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Ser 3364

Revised

From: Commander, Naval Oceanographic Office
To: Dr. Alan W. Lohanick, Physicist GS-9

Subj: Arctic Field Operations

Ref: (a) 4683 ABGP Thule AB, Greenland Msg 092000Z Aug 1973

Encl: (1) Flight Schedule for Project BIRDSEYE 8-74
(2) Technical Specifications for Project BIRDSEYE 8-74

1. The proposed flight schedule and technical specifications for Project BIRDSEYE 8-74 Arctic Field Operations to be conducted during the period 17-29 April 1974, are forwarded as enclosures (1) and (2), respectively.

2. Dates and procedural sequences for conduct of the mission are tentative. To achieve maximum effectiveness you may vary, if required, procedural sequences during the conduct of the mission. Procedural changes will be made in concurrence with the aircraft commander to insure flight safety.

3. Theater clearance for visiting Thule AB, Greenland has been approved by reference (a).

4. By copy of this letter, Oceanographic Development Squadron EIGHT is requested to provide aircraft services needed to accomplish this mission.

track	slow time	cum.	NM
2	2.8 = 2.8		532
3	2.7, 2.1 = 4.8	7.6	1444
4	2.1, 1.3 = 3.4	11.0	2090
5	2.3, 2.8 = 5.1	16.1	3059
6	3.4, 1.2, 1.2 = 5.8	21.9	4161
7	2.1 = 2.1	24.0	4370

Copy to:
OCEANDEVRON EIGHT
CNO (OP-095, 513, 616, 943 NRC)
CINCLANT (JRC)
CINCLANTFLT
COMNAVAIRLANT
OCEANAV
COMSUBCONDFLT
COMICEDEFOR
COMNAVWEASERVCOM
COMFAIR KEFLAVIK
CINCAL
COMALAIRC

2.0
1.9
2.4
2.9
89.0

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Ser 3364

Copy to: (Cont.)
NAS PATUXENT RIVER
FLEWEAPAC SUITLAND
COMCHASWGRU
NAVSTA KEFLAVIK
ANR, ANRC
THULE AB, GREENLAND
SONDRESTROM AB, GREENLAND
21 AIR DIV/OOP-W, HANCOCK FIELD, NY
744 ACW SQ (AAC)
5010 COMBAT SUPPORT GROUP

Blind copy to:
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Code 01
Code 3000
Code 3100
Code 3300
Code 33212
Code 5000
Code 6000
Code 6100
Code 6140
Code 6170

Orig: A. Lohanick, Ext. 72864, Code 6140
Typ:m.emmons 2/26/74 No R/S #

TECHNICAL SPECIFICATION FOR AIRBORNE LASER PROFILING DATA ACQUISITION STANDARDIZATION TECHNIQUES OF SEA ICE IN ARCTIC REGIONS

BIRDSEYE 8-74

17-29 APRIL 1974

1.0 INTRODUCTION

1.1 Purpose of Operations:

Project BIRDSEYE is an Arctic ice research program conducted by the Naval Oceanographic Office. Project aims include improvement, development, and evaluation of objective techniques for ice observation, the refinement of forecasting techniques, and the continuing acquisition of statistical and historical data for present and future applications to military Arctic operations.

Repeated observations are made, of the same ice at various times, for empirical hindcasting studies. Observations made in an area at the beginning and end of a selected time interval, are used to determine changes in the ice during that interval. These changes are then empirically related to wind and pressure patterns in the area. A given pressure field can be expected to correlate strongly with sea ice changes, and much of the data already accumulated can provide ice change determinations.

1.2 Scope:

All operations on this mission will be conducted from the Project BIRDSEYE aircraft.

The mission is to include the collection of laser profilometer data over selected sea ice areas. The data will be used to determine the degree of ice surface roughness and types of ice features, as well as to determine the distribution of ice types. The Senior NAVOCEANO Representative, (SNR) is authorized to modify or implement these specifications as required, to best satisfy the requirements of the mission.

2.0 LOCALE

This survey will be conducted over the Baffin Bay - Labrador Sea area, the Arctic Ocean, the Beaufort and Chukchi Seas, and the Bering Sea - Bering Strait areas. The aircraft will stage from Thule AB, Greenland, and Eielson AFB, Alaska. The six flight tracks listed in the Flight Schedule, which comprise the entire mission (except those tracks including NAS Patuxent River) are shown individually in Figures 1 through 6. Track coordinates are given in Table I.

3.0 PROCEDURE

3.1 General Ice Observations:

Ice data are collected by visual observation augmented by laser profiling, radar plotting, and photography. A team of NAVOCEANO ice observers

simultaneously record separate aspects of ice coverage at all times. The World Meteorological Organization (WMO) ice code observations are made from the bow of the aircraft. Ridges and water openings are observed from viewing ports aft of the flight deck. Data are initially recorded by the forward observer for semicircular areas of ice coverage two miles in radius forward of the aircraft. Such areas represent WMO spot observations and are observed at five minute intervals. WMO ice data are recorded in numerical code during the flight. The forward observer also makes a plot of significant ice and water features. This plot is known as the ice mapping plot and is used as an aid in compiling WMO ice data. Ice mapping data, recorded in less detail than the WMO data, covers the full range of effective visibility.

3.2 Water Opening Count:

Water openings are counted and measured along the flight track utilizing a mark on the observation port. Counts are made for ten-minute periods. Classification of sizes and orientations of water openings, is made in accordance with procedures standardized on past BIRDSEYE missions.

3.3 Radar Data:

Radar observations of pack boundaries, water openings, and ice islands are obtained by radar plot and photography.

3.4 Meteorological Data:

In-flight weather observations are recorded at 30-minute intervals. The aircraft navigator records flight-level windspeed and drift on the BIRDSEYE navigation log. Atmospheric pressure and corrected free-air temperature are obtained at desired altitudes with the AN/AMO-17 aerograph. The ice observer in bow position records the amount and type of predominant clouds above and below the aircraft.

3.5 Remote Sensing:

The laser profilometer system (equipment is described below), the infrared scanner, and aerial camera will be used on all flight tracks in the Arctic area, to maximize sea ice observation during the mission. The data from the profilometer and infrared scanner will be cross-correlated with photography from a 35 MM strip camera and the CA-14 aerial camera, for maximum recovery of information, regarding all aspects of sea ice classification and features.

Particular attention will be paid to standardizing the acquisition of data taken from the laser profilometer. Once this standardization is accomplished, reduction of data from future missions can be accomplished in a uniform and more useful way.

4.0 PERSONNEL

The Naval Oceanographic Office (NAVOCEANO) will provide the senior NAVOCEANO Representative, one oceanographer, one physicist, and one electronics technician. Fleet Weather Facility, Suitland will provide two aerial ice observers. Photographic assistance is required.

5.0 EQUIPMENT

The following remote sensing equipment will be carried aboard the RP-3A aircraft.

5.1 A laser profiling system.

5.2 An AN/AAR-35 infrared scanner.

5.3 A CA-14 (gyro-mounted) Cartographic Camera system.

5.4 An AMQ-17 aerograph and dew point hygrometer to record flight level meteorological data.

5.5 A 35 MM Strip Camera.

6.0 DATA REDUCTION AND REPORTS

6.1 Progress Reports:

No progress reports will be submitted during this mission unless there is a major casualty, loss of equipment, or major change to these specifications. A SITREP message, coordinated between the Aircraft Commander and the Senior NAVOCEANO Representative will be sent to NAVOCEANO and OCEANDEVRON EIGHT upon completion of each local flight.

6.2 Data Reduction:

No data collected by remote sensors will be reduced in the field during this mission. All such data collected, however, will be constantly monitored to insure proper functioning of electronic equipment. Maximum effort will be made to process all visual ice observations during flight so that ice information can be expeditiously transmitted to interested agencies. Navigation logs will be delivered by the senior ice observer to the Naval Oceanographic Office.

6.3 Reports:

A TAD report will be prepared by the senior scientist within two weeks after completion of the mission.

A report will also be prepared on the standardized methods of data acquisition using the Laser Profilometer, for use on future missions.

TABLE I
BIRDSEYE 8-74

Date	Track No.	Route
17 April 1974	1	NAS PAX Direct Goose Bay, Labrador
18 April 1974	2	Goose Bay - 69N 6045W - 75N 75W - Thule AB
20 April 1974	3	Thule AB - 7330N 73W - 69N 6230W - 69N 62W - 7430N 75W - Thule AB
22 April 1974	4	Thule AB - 90N - Eielson AFB
24 April 1974	5	Eielson AFB - 73N 160W - 71N 135W - 7130N 135W - 7430N 155W - Eielson AFB
26 April 1974	6	Eielson AFB - 75N 125W - 75N 120W - 7415N 113W - 7415N 80W - Thule AB
28 April 1974	7	Thule AB - 75N 70W - 7030N 6045W - Goose Bay
29 April 1974	8	Goose Bay, Labrador direct NAS PAX

1 1330Z 0930L
1630Z 1430L

2 1200Z
2000Z

3 1400Z
1900Z

4 1400Z
2330Z 1330L

5 1900Z 0900L
0400Z 1800L

6 1600Z 0600L
0030Z

7 1600Z 1300L
2000Z 1600L

8 1600Z 1300L
2000Z 1600L

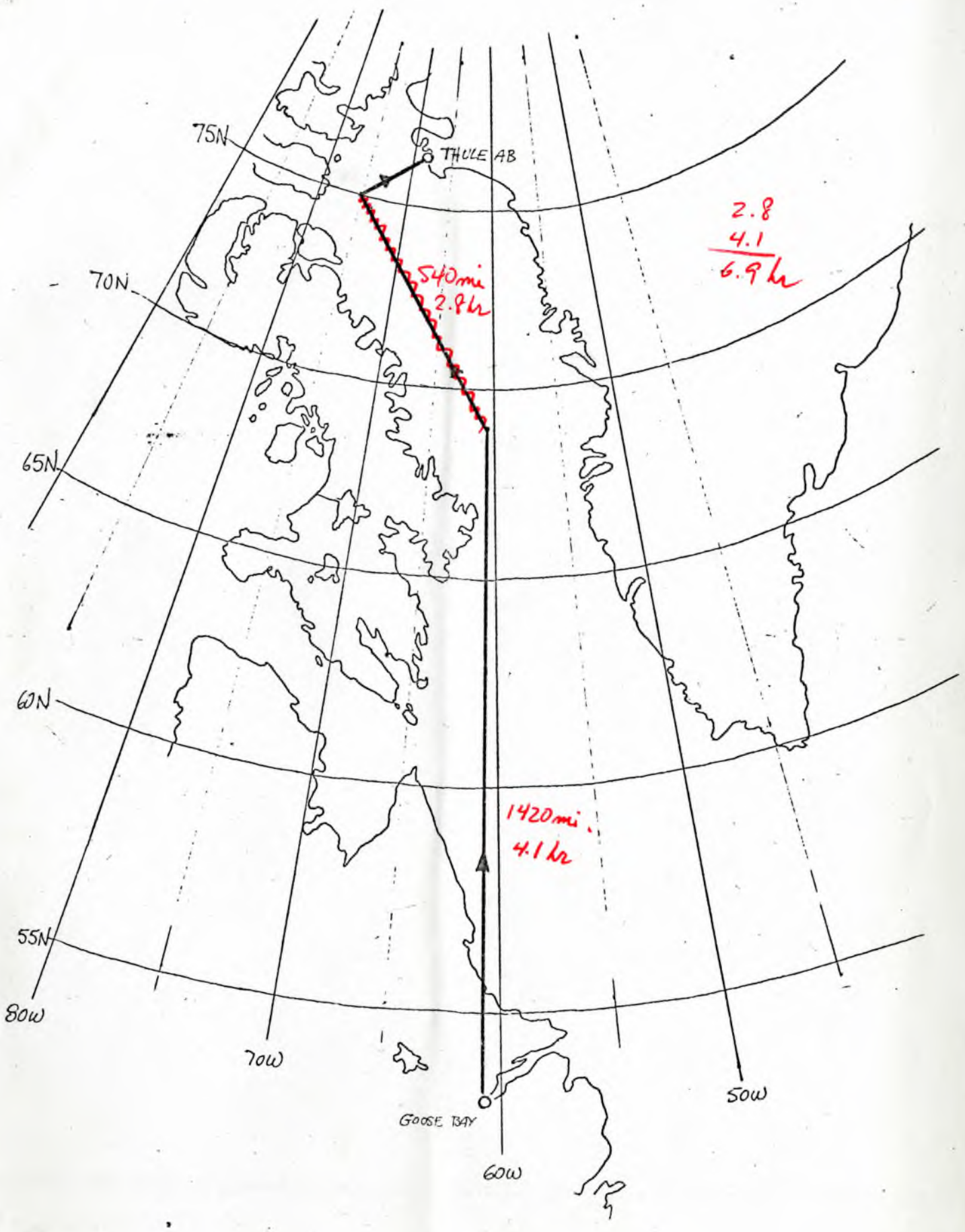
Track 2. 1200Z
2000Z

3 1400Z
1900Z

6 1600Z (0600)
0030Z

7 1200Z
2000Z (1700)

8 1600Z (1300)
2000Z (1600)



TRACK 2

FIGURE 1