.7E	1969		0	0/0	29	36	15:20:37	257.9	6380	2917
17	18	15:21:0.1Z	N 66 47.298	33V VQ 70036 07944	WGE	2208 FT	215C	722A	9C	43	49	00+00+16	1.0	-12	42874
Cruise			E 014 19.122	Level Flight APLN	6.8E	2208		0	0/0	43	49	15:20:53	258.9	6368	2861
18	19	15:21:14.5Z	N 66 47.719	33V VQ 71644 08709	WGE	2493 FT	209C	519A	9C	57	64	00+00+16	1.0	-12	42862
Cruise			E 014 21.305	Level Flight APLN	6.8E	2493		0	0/0	57	64	15:21:09	259.8	6356	2795
19	20	15:21:30.5Z	N 66 48.127	33V VQ 73487 09449	WGE	2326 FT	217C	716A	9C	61	68	00+00+17	1.1	-14	42848
Cruise			E 014 23.811	Level Flight APLN	6.8E	2326		0	0/0	61	68	15:21:26	260.9	6342	2913
20	21	15:21:44.9Z	N 66 48.364	33V VQ 75230 09873	WGE	2231 FT	222C	787A	9C	69	76	00+00+15	1.0	-13	42835
Cruise			E 014 26.184	Level Flight APLN	6.8E	2231		0	0/0	69	76	15:21:41	261.9	6329	2989
21	22	15:21:56.2Z	N 66 48.163	33V VQ 76514 09487	WGE	1637 FT	224C	818A	10C	99	106	00+00+11	0.7	-9	42826
Cruise			E 014 27.842	Level Flight APLN	6.8E	1637		0	0/0	99	106	15:21:52	262.6	6320	3008
22	23	15:22:0.9Z	N 66 48.021	33V VQ 77033 09220	WGE	1640 FT	223C	1241A	9C	110	117	00+00+05	0.3	-4	42822
Cruise			E 014 28.653	Level Flight APLN	6.8E	1640		0	0/0	110	117	15:21:57	262.9	6316	3018
23	24	15:22:15.2SZ	N 66 48.438	33V VQ 78428 09983	WGE	1837 FT	210C	835A	10C	54	61	00+00+14	0.9	-11	42811
Cruise			E 014 30.549	Level Flight APLN	6.9E	1837		0	0/0	54	61	15:22:11	263.8	6305	2804
24	25	15:22:29.7	N 66 49.172	33V VQ 79698 11338	WGE	1115 FT	252C	645A	12C	36	43	00+00+14	1.0	-14	42797
Cruise			E 014 32.269	Level Flight APLN	6.9E	1115		0	0/0	36	43	15:22:25	264.8	6291	3653
25	26	15:22:45.7Z	N 66 50.075	33V VQ 80996 13005	WGE	1050 FT	224C	330A	12C	31	37	00+00+18	1.1	-15	42781
Cruise			E 014 34.025	Level Flight APLN	6.9E	1050		0	0/0	31	37	15:22:43	265.9	6275	3050
26	27	15:22:53.70Z	N 66 50.464	33V VQ 81626 13724	WGE	1050 FT	232C	311A	12C	34	41	00+00+08	0.5	-7	42774
Cruise			E 014 34.863	Level Flight APLN	6.9E	1050		0	0/0	34	41	15:22:51	266.5	6268	3198
27	28	15:22:55.25Z	N 66 50.560	33V VQ 81702 13902	WGE	919 FT	227C	401A	12C	15	22	00+00+02	0.1	-1	42773
Cruise			E 014 34.983	Level Flight APLN	6.9E	919		0	0/0	15	22	15:22:52	266.6	6267	3104
28	29	15:22:56.9Z	N 66 50.644	33V VQ 81811 14058	WGE	919 FT	214C	343A	12C	28	35	00+00+02	0.1	-1	42772
Cruise			E 014 35.130	Level Flight APLN	6.9E	919		0	0/0	28	35	15:22:54	266.7	6266	2885
29	30	15:22:58.5Z	N 66 50.706	33V VQ 81959 14171	WGE	1115 FT	207C	193A	12C	45	52	00+00+02	0.1	-1	42770
Cruise			E 014 35.332	Level Flight APLN	6.9E	1115		0	0/0	45	52	15:22:56	266.8	6264	2780
30	31	15:23:0.0Z	N 66 50.742	33V VQ 82128 14236	WGE	1247 FT	200C	42A	12C	62	68	00+00+02	0.1	-1	42769
Cruise			E 014 35.563	Level Flight APLN	6.9E	1247		0	0/0	62	68	15:22:58	266.9	6263	2687
31	32	15:23:1.7Z	N 66 50.751	33V VQ 82301 14252	WGE	1115 FT	193C	57A	13C	78	85	00+00+02	0.1	-1	42768
Cruise			E 014 35.798	Level Flight APLN	6.9E	1115		0	0/0	78	85	15:22:59	267.0	6262	2602
32	33	Last record	N 66 50.749	33V VQ 82384 14248	WGE	919 FT	190C	112A	13C	86	92	00+00+01	0.0	-1	42767
Cruise			E 014 35.912	Level Flight APLN	6.9E	919		0	0/0	86	92	15:23:00	267.0	6261	2570
33	34	Location	N 66 50.730	33V VQ 82756 14322	WGE	984 FT	190C	0A	13C	71	78	00+00+04	0.2	-3	42764
Cruise			E 014 36.420	Level Flight APLN	6.9E	984		0	0/0	71	78	15:23:04	267.2	6258	2814



Leg # Leg Type	Turn Pt WapPt #	Fix/Point Desc	Latitude WGS84 Longitude WGS84	MGRS Local FPM Mode	Datum MV	Elev PA	Aspd Bank	Altitude MSA	OAT Wind	MH MC	TH TC	Leg Time Clock Time
14	15	15:20:2.5Z	N 66.44.047	33W VQ 66281 01946	WGE	1837 FT	216C	1034A	9C	20	27	00+00:51
Cruise			E 014.14.101	Level Flight APLN	6.7E	1837		0	0/0	20	27	15:19:51
15	16	15:20:31.2SZ	N 66.45.885	33W VQ 67563 05346	WGE	1942 FT	220C	701A	10C	14	20	00+00:31
Cruise			E 014.15.819	Level Flight APLN	6.7E	1942		0	0/0	14	20	15:20:22
16	17	15:20:45.7Z	N 66.46.668	33W VQ 68657 06789	WGE	1969 FT	217C	800A	10C	29	36	00+00:15
Cruise			E 014.17.259	Level Flight APLN	6.7E	1969		0	0/0	29	36	15:20:37
17	18	15:21:0.1Z	N 66.47.298	33W VQ 70036 07344	WGE	2208 FT	215C	722A	9C	43	49	00+00:16
Cruise			E 014.19.122	Level Flight APLN	6.8E	2208		0	0/0	43	49	15:20:53
18	19	15:21:14.5Z	N 66.47.719	33W VQ 71644 08709	WGE	2493 FT	209C	519A	9C	57	64	00+00:16
Cruise			E 014.21.305	Level Flight APLN	6.8E	2493		0	0/0	57	64	15:21:09
19	20	15:21:30.5Z	N 66.48.127	33W VQ 73487 09449	WGE	2326 FT	217C	716A	9C	61	68	00+00:17
Cruise			E 014.23.811	Level Flight APLN	6.8E	2326		0	0/0	61	68	15:21:26
20	21	15:21:44.9Z	N 66.48.364	33W VQ 75230 09973	WGE	2231 FT	222C	797A	9C	69	76	00+00:15
Cruise			E 014.26.184	Level Flight APLN	6.8E	2231		0	0/0	69	76	15:21:41
21	22	15:21:56.2	N 66.48.163	33W VQ 76514 09487	WGE	1837 FT	224C	818A	10C	99	108	00+00:11
Cruise			E 014.27.342	Level Flight APLN	6.9E	1837		0	0/0	99	108	15:21:52
22	23	15:22:0.9Z	N 66.48.021	33W VQ 77033 09220	WGE	1640 FT	223C	1241A	9C	110	117	00+00:05
Cruise			E 014.28.653	Level Flight APLN	6.8E	1640		0	0/0	110	117	15:21:57
23	24	15:22:15.2SZ	N 66.48.438	33W VQ 78428 09983	WGE	1837 FT	210C	835A	10C	54	61	00+00:14
Cruise			E 014.30.549	Level Flight APLN	6.9E	1837		0	0/0	54	61	15:22:11
24	25	15:22:29.7	N 66.49.172	33W VQ 79698 11338	WGE	1115 FT	252C	645A	12C	36	43	00+00:14
Cruise			E 014.32.269	Level Flight APLN	6.9E	1115		0	0/0	36	43	15:22:25
25	26	15:22:45.7Z	N 66.50.075	33W VQ 80996 13005	WGE	1050 FT	224C	330A	12C	31	37	00+00:18
Cruise			E 014.34.025	Level Flight APLN	6.9E	1050		0	0/0	31	37	15:22:43
26	27	15:22:53.70Z	N 66.50.464	33W VQ 81628 13724	WGE	1050 FT	232C	311A	12C	34	41	00+00:08
Cruise			E 014.34.883	Level Flight APLN	6.9E	1050		0	0/0	34	41	15:22:51
27	28	15:22:55.2SZ	N 66.50.560	33W VQ 81702 13902	WGE	919 FT	227C	401A	12C	15	22	00+00:02
Cruise			E 014.34.983	Level Flight APLN	6.9E	919		0	0/0	15	22	15:22:52
28	29	15:22:56.9Z	N 66.50.644	33W VQ 81811 14058	WGE	919 FT	214C	343A	12C	28	35	00+00:02
Cruise			E 014.35.130	Level Flight APLN	6.9E	919		0	0/0	28	35	15:22:54
29	30	15:22:58.5Z	N 66.50.706	33W VQ 81959 14171	WGE	1115 FT	207C	193A	12C	45	52	00+00:02
Cruise			E 014.35.332	Level Flight APLN	6.9E	1115		0	0/0	45	52	15:22:56
30	31	15:23:0.0SZ	N 66.50.742	33W VQ 82128 14236	WGE	1247 FT	200C	42A	12C	62	68	00+00:02
Cruise			E 014.35.563	Level Flight APLN	6.9E	1247		0	0/0	62	68	15:22:58
31	32	15:23:1.7Z	N 66.50.751	33W VQ 82301 14252	WGE	1115 FT	193C	57A	13C	78	85	00+00:02
Cruise			E 014.35.798	Level Flight APLN	6.9E	1115		0	0/0	78	85	15:22:59
32	33	Last record	N 66.50.749	33W VQ 82384 14248	WGE	919 FT	190C	112A	13C	86	92	00+00:01
Cruise			E 014.35.912	Level Flight APLN	6.9E	919		0	0/0	86	92	15:23:00
33	34	Location	N 66.50.790	33W VQ 82756 14322	WGE	984 FT	190C	0A	13C	71	78	00+00:04
Cruise			E 014.36.420	Level Flight APLN	6.9E	984		0	0/0	71	78	15:23:04

COM NAOC Safety Brief

Flying in Norway

Current as of 01 June 2021

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References

- Military Air Regulations — 12 May 2017
- Air Operational Procedures (AOP): — 09 Jun 2017
- Aeronautical Information Publication (AIP) — www.ippc.no
- Agreement on Use of AMC Manageable Areas: — 28 Jan 2021

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Scope

- Flightplans / NOTAM / Met
- Civilian regulations / Air space
- Military Regulations / FUA
- Low Level flying in general
- Aircraft specific operations
  - Fighter aircraft
  - Fixed wing/transport
  - Maritime aircraft / MPA
  - Helicopters
  - Maritime helicopters
- Maps
- Phone numbers
- Main takeaways

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Flightplans/NOTAM/MET

- Flightplans
  - File 1 hr prior to T/O
  - Call Norway AIS briefing office
    - +47 6481 9000/+47 6481 9015 or ippc.no
- ATO Feeder/airpace request to NAOC
  - NLT 0900L the day prior (on Friday if flying Monday)
- NOTAM
  - ippc.no
- MET
  - ippc.no (METAR/TAF)
  - MWO: Oslo 22963000, Bergen 55236650, Tromsø 77621300

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General Information

- AIP: www.ippc.no (AIS publications)
- PPR
  - Check AIP for requirements
- Opening hours
  - Refer to AIP Norway and NOTAM
- Fuel
  - Normally available inside opening hours (some AFIS fiels do not have fuel)

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Civilian regulations

- Civilian airspace regulations are in accordance with SERA (Standardized European Rules of the Air), and additions depicted in BSL-F
  - www.caa.no
- Aeronautical Information Package Norway (AIP Norway)
  - www.ippc.no

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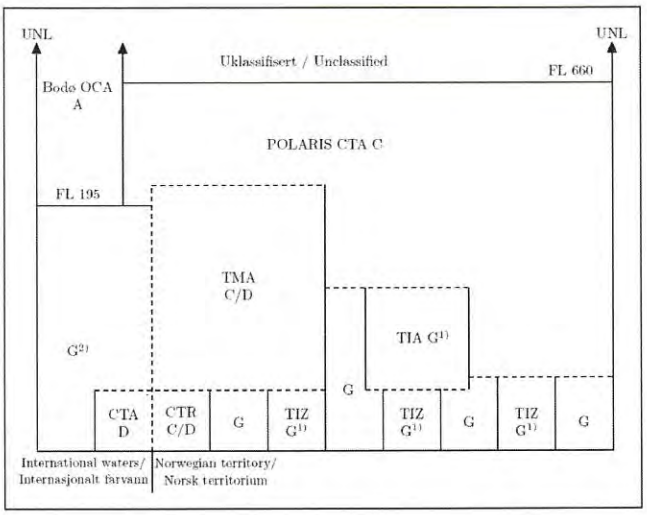
Civilian Airspace Structure (AIP Norway ENR 1.4)

- In Norway there are 4 classifications of airspace, A, C, D and G which comply with ICAO standards
  - 1) TIA and TIZ, and CTR outside opening hrs, are classified as RMZ (Radio Mandatory Zone)
  - 2) Some exceptions



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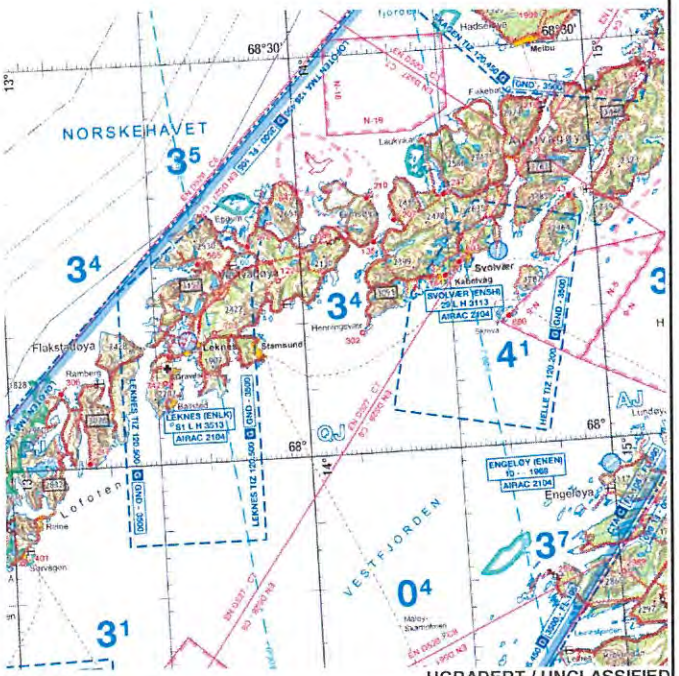
Communication

- All clearances shall be read back as given by ATC
  - (Do not use copy/wilco/roger)
- Radio Mandatory Zones (RMZ)
  - Closed CTR and AFIS airports (TIZ/TIA) are G airspace and defined as RMZ.
  - **Before** entering and manouvering within you shall transmit on respective CTR/AFIS frequency stating your callsign and intentions.


NORSKEHAVET
VESTFJORDEN
Svolvær
Leknes
Engelsvika
Engelsvika
Engelsvika

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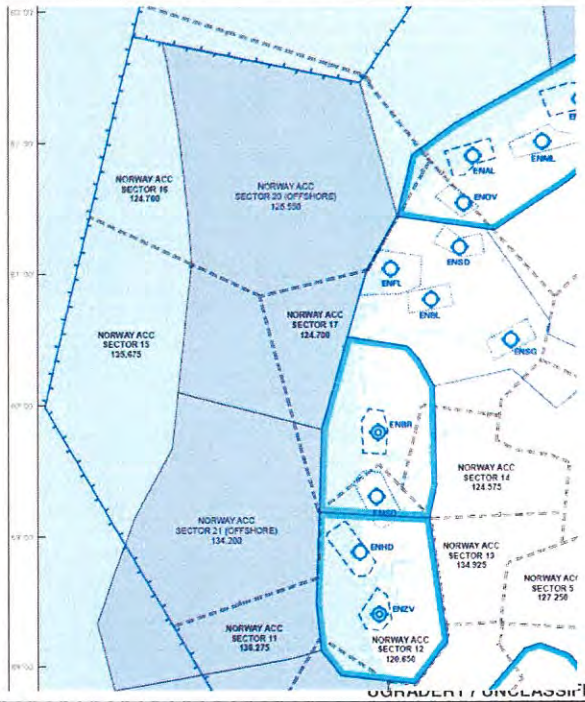
Offshore CTAs and ADSs

- CTA
  - Class D Airspace
  - 1500`AMSL – FL085
- ADS
  - Class G Airspace
  - GND – 1500`AMSL
- Contact Norway ACC «Polaris Control» for traffic information or clearance
- AIP ENR 2.1 + 2.2



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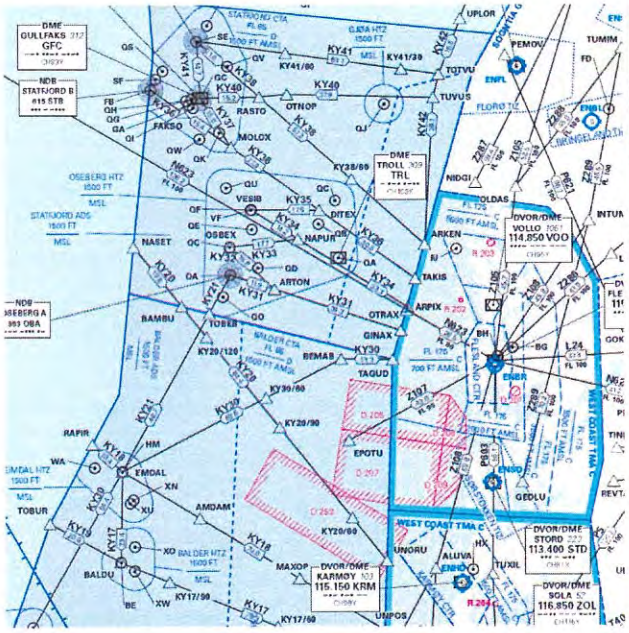
Offshore Helicopter routes

- **Normally:**
  - Remain within 4 NM of route
  - 2000` out
  - 3000` in
  - May be lower in case of icing.
- Remain in contact with «Polaris Control»
- AIP ENR 2.2



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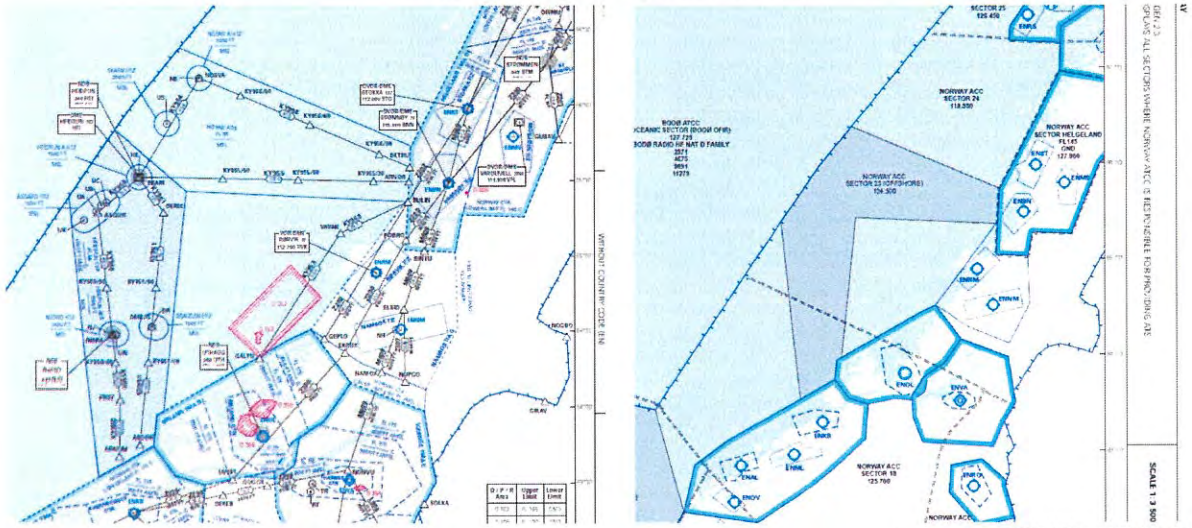
Offshore Helicopter routes



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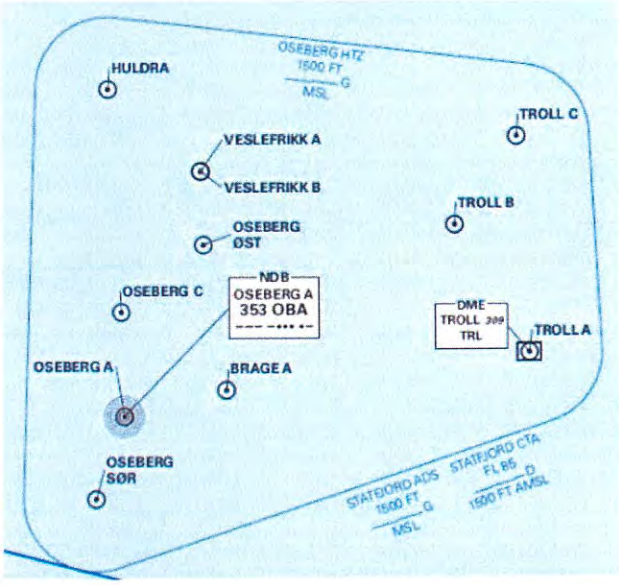
Helicopter Traffic Zone (HTZ)

- Established at all permanent offshore installations with a landing pad.
- 5NM radius
- 2000` AMSL
- RMZ
- Usually «Polaris Control»
- Positions and frequencies: **AIP ENR 2.2**



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Safety Zones

- Offshore facilities have a 500 meter safety zone above and around.
- Unauthorized activities within the zone is forbidden.
- Refer to AIP ENR 2.2

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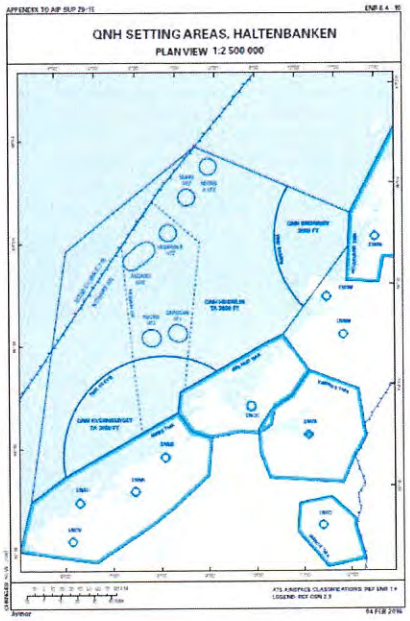
QNH SETTING AREAS

- QNH Settings and regions:
  - For air traffic operating on the Norwegian continental shelf, QNH setting areas are established. When flying in these areas altimeter setting is based on observed local QNH from a METAR station area.
  - ATS will state the QHH for the areas via R/T. When crossing a border between QNH areas, the altimeter setting shall be changed when informed by ATS



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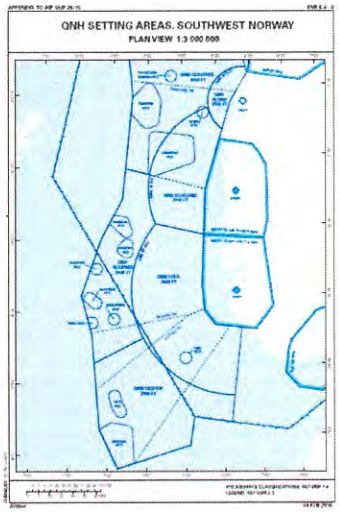
QNH SETTING AREAS cont'd



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Airspace Structure

- There is no military control outside Military Training Areas / Flexible Use of Airspace (FUA) like in other parts of Europe. We do not have military close control.
- Flying VFR, you will vertically and laterally pass numerous different zones, areas and classes of airspace.
- Clearance is mandatory if you intend to enter controlled airspace.
- **Aircraft will avoid flying into uncontrolled TIZ/TIA space. Two way prior comms is mandatory if you have to enter.**
- It is the pilot's responsibility to adhere to the airspace structure!
- We've had numerous near misses and airspace violations involving foreign aircraft the last years, and that is as always not acceptable!
- **VFR flight gives you a lot of freedom, but also a lot of responsibility!**

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Military regulations

- BML
  - Regulations for military aircraft
  - No english version

Bestemmelser for Militær Luftfart

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Flexible use of airspace (FUA)

- Agreement effective as of 12. November 2015
  - Separates Mil/civ traffic
  - Typical: FL 660
    Unspecified
- Lower limit typically corresponds to lower limit of controlled airspace
- When G airspace below, expect to be cleared area from Ground and up to requested altitude
- Area entry:
  - Prior to entering FUA airspace, contact TAC C2 (usually ATC hands you over)
- Area exit:
  - Advice TAC C2 about 5-10 min before leaving FUA airspace with intentions for RTB (IFR of VFR, and altitude)
- **Do NOT leave FUA airspace without a clearance from TAC C2**
- CRC is always available on NATO COMMON

FUA AIRAC JAN21

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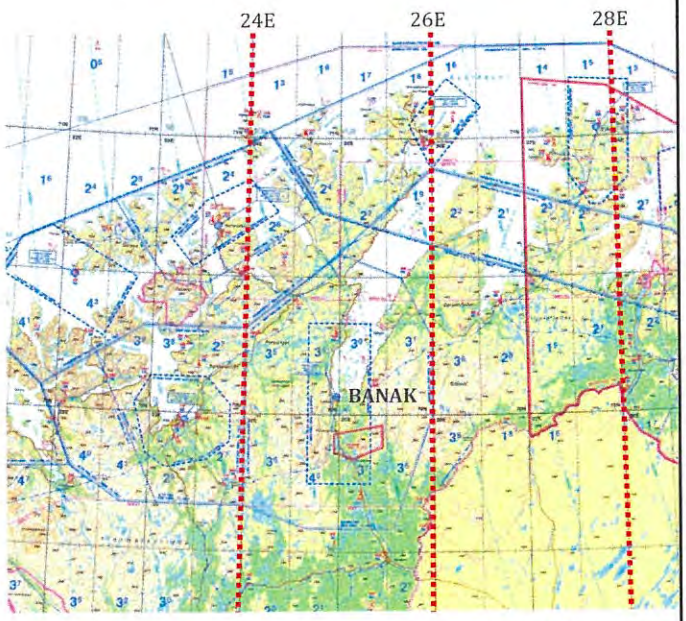
Geographic restrictions

- **Flying EAST of 24 Degrees:**
  - Approval COM NAOC
    - Requests, routes, timings - Nav-log post flight
    - Flight-following mandatory (fighter A/C)
- **Flying EAST of 28 Degrees East:**
  - Not authorized for Fighter a/c
- **Border distance SWE / FIN / RUS:**
  - 10 NM (5 NM along approved low level routes/ Training ranges / Departure-Approach)



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Temperature correction

- MSAA corrections to low temp's (ICAO doc 8168):

Table III-1-4-1 b). Values to be added by the pilot to minimum promulgated heights/altitudes (ft)

Aerodrome temperature (°C)	*Height above the elevation of the altimeter setting source (feet)*													
	200	300	400	500	600	700	800	900	1 000	1 500	2 000	3 000	4 000	5 000
0	20	20	30	30	40	40	50	50	60	90	120	170	230	280
−10	20	30	40	50	60	70	80	90	100	150	200	290	390	490
−20	30	50	60	70	90	100	120	130	140	210	280	420	570	710
−30	40	60	80	100	120	140	150	170	190	280	380	570	760	950
−40	50	80	100	120	150	170	190	220	240	360	480	720	970	1 210
−50	60	90	120	150	180	210	240	270	300	450	590	890	1 190	1 500

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Wind correction

- MSAA corrections to strong winds:
  - Guideline tool from ICAO doc 8168:
    - «It is up to the pilot-in command to evaluate whether the combination of terrain, wind strength and direction are such as to make a correction for wind necessary.»

Table III-1-4-5. Altimeter error due to wind speed (non-SI units)

Wind speed (kt)	*Altimeter error (ft)*
20	53
40	201
60	455
80	812

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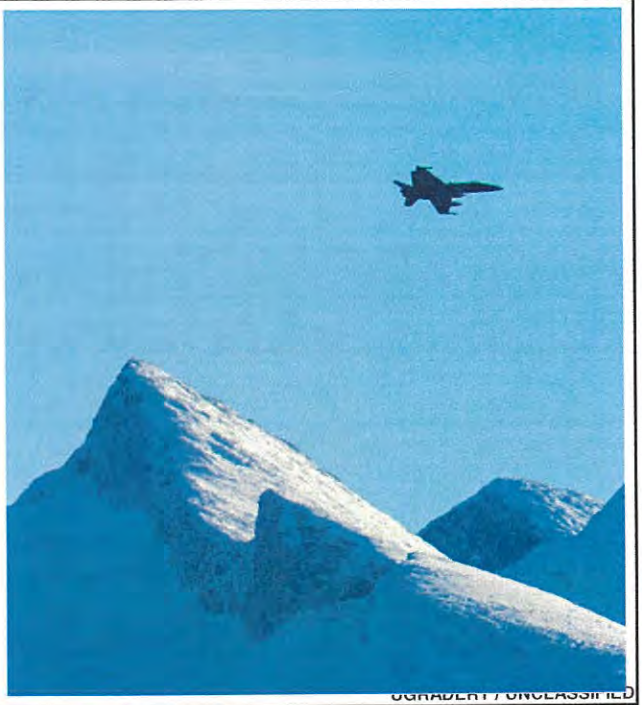
Low Level Flying (<1000ft AGL)

- NAOC is the approval authority for all low level flying to ensure deconfliction from other military and known civilian traffic, noice-sensitive areas, furfarms, powerlines etc.
  - Normally, such approval will only be given when aircrew are departing from a Norwegian airfield or airbase.
- In certain conditions (e.g. during exercises), NAOC may approve low level flying in Norway for aircrew departing from abroad.
- Can be delegated to an experienced RNORAF pilot during exercises or other activities.
- Mandatory face to face or VTC brief required (telephone conference can be used if no other option available. Needs to approved by NAOC)



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Aborted low level flying

- If you have to abort low level flying, and this results in flying into IMC without prior coordination with ATC, the following applies when inside controlled airspace:
  - Climb above minimum safe altitude and level off at the lowest flight level that ends with 5 (FL35, FL45, FL55 etc.) or a higher altitude with 5 if a emergency situation so requires.
  - Inform appropriate controlling agency (ATC/CRC (Fighter Controller)) ASAP. Obtain an IFR clearance as soon as practical.
  - If unable to contact controlling agency (ATC/CRC), Squawk mode 3, code 7600 or 7700 if a emergency situation exists.
- **If an emergency situation exists, regardless of position:**
  - Climb to a safe altitude.
  - Squawk IFF Mode 3, code 7700.
  - Broadcast MAYDAY message on VHF or UHF Guard frequency.

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Deviating from Preplanned Low-Level Track

- When forced to deviate from the pre-planned track due to poor weather conditions or other reasons, low-level flying will be discontinued.
- Low-level flying may be continued if and when the aircraft or formation is able to get back on the planned track.

Minimum safe altitude

- When planning the low level route:
  - A minimum safe abort altitude (MSAA) shall be determined and clearly depicted on the map for each leg or section of the route.
  - The MSAA is calculated based on the highest obstacle within 5NM on either side of planned track.
  - MSAA shall ensure 2000' terrain separation if the highest obstacle is above 6000' MSL, otherwise 1000' terrain separation.
  - These MSAA's shall be corrected for low temperature conditions and strong winds.

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Violations of low level flying regulations

- All violations of regulations regarding minimum altitudes are to be reported to Host Unit (HU) Air Wing Commander and COM NAOC as soon as possible.
- HU Air Wing Commanders are given disciplinary authority on behalf of COM NAOC.

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Airspace for low level flying

- Norway has no dedicated low level airspace or corridors.
- The whole country and open waters is available for low level as long as minimum heights above the following areas are adhered to:
  - Cities, and smaller, densely populated areas
  - National parks
  - Fox/mink farms
  - Protected areas
  - *Low flying over "open waters" means flying outside the Norwegian coast line, and more than 1 NM from islands and peninsulas.*

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FIXED WING SECTION

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Minimum altitudes – Foreign mil A/C

- As a general rule, aircraft will not fly lower than 1000' AGL, except during take-off and landing.
- The minimum altitude over cities and villages for Fighter a/c is 3000' AGL.
- Low flying (below 1000') requires NAOC approval.

- 500' AGL min ALT may be approved as a general minimum altitude for an *approved low level route, inside a defined exercise area or inside a gunnery range.*
  - Such approval may be granted on a mission to mission basis, or for a specific range of missions.
- 300' AGL min ALT may be approved inside a **defined exercise area** when participating in a planned exercise or other activity approved by COM NAOC. *If a defined exercise area is not specified, or parts of the flight will occur outside the specified exercise area,* 300' min ALT may still be approved inside a further specified area.
  - Such approval may be granted on a mission to mission basis, or for a specific range of missions.

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Minimum altitudes – Fighter A/C

- For Fighter A/C, 200' AGL min ALT may be approved provided the mission is conducted as a formation flight led by a Norwegian pilot.
- Prerequisites for flying 200' AGL in Norway is that the low level route has been flown and recognized at 300'-500' AGL within the last 12 months.
  - Reason: Towers and power lines are often erected without being reported to appropriate authorities, and without corresponding map updates.

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Minimum altitudes MPA & Transport A/C

- Foreign MPA and Transport A/C flying in IMC may fly down to 200ft AGL min ALT over the water provided the A/C is equipped with radar altimeter, operational navigation equipment, the mission requires it and the A/C is 5NM or more from shore over open water

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Fur animal vulnerability seasons – Fighter A/C

- Red : 15 March – 25 June
- Yellow : 1 March – 14 March & 26 June – 10 July
- Green : 11 July – 28 (29) February

Overall fur animal season is 1 March – 10 July

Red:	Low level training with fighter aircraft is to be avoided. Fighters are to stay 3000'AGL / 3.0nm away from known fur farms. A/G exercises with continuous noise is not allowed below 8000'AGL within 10nm of known fur farms.
Yellow:	Fighters are to stay 3000'AGL / 0.5nm away from known fur farms.
Green:	No restrictions.

SAR & medevac missions are exempt when needed.

1/1	–	28/2	1/3 – 14/3	15/3	–	5/6	26/6	– 10/7	1/1	–	31/12

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Fur animal vulnerability seasons – Multi Engine & Small A/C

- Red : 15 March – 25 June
- Yellow : 1 March – 14 March & 26 June – 10 July
- Green : 11 July – 28 (29) February

Overall fur animal season is 1 March – 10 July

General:	Exercise caution using high engine power when close to fur farms.
Red:	Low level training with multi engine and small size A/C is to be avoided. Multi Engine and smaller size a/c are to stay 2000'AGL / 2.0nm away from known fur farms.
Yellow:	Multi Engine and smaller size A/C are to stay 2000'AGL / 0.5nm away from known fur farms.
Green:	No restrictions

SAR & medevac missions are exempt when needed.

1/1	–	28/2	1/3 – 14/3	15/3	–	5/6	26/6	– 10/7	1/1	–	31/12

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Norwegian Air Operations Centre

Reindeer

- Reindeer may be sensitive to noise from aircraft. Great caution is required to avoid overflying herds of reindeer at low altitudes. If possible, stay clear of reindeer-flocks when flying low level.
- The following periods require increased attention to avoid areas with reindeer:
  - 15. April – 15. June and
  - 25. August – 31. October

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Bird congested areas

- AIP-Norway ENR 5.6 describes the most important bird congested areas, and the most common migration routes during spring and autumn.
- Consult AIP Norge ENR 5.6 for recommended minimum altitudes for flying over bird congested areas and migration routes.
- Associated maps are no longer found in AIP-Norway. Bird congested areas are however marked on LFC Norway 1:500000 charts.

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Norwegian Air Operations Centre

Norwegian national holidays

- Low flying is not permitted on the following national holy days:
  - 1. January,
  - Maundy Thursday,
  - Good Friday,
  - Easter Eve,
  - Easter Sunday and Easter Monday,
  - 1. May, 17. May,
  - Ascension Day,
  - Whit Sunday and Whit Monday
  - 25. and 26. December.
- The same restriction applies after 13:00 local time on 24. and 31. December, and Pentecost Eve.

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Flying at Supersonic speed

- Over land:
  - Above FL300 only
- Over open Water:
  - Minimum FL150 provided:
    - A/C is more than 10NM from land, pointing away from coastline.
    - A/C is more than 30NM from land.
    - If above conditions cannot be satisfied, use minimum altitude FL300.

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Chaff & Flares

Release of Chaff:

- Use of "Bulk Chaff" is to be coordinated with COM NAOC.
  - Take upper winds into consideration.
- Use of "Self Protection Chaff" within Air Traffic Control Zone and TMA is to be coordinated with ATC.
  - No restrictions inside Military Training Areas (TSA / FUA).

Release of Flares:

- No use of flares below 3000 feet AGL over land.
- Over open water; no altitude limit, but stay clear of vessels.
- No use of flares above populated areas.
- No use of flares at night unless approved by COM NAOC.
- When releasing flares make sure that adversary is:
  - Above or at same altitude
  - On lead pursuit curve, or
  - On pure pursuit curve

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ROTARY WING SECTION

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Helicopter specifics – Low Level Flying

- Minimum altitude for foreign crews is 1000' AGL. (Lower altitudes must be approved by COM NAOC and require a face to face VFR briefing).
- **Low level flying is defined below 500' AGL.**
- **Tactical flying** below 200' AGL only in areas well known to the crew. Mission will be briefed with special attention to power lines and other low level hazards.
- For **tactical** terrain following flying, minimum altitude is 50' AGL.
- Minimum altitude in populated areas (cities) is 1000' AGL.
- Minimum altitude over protected areas is 1000' AGL.

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Minimum altitudes maritime helicopter

- Foreign maritime helicopters flying in IMC may fly down to 200' AGL min ALT over the water provided the a/c is equipped with radar altimeter, operational navigation equipment, the mission requires it and the helicopter is over open water 800 meters (2400') or more from shore/installations.

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Fur animal vulnerability seasons – helicopters

- Red : 15 March – 25 June
- Yellow : 1 March – 14 March & 26 June – 10 July
- Green : 11 July – 28 (29) February

Overall fur animal season is 1 March – 10 July

Red & Yellow: Helicopters are to stay 1000'AGL / 0.5nm away from known fur farms.
Green: No restrictions

SAR & medevac missions are exempt when needed.

1/1	-	28/2	1/3 – 14/3	15/3	-	5/6	26/6	– 10/7	1/1	-	31/12

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  - 1. May, 17. May,
  - Ascension Day,
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  - 25. and 26. December.
- The same restriction applies after 13:00 local time on 24. and 31. December, and Pentecost Eve.

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Helicopter specifics – Landing outside airfield

- Landing on cultivated areas (Farmland) requires permission from the owner.
- Landing within military establishment without permanent landing area is subject to permission from the commander of the establishment.
- Landing inside densely populated area is subject to permission by the local police and by the owner or user of the area.

	Cultivated Ground	Uncultivated Ground	National Park etc
SAR/Police/etc	YES	YES	YES
Mil ops	**NO (Owner)**	**YES**	**NO**
Exercise	YES **(Owner)**	YES	**NO**

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Helicopter specifics – VFR operations

- **Flying under bridges, power lines or any other installation is prohibited.**
- **VFR Flight visibility below 1000' AGL**
  - Day:
    - min 0,8 km (civilian rules)
  - Night:
    - min 5 km visibility with distinctive terrain contours (military rules)
  - Night with NVG:
    - min 3 km visibility with distinctive terrain contours. Cloud base min 300'AGL (military rules)
- **Special VFR (inside a control zone)**
  - Min 800 m visibility
  - Clear of cloud and surface in sight

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Helicopter specifics – NVG operations

- If you are
  - outside controlled airspace and
  - below 500ft AGL and
  - NVG ops are reported on flightplan

  Then conventional exterior lights may be switched off
  (IR lights should be on)

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[END OF ROTARY WING SECTION]

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MAPS

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ENCLOSURE (31 4)

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Map requirements/availability

- The Norwegian mil GEOMETOC services have several types of maps available:
  - ***M517-AIR (1:250K)**
  - ***LFC (1:500K)**
  - FLMA (1:1M)
  - N100-AIR (1:100K)
  - N50-AIR (1:50K)
- All maps are available in the following formats:
  - POD (Print-On-Demand) (M517, LFC, FLMA only)
  - GeoTIFF 169dpi
  - GeotTIFF 400dpi
  - Geopackage
  - MbTiles (For use in desktop app MapTiler and iOS app Foreflight)

** Maps to be used as reference to protected areas and areas prohibited for low flying.*

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Map requirements/availability cont'd

- Updates to the maps are issued according to AIRAC releases by Avinor (NOR CAA), approximately once a month.
  - This will enable aircrew to identify areas were low flying is prohibited.
- Your host base will be responsible for printing updated maps.
  - Downloads will be made available on request, but aware of file size in relation to your available bandwidth.
- If possible, obtain current maps through your own GEOMETOC organization

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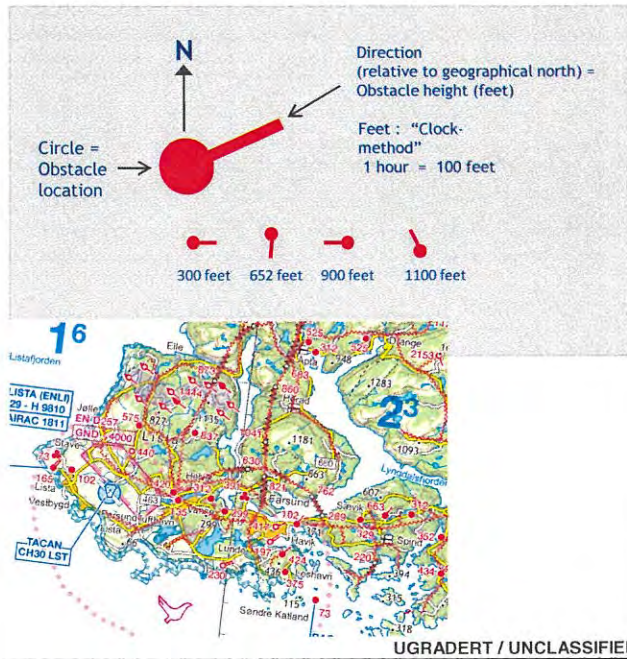
Map legend – vertical obstacle depiction

- Single < 100 feet
- Single <100 feet – lit
- Multiple < 100 feet
- Multiple < 100 feet – lit
- Single 100 feet or higher
- Single 100 feet or higher – lit
- Multiple 100 feet or higher
- Multiple 100 feet or higher - lit



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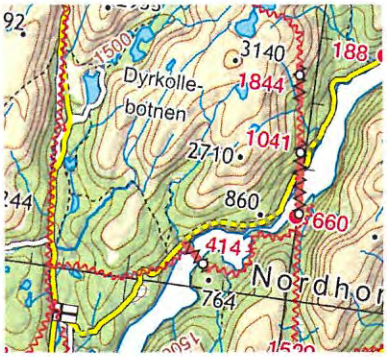
Map legend – Powerlines/spans

Powerline

Powerspan/bridge



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ENCLOSURE (31 6)

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Map legend – Danger- and restricted areas

- Permanent Danger areas
  - Activity dangerous for aircraft may take place. Recommend to coordinate activity with NAOC before entry.
- Temporary Danger areas
  - Activity dangerous for aircraft may take place. NOTAM activated.
- NOR NAVY firing area (SDP103(G))
  - Same marking as temporary danger ares. Identification will correspond with region. E.g. Eastern parts of Norway Ø10, Ø11, etc.
- Restricted areas
  - Same marking as Danger areas. Identification «EN Rxxx» in stead of «EN Dxxx». To be avoided unless authorized by approval authority.

Permanent Danger area

Temporary Danger area

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ENCLOSURE (31 7)

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Map legend – protected areas

- **Protected area – restriction 1000 feet**
  - Protected area 1.MAY-31.jul
    - NOR A/C allowed below 1000ft outside these dates
    - **Foreign A/C: 1000ft restriction all year**
- **Protected area – restriction NO LDG**
  - Protected area NO LDG →
  - Applies all year unless otherwise depicted

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Map legend – airspace

TMA

TIA

CTA

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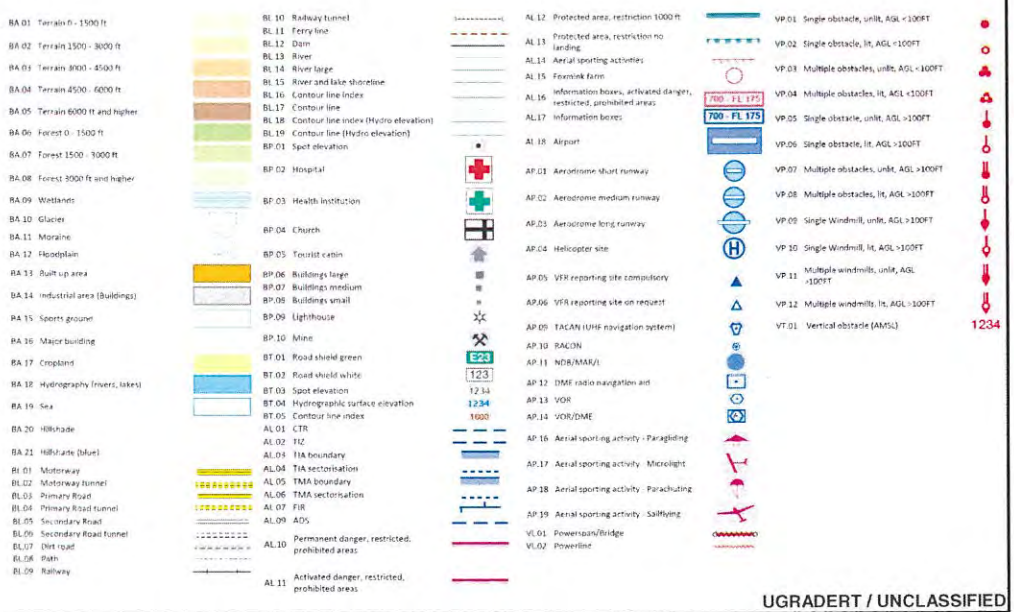
Map legend –

- N50AIR
- N100AIR
- N250AIR
- N500AIR



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HAZARDS

- The Ground
- Wires and towers
- Aircraft and helicopters
- Gliders and paragliders
- Unmanned Vehicles (UAV's)
- Birds
- Low sun
- White out (featureless terrain)
- Wind

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The Ground

- Keep your priorities straight regarding your maneuvers and flight versus the proximity to the ground and the terrain surrounding you.
- If you have to look away, ensure deconfliction with ground for the duration. Quick cross-checks are paramount.
- GCAS systems may save you, but you have to act quickly.
- IF YOU ARE NOT 100% SURE YOU ARE IN THE RIGHT FJORD OR VALLEY
- - CLIMB OR TURN AROUND!

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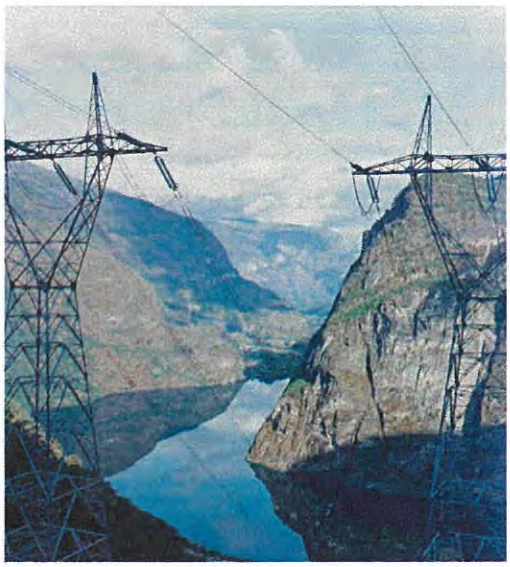
Wires and Towers

- Most towers are under 200 feet AGL. (mobile phone towers).
- Short wire spans are as deadly as long spans.



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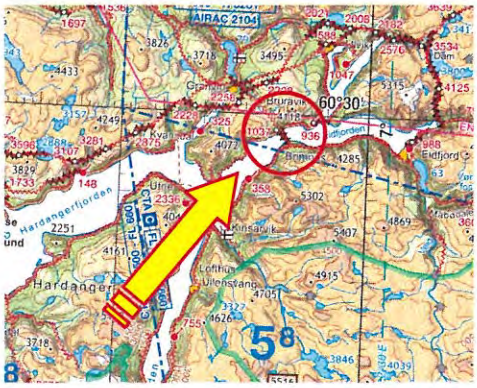
Power lines

- How easy is it to see wires if you don't know where they are.....?



LFC 1:500K

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Power lines

- This is what you see...

- But this is what you get...

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Power lines

- How about this one?

- NOVIK, 20 NM south of Bodø

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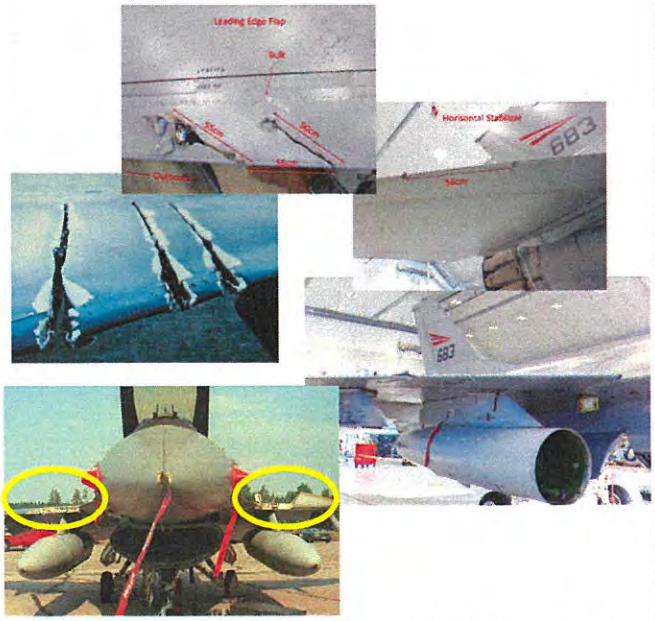
Power lines

- Be aware of this variant!



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Wires

- Techniques on avoiding wires.
- Techniques on finding wires.

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Aircraft and Helicopters

- Where?
- How to reduce risk?
- TCAS

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Flying Hazards; Other Aircraft

- On-shore Civ VFR may fly without flightplan and talk to Nobody.
  - Refer to IPPC/briefing/Statnett for info about Powerline building operations (Typical 500 AGL slingload).
- Fly on the right side in the walleys to prevent head-on collisions with Other VFR traffic.

- Offshore helicopter traffic in/over the exercise area.
  - In ADS (G airspace).
    - Requested to communicate position & intentions with ATC.
  - In D or C airspace:
    - Always obtain ATC clearance first.

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Dense civil helicopter operations

- Typical
  - GND – 500ft AGL
  - Slingload
  - No flightplan
  - No comms with ATC in G airspace

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ENCLOSURE (31) 7

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Areal sporting activity

- Where?
- How to avoid?

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UAVs

- Where?
- How to avoid?

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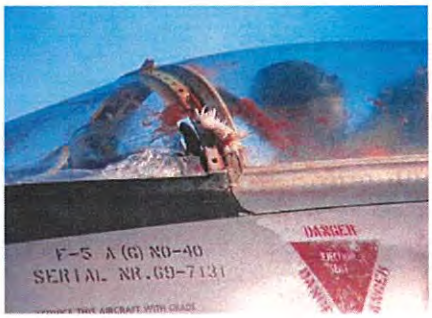
Birds

- Birds are normally not a big problem during winter
- Eagles and falcons in mountains
- Largest concentration of birds along the coast.
  - Avoid overflying small islands and fishing boats



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Bird

- Where?
- How to avoid?

Bird concentration areas

Flying below 1500 feet above the surface may involve a risk

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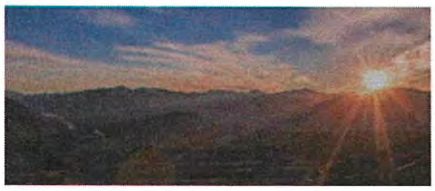
Low sun

- Planning consid's.
  - If avoidable: Don't plan low level flying «into» a low sun.
- Techniques.
  - Flight path deconfliction.



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Winter

- Low sun - white snow-cover
- Expect winter conditions, even in summer...

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Winter

- Visual height references:
  - No trees / small trees
  - Rocks – size
- Depth perception in dim light conditions:
- NVG flight in snow conditions
- Wx may change rapidly - CHECK LATEST
- METAR`s – keep updated. Plan for bad weather

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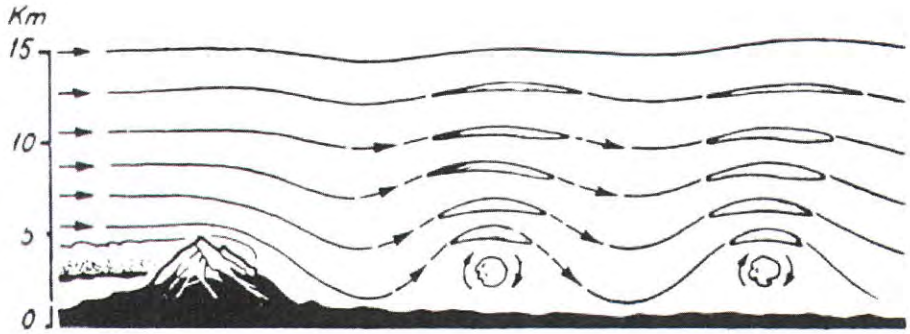
Wind

- Severe turbulence - heavy downdrafts



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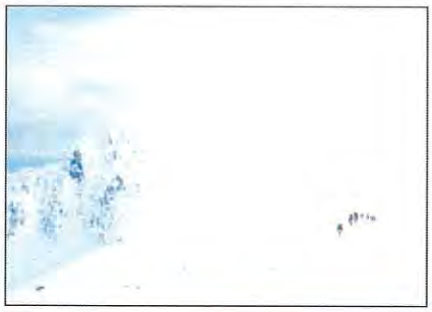
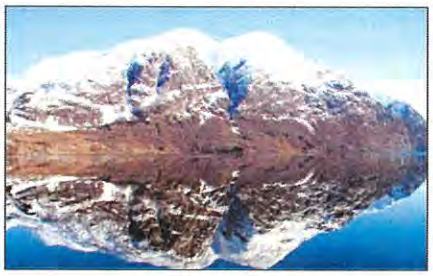
- Snow/desert: Can be hard to judge altitude. The rock you assume to be 5 meters in diameter is only 1 meter, leading to a misperception of altitude.
- PGCAS can save you, but best to recognize hazard and avoid putting flight path marker into terrain.
- Water: «Glassy» water makes it hard to judge altitude. Use RALT to ease the a/c down.





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The following subjects are Norwegian recommended emphasis items for low level authorization:

- Choice of routing, terrain, known hazards/obstacles (wires, towers), and fur farms.
- Danger areas and other airspace restrictions
- Weather and light conditions.
- Airspace structure and communication with ATC.
- Other air traffic below 3000 feet AGL.
- Weather aborts and minimum safe altitudes. Your position in relation to surrounding terrain and min safe altitude.
- Contingencies (uncertain about position, wingman blind etc.)
- Guidance and restrictions for (parts of) the planned route.
- Flight lead and flight members' experience and low level currency.

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Please....

Do not expect to be approved for low level unless it's a part of your squadrons mission sets!

There are few restrictions and regulations for Low Level flying in Norway.

Please acknowledge- & adhere to the ones we have, then hopefully, we can keep things the way they are!

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MAIN TAKEAWAYS

- **AIRSPACE**
  - Radio procedures
- **Low Level restrictions**
  - Mink Farms
  - Reindeer
  - Protected areas
    - 1000ft AGL
    - NO LAND/NO HOVER
- **Weather/season**
  - Fuel consids/alternates
- **NAOC ATO**
  - Inputs needed 0900L the day prior
    - Maps: forward to *naoc@mil.no*
    - *DOTAHs: call A3-5 if not able*

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Reporting of safety related incidents

- All safety related incidents and occurences shall be reported to the loacal Wing Safety Officer (WFSO) or directly to the Inspectorate of Flight Safety.
- In some cases incidents shall also be reported anonymously to the Norwegian Civil Aviation Authority (CAA) in accordance with EU Reg 376/2014 and 2015/1018 Annex I.
- The form NF-2007 shall be utilized for all incident reporting involving ATC and/or civil aircraft.
- Examples:
  - Runway incursions
  - Bird strikes
  - Anytime «mayday» is decleared
  - ATC clearance violations
  - Training Area violations
  - Near miss
  - Illuminated by laser

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Useful phone numbers (civ/mil)

- NAOC
  - NDO: +47 7553 6900 / 0565-6900
  - A3-3 FICO: +47 7553 6931 / 0565-6931
  - A3-5 (ATO): +47 7553 xxxx / 0565-xxxx
- Wing ops:
  - ENBO
  - ENOL
  - ENDU
  - ENAN
  - ENGM
  - ENRY

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UNITED STATES MARINE CORPS

MARINE MEDIUM TILTROTOR SQUADRON 261 (-) REINFORCED, COLD RESPONSE DETACHMENT
MARINE AIRCRAFT GROUP 26, 2D MARINE AIRCRAFT WING, FMF
POSTAL SERVICE CENTER BOX 21016
JACKSONVILLE, NC 28545-1016

MISSION: *SUPPORT THE MAGTF COMMANDER BY PROVIDING ASSAULT SUPPORT TRANSPORT OF COMBAT TROOPS, SUPPLIES AND EQUIPMENT, DAY OR NIGHT, UNDER ALL WEATHER CONDITIONS DURING EXPEDITIONARY, JOINT, OR COMBINED OPERATIONS.*

FLIGHT SCHEDULE MONDAY, 21 FEBRUARY 2022 (2052)

NO FLIGHTS SCHEDULED

SCHEDULED HOURS
0.0

FEB(GOAL/SCHEDULED/EXECUTED)
26.2 / 6.0 / 6.0
QTR
600.3 / 237 / 195.2
FY
2426.0 / 543.5 / 490.2

ADMIN NOTES:

START	END	LOCATION	REMARKS	NOTES	POC
0800	0830	OPS 5	MAINTENANCE MEETING	DESIGNATED PERSONNEL	(b)(3), (b)(6), (b)(7)c
NLT	0800	BARRACKS I	WEAPONS TURN IN	ALL MAINBODY PERSONNEL	
0900	1000	OPS NORTH	NORWAY COURSE RULES	ALL PILOTS TO ATTEND	
1100	1130	OPS 5	STAFF SYNC / WEEKLY SYNC	ALL SHOPS TO SEND A REPRESENTATIVE	
1130	1200	OPS 5	OPS SYNC	OPS PERSONNEL TO ATTEND	
1500	1600	OPS NORTH	2D MAW OPS SYNC	(b)(3), (b)(6), (b)(7)c TO ATTEND	
1700	1730	OPS 5	MAINTENANCE MEETING	DESIGNATED PERSONNEL	

FLIGHT SCHEDULE TUESDAY, 22 FEBRUARY 2022 (2053)

NO FLIGHTS SCHEDULED

ADMIN NOTES:

START	END	LOCATION	REMARKS	NOTES	POC
NLT	COB	INDIVIDUAL SHOPS	COLD WEATHER TRAINING VIDEOS	SHOP LEADERS TO FACILITATE	(b)(3), (b)(6), (b)(7)c
0800	0830	OPS 5	MAINTENANCE MEETING	DESIGNATED PERSONNEL	
0900	1000	OPS 5	INTRO TO WINTER SERVICE TRAINING	ALL AIRCREW TO ATTEND	
[illegible]	1100	OPS 5	COLD WEATHER INJURIES	ALL AIRCREW TO ATTEND	
[illegible]	1130	OPS 5	COLD WEATHER NUTRITION	ALL AIRCREW TO ATTEND	
[illegible]	1400	OPS 5	COLD WEATHER CLOTHING DEMO	ALL AIRCREW TO ATTEND	
1400	1500	OPS 5	COLD WEATHER LEADERSHIP	ALL AIRCREW TO ATTEND	
1500	1600	OPS NORTH	2D MAW OPS SYNC	(b)(3), (b)(6), (b)(7)c TO ATTEND	
1500	1600	OPS 5	SIBERIA TRAINING	ALL AIRCREW TO ATTEND	
1700	1730	OPS 5	MAINTENANCE MEETING	DESIGNATED PERSONNEL	

FLIGHT SCHEDULE WEDNESDAY, 23 FEBRUARY 2022 (2054)

NO FLIGHTS SCHEDULED

ADMIN NOTES:

START	END	LOCATION	REMARKS	NOTES	POC
NLT	COB	INDIVIDUAL SHOPS	COLD WEATHER TRAINING VIDEOS	SHOP LEADERS TO FACILITATE	(b)(3), (b)(6), (b)(7)c
0800	0830	OPS 5	MAINTENANCE MEETING	DESIGNATED PERSONNEL	
0900	1000	OPS 5	INTRO TO BIVOUAC	ALL AIRCREW TO ATTEND	
1000	1100	OPS 5	AVALANCHE / SAFE ROUTING	ALL AIRCREW TO ATTEND	
1100	1200	OPS 5	COLD WEATHER WEAPONS EFFECTS	ALL AIRCREW TO ATTEND	
1330	1430	OPS 5	SURVIVAL GEAR PRAC APP	ALL AIRCREW TO ATTEND	
1500	1600	OPS NORTH	2D MAW OPS SYNC	(b)(3), (b)(6), (b)(7)c TO ATTEND	
1700	1730	OPS 5	MAINTENANCE MEETING	DESIGNATED PERSONNEL	
1900	0600	FIELD	OVERNIGHT SURVIVAL GEAR PRAC APP	ALL AIRCREW TO ATTEND	

FLIGHT SCHEDULE THURSDAY, 24 FEBRUARY 2022 (2055)

NO FLIGHTS SCHEDULED

SCHEDULE 24: CAPT REYNOLDS, R.
SCHEDULE 48: CAPT TOMKIEWICZ, M.

ADMIN NOTES:

START	END	LOCATION	REMARKS	NOTES	POC
NLT	COB	INDIVIDUAL SHOPS	COLD WEATHER TRAINING VIDEOS	SHOP LEADERS TO FACILITATE	(b)(3), (b)(6), (b)(7)c
0600	0700	FIELD	PRAC APP PACKUP AND DEBRIEF	ALL AIRCREW TO ATTEND	
0800	0830	OPS 5	MAINTENANCE MEETING	DESIGNATED PERSONNEL	
1400	1430	OPS 5	WEEKLY SYNC	ALL SHOPS TO SEND A REPRESENTATIVE	
1500	1600	OPS NORTH	2D MAW OPS SYNC	(b)(3), (b)(6), (b)(7)c TO ATTEND	
[illegible]	1730	OPS 5	MAINTENANCE MEETING	DESIGNATED PERSONNEL	

[illegible]: /S/
[illegible]N: /S/
MAINT: /S/

/S/
(b)(3), (b)(6), (b)(7)c
COMMANDING OFFICER

Enclosure (32)

From:
To: (b)(3), (b)(6), (b)(7)c
Cc:
Subject: RE: Data Request
Date: Wednesday, May 25, 2022 1:31:28 PM
Attachments: (CUI) CR22 VMM-261 FLIGHT SCHEDULE 21-24 FEB 22.pdf
Low Level Brief - Part 1 - Rules Regulations (ARC WIP).pptx
Low Level Brief - Part 2 - Recommended Procedures in Norway (ARC WIP).pptx
2022-02-21 (U) Gen Local Area Brief SOF (ARC).pptx

Sir,

Sorry for the delayed response. I took a bit of leave and am getting caught up.

There was no roster for that training. See attached schedule for the brief occurring on the 21st. All pilots attended that were present to include the mishap crew members. Also, I've attached the briefs we received. Let me know if you have any questions.

Very Respectfully,

(b)(3), (b)(6), (b)(7)c

-----Original Message-----
From: (b)(3), (b)(6), (b)(7)c
Sent: Tuesday, May 24, 2022 11:51 AM
To:
Cc: (b)(3), (b)(6), (b)(7)c
(b)(3), (b)(6), (b)(7)c
Subject: RE: Data Request

(b)(3), (b)(6), (b)(7)c

Thanks for following up on this. I don't think there was ever a definitive answer via email regarding the NAOC training.

If the answer is that there is not a physical record of all of the personnel from VMM-261 in Norway receiving the brief that is ok.

However, if the understanding is that all of the pilots, and specifically that any of the crew of GT31 did receive that brief, it would be helpful to have an email from you and each of the personnel in the CC line stating that and ideally when/where. A flight schedule with the brief as a ground event would be bonus material in that regard if you have it.

(b)(3), (b)(6), (b)(7)c

-----Original Message-----

Enclosure (32)

From: (b)(3), (b)(6), (b)(7)c
Sent: Wednesday, May 18, 2022 7:11 AM
To: (b)(3), (b)(6), (b)(7)c
Subject: RE: Data Request

Sir,

I'll look to see if there was a roster if that is what you're referring to.
I'll see what my team can figure out for you.

I'm not sure a document exists on who reached the site when, but I know my team did not reach the site until 24 March. A spec ops team which included Counter Intel, Navy Seals, and a PJ were on scene either that night or next day.

(b)(3), (b)(6), (b)(7)c
See if there is any document pertaining to the NAOC safety brief. If we don't have it, maybe ARC can help locate it.

Very Respectfully,

(b)(3), (b)(6), (b)(7)c

-----Original Message-----
From (b)(3), (b)(6), (b)(7)c
Sent: Friday, May 13, 2022 11:21 AM
To: (b)(3), (b)(6), (b)(7)c
Subject: Data Request

(b)(3), (b)(6), (b)(7)c

Is it possible to obtain a couple of products from your team if you have it?

Copy of NAOC Safety Brief Attendance for mishap crew members

Reference document of when and who first reached the mishap site

Thank you,

V/R,

(b)(3), (b)(6), (b)(7)c

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V/R,

(b)(3), (b)(6), (b)(7)c

Enclosure (32)

ENCLOSURE (33)

Flights Cancelled due to Weather*,**														
	2-Mar	7-Mar	8-Mar	10-Mar	12-Mar	13-Mar	18-Mar	21-Mar	23-Mar	25-Mar	27-Mar	28-Mar	29-Mar	Totals
AV-8B			4				8	6	8	2	6	2	6	42
CH-53E	1									1				2
MV-22B		1						1			1			3
UH-1Y	4													4
AH-1Z														0
KC-130J							1			1				2
F/A-18		4	4	4	2	4	10	6	10			2	10	56
TOTALS	**5**	**5**	**8**	**4**	**2**	**4**	**19**	**13**	**18**	**4**	**7**	**4**	**16**	**109**

* DATES NOT DEPICTED - NO WEATHER CANCELLATIONS

** INCLUDES FCF LINES CANX DUE TO WEATHER

ENCLOSURE (34)

BUNO 168330 KVADR Data

18 March 2022

Page 1

1521:53Z – 1523:03Z

TIME	Sequence_Number	HOURS	MINUTES	SECONDS	LATITUDE(DEGREES)	LONGITUDE(DEGREES)	WIND_SPEED	WIND_DIRECTION	BARO_ALTITUDE(FEET)	PRESSURE_ALTITUDE	RADAR_ALTITUDE_DATA(F	TRUE_HEADING	CALIBRATED_AIRSPEED(KNOTS)	L_AOA(DEGREES)	R_AOA(DEGREES)	VELOCITY_VERTICAL_SYSTEM (FEET/SEC)	NORMAL_ACCELERATION(FEET/SECOND/SECOND)	G Load	LONGITUDINAL_STICK_POSITION(INCHES)	LATERAL_STICK_POSITION(INCHES)	THROTTLE_POSITION(INCHES)	DIRECTIONAL_PEDAL_POSITION(INCHES)
22718.6	14199																-33.34375	1.0	-0.81738072	-0.48730344	2.44677108	0.0119148
22718.8	14199												222	1	-1		-31.5625	-1.0	-0.78027144	-0.43652232	2.46972024	0.0158864
22719	14199																-35.78125	-1.1	-0.80468544	-0.38376808	2.45800152	0.019858
22719.2	14199				66.80406734	14.46002592					903	0.692382813	221.875	2	1	-25.4375	-37.6875	-1.2	-0.66210768	-0.26171808	2.45800152	0.0238296
22719.4	14199																-42.34375	-1.3	-0.61230312	-0.14257776	2.44091172	0.0238296
22719.6	14199												220.25	4	3		-38.5	-1.2	-0.53906112	-0.439452	2.47899756	0.0158864
22719.8	14199																-39.09375	-1.2	-0.48242064	-0.58495944	2.46386088	0.0119148
22720	14200	15	21	54.5	66.80363584	14.4619453	25	244	3022	2544	845	0.701660156	219.75	3	3	-21.71875	-40.21875	-1.3	-0.44726448	-0.61132656	2.44286484	0
22720.2	14200																-39.25	-1.2	-0.4345692	-0.62792808	2.43700548	-0.0119148
22720.4	14200												220.5625	4	3		-40.9375	-1.3	-0.40917864	-0.63574056	2.43700548	-0.0238296
22720.6	14200																-38.8125	-1.2	-0.44726448	-0.7226544	2.44677108	-0.0317728
22720.8	14200				66.80318339	14.46383491					829	0.703125	219.9375	3	3	-17.28125	-39.8125	-1.2	-0.44042856	-0.79980264	2.4487242	-0.019858
22721	14200																-37.625	-1.2	-0.3808584	-0.86034936	2.46386088	-0.019858
22721.2	14200												222.375	2	1		-34.4375	-1.1	-0.36816312	-0.8740212	2.46386088	-0.0317728
22721.4	14200																-31.34375	-1.0	-0.40624896	-0.878904	2.45409528	-0.0635456
22721.6	14201	15	21	56.09375	66.80271953	14.46570793	25	245	3006	2528	818	0.697265625	224.875	1	0	-15.375	-37	-1.2	-0.39648336	-0.86327904	2.4487242	-0.0556024
22721.8	14201																-34.65625	-1.1	-0.37792872	-0.92675544	2.45067732	-0.079432
22722	14201												226.0625	1	-1		-33.03125	-1.0	-0.33984288	-0.95898192	2.45263044	-0.0873752
22722.2	14201																-36.78125	-1.1	-0.38671776	-0.98534904	2.4389586	-0.0873752
22722.4	14201				66.80225476	14.46758363					832	0.691894531	227.5	2	0	-13.53125	-34.21875	-1.1	-0.42187392	-0.98730216	2.44481796	-0.0834036
22722.6	14201																-34.09375	-1.1	-0.38964744	-1.01659896	2.45263044	-0.0834036
22722.8	14201												227.375	1	0		-33.375	-1.0	-0.49511592	-1.02734112	2.45995464	-0.1032616
22723	14201																-33.46875	-1.0	-0.6689436	-0.95312256	2.45995464	-0.1270912
22723.2	14202	15	21	57.703125	66.80179937	14.46947786	24	245	2987	2509	888	0.681152344	227.4375	1	-1	-13.5	-33.125	-1.0	-0.89062272	-0.91894296	2.45409528	-0.1429776
22723.4	14202																-35.0625	-1.1	-1.0644504	-0.76757616	2.45800152	-0.1628356
22723.6	14202												226	1	0		-37.3125	-1.2	-1.2744108	-0.73925592	2.45800152	-0.1668072
22723.8	14202																-40.21875	-1.3	-1.41308232	-0.51074088	2.44286484	-0.1628356
22724	14202				66.80136569	14.47141048					1061	0.658691406	225.8125	3	2	-10.78125	-45.125	-1.4	-1.48632432	-0.48730344	2.43700548	-0.1747504
22724.2	14202																-48.09375	-1.5	-1.34667624	-0.6249984	2.42968128	-0.1906368
22724.4	14202												226.625	5	4		-50.25	-1.6	-1.245114	-0.76757616	2.43358752	-0.2065232
22724.6	14202																-51.875	-1.6	-1.1914032	-0.86620872	2.43358752	-0.218438
22724.8	14203	15	21	59.296875	66.80097166	14.47339782	24	245	2934	2456	1219	0.635253906	225.9375	6	6	-2.96875	-51.6875	-1.6	-1.16991888	-0.83105256	2.43700548	-0.2422676
22725	14203																-51.75	-1.6	-1.25760928	-0.75781056	2.43505236	-0.2462392
22725.2	14203												224.75	6	6		-52.09375	-1.6	-1.29296544	-0.63769368	2.4389586	-0.2462392
22725.4	14203																-52.8125	-1.7	-1.55566008	-0.29882736	2.43358752	-0.2541824
22725.6	14203				66.80062842	14.47544343					1262	0.60546875	225.25	6	6	3.125	-53.1875	-1.7	-1.82519064	-0.26464776	2.4389586	-0.258154
22725.8	14203																-56.4375	-1.8	-1.92675288	-0.17890528	2.42772816	-0.2621256
22726	14203												224.1875	8	7		-60	-1.9	-1.78417512	-0.34374912	2.42577504	-0.2660972
22726.2	14203																-59.5625	-1.9	-1.69237848	0.4687488	2.41991568	-0.2700688
22726.4	14204	15	22	0.90625	66.80035366	14.47755166	24	245	2926	2448	1241	0.573242188	223.8125	10	8	9.8125	-59.21875	-1.9	-1.6894488	-0.50585808	2.42577504	-0.2660972
22726.6	14204																-58.96875	-1.8	-1.82519064	-0.4980456	2.43358752	-0.2621256
22726.8	14204												222.75	9	8		-57.84375	-1.8	-1.95507312	-0.439452	2.43505236	-0.2541824
22727	14204																-55.65625	-1.7	-2.24315832	-0.26757744	2.43358752	-0.2422676
22727.2	14204				66.80015408	14.47970873					1224	0.544433594	222.0625	8	8	13	56.34375	-1.8	2.44921248	0.11232784	2.4316344	-0.2462392

BUNO 168330 KVADR Data

18 March 2022

1521:53Z – 1523:03Z

Page 2

TIME	Sequence_Number	HOURS	MINUTES	SECONDS	LATITUDE(DEGREES)	LONGITUDE(DEGREES)	WIND_SPEED	WIND_DIRECTION	BARO_ALTITUDE(FEET)	PRESSURE_ALTITUDE	RADAR_ALTITUDE_DATA(F	TRUE_HEADING	CALIBRATED_AIRSPEED(KNOTS)	AL_AOA(DEGREES)	R_AOA(DEGREES)	VELOCITY_VERTICAL_SYSTEM (FEET/SEC)	NORMAL_ACCELERATION(FEET/SECOND/SECOND)	G Load	LONGITUDINAL_STICK_POSITION(INCHES)	LATERAL_STICK_POSITION(INCHES)	THROTTLE_POSITION(INCHES)	DIRECTIONAL_PEDAL_POSITION(INCHES)
22727.4	14204																-56.59375	-1.8	-2.50682952	-0.16894488	2.42577504	-0.2422676
22727.6	14204												220.1875	8	9		-58	-1.8	-2.56347	-0.1611324	2.4218688	-0.2422676
22727.8	14204																-60.96875	-1.9	-2.58886056	-0.2539056	2.41649772	-0.2462392
22728	14205	15	22	2.5	66.80003397	14.48189833	24	245	2952	2474	1209	0.5078125	219.125	10	10	16.65625	-61.09375	-1.9	-2.68358688	-0.3710928	2.41649772	-0.2660972
22728.2	14205																-61.40625	-1.9	-2.7978444	-0.38378808	2.4218688	-0.2819836
22728.4	14205												218.1875	10	11		-62.375	-1.9	-2.69335248	-0.46093632	2.42772816	-0.2859552
22728.6	14205																-62.125	-1.9	-2.45897808	-0.66992016	2.42772816	-0.3058132
22728.8	14205				66.79999961	14.48409783					1177	0.47265625	216.625	11	12	20.875	-60.65625	-1.9	-2.38573608	-0.537108	2.42577504	-0.3097848
22729	14205																-58.875	-1.8	-2.28417384	-0.5028284	2.4316344	-0.3058132
22729.2	14205												214.75	10	11		-58.09375	-1.8	-2.30663472	-0.42870984	2.4316344	-0.3137564
22729.4	14205																-57.5	-1.8	-2.3290956	-0.439452	2.42772816	-0.3336144
22729.6	14206	15	22	4.109375	66.8000439	14.48628374	24	245	2989	2511	1147	0.438476563	214.5	10	10	21.21875	-57	-1.8	-2.65233696	-0.28027272	2.42382192	-0.3336144
22729.8	14206																-57.96875	-1.8	-2.70604776	-0.20898384	2.41796256	-0.3296428
22730	14206												214.0625	9	10		-57.53125	-1.8	-2.70604776	-0.17773392	2.41649772	-0.3296428
22730.2	14206																-57.78125	-1.8	-2.6708916	-0.11914032	2.42577504	-0.3256712
22730.4	14206				66.8001861	14.48843739					1196	0.397460938	212.1875	11	11	19.125	-58.6875	-1.8	-2.59179024	-0.12988248	2.42772816	-0.317728
22730.6	14206																-58.375	-1.8	-2.56054032	-0.13476528	2.42382192	-0.3097848
22730.8	14206												211.125	11	11		-58.375	-1.8	-2.45413424	-0.15039024	2.42577504	-0.29787
22731	14206																-58.5625	-1.8	-2.43358752	-0.16406208	2.42382192	-0.2899268
22731.2	14207	15	22	5.703125	66.80040889	14.49053446	24	245	3021	2543	1226	0.36328125	209.25	12	11	16.3125	-58.15625	-1.8	-2.46874368	-0.20410104	2.4218688	-0.2859552
22731.4	14207																-56.125	-1.8	-2.4462828	-0.49998872	2.4316344	-0.2819836
22731.6	14207												207.875	10	10		-56.03125	-1.8	-2.43065784	-0.45507696	2.41991568	-0.278012
22731.8	14207																-55.65625	-1.7	-2.56932936	-0.097656	2.41649772	-0.2740404
22732	14207				66.80071358	14.49255592					1160	0.328613281	207.75	9	10	11.75	-54.09375	-1.7	-2.52831384	-0.09472632	2.4218688	-0.2740404
22732.2	14207																-53.78125	-1.7	-2.30370504	-0.21191352	2.42772816	-0.2740404
22732.4	14207												207.25	10	10		-55.5	-1.7	-2.12597112	-0.2783196	2.42382192	-0.2740404
22732.6	14207																-54.78125	-1.7	-2.13288704	-0.12402312	2.4218688	-0.2740404
22732.8	14208	15	22	7.296875	66.80109495	14.49448259	24	245	3045	2567	1145	0.296386719	206	10	11	6.21875	-54.15625	-1.7	-2.27831448	-0.05691384	2.42382192	-0.2740404
22733	14208																-55.0625	-1.7	-2.27245512	-0.02343744	2.41649772	-0.278012
22733.2	14208												205.1875	10	10		-55.25	-1.7	-2.23046304	-0.01269528	2.4145446	-0.2819836
22733.4	14208																-54.21875	-1.7	-2.14550232	-0.00781248	2.4145446	-0.2819836
22733.6	14208				66.80154984	14.49629651					1109	0.263183594	205.9375	10	10	0.6875	-54.125	-1.7	-2.08788528	0.06445296	2.41259148	-0.2819836
22733.8	14208																-54.09375	-1.7	-1.82812032	0.24706968	2.41063836	-0.278012
22734	14208												206	9	10		-51.6875	-1.6	1.50487896	0.47949096	2.4145446	-0.2700688
22734.2	14208																-50.8125	-1.6	1.27050456	0.57519384	2.41991568	-0.2621256
22734.4	14209	15	22	8.90625	66.80207044	14.49798664	24	245	3053	2575	1065	0.240234375	206	8	9	-5.5	-47.875	-1.5	-1.18261416	0.60449064	2.41991568	-0.2541624
22734.6	14209																-45.625	-1.4	-1.41991824	0.44531136	2.42382192	-0.2502108
22734.8	14209												205.5625	6	7		-44.6875	-1.4	-1.23632496	0.44531136	2.42577504	-0.238296
22735	14209																-43.96875	-1.4	1.06152072	0.58886568	2.42577504	0.2303528
22735.2	14209				66.80264351	14.49936378					1013	0.221679688	206	6	6	-11.34375	-43.3125	-1.4	-0.93163824	0.68945136	2.41991568	-0.2144664
22735.4	14209																-42.625	-1.3	-0.81738072	0.84277128	2.41991568	-0.2065232
22735.6	14209												205.375	6	6		-41.5	-1.3	-0.59960784	0.91113048	2.41991568	-0.1546084
22735.8	14209																38.0625	-1.2	-0.49511592	0.8984352	2.42577504	-0.1906368
22736	14210	15	22	10.5	66.8032579	14.50104134	24	245	3050	2572	960	0.212890625	204.4375	3	4	16.09375	36.4375	1.1	-0.47265504	0.8984352	2.42577504	-0.1866652

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22736.2	14210																-36.5625	-1.1	-0.4785144	0.88281024	2.42772816	-0.1826936
22736.4	14210												205	2	4		-35.625	-1.1	-0.35546784	0.94335696	2.4316344	-0.1866652
22736.6	14210																-35.125	-1.1	-0.18456984	0.98827872	2.4316344	-0.19858
22736.8	14210				66.80390155	14.50244615					915	0.207519531	205.5625	2	4	-19.0625	-33.6875	-1.1	-0.17773392	0.9912084	2.42772816	-0.2144664
22737	14210																-33	-1.0	-0.20312448	1.00198056	2.42772816	-0.2224096
22737.2	14210												205.75	1	3		-31.84375	-1.0	-0.18749952	0.99316152	2.4316344	-0.218438
22737.4	14210																-31.21875	-1.0	-0.1806636	0.9912084	2.42577504	-0.2144664
22737.6	14211	15	22	12.109375	66.80456422	14.50380393	24	245	3034	2556	883	0.20703125	206	0	1	-21.90625	-29.875	-0.9	-0.24121032	0.80859168	2.43358752	-0.2065232
22737.8	14211																-29.09375	-0.9	-0.19726512	0.60937344	2.43700548	-0.1946084
22738	14211												206.875	0	1		-26.78125	-0.8	-0.18456984	0.73144344	2.43505236	-0.1826936
22738.2	14211																-25.625	-0.8	-0.16796832	0.63574056	2.4389586	-0.1668072
22738.4	14211				66.8052388	14.50514101					885	0.207519531	207.25	-1	0	-26.875	-26.25	-0.8	-0.13964808	0.48730344	2.44286484	-0.1509208
22738.6	14211																-25.0625	-0.8	-0.20605416	0.66503736	2.4389586	-0.1469492
22738.8	14211												207.1875	-2	0		-26.71875	-0.8	-0.44042856	0.41601456	2.44286484	-0.158864
22739	14211																-27.8125	-0.9	-0.5419908	0.13574184	2.4389586	-0.1469492
22739.2	14212	15	22	13.703125	66.80592134	14.506476	24	241	2996	2518	874	0.206542969	208.25	-1	0	-31	-28.375	-0.9	-0.40234272	0.48730344	2.4389586	-0.1270912
22739.4	14212																-29.28125	-0.9	-0.30468672	0.46093632	2.44286484	-0.1231196
22739.6	14212												209.5	-1	1		-29.9375	-0.9	0.01855464	0.708006	2.4316344	-0.0553184
22739.8	14212																-30.75	-1.0	-0.15527304	0.48730344	2.44091172	-0.09929
22740	14212				66.80660974	14.50781032					858	0.205566406	209.5	-1	1	-32.28125	-31.59375	-1.0	-0.25097592	0.22851504	2.4389586	-0.0873752
22740.2	14212																-32.46875	-1.0	0	0.65722488	2.41649772	-0.0675172
22740.4	14212												209.75	0	2		-31.5	-1.0	0.31640544	0.5517564	2.40282588	-0.0516308
22740.6	14212																-30.59375	-1.0	0.5224596	0.44042856	2.38182984	-0.0238296
22740.8	14213	15	22	15.296875	66.80730309	14.509151	24	235	2942	2464	835	0.205078125	210.75	-1	1	-33.625	-28.21875	-0.9	0.5761704	0.47949096	2.380365	-0.0158864
22741	14213																-30.625	-1.0	0.64257648	0.41406144	2.41259148	-0.0158864
22741.2	14213												210.3125	1	1		-28.0625	-0.9	0.5957016	0.31835856	2.4218688	-0.0119148
22741.4	14213																-29.3125	-0.9	0.30371016	0.07421856	2.42382192	0
22741.6	14213				66.80799938	14.51049982					798	0.206542969	212.5	-2	1	-37.53125	-24.34375	-0.8	0.24999936	0.03515616	2.4560484	-0.0039716
22741.8	14213																-23.125	-0.7	0.0341796	0	2.44481796	0.0119148
22742	14213												215.625	-3	2		-24.4375	-0.8	0.19335888	0.04589832	2.43700548	0
22742.2	14213																-27.875	-0.9	0.3320304	0.31542888	2.41991568	0.0278012
22742.4	14214	15	22	16.90625	66.80869843	14.51156992	25	230	2889	2410	762	0.206542969	215.75	-2	-1	-42.25	-28.6875	-0.9	0.6396468	0.47753784	2.38182984	0.0317728
22742.6	14214																-28.75	-0.9	0.83886504	0.53027208	2.35936896	0.0317728
22742.8	14214												213.1875	1	1		-27.6875	-0.9	0.87695088	0.46679568	2.34960336	0.0317728
22743	14214																-27.6875	-0.9	0.91894296	0.39257712	2.31005268	0.0317728
22743.2	14214				66.80939781	14.51325679					744	0.208007813	211.5	-2	0	-45.78125	-28.375	-0.9	0.99504432	0.48535032	2.19774828	0.0317728
22743.4	14214																-26.84375	-0.8	1.15331736	0.50378776	2.19774828	0.0317728
22743.6	14214												213.4375	-2	-1		-24.5	-0.8	1.1181612	0.32617104	2.13671328	0.0238296
22743.8	14214																-23.4375	-0.7	1.1621064	0.32910072	1.60448808	0.0238296
22744	14215	15	22	18.5	66.81009728	14.51466654	26	230	2823	2344	710	0.208007813	216.625	-3	-3	52.4375	-23.21875	-0.7	1.2353484	0.50097528	1.62548412	0.0278012
22744.2	14215																-28.3125	-0.8	1.4794884	0.7470684	1.6406208	0.035716
22744.4	14215												217.875	-2	-2		-22.6125	-0.7	1.58105064	0.68652168	1.69774956	0.0556024
22744.6	14215																-22.03125	-0.7	1.44726192	0.49023312	1.68798396	0.0834036
22744.8	14215				66.81079491	14.51609449					697	0.211914063	218.8125	2	3	-60.71875	20.59375	0.6	1.43847288	0.24414	1.684566	0.1112048

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22745	14215																19.9375	0.6	1.66894104	0.10937472	1.71483936	0.119148
22745.2	14215												218.5	-3	-3		19.75	0.6	1.91991696	0.10937472	1.73192916	0.09929
22745.4	14215																19.5	0.6	1.85937024	0.14062464	1.72069872	0.0913468
22745.6	14216	15	22	20.09375	66.8114896	14.51754523	26	230	2737	2258	725	0.218261719	221.5	-4	-3	-71.875	17.21875	0.5	1.70702688	0.21777288	1.72265184	0.0953184
22745.8	14216																19.03125	0.6	1.33007472	0.33105384	1.7187456	0.1032616
22746	14216												221.3125	-4	-3		20.125	0.6	1.24218432	0.35253816	1.7187456	0.09929
22746.2	14216																21.6875	0.7	1.14648144	0.41894424	1.71288624	0.0913468
22746.4	14216				66.81217994	14.51902614					772	0.219726563	223.625	-3	-3	-81.21875	24.25	0.8	1.245114	0.62792808	1.69774956	0.0834036
22746.6	14216																26.09375	0.8	1.21972344	0.5273424	1.71483936	0.0834036
22746.8	14216												224.9375	-2	-2		28.25	0.9	1.30175448	0.33398352	1.68993708	0.0873752
22747	14216																27.71875	0.9	1.22948904	0.22851504	1.70360892	0.0913468
22747.2	14217	15	22	21.703125	66.81286465	14.52054184	26	230	2596	2116	809	0.2265625	227.25	-1	-2	-86.5625	26.46875	0.8	1.05175512	0.14355432	1.72411668	0.0913468
22747.4	14217																27.09375	0.8	0.85839624	0.024414	1.72802292	0.0953184
22747.6	14217												229.125	-1	-2		29.46875	0.9	0.87109152	-0.08203104	1.73388228	0.0834036
22747.8	14217																31.125	1.0	0.76366992	-0.20410104	1.73388228	0.0873752
22748	14217				66.81354552	14.52210112					845	0.237792969	230.1875	0	-1	-89.0625	32.59375	1.0	1.01366928	-0.20117136	1.71679248	0.1072332
22748.2	14217																34.40625	1.1	1.14062208	0.341796	1.68261288	0.1231196
22748.4	14217												230.625	0	0		33.46875	1.0	1.36816056	0.56445168	1.67675352	0.1270912
22748.6	14217																32.5	1.0	1.4794884	0.48730344	1.67870664	0.1310628
22748.8	14218	15	22	23.296875	66.81421833	14.52370467	26	230	2437	1957	853	0.247558594	231.4375	0	0	-90.0625	31.53125	1.0	1.21679376	0.1855464	1.7602494	0.119148
22749	14218																32.90625	1.0	1.10546592	0.04589832	1.86864756	0.0913468
22749.2	14218												232.625	-1	0		32.40625	1.0	1.05175512	-0.03124992	2.47704444	0.0635456
22749.4	14218																33.8125	1.1	0.84570096	-0.24609312	2.3974548	0.0436876
22749.6	14218				66.8148826	14.52536001					949	0.255371094	233	0	0	-90.71875	35.15625	1.1	0.95019288	-0.14550744	2.34765024	0.0476592
22749.8	14218																36.3125	1.1	0.93456792	-0.20117136	2.34765024	0.0436876
22750	14218												234.125	1	1		37.40625	1.2	0.96288816	-0.2490228	2.33446668	0.0436876
22750.2	14218																37.125	1.2	0.97265376	-0.26757744	2.32860732	0.0436876
22750.4	14219	15	22	24.90625	66.81554024	14.5270695	26	230	2284	1803	990	0.259277344	235.1875	1	0	-88.46875	36.6875	1.1	0.89941176	-0.2783196	2.2924746	0.0476592
22750.6	14219																39.0625	1.2	0.8935524	-0.09472632	2.28124416	0.0635456
22750.8	14219												236.5625	2	1		39.375	1.2	0.86425688	-0.439452	2.3022402	0.0675172
22751	14219																40.40625	1.3	0.27246024	-0.74413872	2.3022402	0.0675172
22751.2	14219				66.81619302	14.52882769					915	0.265625	238.1875	2	1	-82.5625	43	1.3	0.51952992	-0.79980264	2.30614644	0.059574
22751.4	14219																45.34375	1.4	0.74413872	-0.60644376	2.29833396	0.0635456
22751.6	14219												239.5	3	3		45.5625	1.4	0.87695088	-0.42578016	2.29636084	0.0675172
22751.8	14219																44.9375	1.4	0.8740212	-0.33593664	2.29833396	0.0754604
22752	14220	15	22	26.5	66.81694497	14.53062225	26	229	2139	1658	796	0.264648438	240.6875	3	2	-73.375	42.03125	1.3	0.80468544	-0.30956952	2.29636084	0.079432
22752.2	14220																40.75	1.3	0.78906048	-0.08496072	2.30419332	0.0913468
22752.4	14220												241.875	1	1		39.34375	1.2	0.78906048	-0.12402312	2.31151752	0.0873752
22752.6	14220																37.40625	1.2	0.7763652	-0.12988248	2.32128312	0.0675172
22752.8	14220				66.81750135	14.53243576					720	0.265136719	243.0625	0	0	-69.03125	35.5625	1.1	0.80468544	-0.61425624	2.32714248	0.0238296
22753	14220																34.25	1.1	0.74120904	-0.72851376	2.32714248	-0.0079432
22753.2	14220												245	1	0		36.03125	1.1	0.94042728	-0.79394328	2.30809956	-0.0317728
22753.4	14220																32.78125	1.0	1.03613016	-0.57714696	2.30809956	-0.0238296
22753.6	14221	15	22	28.09375	66.81816495	14.53425195	26	228	2041	1560	687	0.259765625	245.6875	1	1	-67.125	36	1.1	0.8837868	-0.5557016	2.33056044	-0.0158864

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22753.8	14221																-38.6875	1.2	0.44628792	-0.81835728	2.34227916	-0.0119148
22754	14221												249	0	-1		-38.09375	-1.2	-0.21874944	-0.70214664	2.33251356	-0.0357444
22754.2	14221																-41.71875	-1.3	-0.57714696	-0.6005844	2.31737688	-0.0317728
22754.4	14221				66.81884271	14.53606026				669	0.247558594	252.875	0	0	-61.375	-43.5	-1.4	-0.36523344	-0.77538864	2.32518936	-0.0079432
22754.6	14221																-46.6875	-1.5	0.24023376	-0.9423804	2.32323624	0.0079432
22754.8	14221												253.625	1	2		-46	-1.4	0.45605352	-0.82616976	2.33056044	0.0119148
22755	14221																-42.1875	-1.3	0.15820272	-0.73925592	2.27391996	0.0039716
22755.2	14222	15	22	29.703125	66.81954193	14.53782965	26	228	1930	1448	635	0.232910156	252.6875	0	1	-54.75	-41.5625	-1.3	-0.57714696	-0.2490228	2.18602956	0
22755.4	14222																-44.4375	-1.4	-0.78320112	-0.09472632	2.17870536	-0.0119148
22755.6	14222												251.25	1	0		-50.9375	-1.6	-0.56738136	-0.26757744	2.11229928	-0.0317728
22755.8	14222																-50.625	-1.6	-0.28222584	-0.26953056	2.12352972	-0.0317728
22756	14222				66.8202725	14.53953247				601	0.212890625	252.6875	4	3	-47.71875	-51.28125	-1.6	-0.22265568	-0.35742096	2.15380308	-0.0317728
22756.2	14222																-45	-1.4	-0.09863256	-0.59277192	2.13280704	-0.019858
22756.4	14222												255.1875	2	0		-43.84375	-1.4	0.79199016	-0.12988248	2.14452576	-0.0079432
22756.6	14222																-49.125	-1.5	0.72558408	0.28027272	2.14257264	-0.0039716
22756.8	14223	15	22	31.296875	66.82103424	14.54114255	26	228	1837	1355	600	0.198730469	255.875	2	1	-42.8125	-47.4375	-1.5	-0.2978508	-0.49999872	2.1826116	-0.0039716
22757	14223																-53.1875	-1.7	-0.04199208	-0.30663984	2.15184996	-0.0079432
22757.2	14223												253.375	3	3		-55.65625	-1.7	0.24706968	-0.34960848	2.16893976	-0.0238296
22757.4	14223																-60.5	-1.9	-0.04785144	-0.01269528	2.0703072	-0.0436876
22757.6	14223				66.82183002	14.54264609				593	0.185546875	258.75	3	6	-33.125	-52.90625	-1.7	-0.2636712	0.22558536	1.57616784	-0.0675172
22757.8	14223																-42.34375	-1.3	-0.45828	0.38671776	1.60058184	-0.0635456
22758	14223												259.75	-1	-2		-34.71875	-1.1	-0.46581912	0.47460816	1.65575748	-0.0516308
22758.2	14223																-35.625	-1.1	-0.4345692	0.41894424	1.68798396	-0.039716
22758.4	14224	15	22	32.90625	66.82265078	14.54405299	26	228	1798	1316	586	0.171875	259.0625	-2	-1	-35.1875	-36.59375	-1.1	-0.24706968	0.31054608	1.66552308	-0.039716
22758.6	14224																-37.6875	-1.2	-0.08007792	0.37695216	1.66942932	-0.0276012
22758.8	14224												258.5625	-2	1		-40.78125	-1.3	-0.26660088	0.64159992	1.62743724	-0.0317728
22759	14224																-37.59375	-1.2	-0.2539056	0.42187392	1.66942932	-0.0476592
22759.2	14224				66.82348511	14.54538521				558	0.163085938	257.125	-2	0	-34.03125	-36.625	-1.1	-0.2636712	0.14062464	1.69774956	-0.0476592
22759.4	14224																-36.78125	-1.1	-0.28222584	-0.04492176	1.6916902	-0.0516308
22759.6	14224												259	-1	1		-35.25	-1.1	-0.28515552	0.07226544	1.72997604	-0.0675172
22759.8	14224																-37.28125	-1.2	-0.30468672	0.12499968	1.71288624	-0.0754604
22760	14225	15	22	34.5	66.82432992	14.54665767	26	228	1729	1247	521	0.153320313	256.6875	0	-1	-31.90625	-38.46875	-1.2	-0.25683528	0.17285112	1.72802292	-0.0714888
22760.2	14225																-41.28125	-1.3	-0.14941368	0.63378744	1.71679248	-0.0556024
22760.4	14225												257.25	1	-1		-41.0625	-1.3	-0.08886696	0.78710736	1.68798396	-0.0436876
22760.6	14225																-37.15625	-1.2	0.02832024	0.73144344	1.71483936	0.0436876
22760.8	14225				66.8251837	14.54787347				495	0.154785156	255.8125	-1	-1	-29.71875	-31.75	-1.0	0.0097656	0.69433416	1.72069872	-0.0317728
22761	14225																-30.3125	-0.9	-0.14257776	0.57812352	1.69579644	-0.0276012
22761.2	14225												254.8125	-3	2		-30.9375	-1.0	-0.23144472	0.46679568	1.684566	-0.0317728
22761.4	14225																-31.96875	1.0	-0.415038	0.6201156	1.6577106	0.039716
22761.6	14226	15	22	36.09375	66.82603992	14.54906185	25	228	1695	1212	465	0.155761719	255.125	-3	0	-30.375	-30.625	1.0	-0.62792808	0.57226416	1.6748004	-0.059574
22761.8	14226																-35.53125	-1.1	-0.64062336	0.28906176	1.67675352	-0.079432
22762	14226												252.3125	-2	1		-33.09375	-1.0	-0.56738136	0.13769496	1.71483936	-0.0953184
22762.2	14226																-31.96875	-1.0	-0.49120968	0.31542888	1.69970268	-0.1151764
22762.4	14226				66.82669462	14.55024303				454	0.151367188	249.9375	2	1	29.65625	30.8125	1.0	-0.96972408	0.70507632	1.7187456	-0.1270912

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22762.6	14226																-34.71875	-1.1	1.02343488	0.87988056	1.68798396	-0.1231196
22762.8	14226												250.875	-1	-1		-39.1875	-1.2	-1.21679376	0.25488216	1.68798396	-0.1032616
22763	14226																-42.8125	-1.3	-1.11523152	0.0878904	1.6748004	-0.0754604
22763.2	14227	15	22	37.703125	66.82774563	14.55142463	22	228	1611	1128	478	0.154296875	251.5	1	2	-22.5625	-46.03125	-1.4	-0.88769304	0.07421856	1.63476144	-0.0635456
22763.4	14227																-41.8125	1.3	-0.92870856	0.57031104	1.64848016	-0.0675172
22763.6	14227												246.8125	1	1		-45.78125	-1.4	-0.88085712	1.025388	1.6832966	-0.059574
22763.8	14227																-43.71875	-1.4	-0.97948968	0.97460688	1.63134348	-0.0635456
22764	14227				66.82859036	14.55262131					469	0.160644531	245	1	2	-13.78125	-45.09375	-1.4	-1.06152072	1.08105192	1.62548412	-0.0556024
22764.2	14227																-42.65625	-1.3	-1.14452832	0.91113048	1.623531	-0.0675172
22764.4	14227												245.125	1	2		-43.71875	-1.4	-1.36913712	0.94335696	1.61230056	-0.0913468
22764.6	14227																-47.09375	-1.5	-1.4257776	1.20019224	1.59325764	-0.1112048
22764.8	14228	15	22	39.296875	66.82942126	14.55385169	22	228	1567	1084	470	0.174804688	242.5	2	3	-3.75	-50.3125	-1.6	-1.44237912	1.3037076	1.59862872	-0.1231196
22765	14228																-50.1875	-1.6	-1.53710544	0.9570288	1.62157788	-0.1310628
22765.2	14228												240.4375	2	2		-45.5	-1.4	-1.61327712	1.17382512	1.60253496	-0.139006
22765.4	14228																-48.28125	-1.5	-1.4257776	1.50194928	1.623531	-0.1509208
22765.6	14228				66.83022676	14.55515969					481	0.193359375	240.9375	4	3	5.0625	-53.5	-1.7	-1.3623012	1.4013636	1.6162068	-0.139006
22765.8	14228																-48.25	-1.5	-1.26757488	1.14941112	1.63476144	-0.1112048
22766	14228												238.6875	5	3		-49.34375	-1.5	-1.53710544	1.19726256	1.63671456	-0.0913468
22766.2	14228																-47.8125	-1.5	-2.19628344	-0.05273424	1.64257392	-0.0834036
22766.4	14229	15	22	40.90625	66.83099999	14.55655485	22	228	1568	1085	532	0.226074219	237.5	3	3	8.40625	-50.3125	-1.6	-2.49413424	-0.2490228	1.62157788	-0.079432
22766.6	14229																-53.71875	-1.7	-2.46483744	-0.2490228	1.61425368	-0.079432
22766.8	14229												236.375	6	7		-58.96875	-1.8	-2.27245512	0.38476464	1.58739828	-0.0635456
22767	14229																-58.5	-1.8	-1.89159672	1.18945008	1.58739828	-0.0079432
22767.2	14229				66.83172243	14.5580734					493	0.25390625	233.75	7	6	12.96875	-55.65625	-1.7	-1.58105064	1.42773072	1.59862872	0
22767.4	14229																-54.0625	-1.7	-1.35351216	1.01757552	1.59862872	0
22767.6	14229												232.5	6	6		-50.03125	-1.6	-1.58105064	0.6249984	1.60253496	-0.0039716
22767.8	14229																-42.28125	-1.3	-2.01854952	-0.2880852	1.63476144	-0.0278012
22768	14230	15	22	42.5	66.83239357	14.55970838	22	228	1600	1117	449	0.275390625	230.375	3	3	8.0625	-40.21875	-1.3	-2.2119084	-0.2539056	1.66356996	-0.0317728
22768.2	14230																-44.15625	-1.4	-2.56932936	-0.41601456	1.61962476	-0.0436876
22768.4	14230												229.6875	3	3		-43.5625	-1.4	-2.43358752	-0.31542888	1.61962476	-0.039716
22768.6	14230																-49.90625	-1.6	-2.36034552	-0.21191352	1.60839432	-0.0278012
22768.8	14230				66.83301182	14.56144737					393	0.30859375	227.5	6	5	3.21875	-51.3125	-1.6	-2.03417448	-0.59277192	1.60839432	-0.0238296
22769	14230																-53.5	-1.7	-1.71483936	-0.8496072	1.5893514	-0.0039716
22769.2	14230												227.125	8	7		-47.625	-1.5	-1.56542568	-0.7861308	1.60448808	0.0158864
22769.4	14230																-45.15625	-1.4	-1.34081688	-1.03808328	1.6162068	0.0119148
22769.6	14231	15	22	44.109375	66.83357365	14.56328209	22	228	1607	1124	346	0.322753906	222.375	4	3	0.65625	-40.375	-1.3	-1.20409848	-1.28222328	1.64843328	0
22769.8	14231																-35.46875	-1.1	-1.26757488	-0.86327904	1.66356996	0.0317728
22770	14231												223.6875	2	1		-34.65625	-1.1	-1.22655936	-1.0937472	1.63134348	0.0278012
22770.2	14231																-32.25	1.0	-1.23241872	1.14159864	1.6503864	0.0079432
22770.4	14231				66.83409618	14.5651712					324	0.333496094	223.375	0	1	-4.15625	-34.03125	1.1	1.18847352	-1.33691064	1.64257392	-0.0039716
22770.6	14231																-37.5	-1.2	-1.12206744	-1.16796576	1.70702688	-0.0079432
22770.8	14231												224.625	2	3		-38.1875	-1.2	-1.02343488	-1.30077792	1.79101104	-0.0119148
22771	14231																-36.21875	-1.1	-0.9472632	-1.78808136	2.26220124	-0.1350344
22771.2	14232	15	22	45.703125	66.83458912	14.56709753	22	228	1596	1113	330	0.33203125	224.1875	3	3	2.09375	-41.78125	1.3	0.96386472	2.15038512	2.31005268	-0.2065232

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22771.4	14232																-37.34375	-1.2	-0.82128696	-2.4951108	2.30419332	-0.337586
22771.6	14232												222.75	3	3		-40.09375	-1.3	-0.76366992	-2.41796256	2.24315832	-0.377302
22771.8	14232																-37.78125	-1.2	-0.78320112	-2.124018	2.24511144	-0.3693588
22772	14232				66.83506848	14.5690335					372	0.307617188	222.25	2	1	2.34375	-39.34375	-1.2	-0.78320112	-2.12108832	2.23776724	-0.39716
22772.2	14232																-38.96875	-1.2	-0.8496072	-1.55175384	2.20897872	-0.3216996
22772.4	14232												225	3	0		-36.5625	-1.1	-0.91601328	-0.4345692	2.23583412	-0.2303528
22772.6	14232																-36.375	-1.1	-0.8398416	-1.0302708	2.23925208	-0.2621256
22772.8	14233	15	22	47.296875	66.83556218	14.57093677	22	229	1612	1129	444	0.284667969	223.375	3	0	3.09375	-36.5	-1.1	-0.98241936	-1.41405888	2.21288496	-0.3653872
22773	14233																-38.90625	-1.2	-0.95409912	-1.41991824	2.22069744	-0.3852452
22773.2	14233												222.5	2	0		-37.625	-1.2	-0.65624832	-1.7138628	2.22997476	-0.4885068
22773.4	14233																-39.75	-1.2	-0.80859168	-1.32714504	2.22606852	-0.4726204
22773.6	14233				66.83608747	14.57277258					470	0.2578125	225.375	2	0	-0.6875	-39	-1.2	-0.49511592	-1.4111292	2.22216228	-0.49645
22773.8	14233																-40.625	-1.3	-0.70702944	-0.9960917	2.2241154	-0.4726204
22774	14233												227.5	3	0		-41.8125	-1.3	-1.05273168	-0.86620872	2.23192788	-0.4487908
22774.2	14233																-48.125	-1.5	-1.50194928	-0.0048828	2.1997014	-0.3812736
22774.4	14234	15	22	48.90625	66.83665845	14.5745052	22	229	1607	1124	557	0.225097656	227.3125	6	3	-9.28125	-43.71875	-1.4	-1.89843264	-0.37890528	2.1997014	-0.4130464
22774.6	14234																-47	-1.5	-2.07519	-0.77050584	2.20507248	-0.4686488
22774.8	14234												227.75	6	2		-48.65625	-1.5	-2.03710416	-0.5957016	2.2070256	-0.4446192
22775	14234																-55	-1.7	-2.01561984	-0.61132656	2.20507248	-0.4487908
22775.2	14234				66.83728374	14.57609517					446	0.180175781	226	8	7	-16.71875	-63.0625	-2.0	-1.88573736	-0.77343552	2.20507248	-0.4487908
22775.4	14234																-64.4375	-2.0	-1.64745672	-0.77831832	2.21288496	-0.4527624
22775.6	14234												227.5	11	8		-60.3125	-1.9	-1.76464392	-0.49599872	2.1997014	-0.4527624
22775.8	14234																-58.25	-1.8	-1.94530752	-0.17480424	2.17675224	-0.436876
22776	14235	15	22	50.5	66.83796845	14.57748924	22	229	1556	1073	408	0.146484375	226.875	9	7	-25.625	-56.34375	-1.8	-1.88183112	0.08007792	2.18456472	-0.3931884
22776.2	14235																-53.78125	-1.7	1.58495688	0.58886568	2.18602956	-0.3455292
22776.4	14235												226.625	8	6		-56.3125	-1.8	-1.3720668	0.31835856	2.19774828	-0.3415576
22776.6	14235																-51.3125	-1.6	-1.49608992	0.19140576	2.1997014	-0.3455292
22776.8	14235				66.83870095	14.57869029					416	0.122070313	224.75	7	5	-36	-50.375	-1.6	-1.66405824	0.03710928	2.2070256	-0.3495008
22777	14235																-49.59375	-1.5	-1.51757424	0.05078112	2.23583412	-0.3256712
22777.2	14235												226.625	4	4		-54.875	-1.7	-1.0839816	1.20507504	2.1386664	-0.258154
22777.4	14235																-48.15625	-1.5	-0.96972408	1.928706	2.10253368	-0.2541824
22777.6	14236	15	22	52.109375	66.83947091	14.57970634	22	229	1512	1029	428	0.102050781	228.375	5	4	-44.0625	-49.4375	-1.5	-1.15038768	2.10643992	1.89159672	-0.2422676
22777.8	14236																-43.625	-1.4	-1.05273168	2.12694768	1.53222264	-0.2303528
22778	14236												228.75	3	2		-38.1875	-1.2	1.19433288	1.71679248	1.53026952	-0.2422676
22778.2	14236																-38.0625	-1.2	-1.14452832	1.53612888	1.56444912	-0.2660972
22778.4	14236				66.84026434	14.58058753					385	0.100097656	228.9375	1	2	-46.9375	-39.6875	-1.2	1.0400364	1.32226224	1.623531	-0.3097848
22778.6	14236																-41.5	-1.3	-1.13476272	1.04882544	1.623531	-0.3653872
22778.8	14236												231.875	2	4		-47.59375	-1.5	-1.20702816	1.1132784	1.5551718	-0.377302
22779	14236																-49.34375	-1.5	-0.98925528	2.16991632	1.50927348	-0.3653872
22779.2	14237	15	22	53.703125	66.84107009	14.5813875	22	229	1430	947	311	0.099121094	232.75	5	6	-37.375	50.59375	-1.6	-0.82128696	2.81053968	1.50927348	-0.2899268
22779.4	14237																-49.46875	-1.5	-0.88085712	3.32128056	1.51317972	-0.2819836
22779.6	14237												232.125	5	4		-42.34375	-1.3	-0.9570288	3.25780416	1.51705596	-0.2859552
22779.8	14237																-42	-1.3	-1.20409648	2.49315768	1.5209922	-0.2899268
22780	14237				66.84187937	14.5821676					391	0.128417969	229	1	2	29.09375	41.59375	1.3	1.40722296	2.3974548	1.52294532	-0.2819836

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TIME	Sequence_Number	HOURS	MINUTES	SECONDS	LATITUDE(DEGREES)	LONGITUDE(DEGREES)	WIND_SPEED	WIND_DIRECTION	BARO_ALTITUDE(FEET)	PRESSURE_ALTITUDE	RADAR_ALTITUDE_DATA(F	TRUE_HEADING	CALIBRATED_AIRSPEED(KNOTS)	L_AOA(DEGREES)	R_AOA(DEGREES)	VELOCITY_VERTICAL_SYSTEM (FEET/SEC)	NORMAL_ACCELERATION(FEET/SECOND/SECOND)	G Load	LONGITUDINAL_STICK_POSITION(INCHES)	LATERAL_STICK_POSITION(INCHES)	THROTTLE_POSITION(INCHES)	DIRECTIONAL_PEDAL_POSITION(INCHES)
22780.2	14237																-49.3125	1.5	-2.06249472	1.31444976	1.54394136	-0.3097848
22780.4	14237												226.875	4	7		-55.3125	-1.7	-2.60155584	1.4355432	1.54003512	-0.2899268
22780.6	14237																-60.125	-1.9	-3.12694512	1.18945008	1.53222264	-0.3058132
22780.8	14238	15	22	55.296875	66.84267037	14.59305768	22	229	1360	876	401	0.1796875	227.125	7	9	-19.5	-64.90625	-2.0	-3.51366288	0.64648272	1.53417576	-0.317728
22781	14238																-72.09375	-2.3	-3.83983392	0.52441272	1.51708596	-0.3137564
22781.2	14238												226.75	12	13		-76.71875	-2.4	-3.8720604	0.55956888	1.5112266	-0.317728
22781.4	14238																-76.28125	-2.4	-3.90331032	0.84765408	1.4868126	-0.3216996
22781.6	14238				66.84341133	14.584163					426	0.241210938	222.875	14	16	-10.78125	-77.625	-2.4	-3.92870088	1.39843392	1.47362904	-0.337586
22781.8	14238																-82.09375	-2.6	-3.92284152	1.0595676	1.69970268	-0.337586
22782	14238												217.75	16	17		-78.6875	-2.5	-3.91893528	0.89550552	2.36669316	-0.3415576
22782.2	14238																-80.0625	-2.5	-3.91893528	0.92480232	2.74511016	-0.3415576
22782.4	14239	15	22	56.90625	66.84407467	14.58551047	22	229	1333	849	343	0.299804688	214.625	19	18	-8.25	-80.6875	-2.5	-3.91893528	0.95898192	2.55516924	-0.3455292
22782.6	14239																-85.28125	-2.7	-3.9257712	1.23241872	2.57030592	-0.3296428
22782.8	14239												212.3125	21	20		-85.59375	-2.7	-3.92870088	1.0888644	2.52831384	-0.3216996
22783	14239																-84.15625	-2.6	-3.92870088	1.19237976	2.49413424	-0.3216996
22783.2	14239				66.84463877	14.58709574					254	0.354492188	212.5	21	19	-10.96875	-80.25	-2.5	-3.92870088	1.16601264	2.3364198	-0.3415576
22783.4	14239																-76.3125	-2.4	-3.9257712	0.99902088	0	-0.3693588
22783.6	14239												210.4375	19	17		-70.90625	-2.2	-3.92284152	0.9960912	0	-0.4329044
22783.8	14239																-70.5625	-2.2	-3.92284152	0.91698984	0	-0.4329044
22784	14240	15	22	58.5	66.84509684	14.58886592	22	229	1319	835	193	0.400878906	207.625	18	16	-25.40625	-67.375	-2.1	-3.93846648	1.09960656	0	-0.4726204
22784.2	14240																-65.625	-2.1	-3.93846648	0.26757744	0	-0.7387176
22784.4	14240												204.625	16	15		-64.875	-2.0	-3.9697164	1.02245832	0	-0.913468
22784.6	14240																-62.5625	-2.0	-3.99510696	0.69726384	0	-0.9214112
22784.8	14240				66.84545031	14.59075654					123	0.446777344	202.8125	16	13	-46.15625	-63.1875	-2.0	-3.99998976	-0.39941304	0	-0.9055248
22785	14240																-61.875	-1.9	-3.99998976	-0.51855336	0	-0.9611272
22785.2	14240												202.125	17	13		-65.25	-2.0	-3.99998976	-0.9960912	0	-1.0088432
22785.4	14240																-65.28125	-2.0	-3.99998976	-1.17089544	0	-1.0287012
22785.6	14241	15	23	0.09375	66.84569489	14.59271422	22	229	1241	757	42	0.502441406	200.5	18	14	-64.125	-64.96875	-2.0	-3.99998976	-1.25292648	0	-1.0286444
22785.8	14241																-68.15625	-2.1	-3.99998976	-1.20214536	0	-1.0405592
22786	14241												198.5625	19	16		-75.1875	2.3	-3.99998976	-1.2792936	0	1.012758
22786.2	14241																-70.28125	-2.2	-3.95409144	-3.8671776	0.13720668	-1.0961616
22786.4	14241				66.84582096	14.59469327					27	0.551269531	198.4375	22	20	-68.90625	-74.46875	-2.3	-2.5439388	0.58007664	2.61376284	-0.8499224
22786.6	14241																-75.90625	-2.4	-2.19628344	-1.70800344	0.81200964	-1.0882184
22786.8	14241												196.3125	22	22		-77.25	-2.4	-2.59471992	-3.99998976	1.20898128	-0.5520524
22787	14241																-72.53125	-2.3	-1.95214344	-3.99998976	2.11571724	-0.8102064
22787.2	14242	15	23	1.703125	66.84584208	14.59663904	22	229	1113	629	57	0.579589844	193.6875	20	21	-57.09375	-66.34375	-2.1	-2.24999424	-3.99998976	3.16698408	-0.7506324
22787.4	14242																-67.21875	-2.1	-3.3837804	-3.7499904	2.72606724	-0.5997116
22787.6	14242												193.625	13	17		-62.40625	-2.0	-3.43163184	-3.99998976	3.38182728	-0.6195696
22787.8	14242																55.875	1.7	-3.36131952	3.91405248	3.29051892	-0.6235412
22788	14242				66.84580771	14.59854442					112	0.589355469	190.5625	8	16	-39.84375	-55.125	-1.7	-3.11424984	-3.60741264	4.00975536	-0.5679388
22788.2	14242																-51.46875	-1.6	-2.8613208	-3.29491344	3.60252984	-0.7387176
22788.4	14242												188.8125	2	14		-46.03125	-1.4	-2.36425176	-2.89745352	3.10643736	-0.6632572
22788.6	14242																-46.40625	-1.5	-2.35448616	-3.01171104	2.91063708	-0.754604

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TIME	Sequence_Number	HOURS	MINUTES	SECONDS	LATITUDE(DEGREES)	LONGITUDE(DEGREES)	CALIBRATED_AIRSPEED(KNOTS)	RADAR_ALTITUDE_DATA(FEET)
11198	6998						204.125	
11198.2	6998							
11198.4	6999	16	31	32.296875	66.82049361	14.54078858	207.375	1354
11198.6	6999							
11198.8	6999						208.0625	
11199	6999							
11199.2	6999				66.82118	14.54231878	208.5	1327
11199.4	6999							
11199.6	6999						208.1875	
11199.8	6999							
11200	7000	16	31	33.90625	66.8218809	14.5438121	207.3125	1288
11200.2	7000							
11200.4	7000						210.375	
11200.6	7000							
11200.8	7000				66.82258833	14.54527432	212.8125	1233
11201	7000							
11201.2	7000						222.0625	
11201.4	7000							
11201.6	7001	16	31	35.5	66.82330314	14.54670243	225.875	1178
11201.8	7001							
11202	7001						224	
11202.2	7001							
11202.4	7001				66.82402642	14.54809936	223.4375	1097
11202.6	7001							
11202.8	7001						226.75	
11203	7001							
11203.2	7002	16	31	37.109375	66.82475388	14.54947298	229.8125	1003
11203.4	7002							
11203.6	7002						229.3125	
11203.8	7002							
11204	7002				66.82548378	14.55082817	229	927
11204.2	7002							
11204.4	7002						230.125	
11204.6	7002							
11204.8	7003	16	31	38.703125	66.8262156	14.55217187	226.9375	773
11205	7003							
11205.2	7003						222.625	
11205.4	7003							
11205.6	7003				66.8269481	14.55350686	218.1875	751
11205.8	7003							
11206	7003						216.875	
11206.2	7003							

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TIME	Sequence_Number	HOURS	MINUTES	SECONDS	LATITUDE(DEGREES)	LONGITUDE(DEGREES)	CALIBRATED_AIRSPEED(KNOTS)	RADAR_ALTITUDE_DATA(FEET)
11206.4	7004	16	31	40.296875	66.82767875	14.55484939	216.6875	691
11206.6	7004							
11206.8	7004						216.875	
11207	7004							
11207.2	7004				66.82840546	14.55621287	215.875	649
11207.4	7004							
11207.6	7004						214.75	
11207.8	7004							
11208	7005	16	31	41.90625	66.82912789	14.55759664	214.9375	698
11208.2	7005							
11208.4	7005						214.75	
11208.6	7005							
11208.8	7005				66.82984773	14.55899122	213.5625	706
11209	7005							
11209.2	7005						212.9375	
11209.4	7005							
11209.6	7006	16	31	43.5	66.8305674	14.56038807	212.5	714
11209.8	7006							
11210	7006						213.1875	
11210.2	7006							
11210.4	7006				66.83128757	14.56178399	212.125	682
11210.6	7006							
11210.8	7006						211.8125	
11211	7006							
11211.2	7007	16	31	45.09375	66.83200993	14.56317119	214.3125	725
11211.4	7007							
11211.6	7007						212.625	
11211.8	7007							
11212	7007				66.83273572	14.56454138	215	868
11212.2	7007							
11212.4	7007						215.1875	
11212.6	7007							
11212.8	7008	16	31	46.703125	66.83346695	14.56589841	216.1875	926
11213	7008							
11213.2	7008						213.9375	
11213.4	7008							
11213.6	7008				66.83420347	14.56723734	213.8125	850
11213.8	7008							
11214	7008						216	
11214.2	7008							
11214.4	7009	16	31	48.296875	66.83494586	14.56855916	214	804
11214.6	7009							

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TIME	Sequence_Number	HOURS	MINUTES	SECONDS	LATITUDE(DEGREES)	LONGITUDE(DEGREES)	CALIBRATED_AIRSPEED(KNOTS)	RADAR_ALTITUDE_DATA(FEET)
11214.8	7009						215.125	
11215	7009							
11215.2	7009				66.83569377	14.56986741	216.8125	774
11215.4	7009							
11215.6	7009						223.25	
11215.8	7009							
11216	7010	16	31	49.90625	66.83644957	14.57115412	220.5625	738
11216.2	7010							
11216.4	7010						219	
11216.6	7010							
11216.8	7010				66.8372083	14.57243211	219.3125	667
11217	7010							
11217.2	7010						219.8125	
11217.4	7010							
11217.6	7011	16	31	51.5	66.83796837	14.57370557	219.5	613
11217.8	7011							
11218	7011						219	
11218.2	7011							
11218.4	7011				66.83872668	14.57498616	217.25	575
11218.6	7011							
11218.8	7011						216.75	
11219	7011							
11219.2	7012	16	31	53.09375	66.83947946	14.57628384	217.375	602
11219.4	7012							
11219.6	7012						216.5	
11219.8	7012							
11220	7012				66.84021774	14.57762394	216.1875	701
11220.2	7012							
11220.4	7012						215.0625	
11220.6	7012							
11220.8	7013	16	31	54.703125	66.84093481	14.57902933	214.375	839
11221	7013							
11221.2	7013						216	
11221.4	7013							
11221.6	7013				66.84161467	14.58052416	217.75	923
11221.8	7013							
11222	7013						219	
11222.2	7013							
11222.4	7014	16	31	56.296875	66.842248	14.58211941	217.9375	1023
11222.6	7014							
11222.8	7014						217.5	
11223	7014							

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TIME	Sequence_Number	HOURS	MINUTES	SECONDS	LATITUDE(DEGREES)	LONGITUDE(DEGREES)	CALIBRATED_AIRSPEED(KNOTS)	RADAR_ALTITUDE_DATA(FEET)
11223.2	7014				66.8428282	14.58381071	218.375	995
11223.4	7014							
11223.6	7014						218.5	
11223.8	7014							
11224	7015	16	31	57.90625	66.8433519	14.58558801	221.125	948
11224.2	7015							
11224.4	7015						229	
11224.6	7015							
11224.8	7015				66.84380771	14.587457	223.875	887
11225	7015							
11225.2	7015						226.5	
11225.4	7015							
11225.6	7016	16	31	59.5	66.84420358	14.58940395	221.875	817
11225.8	7016							
11226	7016						223.875	
11226.2	7016							
11226.4	7016				66.84456099	14.59139398	232	768
11226.6	7016							
11226.8	7016						229.9375	
11227	7016							
11227.2	7017	16	32	1.09375	66.84487103	14.59343246	224.875	727
11227.4	7017							
11227.6	7017						220.875	
11227.8	7017							
11228	7017				66.84514839	14.59550438	217.75	693
11228.2	7017							
11228.4	7017						216.875	
11228.6	7017							
11228.8	7018	16	32	2.6875	66.845397	14.59759525	217.875	696
11229	7018				IVO Last Recorded Location on Mishap Day			
11229.2	7018						217.75	
11229.4	7018							
11229.6	7018				66.84562172	14.59969659	218.75	798
11229.8	7018							
11230	7018						219	
11230.2	7018							
11230.4	7019	16	32	4.296875	66.84584644	14.60179199	219.875	842
11230.6	7019							
11230.8	7019						219.3125	
11231	7019							
11231.2	7019				66.84609219	14.60387003	218.875	782
11231.4	7019							

TIME	Sequence_Number	HOURS	MINUTES	SECONDS	LATITUDE(DEGREES)	LONGITUDE(DEGREES)	CALIBRATED_AIRSPEED(KNOTS)	RADAR_ALTITUDE_DATA(FEET)
11231.6	7019						218.5	
11231.8	7019							
11232	7020	16	32	5.90625	66.84636871	14.60592544	218.3125	732
11232.2	7020							
11232.4	7020						217.875	
11232.6	7020							
11232.8	7020				66.84668052	14.60794858	217	674
11233	7020							
11233.2	7020						215.5625	
11233.4	7020							
11233.6	7021	16	32	7.5	66.8470308	14.60993106	214.75	609
11233.8	7021							
11234	7021						214.25	
11234.2	7021							
11234.4	7021				66.84741796	14.61187055	214.5	494
11234.6	7021							
11234.8	7021						213.5625	
11235	7021							
11235.2	7022	16	32	9.09375	66.84784032	14.61376294	212.4375	364
11235.4	7022							
11235.6	7022						211.625	
11235.8	7022							
11236	7022				66.84829152	14.61561249	211.8125	[illegible]
11236.2	7022							
11236.4	7022						212.25	
11236.6	7022							
11236.8	7023	16	32	10.703125	66.84876753	14.6174275	212.375	344
11237	7023							
11237.2	7023						212.6875	
11237.4	7023							
11237.6	7023				66.84926977	14.61920287	213.0625	490
11237.8	7023							
11238	7023						212.8125	
11238.2	7023							
11238.4	7024	16	32	12.296875	66.84979968	14.62093449	212.125	635
11238.6	7024							
11238.8	7024						212.4375	
11239	7024							
11239.2	7024				66.85035733	14.62261934	213.125	743
11239.4	7024							
11239.6	7024						214	
11239.8	7024							

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Profile indicative of short duration terrain crossing at exit point of valley

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TIME	Sequence_Number	HOURS	MINUTES	SECONDS	LATITUDE(DEGREES)	LONGITUDE(DEGREES)	CALIBRATED_AIRSPEED(KNOTS)	RADAR_ALTITUDE_DATA(FEET)
11240	7025	16	32	13.90625	66.85094607	14.62424903	214.6875	868
11240.2	7025							
11240.4	7025						213.75	
11240.6	7025							
11240.8	7025				66.85156591	14.62581687	215.625	1007
11241	7025							
11241.2	7025						215.875	
11241.4	7025							
11241.6	7026	16	32	15.5	66.85221593	14.627321	216.5625	995
11241.8	7026							
11242	7026						216.75	
11242.2	7026							
11242.4	7026				66.85290249	14.62873695	217.125	963
11242.6	7026							
11242.8	7026						216.875	
11243	7026							
11243.2	7027	16	32	17.09375	66.85362493	14.6300535	216.0625	926
11243.4	7027							
11243.6	7027						216.6875	
11243.8	7027							
11244	7027				66.8543772	14.63127567	216.75	906
11244.2	7027							
11244.4	7027						217.1875	
11244.6	7027							
11244.8	7028	16	32	18.703125	66.85515253	14.63242072	218.375	869
11245	7028							
11245.2	7028						218.3125	
11245.4	7028							
11245.6	7028				66.85594286	14.6335076	218.9375	843
11245.8	7028							
11246	7028						219.75	
11246.2	7028							
11246.4	7029	16	32	20.296875	66.85674735	14.63453748	219.5	802
11246.6	7029							
11246.8	7029						219.3125	
11247	7029							
11247.2	7029				66.85756836	14.63549847	219	777
11247.4	7029							
11247.6	7029						219.0625	
11247.8	7029							
11248	7030	16	32	21.90625	66.85840311	14.63638787	218.375	738
11248.2	7030							

Polaris ACC Bodø - RADAR and radio communication summary regarding GHOST31 flight March 18 2022.

All times UTC.

Freq 118,55Mhz (Polaris ACC): (GHOST 31 departed ENBO 13:33)

13:42:42 GHOST31 checks in on 118,55MHz "Southbound"

14:09:20-14:11:12 "Unreadable" from ATC "contact Stokka freq 120,4Mhz"

There are no transmissions from GHOST31 on 118.55 MHz between 14:11:12 to 15:30:00.

MSSR radar Polaris ACC:

Radar contact between 13:32:44 (departure) until time 13:59:26 (BOO VOR R-211 46Nm)

altitude 1000-1100 ft.

Radar contact between 14:01:50 (STO VOR R-015 35Nm) until time 14:05:25 (STO VOR R-016 28Nm) altitude 1000-1200 ft.

Radar contact between 14:11:15 (STO VOR R-017 11Nm) until time 14:24:45 (BNN VOR R-320 12Nm) altitude 800-1100 ft.

Radar contact between 14:26:15 (BNN VOR R-294 11Nm) until time 14:26:44

altitude 900 ft.

Radar contact between 14:32:05 (BNN VOR R-226 14Nm) until time 14:36:47

altitude 300-900 ft.

Radar contact between 14:38:16(BNN VOR R-165 12Nm) until time 14:39:45(BNN VOR R-149 9 Nm) altitude 600 ft.

Radar contact between 14:44:25(BNN VOR R-077 6 Nm) until time 14:45:30

altitude 900 ft.

Radar contact between 14:46:30 (BNN VOR R-042 6 Nm) until time 14:55:00

altitude 900 ft.

Last shown on MSSR radar at position 65536N0125116E time 14:55, 900 feet, turning southeast.

ENST (Stokka AFIS) last contact with GHOST31 time 1455.

ENMS (Mosjoen AFIS) in contact with GHOST31 time 1458-1501

ENRA (Rana AFIS) in contact between 1504-1510. GHOST31 informed ENRA (Rana AFIS) "Entering your zone in the west to leave to the north" No further contact after that.

Info

- Gul linje viser der vi har hatt radarkontakt med GT31.
- CRC har ikke på noe tidspunkt hatt radiokontakt med GT31 .
- På siste posisjon ble GT31 sett med to IFF plott med 12 sekunders mellomrom. Høyde på plott 1 var 2800fot, høyde på plott 2 var 2900fot. På bakgrunn av kun to plott kan vi ikke med sikkerhet si noe om hvilken HDG GT31 hadde.

ENCLOSURE (36)

Info

- Yellow line shows where we have had radar contact with GT31.
- CRC has at no time had radio contact with GT31.
- In the last position, the GT31 was seen with two IFF plots at 12 second intervals. Height of plot 1 was 2800 feet, height of plot 2 was 2900 feet. Based on only two plots, we can not say with certainty which HDG GT31 had.