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DEPARTMENT OF COMMERCE/ National Oceanic and Atmospheric Administration

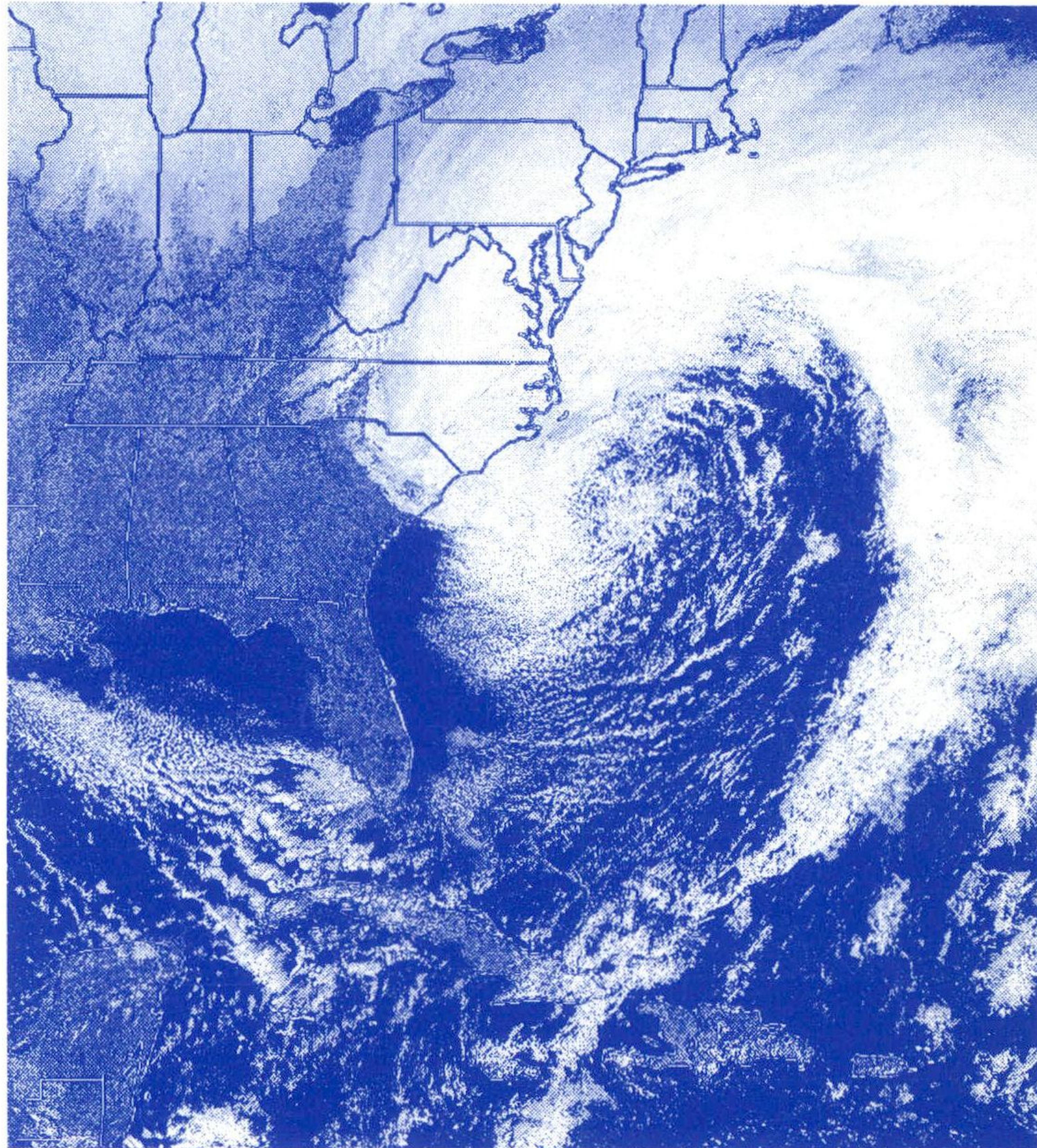
# JFCM



OFFICE OF THE FEDERAL COORDINATOR FOR  
METEOROLOGICAL SERVICES AND SUPPORTING RESEARCH

## National Winter Storms Operations Plan

FCM-P13-1998



Washington, DC  
November 1998

NOAA/NESDIS GOES-8 Ch. 1, 2, 4  
28 January 1998 16:40 UTC

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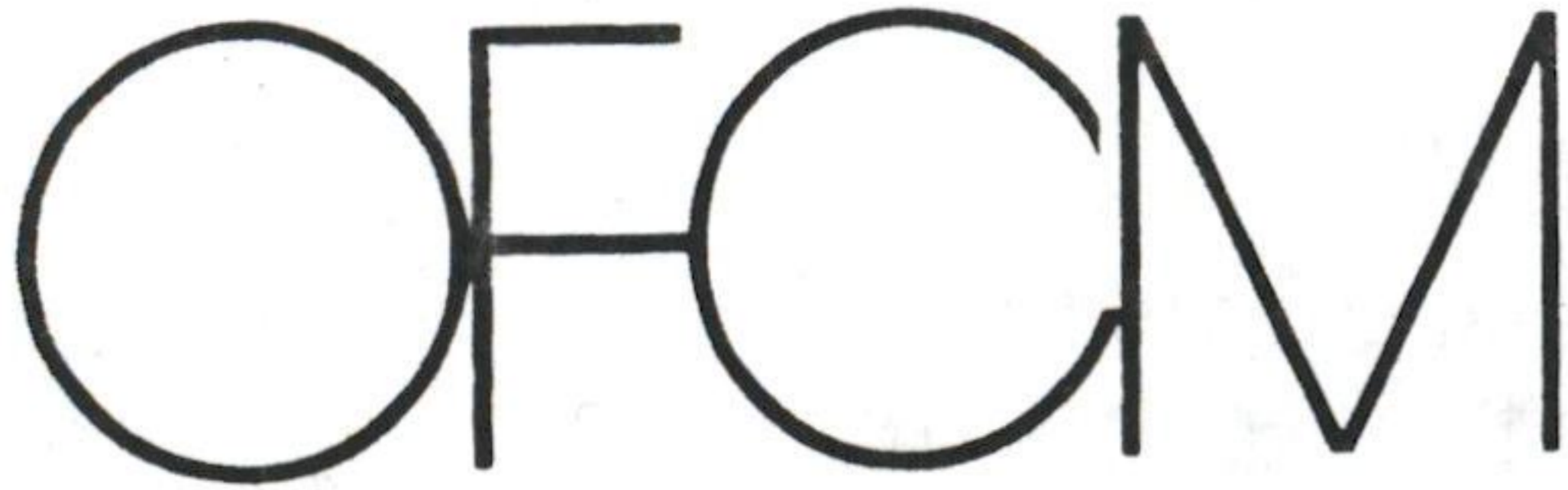
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November 12, 1999

MEMORANDUM FOR: Holders of the National Winter Storms Operations Plan  
(See Distribution)

FROM: Robert J. Dumont  
Secretary, Working Group for Hurricane and Winter Storm  
Operations and Research

SUBJECT: Changes to the National Winter Storms Operations Plan  
(FCM-P13-1998)

Please make the following "pen and ink" and page changes to the November 1998 version of the National Winter Storms Operations Plan. With the lack of substantial changes, we could not justify the cost associated with the printing and distribution of a 1999 version.

a. "Pen and Ink Changes."

- 1) Para 2.1 (page 2-1) Add after the first sentence: "As currently defined, the winter storm season runs from 1 November through 15 April."
- 2) Para 2.2.1 (page 2-1). Change the end of the first sentence to read: "...and North Pacific Ocean east of the date line in response to DOC needs."
- 3) Para 2.4.5.2 (page 2-4). Delete the first sentence and add: "Using requirements stated by NCEP/HPC, CARCAH will prepare the WSPOD daily between November 1 and March 31, and at other times during the year as required. CARCAH will coordinate with DOD and DOC to effect maximum useful data from available resources."
- 4) Para 2.5.6.1 (page 2-9). Change the example remark to read: "RMK AF980 WSWSA TRACK01 OB 02."
- 5) Para 2.5.6.2 (page 2-9). Change the example remark to read: "RMK NOAA3 WSWSP TRACK02 OB 23."
- 6) Page 2-9. Add the following note at the bottom of the page: "Note: Use A for an Atlantic mission (WSWSA) and P for a Pacific mission (WSWSP)."

- 7) Para 3.2.1.1 (page 3-2). Fourth sentence, first paragraph make the following changes: After "equivalent infrared sectors" insert "(four kilometer)" and after "water vapor" insert "(eight kilometer)."
- 8) Para 3.2.1.1 (page 3-2). Third sentence, second paragraph add: "...for GOES-8 or GOES-10 in the event of a catastrophic failure." Replace the fourth sentence with the following: "The launch of the next GOES satellite (GOES-L/11) has slipped several months due to launch vehicle problems, and a firm launch date has not been selected. The launch will not occur before December 1999 and will likely slip into the year 2000."
- 9) Para 3.2.1.2 (page 3-3). Replace as follows: "Currently NOAA-12, NOAA-14, and NOAA-15 provide data for direct readout Automatic Picture Transmission (APT) and High Resolution Picture Transmission (HRPT). NOAA-15 became operational in December 1998. NOAA-15 carries the same instrumentation as the earlier satellites with the addition of the Advanced Microwave Sounding Unit (AMSU), which is scheduled for full operations in early 2000. The AMSU instrument provides total precipitable water and rain rate information to analysts. NOAA-15 has replaced NOAA-12 for recorded data operations (AVHRR GAC and LAC). NOAA-L (16) is currently scheduled for launch in the summer of 2000."
- 10) Para 3.2.1.3 (page 3-3). First sentence, first paragraph, insert "*Winter*" between "*National*" and "*Storms*."
- 11) Para 3.2.1.3 (page 3-5). Beginning last sentence, second paragraph, change to read: "...NWS forecast offices and River Forecast Centers (RFC) across the United States via the Automation of Field Operations and Services (AFOS) system and on the internet. The capability to send this information to AWIPS is under development."
- 12) Para 3.2.1.3 (page 3-5). First sentence, third paragraph, change "NOAA is conducting" to "NOAA has conducted." Delete the third sentence and replace as follows: "However, RAMDIS is being rapidly phased out as the AWIPS system deployments near completion." Add the following sentence to the end of the paragraph: "The Y2K compliant system and software for providing a full suite of products via NOAAPORT to AWIPS was brought into operations in September 1999."
- 13) Para 3.2.2 (page 3-5). Add the following sentence to the end of the paragraph: "The next DMSP satellite is scheduled to be launched in December 1999."

14) Table 3-1 (page 3-4). Make the following changes to the Polar Orbit section of the table:

a) Column labeled "TYPE OF DATA":

- NOAA-12 - drop AVHRR GAC and LAC (recorded) and TOVS
- NOAA-14 - delete (same as NOAA-12) and replace with "AVHRR GAC and LAC (recorded), HRPT and APT (direct), and TOVS."
- NOAA-15 - delete (Operational Nov 98); change to read: " (same as NOAA-14) plus AMSU-A in use; AMSU-B expected to become operational in 2000."

b) Column labeled "LOCAL TIME":

- NOAA-12 - 0513D/1713A
- NOAA-14 - 0333D/1533A
- NOAA-15 - 0731D/1932A
  
- DMSP F-11 - 0731D/1932A
- DMSP F-12 - 0844D/2044A
- DMSP F-13 - 0558D/1758A
- DMSP F-14 - 0848D/2048A

15) Para 3.3.1.2 (page 3-6). Add the following sentence to the end of the paragraph: "Spectral wave information is reported in FM65-IX WAVEOB code."

16) Para 3.3.2.1 (page 3-6). Replace the last two sentences with the following sentence: "AES Canada is expected to deploy additional drifters in the area in the fall and winter of 1999."

b. Page Changes. Replace pages 3-7 through 3-10.

Attachment

Chapter 3, Other Observations, pages 3-7 through 3-10

## NDBC MOORED BUOY (ATLANTIC BASIN LOCATIONS)

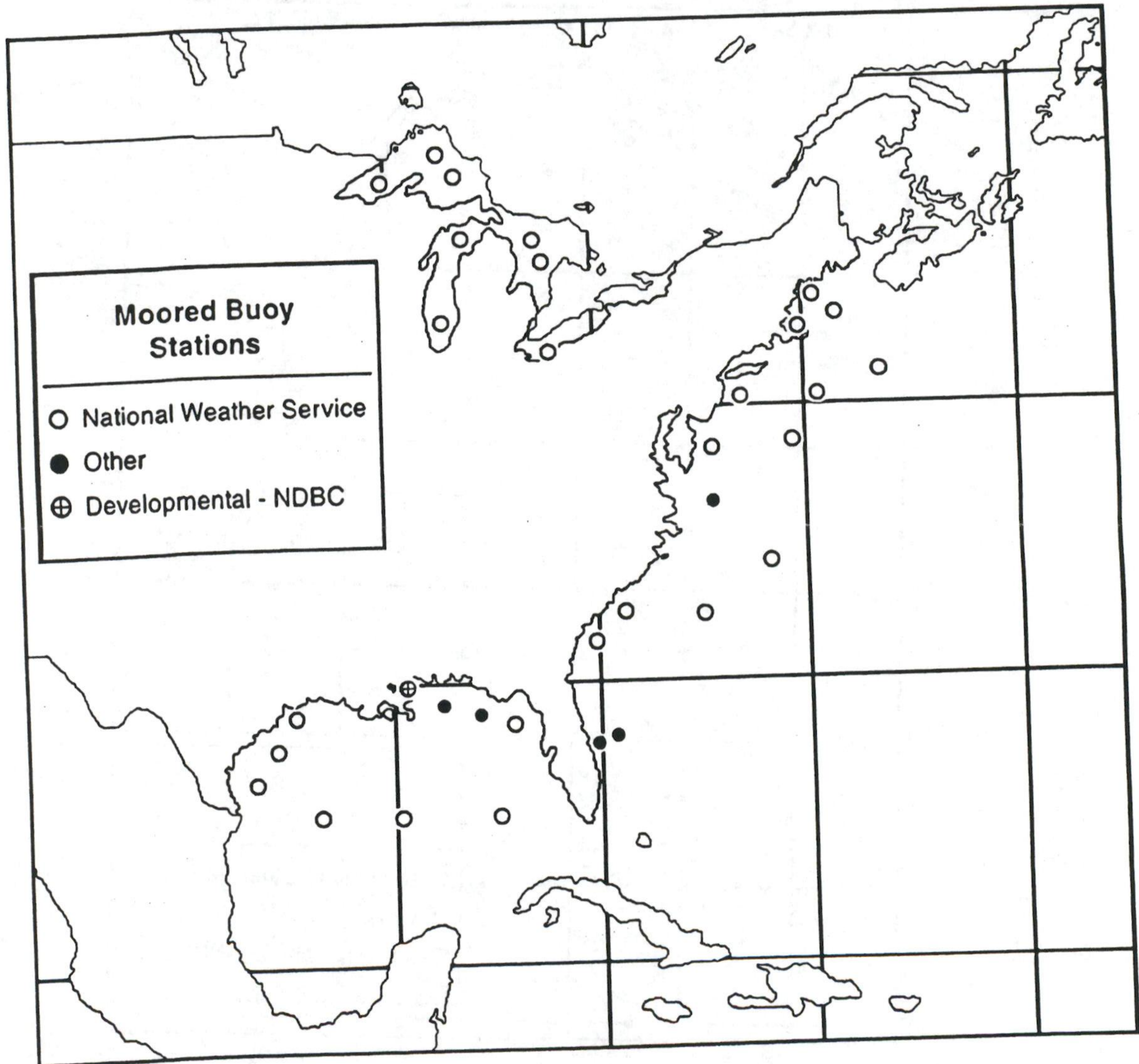


Figure 3-1. NDBC moored buoys - Atlantic basin.

# NDBC MOORED BUOY (PACIFIC BASIN LOCATIONS)

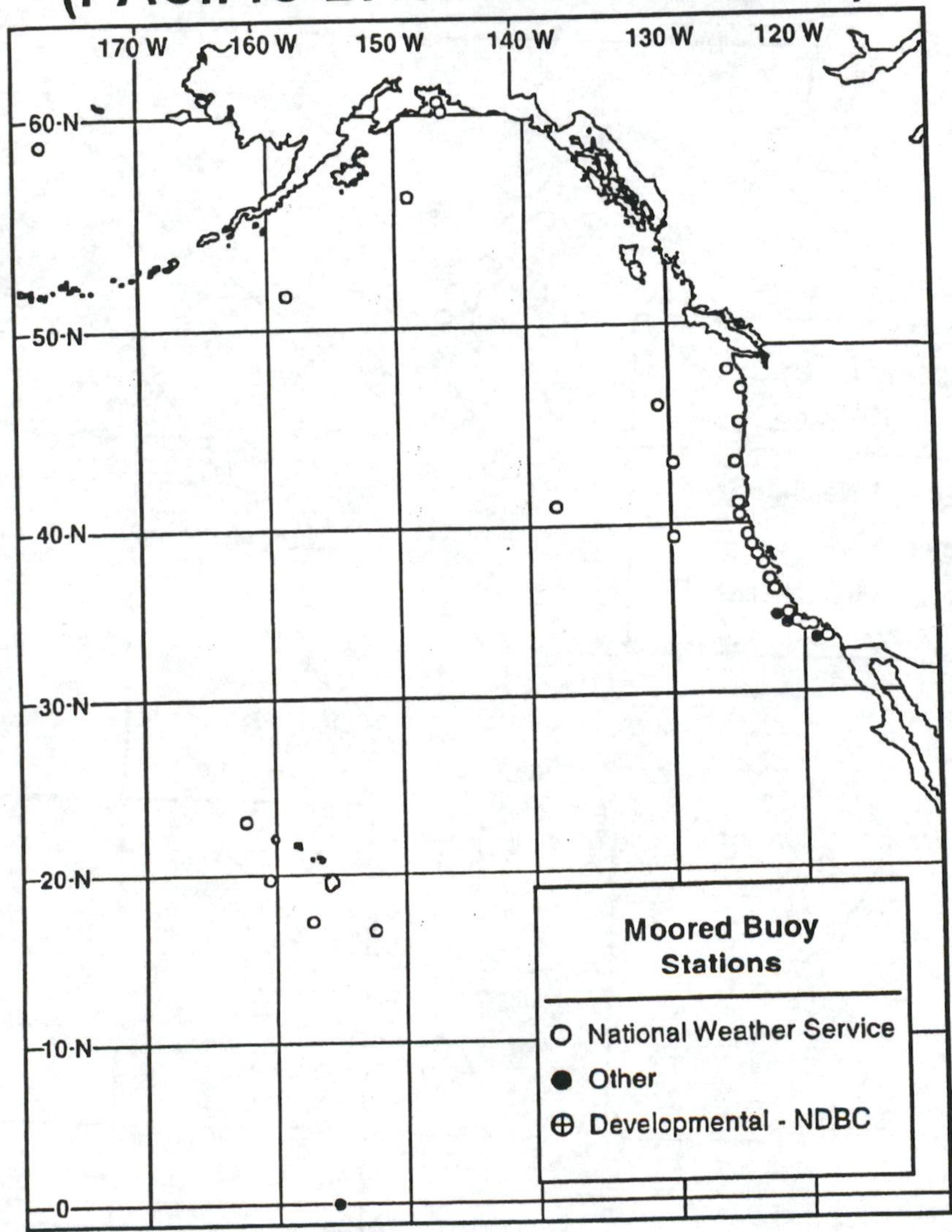


Figure 3-2. NDBC moored buoys - Pacific basin.

# COASTAL-MARINE AUTOMATED NETWORK (C-MAN)

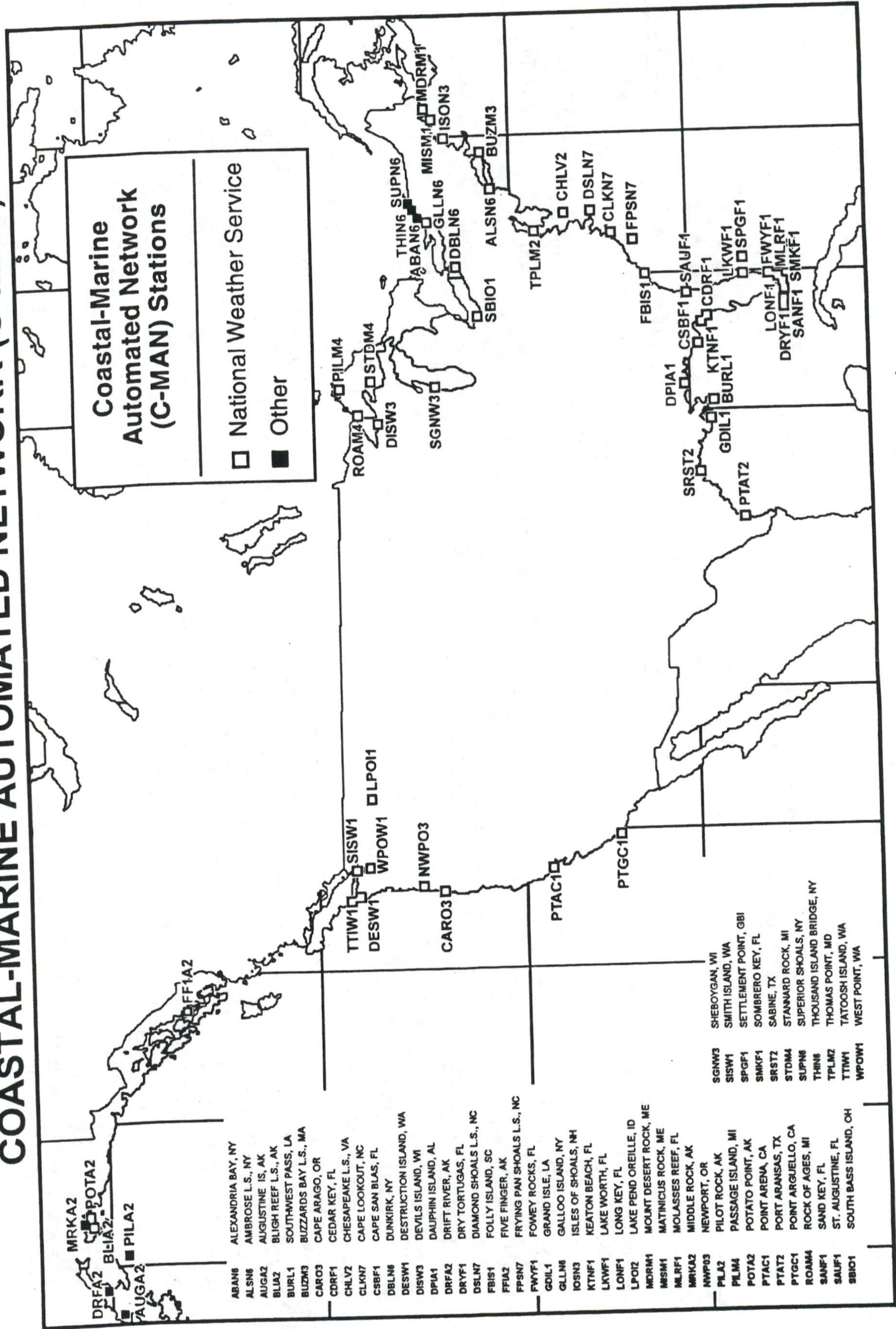


Figure 3-3. NDBC fixed C-MAN stations in North America.



## Table 3-2. Moored buoy payload data.

PARAMETER	REPORTING RANGE	REPORTING RESOLUTION	SAMPLE INTERVAL	SAMPLE PERIOD	TOTAL SYSTEM ACCURACY
WIND SPEED	0 TO 62 m/s	0.1 m/s	1 s	8 min <sup>1</sup>	±1 m/s or 10%
WIND DIRECTION	0 TO 360°	1°	1 s	8 min <sup>1</sup>	±10°
PEAK WIND	0 TO 82 m/s	1 m/s	1 s	5 s	±1 m/s or 10%
AIR TEMPERATURE	-40 TO 50 °C	0.1 °C	90 s	8 min	±1 °C
ATMOSPHERIC PRESSURE	800 TO 1100 hPa	0.1 hPa	4 s	8 min	±1 hPa
SEA SURFACE TEMPERATURE	-7 TO 41 °C	0.1 °C	1 s	8 min	±1 °C
SIGNIFICANT WAVE HEIGHT	0 TO 35 m	0.1 m	0.39 s	20 min	±0.2 m or 5%
WAVE PERIOD	3 TO 30 s	0.1 s	0.39 s	20 min	±1 s
NONDIRECTIONAL WAVE SPECTRA	0.03 TO 0.40 Hz	0.01 Hz	0.39 s	20 min	—
DEW POINT TEMPERATURE <sup>2</sup>	-35 TO 30 °C	0.1 °C	1 s	8 min	±1 °C
SOLAR RADIATION <sup>2</sup>	0 TO 2150 W/m <sup>2</sup>	0.5 W/m <sup>2</sup>	1 s	8 min	±5%
PRECIPITATION RATE <sup>2</sup>	1 TO 1600 mm/hr	1 mm	1 s	15 min	±5%
DIRECTIONAL WAVES <sup>2</sup>	0 TO 360°	1.0°	0.5 s	20 min <sup>3</sup>	±5°
OCEAN CURRENTS (ADCP) <sup>2</sup>	0 TO 1000 cm/s	0.5 cm/s	1.5 s	20 min	±2 cm/s

<sup>1</sup>FOR CONTINUOUS WINDS, SUCCESSIVE 10-MIN SAMPLES

<sup>2</sup>PARAMETER REPORTED ON SELECTED BUOYS

<sup>3</sup>WAVE SAMPLING PERIOD 40 MIN ON SOME SYSTEMS

**FEDERAL COORDINATOR  
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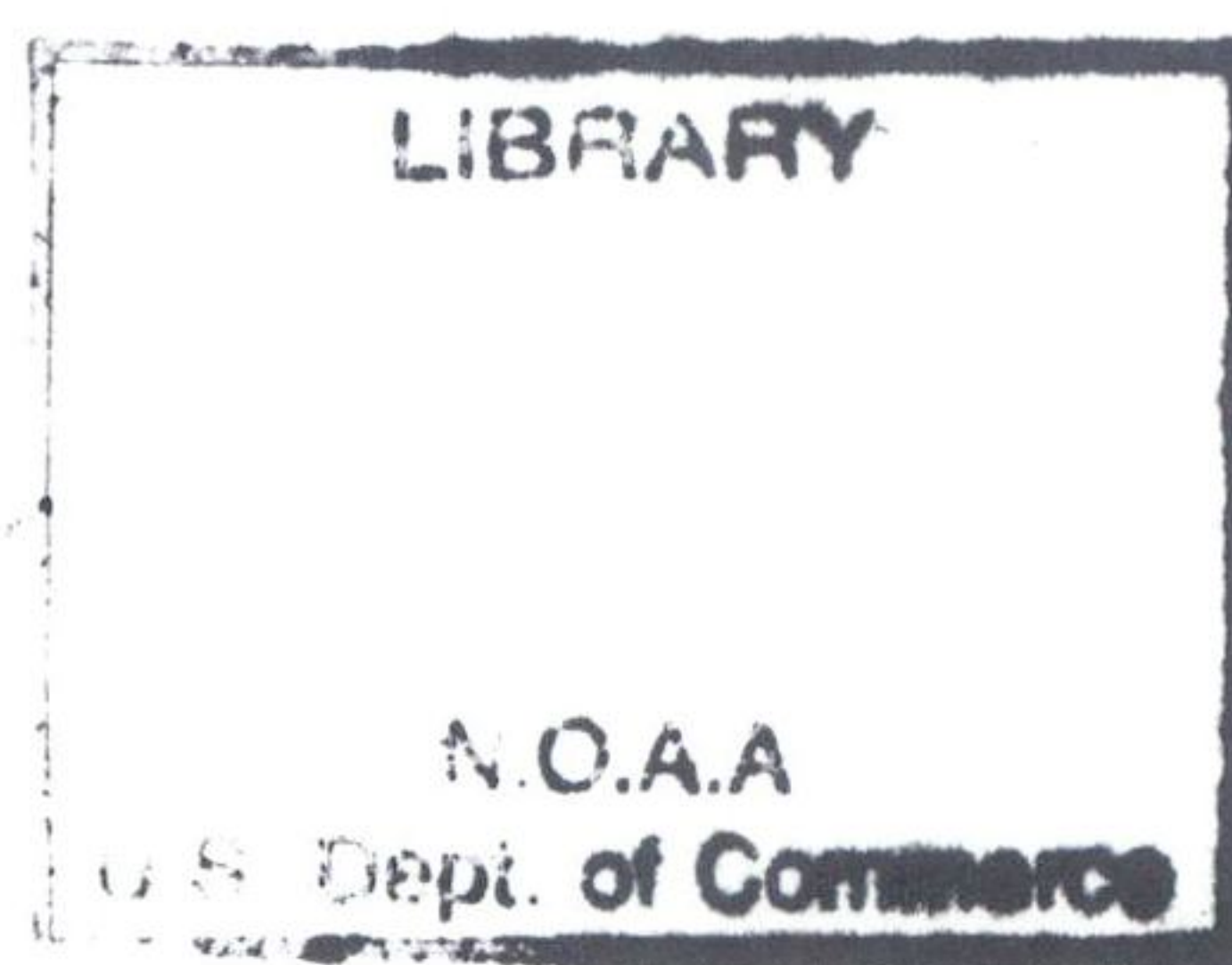
**NATIONAL WINTER STORMS**

**OPERATIONS PLAN**

QC  
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N381  
1998

FCM-P13-1998

Washington, D.C.  
November 1998



## CHANGE AND REVIEW LOG

Use this page to record changes and notices of reviews.

Change Number	Page Numbers	Date Posted	Initial
1			
2			
3			
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Changes are indicated by a vertical line in the margin next to the change.

Review Date	Comments	Initial

## FOREWORD

This is the 24th edition of the *National Winter Storms Operations Plan*. The purpose of the plan is to coordinate the efforts of the federal meteorological community to provide enhanced weather observations of severe winter storms that impact the coastal regions of the United States. The goal: Improve the accuracy and timeliness of severe winter storm forecast and warning services provided by the Nation's weather service organizations. These forecast and warning responsibilities are shared by the National Weather Service, within the Department of Commerce and the National Oceanic and Atmospheric Administration (NOAA), and the weather services of the United States Air Force and the United States Navy, within the Department of Defense. While the plan documents requirements for surface, upper air, and satellite observations of all types, it focuses on the coordination of requirements for aircraft weather reconnaissance observations provided by the Air Force Reserve Command's 53rd Weather Reconnaissance Squadron and NOAA's Aircraft Operations Center.

Within the organizational infrastructure of the Office of the Federal Coordinator for Meteorological Services and Supporting Research, the Working Group for Hurricane and Winter Storms Operations and Research (WG/HWSO&R) is responsible for maintaining the plan. All of the chapters in this edition have minor updates or changes. The information on satellite and data buoy observations in Chapter 3 has been extensively updated, and Appendix F contains updated storm tracks for the East and Gulf Coasts.

During January and February of 1998, winter storm missions were flown in the Northeast Pacific Ocean in support of an adaptive observing strategy experiment called NORPEX 98. Similar missions are planned for the 1998-1999 winter storm season. In the coming year, the WG/HWSO&R will be investigating the need to formally document and coordinate winter storm mission requirements for the Northeast Pacific Ocean.



Samuel P. Williamson

Federal Coordinator for Meteorological  
Services and Supporting Research



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## CHAPTER 1

### RESPONSIBILITIES OF COOPERATING AGENCIES

#### 1.1 General.

**1.1.1 National Weather Service (NWS).** The National Weather Service is responsible for issuing winter storm forecasts, watches, warnings, and advisories to the public and various special user groups. Its responsibilities are documented in *National Weather Service Operations Manual*, Chapter A-02, "National Weather Service Mission," and in Chapter C-42, "Winter Weather Warnings."

**1.1.2 U.S. Navy (USN).** The U.S. Navy, through the Naval Meteorology and Oceanography Command (NAVMETOCOM), is responsible for issuing gale, storm, high seas warnings, and winter weather forecasts for fleet operations and Navy shore installations and Marine Corps operations and installations, as elaborated in the NAVMETOCOM Instruction 3140.1 series.

**1.1.3 U.S. Air Force (USAF).** The U.S. Air Force, through local and centralized weather units, is responsible for issuing military weather warning advisories and point warnings to all Air Force and Army (including Reserve and National Guard) installations, facilities, and operations related to winter storms for those hazardous phenomena specified in local agreements (such as Memorandum of Agreements or local regulations).

#### 1.2 Responsibilities.

**1.2.1 The Department of Commerce (DOC).** The DOC, through the National Oceanic and Atmospheric Administration (NOAA), will:

- Provide basic surface, upper air, and radar observations from its network of stations making such observations.
- Provide additional observations, when required, making available all reports to any requesting agency.
- Provide basic analyses and forecasts through the National Centers for Environmental Prediction (NCEP), Camp Springs, Maryland.
- Provide products under a multi-tier concept consisting of Weather Service Forecast Offices (WSFO) and local Weather Service Offices (WSO) along contiguous U.S. coastal areas, who will provide outlooks, statements, advisories, watches, and warnings, when appropriate.

- Provide advice on aircraft reconnaissance requirements forwarded through NCEP's Tropical Prediction Center/National Hurricane Center (TPC/NHC) to the Chief, Aerial Reconnaissance Coordination, All Hurricanes (CARCAH), from NCEP's Hydrometeorological Prediction Center (HPC) (the HPC is the central coordinating office for all winter storm reconnaissance requirements).
- Operate satellite systems capable of providing coverage of the coastal areas of the contiguous United States during the winter storm season.
- Coordinate with the National Aeronautics and Space Administration (NASA) to obtain pertinent meteorological data from NASA research and development experimental satellites.
- Coordinate with the Department of Defense (DOD) to obtain pertinent meteorological data from the Defense Meteorological Satellite Program.
- Provide satellite data for selected situations to authorized research facilities.
- Furnish aircraft from the NOAA Aircraft Operations Center (AOC) to support the following operational reconnaissance objectives:
  - ▶ The primary objective is to provide additional real-time meteorological data to operational forecasters in an attempt to improve the quality of forecasts associated with winter coastal storms.
  - ▶ The secondary objective is to provide the data and analyses to better understand the structure and dynamics of these winter storm systems.
- Provide oceanographic and meteorological surface data obtained from offshore buoy deployment, if possible, within existing facilities.
- Provide dissemination of weather observations to appropriate agencies.

**1.2.2 The Department of Defense (DOD). The DOD will:**

- Make available to NOAA agencies, through Detachment 7, Air Force Weather Agency (AFWA), basic surface, upper air, and radar observations from those DOD stations making such observations, pilot reports (PIREP), and aircraft reports (AIREP) that become available.

- Furnish to NWS, aircraft reconnaissance observations that are within its capabilities and in accordance with established reconnaissance priorities, and special observations detailed in Chapter 2 of this plan.
- Designate CARCAH as the point of contact for coordination with NCEP/HPC for aircraft reconnaissance required in support of this plan.
- Provide weather reconnaissance data monitor services to evaluate and disseminate reconnaissance reports.
- Provide satellite communications (SATCOM) access to relay reconnaissance reports from the aircraft to CARCAH.
- Provide USAF aeronautical station communications to relay reconnaissance reports from the aircraft to CARCAH.
- Provide warnings to all DOD facilities and military units of weather that threatens to impact their operations or damage their installations.

### **1.2.3 Department of Transportation (DOT).**

#### **1.2.3.1 The Federal Aviation Administration (FAA). The FAA will:**

- Provide Air Traffic Control (ATC) services as appropriate to support this plan.
- Disseminate PIREPs and AIREPs.
- Provide hourly and special weather observations at selected terminal and flight service station locations.

#### **1.2.3.2 The U.S. Coast Guard (USCG). The USCG will:**

- Provide surface observations to NWS from its coastal facilities and vessels.
- Collect special weather observations from surface ships of opportunity and provide them to the NWS.
- Provide personnel, vessel, and communications support to the National Data Buoy Center for development, deployment, and operation of environmental data buoy systems.

## CHAPTER 2

### AIRCRAFT RECONNAISSANCE

**2.1 General.** All Department of Commerce (DOC) winter storm reconnaissance needs will be requested and provided in accordance with the procedures of this chapter. The DOC has identified a requirement for, and the Department of Defense (DOD) maintains aircraft to support up to two operational weather reconnaissance sorties per day. In times of national emergency or war, some or all DOD reconnaissance resources may not be available to fulfill DOC needs.

#### **2.2 Responsibilities.**

**2.2.1 DOD.** The DOD, through the Air Force Reserve Command's 53rd Weather Reconnaissance Squadron (53 WRS), is responsible for providing operational aircraft for winter storm synoptic tracks in the Atlantic Ocean, Gulf of Mexico, and North Pacific Ocean in response to DOC needs. The Global Decision Support System (GDSS) JCS Priority Code for tasked, operational weather reconnaissance is **1A3** (IAW DOD Regulation 4500.9-R and Joint Publications 4-01 and 4-04). The Force Activity Designator (FAD)/Urgency of Need Designator (UND) Supply Priority Designator Determination code is **IIA2** (IAW Joint Publication 4-01 and Air Force Manual 23-110, Volume 2, Part 13, Attachment 3A-2.)

**2.2.2 DOC.** The DOC, through the NOAA Aircraft Operations Center (AOC), is responsible for aircraft operations that will be used (when available, on request) as backup for 53 WRS aircraft reconnaissance, for a storm or storm threat. Additionally, NOAA AOC aircraft missions may be flown on storms of research interest as desired by the Environmental Research Laboratories. All such flights will be listed by the Chief, Aerial Reconnaissance Coordination, All Hurricanes (CARCAH) in the Winter Storm Plan of the Day (WSPOD).

**2.2.3 DOT.** The DOT is responsible for providing air traffic control services to aircraft when within airspace controlled by the FAA. This includes offshore oceanic airspace. It should be noted that more expeditious handling of winter storm reconnaissance aircraft will result by following the procedures outlined in the FAA/AFRES Letter of Agreement (LOA) entitled, Meteorological Reconnaissance Flights, as found in Appendix I. (Note: An updated LOA is currently in coordination.)

**2.3 Operational Control of Aircraft.** Operational control of aircraft flying winter storm reconnaissance missions will remain with the operating agencies of DOC or DOD, as appropriate.

#### **2.4 Reconnaissance Planning and Flight Notification.**

**2.4.1 Requirements.** NCEP/HPC will forward mission requirements to CARCAH for tasking in the WSPOD within the responsibilities stated above. The CARCAH will advise

NCEP/HPC of mission availability or nonavailability and expected responsiveness of DOD and DOC assets. NCEP/HPC will be responsible for requesting all reconnaissance flights and will provide information as specified in paragraph 2.4.5. NCEP/HPC will also forward NWS mission requirements for the next 24-hour period (1100 UTC to 1100 UTC) and an outlook for the succeeding 24 hours to CARCAH not later than 1530 UTC each day. Vertical observation positions will be identified by NCEP/HPC through CARCAH and the WSPOD. CARCAH will pass all tasking, amendments, and cancellations to the flying units.

**2.4.2 Change to Requirements.** Changes to mission requirements will be accepted by CARCAH based on the following guidelines:

- Early departures will not be requested.
- When notification is received more than 2 1/2 hours prior to scheduled aircraft departure:
  - ▶ Changes to tracks normally will be limited to substitution of one track for another.
  - ▶ Departure delays of up to 6 hours will be acceptable in accordance with MCR 55-130, volume 1, paragraph 3.10.
- When notification is received more than 4 hours prior to scheduled aircraft departure time, departure delay requests will be evaluated in accordance with appropriate flight management directives.

**2.4.3 Cancellation of Requirements.** Missions should be canceled prior to aircraft departure and as much in advance as possible to allow maximum resource conservation. Cancellation after departure may result in degradation of follow-on mission capability.

#### **2.4.4 Satisfaction of Requirements.**

**2.4.4.1 Satisfied.** Requirements are considered satisfied when an observation is or could have been taken (as in the case where aircraft are diverted from original track) at the specified location (control point) by the expiration time and a sufficient number of drops were accomplished to satisfy the customer's requirements.

**2.4.4.2 Missed.** Requirements are either satisfied as per paragraph 2.4.4.1 or they are considered missed.

**2.4.4.3 Written Assessment.** The requesting agency, NCEP/HPC and/or a WFSO, will provide CARCAH a written evaluation (Figure 2-1) of the weather reconnaissance mission any time its timeliness and quality are outstanding or substandard. Requirements levied as "resources permitting" will not be assessed for timeliness. These assessments should be

DATE \_\_\_\_\_  
TO: CARCAH  
FROM:  
SUBJECT: MISSION \_\_\_\_\_ EVALUATION  
(MISSION IDENTIFIER)

I. PUBLISHED REQUIREMENTS

1. CONTROL POINT AND TIME \_\_\_\_\_
2. FLIGHT TRACK \_\_\_\_\_
3. EXPIRATION TIME of REQUIREMENT \_\_\_\_\_
4. MISCELLANEOUS (DROP PSNS, ALTITUDES, etc.) \_\_\_\_\_  
\_\_\_\_\_

II. RECONNAISSANCE MISSION PERFORMANCE

1. CONTROL PT TIME: \_\_\_\_\_ ON TIME \_\_\_\_\_ LATE \_\_\_\_\_ EARLY \_\_\_\_\_ MISSED
2. FLIGHT TRACK FLOWN: \_\_\_\_\_ COMPLETELY \_\_\_\_\_ PARTIALLY \_\_\_\_\_ OTHER
3. HORIZONTAL DATA COVERAGE: COMPLETE \_\_\_\_\_ TIMELY \_\_\_\_\_ ACCURATE \_\_\_\_\_  
INCOMPLETE \_\_\_\_\_ UNTIMELY \_\_\_\_\_ INACCURATE \_\_\_\_\_
4. VERTICAL DATA COVERAGE: COMPLETE \_\_\_\_\_ TIMELY \_\_\_\_\_ ACCURATE \_\_\_\_\_  
INCOMPLETE \_\_\_\_\_ UNTIMELY \_\_\_\_\_ INACCURATE \_\_\_\_\_

III. OVERALL MISSION EVALUATION

OUTSTANDING \_\_\_\_\_  
UNSATISFACTORY \_\_\_\_\_ FOR: COMPLETENESS \_\_\_\_\_ ACCURACY \_\_\_\_\_ TIMELINESS \_\_\_\_\_  
EQUIPMENT \_\_\_\_\_ PROCEDURES \_\_\_\_\_ OTHER \_\_\_\_\_

IV. REMARKS (BRIEF BUT SPECIFIC) \_\_\_\_\_  
\_\_\_\_\_

V. REPLY BY ENDORSEMENT \_\_\_\_\_ YES \_\_\_\_\_ NO

\_\_\_\_\_  
(Forecaster's Signature)

Figure 2-1. Sample mission evaluation form.

mailed to CARCAH at:

CARCAH  
National Hurricane Center  
11691 SW 17th Street  
Miami, FL 33165-2149

**2.4.4.4 Reconnaissance Summaries.** CARCAH will maintain seasonal reconnaissance summaries detailing missions actually flown to satisfy levied requirements.

#### **2.4.5 Reconnaissance Winter Storm Plan of the Day (WSPOD).**

**2.4.5.1 Coordination.** NCEP/HPC will coordinate with the appropriate National Weather Service (NWS) field offices as needed and provide WSPOD information (Figure 2-2.) to CARCAH by 1430 UTC. Direct discussion in weather situations is also encouraged between the Navy and NCEP with respect to storms or storm threats. The East Coast Navy point of contact is the Naval Atlantic Meteorology and Oceanography Center (NAVLANTMETOCEN) through their Norfolk Command Duty Officer. NCEP/HPC will provide the following data to CARCAH when applicable:

- Track and flight level desired.
- Selected trackpoint (control point) and time the aircraft is required at the point.
- Dropsonde release points and special requirements.
- Expiration time of requirement (latest time at the control point when the mission requirement is regarded as satisfied).
- Succeeding day outlook (anticipated track, control point, control point time).

**2.4.5.2 Preparation.** Using requirements stated by NCEP/HPC, CARCAH will prepare the WSPOD as required throughout the season in coordination with DOD and DOC to effect maximum useful data from available resources. Format for the WSPOD is shown in Figure 2-3.

**2.4.5.3 Dissemination.** The WSPOD will be made available in message form to all appropriate agencies, such as FAA, DOD, and NOAA, that provide support or control reconnaissance aircraft. The CARCAH will be responsible for disseminating the WSPOD as soon as possible after DOC requirements, including changes, are received. If there are no current day or succeeding-day reconnaissance requirements, a negative report, which covers the appropriate time frame, will be disseminated. Amendments will be disseminated as required. During the



month of November, the WSPOD will be disseminated as a NOTE added to the Tropical Cyclone Plan of the Day (TCPOD). *NOTE: The WSPOD is disseminated under the header "MIAREPRPD" for AWIPS users and "NOUS42 KNHC" for AWDS users. The WSPOD can also be accessed via Internet at [www.hurricanehunters.com/wxdata.htm](http://www.hurricanehunters.com/wxdata.htm) and clicking on Plan of the Day.*

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**Figure 2-2. National Winter Storms Operations Plan Coordination Request.**

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NWSOP COORDINATED REQUEST FOR AIRCRAFT RECONNAISSANCE

\_\_\_\_\_ 1. No flight is desired or previously requested flight is cancelled.

\_\_\_\_\_ 2. A flight is requested.

A. Track Number and altitude

\_\_\_\_\_

B. Control point and control point time

\_\_\_\_\_

C. Expiration time (at control point)

\_\_\_\_\_

D. Specific instructions (such as dropsonde positions)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ 3. Succeeding day outlook.

A. Negative

\_\_\_\_\_

B. Possible Track Number \_\_\_\_\_

\_\_\_\_\_

Control point and time \_\_\_\_\_

4. Coordination (initials)

NCEP/HPC \_\_\_\_\_

53 WRS \_\_\_\_\_

AOC \_\_\_\_\_

CARCAH \_\_\_\_\_

INSTRUCTIONS: Date and Time \_\_\_\_\_. Fill in appropriate spaces as required. Pass all requests, changes, or cancellations to CARCAH immediately.

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**Figure 2-3. Winter Storm Plan of the Day (WSPOD) Format.**

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FM: CARCAH, NATIONAL HURRICANE CENTER, MIAMI, FL

TO: (AFRC/NOAA APPROVED ADDRESSEES)

SUBJECT: RECONNAISSANCE WINTER STORM PLAN OF THE DAY (WSPOD)  
VALID \_\_\_\_\_ Z (MONTH) TO \_\_\_\_\_ Z (MONTH) (YEAR)  
WSPOD NUMBER.....(YR) - \_\_\_\_\_

1. FLIGHT ONE

A. \_\_\_\_\_ (TRACK/CONTROL POINT/TIME)

B. \_\_\_\_\_ (MISSION IDENTIFIER)

C. \_\_\_\_\_ (DEPARTURE POINT/ESTIMATED  
DEPARTURE TIME)

D. \_\_\_\_\_ (DROP POSITIONS)

E. \_\_\_\_\_ (ALTITUDE/EXPIRATION TIME)

F. \_\_\_\_\_ (REMARKS, if needed)

2. OUTLOOK FOR SUCCEEDING DAY

A. \_\_\_\_\_ (ANTICIPATED TRACK/CONTROL  
POINT/TIME)

B. \_\_\_\_\_ (REMARKS, if needed)

---

#### **2.4.5.4 Responsiveness.**

- Notification of reconnaissance requirements should be made early enough to allow 16 hours plus en route flying time to the control point.
- The succeeding day outlook portion of the WSPOD is designed to allow advance notification.
- When circumstances do not allow the appropriate notification lead time, the mission will be levied as "resource permitting."

### **2.5 Reconnaissance Flights.**

#### **2.5.1 General Storm Tracks.**

**2.5.1.1 East Coast and Gulf Coast.** The Air Force mission name for winter storms is "CORONET COAST." Air Force tracks CORONET COAST 01 through 06 (Figures F-1 through F-6) normally will be flown during a storm or storm threat.

**2.5.1.2 ATC Communications Backup.** TEAL aircraft may utilize SATCOM to relay ATC communications through CARCAH or Alternate CARCAH/SOF when voice communications are unavailable or unusable. This capability should only be exercised to preclude an emergency or other safety-related situation. (See ATC Clearance procedures letter, Appendix G.)

**2.5.1.3 Airborne Diversions.** Within operational limitations and with prior FAA Air Route Traffic Control Center (ARTCC) approval, airborne diversions deemed advisable by the airborne meteorologist may be made from these tracks.

**2.5.1.4 Permanent Changes to Tracks.** Permanent changes to winter storm reconnaissance tracks must be coordinated with DOD, FAA and DOC at least 30 days in advance of the implementation date.

**2.5.2 Flight Plans.** Flight plans for reconnaissance flights will be filed with the FAA as soon as practicable before departure time.

**2.5.2.1 Prior Coordination.** The 53WRS/DO will ensure that an Altitude Reservation Approval Request (ALTRV APREQ) is submitted to the Central Altitude Reservation Function (CARF) at least 12 hours prior to planned departure at DSN 725-3333 or (703) 904-4427, FAX (703) 904-4460. Include the following information in the APREQ (see sample APREQ, Appendix H):

- Mission call-sign.
- Track name/identifier.

- Estimated time over start ALTRV point.
- Location of dropsonde release points.
- Requested altitudes/flight levels.
- Any special requests or deviations from published routes.

[**Note:** If the track to be flown is not a published storm track, the ALTRV APREQ shall be submitted as far in advance as possible, in standard ALTRV format as specified in FAA Handbook 7610.4, Special Military Operations.]

**2.5.3 Flight Levels.** Tracks are normally tasked for the 300 mb level (FL 310). If unable to maintain the tasked altitude for any reason, fly as close to the tasked level as possible. When operating under an Instrument Flight Regulation (IFR) flight plan, reconnaissance aircraft will fly only at Air Traffic Control (ATC) assigned altitudes and will accept altitude changes as directed by ATC.

**2.5.4 Dropsonde Releases.** During winter storm operations, it is possible that other aircraft could be in the dropsonde release area. In other than Class G airspace, dropsonde instrument releases shall be coordinated with ATC by advising of a pending drop at least 10 minutes prior to drop when in direct radio contact with ATC. When contact with ATC is via Aeronautical Radio, Incorporated (ARINC), dropsonde release coordination shall be included with the position report prior to the point where the dropsonde will be released. **EXAMPLE:** *"TEAL 63, SLATN at 1215, FL310, estimating FLANN at 1250. CHAMP next, Dropsonde release at FLANN."*

**2.5.4.1 Advisory Broadcasts.** Commencing 5 minutes prior to release of a dropsonde, the aircraft commander will broadcast in the blind on 121.5 and 243.0 to advise any traffic in the area of the pending drop. These broadcasts should not be made when in ATC radar contact and ATC has provided a traffic advisory.

## **2.5.5 Air Traffic Control (ATC).**

**2.5.5.1 ATC Priority.** If mission requirements dictate, crews may specifically request "Priority Handling" from ATC in accordance with FAA Order 7110.65, Air Traffic Control, paragraph 2-1-4.1. (See ATC Clearance Letter, Appendix G).

**2.5.5.2 ATC Separation.** ATC will provide air traffic control separation between all aircraft operating on storm missions and between storm mission aircraft and nonparticipating aircraft operating on IFR within controlled airspace. Mission commanders should be aware that nonparticipating aircraft may be operating near storm areas; thus adherence to an ATC clearance is mandatory for safety purposes.

**2.5.5.3 Assigned Altitudes.** When storm aircraft cannot maintain assigned altitudes due to turbulence, ATC should be advised. Normal vertical separation of 1000 feet at flight level (FL) 290 and below and 2000 feet above FL 290 will be provided by ATC to aircraft operating

in the storm area. Unless otherwise coordinated with ATC, the altitudes between storm-mission aircraft may be used by ATC for nonparticipating aircraft.

**2.5.5.4 Military Clearance.** For the east coast storms, the U.S. Navy through Commander in Chief, Atlantic Fleet Oceanic Aircraft Coordinator (CINCLANTFLT OAC) will review the WSPOD for each proposed flight to determine if clearance into a particular area will be required. Each mission will need to be coordinated with the regional controlling agencies for each warning area. The reconnaissance unit flying the mission will contact the appropriate clearance agencies prior to entry into any restricted airspace.

**2.5.5.5 Coordination of Non-Standard Procedures.** Any procedure desired by storm-mission commanders that is outside the above parameters must be coordinated with the appropriate ATC center.

**2.5.6 Data Requirements.** Data requirements are defined in Table 2-1. Data will be coded and transmitted in standard reconnaissance code (RECCO) for flight level observations (Appendix D) or World Meteorological Organization upper-level pressure, temperature, humidity and wind report from a sonde released by carrier balloons or aircraft (WMO TEMP DROP) format for dropsonde soundings (Appendix E).

**2.5.6.1 First Observation Remarks.** A plain language remark stating the departure station (International Civil Aviation Organization (ICAO) four letter identifier), time of departure, and estimated time of arrival (ETA) at the coordinates of the control point will be appended to the first observation.

EXAMPLE: URNT10 KNHC 051845  
97779...TEXT...  
RMK AF986 TRACK 01 OB 01  
DPTD KBIX 05/1800Z. ETA 36.9N 72.7W 06/0210Z.

**2.5.6.2 Last Observation Remarks.** A plain language remark stating ETA and intended arrival station (ICAO four letter identifier), number of observations, and monitor that copied observations will be appended to the last observation.

EXAMPLE: URNT10 KNHC 060210  
97779...TEXT...  
RMK NOAA3 TRACK 02 OB 23  
ETA KMCF 06/0330Z. LAST REPORT OBS 01 THRU 23 TO KNHC.

Table 2-1. Requirement for aircraft reconnaissance data.

<u>Data required</u>	<u>Altitudes where data are required</u>	<u>Areal portion of cyclone or environment where data are needed</u>	<u>Time and frequency of observations</u>	<u>Accuracy required</u>
Synoptic data --pressure (heights), temperature, moisture, and winds--for national weather prediction and medium range forecasting.	At altitudes indicated in the WSPOD.	Throughout the marine portion of area as defined in Chapter 1.	**Dropsondes as specified in Plan of the Day (drop interval approximately 300 nmi (550 km)). While over water, horizontal observations approximately every 20 minutes, at major turn points, and at the control point.	+ - 5 kt (2.5 m/s) (wind speed) + - 10° (wind direction) + - 1°C + - 20m + - 2 mb (200 Pa) Position within 20 nmi (37 km)
Location and strength of radar echoes.	Any level.	All sectors.	When available.	
*Ocean wave heights and wave lengths, sea surface wind estimates	Sea Surface.	All quadrants.	Every horizontal observation at or below 700 mb (70 kPa).	+ - 10% (Wave height) + - 10 ft. (3m) (wave length) 5 kt (2.5 m/s) (wind speed) 10° (wind direction)

\*Ocean wave heights and wave lengths will not be reported by USAF aircraft.

\*\*Includes dropwindsondes. If a sonde fails or vertical data are otherwise unobtainable at a specified position, make another release as soon as possible.

## CHAPTER 3

### OTHER OBSERVATIONS

**3.1 General.** In addition to aerial reconnaissance data, the observational system used in support of the *National Winter Storms Operations Plan* includes land surface, ship, radar, buoy, upper air, and satellite data. The routine operations of these various data sources are detailed in the following Federal Meteorological Handbooks and plans:

- Federal Meteorological Handbook No. 1, *Surface Weather Observations and Reports*
- Federal Meteorological Handbook No. 2, *Surface Synoptic Codes*
- Federal Meteorological Handbook No. 3, *Rawinsonde and Pibal Observations*
- Federal Meteorological Handbook No. 11, *Doppler Radar (Parts A, B, C, and D)*
- *Operations of the National Weather Service*
- *Federal Plan for Environmental Data Buoys*
- The *GOES User's Guide* and operational amendments
- *The NOAA Polar Orbiter Data Users Guide*
- *National Operations Plan for Drifting Data Buoys*
- *The Coastal Marine Automated Network (C-MAN) NWS Users Guide*
- *Tide/Water Level Information Data and Evaluation System (TIDES) NWS Users Guide*

Procedures for obtaining special or non-routine observations required in support of winter storm detection and forecasting, while covered to some extent in these documents, are described in detail in *National Weather Service Operations Manual*, Chapter B-90, "Special Warning Program Observations." The chapter covers observational programs of several agencies involved. The only two observational programs that will be covered in any detail here are the two data sources that provide unique capabilities to support winter storm analysis and forecasting.

## **3.2 Satellite Observations.**

**3.2.1 Department of Commerce (DOC), National Oceanic and Atmospheric Administration (NOAA), the National Environmental Satellite, Data, and Information Service (NESDIS).**

**3.2.1.1. Geostationary Operational Environmental Satellite (GOES).** The GOES system currently consists of a two operational satellite constellation over the U.S. and adjacent waters. GOES-8, which introduced a 3-axis stabilized geosynchronous satellite to NOAA operations, is positioned at 75 degrees West; GOES-10, the successor to GOES-9, is positioned at 135 degrees West. The principal GOES-8 and GOES-10 products (see Table 3-1) are half-hourly pictures with navigation and calibration files included. During the daylight hours, one, two, four, and eight kilometer resolution visible fixed standard sectors are produced for AWIPS/NOAAPORT distribution; equivalent infrared sectors, including water vapor, for all channels are available 24 hours a day. Satellite raw and remapped imagery, with navigation and calibration, is available to RAMSDIS users within the NWS and NESDIS community.

GOES-10 was launched in May 1997 and, after a difficult and extended checkout, was moved to 135 degrees West to replace the failing GOES-9. GOES-10 was declared operational on July 18, 1998, while stationed at 90 degrees West and then was subsequently moved to its operational location at 135 degrees West. GOES-9 was moved to 105 degrees West to serve as a short-term replacement for GOES-8 in the event of a catastrophic failure. The next GOES satellite is scheduled to be launched in May 1999.

GOES-8 and GOES-10 host an imager capable of detecting atmospheric temperature and moisture measurements in five spectral bands at high resolutions, including the new 3.9 micron and 12.0 micron wavelengths. GOES-8 and GOES-10 also have the feature of transmitting these five spectral bands simultaneously, affording the user community continuous views of atmospheric measurements in various wavelengths, each with its own meteorological and hydrological applications. The GOES-8 and GOES-10 spacecraft were also designed for flexible scanning of the Earth; any variation of scan or sector coverage at regular time intervals can be scheduled in a 30-minute time frame. The five channels and respective resolutions are as follows:

- Channel 1 (Visible, 0.55 to 0.75 microns) - one kilometer resolution.
- Channel 2 (Infrared, 3.8 to 4.0 microns) - four kilometer resolution.
- Channel 3 (Water vapor, 6.5 to 7.0 microns) - eight kilometer resolution.
- Channel 4 (Infrared, 10.2 to 11.2 microns) - four kilometer resolution.
- Channel 5 (Infrared, 11.5 to 12.5 microns) - four kilometer resolution.



For AWIPS/NOAAPORT and RAMSDIS applications, the flexible scanning of GOES-8 and GOES-10 allows transmissions of 15-minute imagery in combination with 30-minute imagery. The analog data formerly provided via GOES-TAP has been replaced with digital data for the new data distribution. The digital data provides the user with the flexibility to customize gridding and enhancement curves for the data. The new GOES-series satellites provide increased resolution for the visible and infrared channels. As compared with their predecessors, GOES-8 and GOES-10 provide double the resolution in water vapor imagery at eight kilometers as well as double the infrared resolution at four kilometers. An important tool in forecasting stratus and fog trends, channel 2 data is available from GOES-8 and GOES-10 to users.

The sounder on GOES-8 and GOES-10, consisting of 19 spectral channels, is used for measurements of atmospheric temperature and moisture profiles, surface and cloud-top temperature, and ozone distribution. Products derived from the sounder include precipitable water and lifted index--a measurement of atmospheric stability. Comparable to the imager, the sounder is capable of providing various scan coverage such as full Earth imagery, sectorized imagery, and local imagery. An independent sounder platform, governed under its own schedule, leads to an expansion of sounder data coverage and an increase in the frequency of transmissions. GOES-8 and GOES-10 also carry vital subsystems; such as, the SEM, DCS, WEFAX, and SAR operations.

**3.2.1.2 NOAA Polar-Orbiting Satellites.** Currently, NOAA-12 and NOAA-14 provide data for direct readout (Automatic Picture Transmission (APT)) and High Resolution Picture Transmission (HRPT). NOAA-15 is scheduled to begin operations in November 1998. NOAA-15 carries the same instrumentation as the earlier satellites with the addition of the Advanced Microwave Sounding Unit (AMSU), which is scheduled to become operational in early to mid 1999. The AMSU will provide total precipitable water and rain rate information to analysts. It has not been determined which satellite will be replaced by NOAA-15.

**3.2.1.3 AWIPS/NOAAPORT, RAMSDIS, and the Satellite Analysis Branch (SAB).** Under the NESDIS support concept, satellite imagery, in support of the *National Storms Operations Plan*, is distributed by the Environmental Satellite Distribution/Interactive Processing Center in Camp Springs, Maryland, to the national centers (NCEP), NWS field offices, and to SAB and other NESDIS units. Data from the polar-orbiting satellites is available to SAB and the NCEP national centers, but not to NWS field sites.

NESDIS operates 24 hours a day to provide a myriad of satellite services and products to NCEP and NWS field sites. Internally at the NOAA Science Center, SAB meteorologists provide satellite interpretation and analyses to NCEP meteorologists, relating valuable information on present locations and intensities of winter storms, as well as the projected movement and development of all these storms. In addition, snowfall estimates are derived from satellite signatures and reported to NCEP and the NWS field sites to assist forecasters in determining fall rates and projected accumulations. As conditions warrant, winter storm precipitation analyses and estimates are disseminated to the appropriate NWS forecast offices and

**Table 3-1. Satellites and Satellite Data Availability for the National Winter Storms Operations Plan.**

**Geosynchronous Orbit**

SATELLITE	TYPE OF DATA	LOCAL TIME	REMARKS
GOES-8	Imager and Sounder: 5 channels from the imager and 19 channels from the sounder.	Every 30 minutes partial full disk; CONUS views available every 15 minutes (2 CONUS views/half-hour.) In rapid scan operations, for detection of rapidly changing weather conditions, 4 CONUS views are available/half-hour including coverage to the equator.	1. 1, 2, 4, and 8 km visible standard sectors covering most of the Americas and the adjacent central and eastern Atlantic Ocean 2. 4 km resolution infrared imagery; 8 km resolution water vapor imagery 3. Same coverage in equivalent infrared sectors with special enhancement curves for primarily nighttime operations, at 1, 2, and 4 km resolutions 4. Independent imager and sounder platforms (eliminates time sharing)
GOES-10	Imager and Sounder: 5 channels from the imager and 19 channels from the sounder.	Every 30 minutes, northern hemisphere; PACUS (combination of western CONUS and Pacific) views every 15 minutes (2 PACUS views/half hour). In rapid scan operations, northern hemisphere views and 4 western CONUS views are provided every half-hour.	5. Full disk IR imagery every 3 hours 6. Routine imagery animation at 15 minute and 30 minute intervals 7. Interactive wind analysis 8. Cloud top heights 9. Satellite precipitation estimates 10. Sounder data products including derived product imagery

**Polar Orbit**

SATELLITE	TYPE OF DATA	LOCAL TIME*	REMARKS
NOAA-12	AVHRR GAC and LAC (recorded) HRPT and APT (direct) TOVS	0158D/1358A	1. Mapped digitized data (cloud cover) 2. Unmapped imagery (all data types) at Direct Readout sites 3. Sea-surface temperature analysis 4. Moisture analysis
NOAA-14	(Same as NOAA-12)	1051D/2251A	5. Soundings 6. Remap GAC Sectors
NOAA-15 (Operational Nov 98)	(Same as NOAA-12) plus AMSU (operational in early to mid 1999)	0331D/1531A	
DMSP F-11	OLS(SGDB), SSM/T-2, SSM/I, SSM/T-1	0643D/1843A	1. Unmapped imagery (DMSP sites only) 2. Mapped imagery (SGDB) 3. Snow and ice coverage 4. Precipitable water
DMSP F-12	OLS, SSM/T-2	0921D/2121A	5. Wind speeds 6. Precipitation rates 7. Moisture analysis
DMSP F-13	OLS, SSM/I, SSM/T-1	0544D/1744A	
DMSP F-14	OLS, SSM/I, SSM/T-2	0842D/2042A	

\* Local time/equatorial crossing time  
D = Daylight descending  
A = Daylight ascending

offices and River Forecast Centers (RFC) across the United States via the Automation of Field Operations and Services (AFOS) system.

Prior to the full deployment of AWIPS products by the end of the decade via the communication NOAAPORT, a point to multi-point satellite broadcast, NOAA is conducting experimental transmissions of digital GOES products to selected NWS field sites. This display medium, RAMSDIS, is used to process digital GOES data from terrestrial networks and enables users to perform a myriad of operations including designed overlays, local remapping, looping, and temperature retrievals. RAMSDIS, a viable workstation, affords the user a preview and familiarization of digital satellite data including its many applications. The evolution of these higher resolution data represents a break through in satellite data quality, thereby improving observations, analyses, and forecasts of mid-latitude storm systems.

#### **3.2.1.4 Points of contact 24 hours/day.**

- NCEP/NCO Senior Duty Forecaster (SDM)--301-763-8298
- NCEP/HPC Senior Branch Forecaster--301-763-8201
- SAB--301-763-8444

**3.2.2 Department of Defense (DOD) Defense Meteorological Satellite Program (DMSP).** The DMSP constellation consists of at least two spacecraft placed in sun-synchronous orbits best suited to support military operations. In addition to the very high resolution visible and infrared imagery, DMSP provides a variety of remotely sensed terrestrial and space environmental data. A suite of microwave radiometers provides microwave imagery as well as surface characteristics and upper air temperature and moisture soundings. The DMSP data capabilities in the area of concern are provided in Table 3-1. Special requests for DMSP support will be addressed to CARCAH.

### **3.3 Automated Coastal Marine and Ocean Observations.**

#### **3.3.1 Moored Data Buoys and Coastal Marine Automated Network.**

**3.3.1.1 Procedures.** Moored buoy and C-MAN stations routinely acquire and transmit data every hour. Buoy observations include sea-level pressure, wind speed, peak 5-second wind, wind direction, air temperature, sea-surface temperature, significant wave height and period, and wave spectral data. A description of the data from a typical moored buoy payload is provided in Table 3-2; data from a typical C-MAN station are shown in Table 3-3. Refer to figures 3-1, 3-2, and 3-3 for the locations and station identifiers of moored buoys and C-MAN stations. Consult NDBC's web site at [www.ndbc.noaa.gov](http://www.ndbc.noaa.gov) for the latest station status or more site specific information.

**3.3.1.2 Communications.** Data are transmitted by ultra high frequency (UHF) communications via the GOES satellite to NESDIS and then are relayed to National Weather Service Telecommunications Gateway (NWSTG) for processing and dissemination. Data from moored buoys are formatted into World Meteorological Organization (WMO) FM13-IX SHIP code. From C-MAN sites, the data are formatted in a modified form of the FM12-IX SYNOP code.

### **3.3.2 Drifting Data Buoys.**

**3.3.2.1 Procedures.** These buoys are deployed by ship or aircraft in data-sparse areas. Their movements are largely dependent upon ocean currents and winds. Data available include position, sea-level pressure, wind speed and direction, air temperature, and sea-surface temperature. Six drifting buoys were deployed in the North Central Pacific by NDBC and AES Canada in September 1998. They are expected to continue transmitting through the winter of 2000. Additional drifters are expected to be deployed in the area in 1999 and 2000 to maintain the observation network.

**3.3.2.2 Communications.** Data are transmitted by UHF communications via the NOAA polar-orbiting satellites to NESDIS ground receiving stations and then relayed to the U.S. Argos Global Processing Center in Landover, Maryland, and to the NWSTG for processing and dissemination. Data from drifting buoys are formatted into WMO FM18-IX BUOY code.

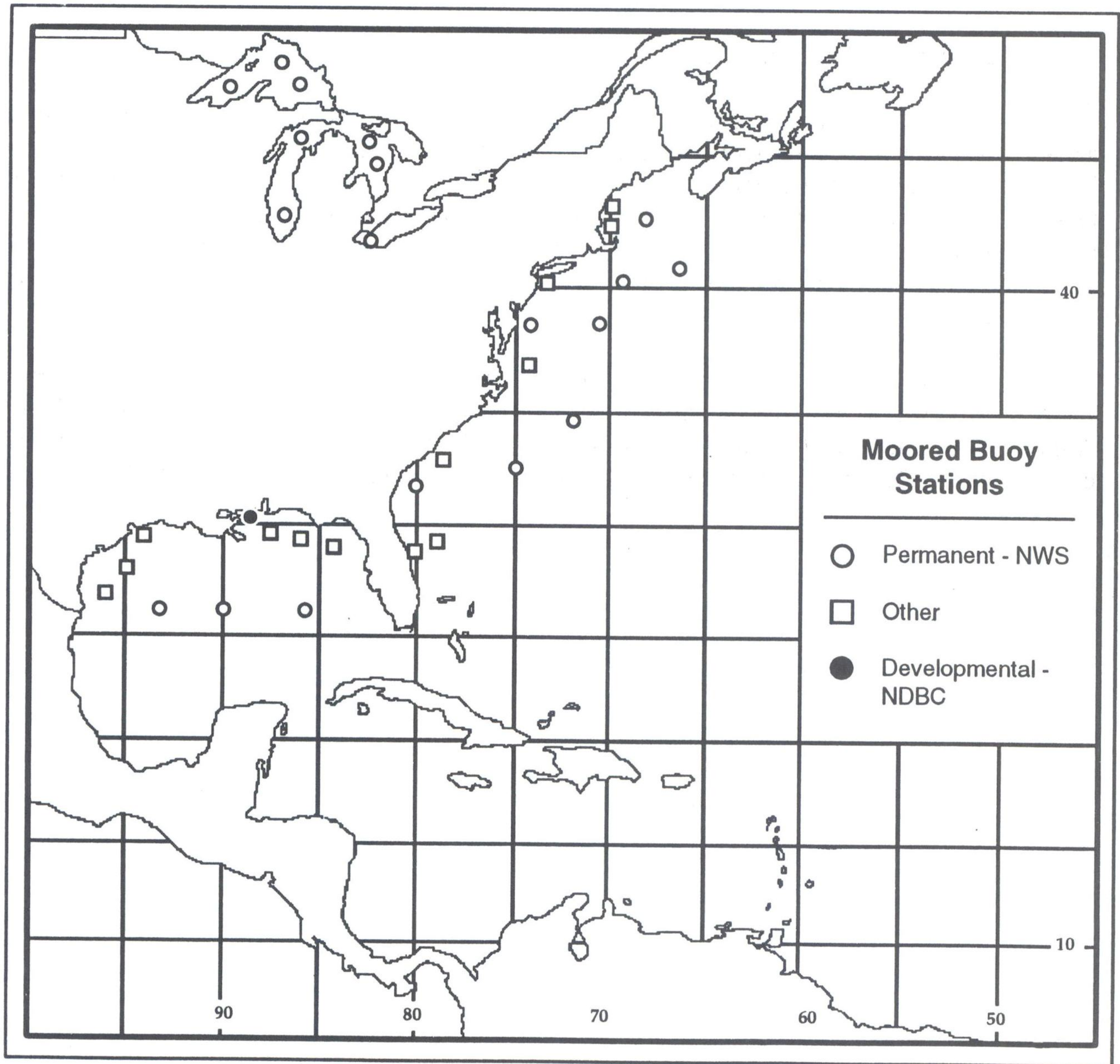


Figure 3-1. Map showing the location of NDBC moored buoys - Atlantic basin.

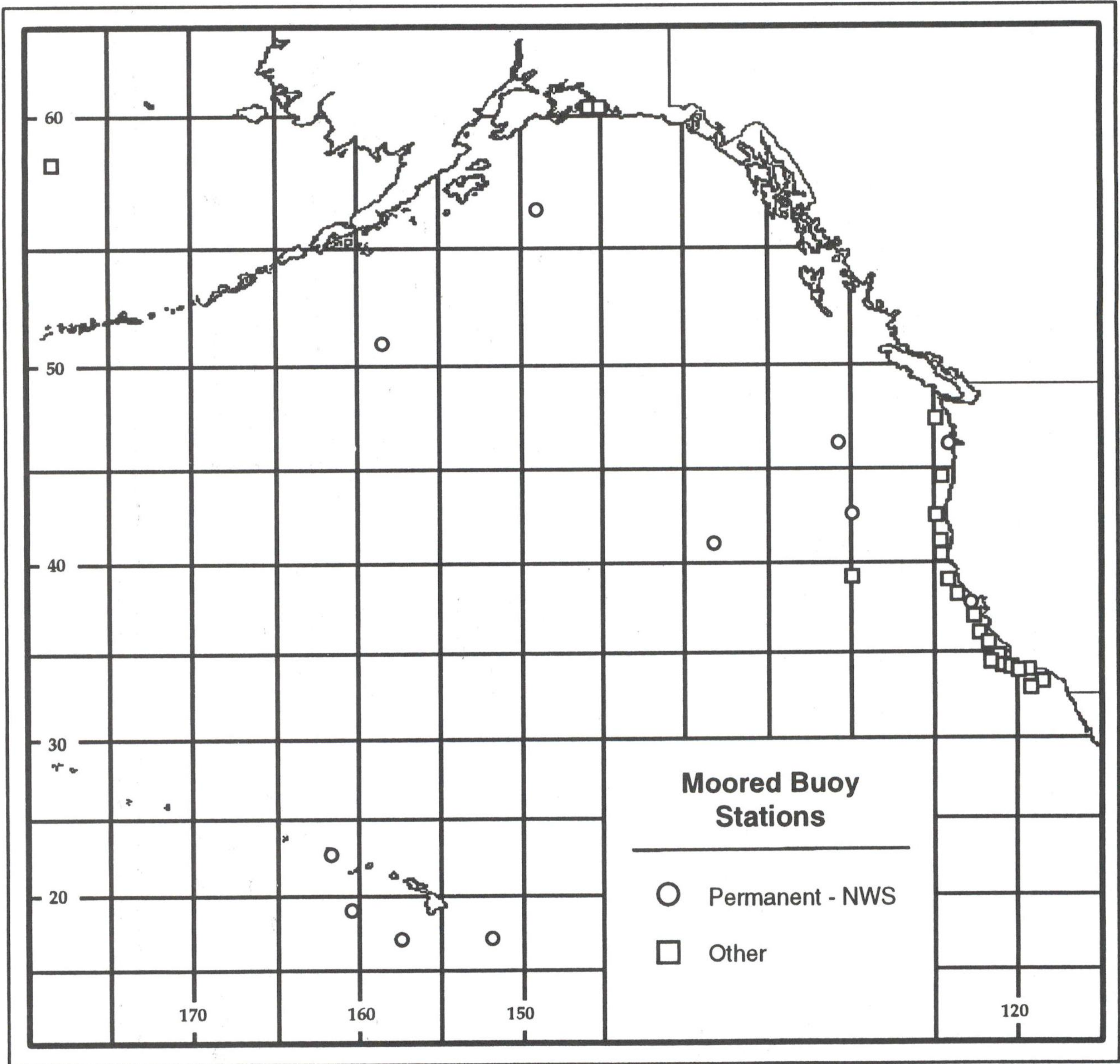


Figure 3-2. Map showing the location of NDBC moored buoys - Pacific basin.

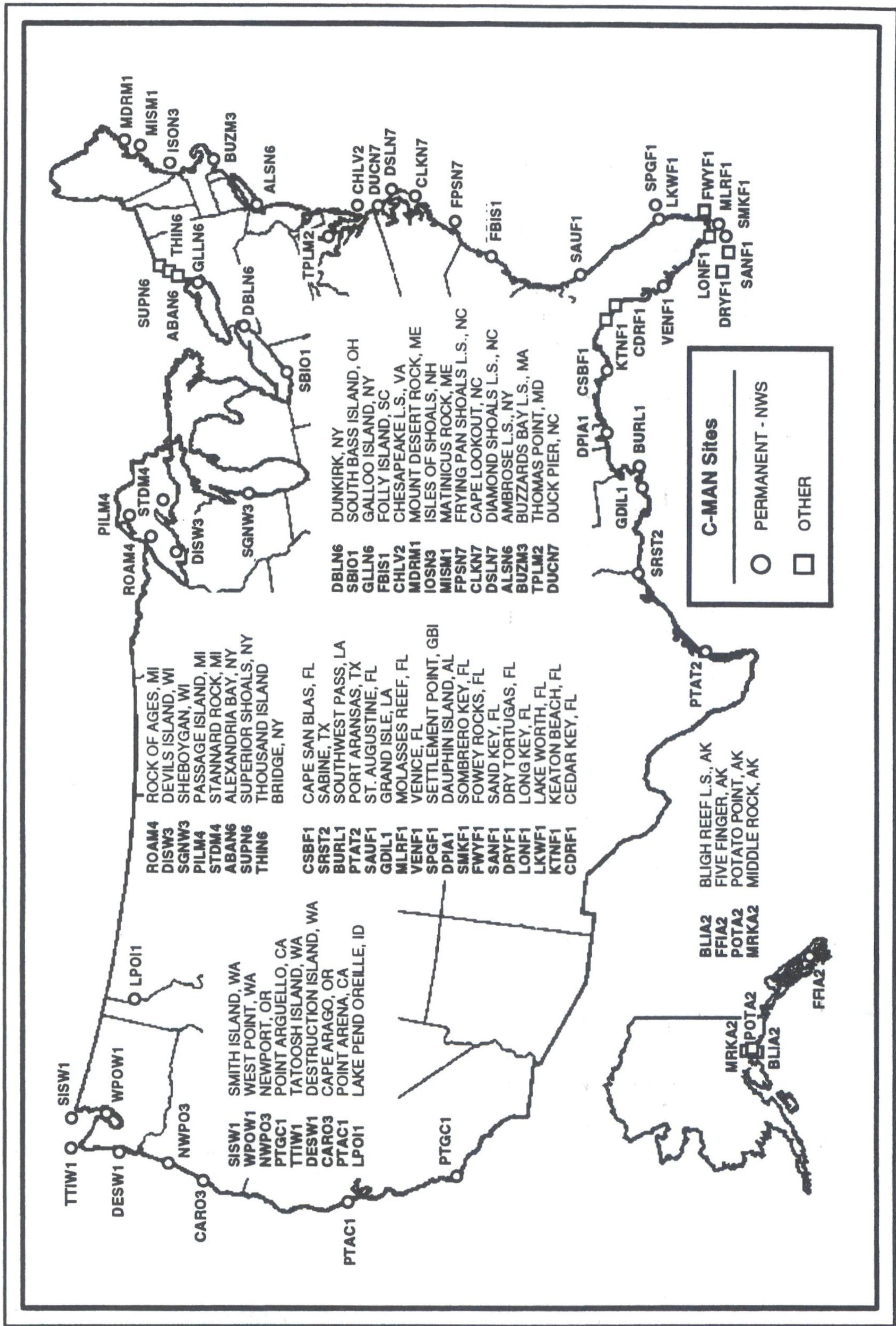


Figure 3-3. Map showing the location of NDBC fixed C-MAN stations in North America, including USCG Navigational Buoys.

**Table 3-2. Moored buoy payload data.**

PARAMETER	REPORTING RANGE	REPORTING RESOLUTION	SAMPLE INTERVAL	SAMPLE PERIOD	TOTAL SYSTEM ACCURACY
WIND SPEED	0 TO 62 m/s	0.1 m/s	1 s	8-10 min	±1 m/s or 10%
WIND DIRECTION	0 TO 360°	1°	1 s	8-10 min	±10°
PEAK WIND	0 TO 82 m/s	1 m/s	1 s	8-10 min	±1 m/s or 10%
AIR TEMPERATURE	-40 TO 50 °C	0.1 °C	90 s	8-10 min	±1 °C
BAROMETRIC PRESSURE	800 TO 1100 hPa	0.1 hPa	4 s	8-10 min	±1 hPa
SURFACE WATER TEMPERATURE	-7 TO 41 °C	0.1 °C	1 s	8-10 min	±1 °C
SIGNIFICANT WAVE HEIGHT	0 TO 35 m	0.1 m	0.39 s	20 min	±0.2 m or 5%
WAVE PERIOD	3 TO 30 s	0.1 s	0.39 s	20 min	±1 s
NONDIRECTIONAL WAVE SPECTRA	0.03 TO 0.40 Hz	0.01 Hz	0.39 s	20 min	—
SOLAR RADIATION*	0 TO 2150 W/m <sup>2</sup>	0.5 W/m <sup>2</sup>	1 s	8-10 min	±5%
DEW POINT TEMPERATURE*	-35 TO 30 °C	0.1 °C	1 s	8-10 min	±1 °C
PRECIPITATION RATE (ORG)*	0.5 TO 1600 mm/hr	1 mm	15 s	15 min	±5%
DIRECTIONAL WAVES*	0.03 TO 0.35 Hz	0.01 Hz	0.5 s	20 min	±5°
HORIZONTAL OCEAN CURRENTS (ADCP)*	0 TO 1000 cm/s	0.5 cm/s	1.5 s	20 min	±2 cm/s

\*PARAMETER REPORTED ON SELECTED BUOYS



**Table 3-3. Data from a typical fixed C-MAN station.**

MEASURANDS (NOTE 1)	REPORTED DATA	REPORTING RANGE	REPORTING RESOLUTION	MINIMUM		TOTAL SYSTEM ACCURACY
				AVERAGING PERIOD (SELECTABLE)	PERIOD (SELECTABLE)	
WIND DIRECTION	TRUE WIND DIRECTION	0° - 360°	1.0°	2 min		±15° TRUE (±10° DESIRED)
WIND SPEED	AVG. WIND SPEED	0 - 120 kn	1.0 kn	2 min		±2.0 kn or 5%
	PEAK WIND GUST	0 - 160 kn	1.0 kn	(SELECTABLE)		±2.0 kn or 5%
WAVES	SIGNIFICANT WAVE HEIGHT (H <sub>1/3</sub> )	0 - 49 m	0.5 m	(SELECTABLE)		0.5 m
	WAVE PERIOD (T)	2.5 - 5 s	1 s	(SELECTABLE)		±1 s
	PROBABLE MAXIMUM WAVE HEIGHT	0 - 49 m	0.5 m	(SELECTABLE)		0.5 m
BAROMETRIC PRESSURE	SEA LEVEL PRESSURE	900 - 1100 hPa	0.2 hPa	2 min		±1.0 hPa ABSOLUTE
AIR TEMPERATURE	AIR TEMPERATURE	-40 to +50 °C	0.1 °C	1 min		±1.0 °C
SEA SURFACE TEMPERATURE*	SEA SURFACE TEMPERATURE	-6 to +40 °C	0.5 °C	1 min		±1.0 °C
DEW POINT	DEW POINT TEMPERATURE	-35 to +30 °C	0.5 °C	1 min		-35 to -24 °C: ±2 °C -23.5 to -1.5 °C: ±1.5 °C -1.5 to +30 °C: ±1.0 °C
SECTOR VISIBILITY	VISIBILITY RANGE	0 - 8 statute mi		2 min		0 to 3 mi: ±10% 3 to 8 mi: ±1 mi
WATER LEVEL	WATER LEVEL	0 - 99.99 ft	0.01 ft	(PERIODICALLY RESET TO ZERO)		TBD
PRECIPITATION	CUMULATIVE PRECIPITATION	0 - 999 mm	1 mm	(PERIODICALLY RESET TO ZERO)		±1 mm or 4%

## CHAPTER 4

### COMMUNICATIONS

#### **4.1 Department of Commerce.**

**4.1.1 National Weather Service (NWS).** All communication systems of the NWS are used in support of the data collection and warning program given in the plan (see Table 4.1). These communication systems are described in the publication, *Operations of the National Weather Service*.

**4.1.2 Aircraft Operations Center (AOC).** The AOC may use the communications facilities of the Air Force described in Paragraphs 4.2.1 and 4.2.2.

#### **4.2 Department of Defense (DOD).**

**4.2.1 U.S. Air Force.** The Air Force's Automated Weather Distribution System (AWDS) will be used to collect and disseminate information on winter storms received from the National Weather Service. The AF's Automated Weather Network (AWN) will be used for the exchange of data between NOAA and the Air Force.

**4.2.2 Weather Reconnaissance.** Weather reconnaissance observations will be transmitted via satellite down link, checked for accuracy, and then entered into the AWN. When the aircraft-to-satellite data link is inoperative, observations will be transmitted using high frequency single sideband radio to CARCAH. A summary of reconnaissance communications capabilities by organization is listed in Table 4.1.

**4.2.3 U.S. Navy.** In the Atlantic, the primary means of dissemination for gale, storm, high seas warnings, other winter storm advisories, and special observations is via the Naval Atlantic Meteorology and Oceanography Center's unclassified (NLMOC.NAVY.MIL) and classified homepages. Data for the Pacific basin is posted on the Naval Pacific Meteorology and Oceanography Center's homepage at METOC.NPMOC.NAVY.MIL. Both graphic and alphanumeric warnings are posted. In addition, the Automated Digital Network (AUTODIN) is also used to distribute alphanumeric data, and gale, storm, and high seas graphics products are posted on the Joint Maritime Command Information System. The Fleet Numerical Meteorology and Oceanography Center/National Centers for Environmental Prediction Data Link (FNLDL) will be used for exchange of data between NWS and the Navy.

**4.3 U.S. Coast Guard.** The Coast Guard operates activities that routinely collect and/or report meteorological data. Those units that collect and transmit (or report) data for this program are Coast Guard Communications facilities at Boston, MA; Chesapeake, VA; Miami, FL; New Orleans, LA; Kodiak, AK; Honolulu, HI; and San Francisco, CA. These facilities collect Automated Mutual Assistance Vessel Rescue (AMVER) messages from merchant vessels and METEO messages from merchant and Coast Guard vessels on a routine basis. The METEO data are then passed directly to the NCEP on the Coast Guard Data Network (CGDN).

**Table 4-1. Reconnaissance organization communications capabilities.**

STATION	ADDRESS	TELETYPE	TELEPHONE
Federal Coordinator for Meteorology (OFCM)	Suite 1500 8455 Colesville Rd. Silver Spring, MD 20910		DSN 851-1460 301-427-2002
CARCAH	National Hurricane Center 11691 SW 17th Street Miami, FL 33165-2149	A B	DSN 434-3420 305-229-4474
National Hurricane Center	11691 SW 17th Street Miami, FL 33165-2149	A B	305-229-4470
Alternate National Hurricane Center	NCEP/HPC Camp Springs, MD	A B	301-763-8201
Central Pacific Hurricane Center	P.O. Box 29879 Honolulu, HI	B	808-973-5284
Naval Atlantic Meteorology and Oceanography Center	NAVLANTMETOCEN Norfolk, VA	A	DSN 564-7750/3770 757-444-7750/3770
Naval Pacific Meteorology and Oceanography Center	NAVPACMETOCEN Pearl Harbor, HI	A	DSN 471-0004 808-471-0004
Aircraft Operations Center	AOC Tampa, FL		813-828-3310
Air Force Weather Agency	AFWA Offutt AFB, NE	A	DSN 271-2586 402-294-2586
FACSFAC VACAPES OAC	FACSFAC VACAPES, Oceana, VA		DSN 433-1233 757-433-1233
53 WRS	53 WRS 817 H Street - Suite 201 Keesler AFB, MS 39534-2453	A	DSN 597-5518/2409 601-377-5518/2409

A - AWDS

B - AWIPS

## CHAPTER 5

### PUBLICITY

**5.1 News Media Releases.** News media releases, other than warnings and advisories, for the purpose of informing the public of the operational and research activities of the Departments of Commerce, Defense, and Transportation should reflect the joint effort of these agencies by giving due credit to the participation of other agencies.

**5.2 Distribution.** Copies of these releases, along with any pertinent pictures, should be forwarded to the following agencies:

- NOAA Office of Public Affairs  
Herbert C. Hoover Building  
14th and Constitution Avenue, N.W.  
Washington, DC 20230
- Commander, Naval Meteorology and Oceanography Command  
1020 Balch Boulevard  
Stennis Space Center, MS 39529-5005
- Hq Air Force Reserve Command (AFRC/PA)  
Robins AFB, GA 31093
- Chief, Environmental Services Division (J-3)  
The Joint Chiefs of Staff  
Washington, DC 20318-3000
- Federal Aviation Administration (APA-310)  
800 Independence Avenue, S.W.  
Washington, DC 20591
- Federal Coordinator for Meteorology  
Suite 1500, 8455 Colesville Road  
Silver Spring, MD 20910

## APPENDIX A

### ABBREVIATIONS

-A-

ADWS	Automatic Digital Weather Switch
AF	Air Force (U.S. Air Force)
AFB	Air Force Base
AFRC	Air Force Reserve Command
AFTN	Aeronautical Fixed Telecommunications Network
AFW	Air Force Weather
AFWA	Air Force Weather Agency
A/G	Air to Ground
AIRMET	Airmen's Meteorological Information Bulletin
AIREP	Aircraft Report
ALTRV APREQ	Altitude Reservation Approval Request
AMVER	Automated Mutual Assistance Vessel
AOC	Aircraft Operations Center
APT	Automatic Picture Transmission
ARINC	Aeronautical Radio, Incorporated
ARTCC	Air Route Traffic Control Center
ATC	Air Traffic Control
AVHRR	Advanced Very High Resolution Radiometer
AWDS	Automated Weather Distribution System
AWIPS	Advanced Weather Interactive Processing System
AWN	Automated Weather Network

-C-

C	Celsius
CA	Commander, Atlantic Area (USCG)
CARCAH	Chief, Aerial Reconnaissance Coordination, All Hurricanes
CARF	Central Altitude Reservations Function
CCGD	Commander, Coast Guard District
CG	Coast Guard
CINCLANTFLT	Commander-in-Chief, Atlantic Fleet
C-MAN	Coastal Marine Automated Network
CONUS	Continental United States
Class G Airspace	Uncontrolled airspace

-D-

DA	Daylight Ascending
DCS	Data Collection System
Det	Detachment
DMSP	Defense Meteorological Satellite Program
DOC	Department of Commerce
DOD	Department of Defense
DOT	Department of Transportation
DRSR	Direct Readout Scanning Radiometer
DSN	Defense Switched Network (AUTOVON)
DTG	Date Time Group

-E-

ESA	European Space Agency
ETA	Estimated Time of Arrival
ETD	Estimated Time of Departure

-F-

FAA	Federal Aviation Administration
FAD	Force Activity Designator
FCMSSR	Federal Committee for Meteorological Services and Supporting Research
FL	Flight Level
FNDL	Fleet Numerical Meteorology and Oceanography Center/ National Center for Environmental Prediction Data Link
ft	Foot, Feet
FSS	Flight Service Station
FTS	Federal Telecommunications System

-G-

GAC	Global Area Coverage
GCCS	Global Command and Control System (USAF)
GDSS	Global Decision Support System
GOES	Geostationary Operational Environmental Satellite

-H-

HF	High Frequency
hr	Hour

HPC  
HRPT

Hydrometeorological Prediction Center (NCEP)  
High Resolution Picture Transmission

-I-

ICAO  
ICMSSR

International Civil Aviation Organization  
Interdepartmental Committee for Meteorological  
Services and Supporting Research

IFR

Instrument Flight Rules

-J-

JCS  
JMCIS  
JP

Joint Chiefs of Staff  
Joint Maritime Command Information System  
Joint Publication

-K-

Km  
kPa  
kt

Kilometer(s)  
Kilopascal  
Knot(s)

-L-

LAC  
LF

Local Area Coverage  
Light Fine

-M-

m  
M-3  
mb  
METEO  
METOC  
mi  
min  
MIST  
mph  
MSB  
m/s

meter(s)  
METEOSAT-3  
millibar(s)--see kPa  
Cable Address for Ships  
Meteorology and Oceanography  
(statute) mile(s)  
minute(s)  
Meteorological Instrument Standard Terminal  
mile(s) per hour  
Meteorological Services Division  
meter(s) per second

-N-

NASA	National Aeronautics and Space Administration
NAVLANTMETOCCEN	Naval Atlantic Meteorology and Oceanography Center
NAVMETOCCOM	Naval Meteorology and Oceanography Command
NAVMETOCCOMDET	Naval Meteorology and Oceanography Command Detachment
NAVMETOCCOMFAC	Naval Meteorology and Oceanography Command Facility
NAVPACMETOCCEN	Naval Pacific Meteorology and Oceanography Center
NAWAS	National Warning System
NCEP	National Centers for Environmental Prediction
NDBC	National Data Buoy Center
NESDIS	National Environmental Satellite, Data, and Information Service
NHC	National Hurricane Center
nm	nautical mile(s)
NOAA	National Oceanic and Atmospheric Administration
NSSL	National Severe Storms Laboratory (NOAA)
NWSTG	National Weather Service Telecommunications Gateway

-O-

OAC	Oceanic Aircraft Coordinator (USN)
OFCM	Office of the Federal Coordinator for Meteorology
OLS	Operational Line Scan System
ONR	Office of Naval Research
OSV	Ocean Station Vessel

-P-

Pa	Pascal
PIREP	Pilot Report

-R-

RAREP	Radar Report
RECCO	Reconnaissance Code

-S-

SAB	Synoptic Analysis Branch
SAR	Search and Rescue
SARLANT	Search and Rescue Atlantic Circuit
SCAT	Satellite Cloudtop and Tropopause



SEM  
SGDB  
SIGMET  
SSB  
SSC  
SSM/I  
SSM/T-1  
SSM/T-2

Solar Environmental Monitor  
Satellite Global Database  
Significant Meteorological Information  
Single Sideband  
Stennis Space Center  
Special Sensor Microwave/Imagery  
Special Sensor Microwave/Temperature  
Special Sensor Microwave/Water Vapor

-T-

TEAL  
TESS  
TOVS  
TPC

Call Sign for State Operated Reconnaissance Aircraft  
Tactical Environmental Support System  
TIROS-N Operational Vertical Sounder  
Tropical Prediction Center

-U-

UHF  
UND  
USA  
USAF  
USCG  
USN  
UTC

Ultra High Frequency  
Urgency of Need Designator  
United States Army  
United States Air Force  
United States Coast Guard  
United States Navy  
Universal Coordinated Time (Z)

-V-

VAS  
VISSR

VISSR Atmospheric Sounder  
Visible and Infrared Spin Scan Radiometer

-W-

WBC  
WEFAX  
WG  
WG/HWSO&R  
  
WFO  
WMO  
WRS  
WS  
WSFO  
WSO  
WSPOD

Identifier for NCEP  
Weather Encoded Facsimile Transmission  
Working Group  
Working Group for Hurricane and Winter  
Storms Operations and Research (OFCM)  
Weather Forecast Office  
World Meteorological Organization  
Weather Reconnaissance Squadron  
Weather Squadron (USAF)  
Weather Service Forecast Office  
Weather Service Office  
Winter Storm Plan of the Day

-X-

XADC

Extended Atlantic Data Coverage

-Z-

Z

Zulu Time (UTC)

## APPENDIX B

### DISTRIBUTION

#### DEPARTMENT OF COMMERCE

#### NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Director, Office of Aircraft Operations (AOC)	5
Deputy Assistant Administrator for Satellite and Information Services (E)	2
Assistant Administrator for Environmental Satellite, Data, and Information Services (Ex1)	1
Chief, Information Service Division, National Climatic Data Center E/CC4)	2
NOAA Central Library (E/OC4)	4
Chief, Satellite Services Division (E/SP2)	1
Assistant Administrator for Ocean Services and Coastal Zone Management (N)	1
Director, Office of NOAA Corps (NC)	1
Director, Office of Public Affairs, NOAA (PA)	2
Director, Office of Oceanic and Atmospheric Research (R)	1
Director, Environmental Research Laboratories (R/E)	4
Director, Atlantic Oceanographic and Meteorological Laboratory (R/E/AO)	5
Director, Program Development and Coordination Staff (R/PDC)	1
Assistant Administrator for Weather Services (W)	1
Director, National Data Buoy Center (W/DB)	3
Director, National Centers for Environmental Prediction (W/NP)	5
Director, NCEP Central Operations (W/NP1)	3
Director, Environmental Modeling Center (W/NP2)	1
Director, Hydrometeorological Prediction Center (W/NP3)	10
Director, Marine Prediction Center (W/NP4)	2
Director, Aviation Weather Center (W/NP6)	2
Director, Storm Prediction Center (W/NP7)	2
Director, Tropical Prediction Center (W/NP8)	2
Director, Office of Meteorology (W/OM)	1
Chief, Integrated Hydrometeorological Services Core (W/OM12)	20
Director, NWS Eastern Region (W/ER)	20
Director, NWS Central Region (W/CR)	2
Director, NWS Southern Region (W/SR)	5
Director, NWS Western Region (W/WR)	2
WSFO, Boston, MA (W/ER09)	2
WSFO, Sterling, VA (W/ER)	2
WSFO, San Juan, PR (W/SR72)	2
NOAA Budget Officer, Office of Management and Budget	1

DEPARTMENT OF DEFENSE

JOINT/UNIFIED/SPECIFIED COMMANDS

The Joint Staff (J3-ROD and JRC)	2
USCINCPAC/J316 Env Group	1
USFORSCOM/FCJ2-WE	1
USSTRATCOM/J-3615	2
CINCUSACOM (J335)	1

DEPARTMENT OF THE AIR FORCE

HQ USAF/XOWX	3
HQ USAF/XOOOW	1
HQ USAF/REO	3
HQ USAFE/DOW	1
HQ PACAF/DOW	1
HQ ACC/DOW	1
HQ ACC/DOLT	2
HQ AFMC/DOW	1
HQ AFRC/DOO	2
HQ AFRC/DOTM	3
HQ AFSPACECOM/DOW	1
HQ AMC/DOW	2
HQ ATC/DOTW	1
HQ AFWA/XO	6
Det 7, AFWA	1
AFW Technical Library	1
CARCAH (OL-A 53 WRS)	8
22 AF/XP	1
22 AF/XPL	1
15 OS/OSW	1
25 ASOS/DOW	1
45 WS/CC	1
45 WS/SPW/XP/SE	3
53 WRS	75
334 TTS/PTMV	1
374 OSS/WE	1
403 WG/XP/CP	2
403 WG/CC/OSF	2
3246 TW/DOW	2
Det 4, 20 WS	1
Phillips Lab/GP	1

DEPARTMENT OF THE ARMY

Hq Department of the Army/DAMI-POI 2

DEPARTMENT OF THE NAVY

Oceanographer of the Navy 2  
Commandant of the Marine Corps (DC/S Aviation) 5  
Commanding Officer, Naval Oceanographic Office (N2513) 75  
Commanding Officer, NAVLANTMETOCEN 1  
CINCLANTFLT (N37, N526) 2  
NRL Stennis Space Center 1  
NRL Monterey 1  
Office of Naval Research 1  
Commander Operational Test and Evaluation Force/Staff Metoc Officer 1

DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION

Boston ARTCC 5  
New York ARTCC 5  
Washington ARTCC 5  
Atlanta ARTCC 5  
Jacksonville ARTCC 5  
Miami ARTCC 5  
Houston ARTCC 5  
ATCSCC Herndon 6  
ATO-100 2  
ANE-500 2  
AEA-500 2  
ASO-500 2  
ASW-500 2  
SJU AIFSS 2

U.S. COAST GUARD

Commandant, USCG Headquarters (NIO, TTM) 3  
Commander, First Coast Guard District 1  
Commander, Fifth Coast Guard District 2  
Commander, Seventh Coast Guard District 2  
Commander, Eighth Coast Guard District 1  
Commanding Officer, USCG Reserve Training Center 1  
Commanding Officer, USCG Air Station, Otis AFB, MA 1  
Commanding Officer, USCG Air Station, Opa Locka , FL 1  
  
Commanding Officer, USCG Air Station, Floyd Bennett  
Field, Brooklyn, NY 1

Commanding Officer, USCG Air Station, New Orleans, LA	1
Commanding Officer, USCG Air Station, Elizabeth City, NC	1
Commander, Atlantic Area, New York, NY	1
Commander, Pacific Area, Alameda, CA	1
<b>DEPARTMENT OF STATE</b>	
Office of Advanced Technology	1
<b>DEPARTMENT OF THE INTERIOR</b>	
Office of Liaison, Bureau of Reclamation	1
<b>FEDERAL EMERGENCY MANAGEMENT AGENCY</b>	
FEMA Region I	2
<b>NATIONAL SCIENCE FOUNDATION</b>	
Director, Division of Atmospheric Sciences	1
Director, Meteorology Program	1
<b>NATIONAL AERONAUTICS AND SPACE ADMINISTRATION</b>	
Atmospheric Sciences Division, MSFC	1
<b>OTHER U.S.</b>	
GSA Federal Information Center	1
Weather Coordinator, Cumberland Management Agency	2
Congressional Research Service, Library of Congress	1
University of Chicago Library, The Joseph Regenstein Library	1
Natural Hazards Research & Applications Information Center, University of Colorado	1
<b>GOVERNMENT OF CANADA</b>	
Officer in Charge, METOC Centre, Maritime Command Headquarters, Halifax, NS	1
Director, Atmospheric Environment Service, Downsview, Ontario	1
Base Meteorological Officer, CFB Greenwood, NS	1
Transport Canada, Ottawa	1
Transport Canada, New Brunswick	1
<b>UNITED KINGDOM</b>	
Assistant Director, Head of Defense Services, Meteorological Office	1

## APPENDIX C

### DEFINITIONS

**Area of Concern.** The geographic area of concern for the *National Winter Storms Operations Plan* covers the Gulf of Mexico and extends about 150 miles inland along the U.S. Gulf Coast. In the Atlantic, the area of concern ranges from latitudes 25°N to 48°N, west of longitude 55°W, extending about 150 miles inland along the eastern coast of the United States.

**Blizzard Warning.** A blizzard warning is a headline carried in NWS forecasts and special weather statements that serves notice to the public of a high probability for the occurrence of blizzard conditions (sustained or gust wind speeds of 35 mph or more, considerable falling and/or blowing snow causing poor visibility, frequently less than one-fourth mile).

**Due Regard.** Operation wherein state operated aircraft assume responsibility for separation from all other aircraft without ATC assistance.

**Freezing Rain (or Drizzle).** The freezing of rain or drizzle on objects as it strikes them. Winter storm warnings should be reserved for occasions when significant, and possibly damaging, accumulations of ice are expected. However, even small amounts are extremely dangerous to traffic when encountered unexpectedly, and these conditions frequently require the issuance of a travelers' advisory.

**Heavy Snow Warning.** A heavy snow warning, carried in NWS forecast and special weather statements, serves notice to the public of a high probability for the occurrence of heavy snow (four inches or more accumulation in 12 hours or six or more inches accumulation in 24 hours in most areas of the country, but some variation in the snowfall criterion is allowable on a regional basis).

**Ice Storm Warning.** This product may be issued when significant ice accumulations are expected and no other winter storm element is expected to occur.

**Mission Identifier.** The nomenclature assigned to winter storm aircraft reconnaissance missions for weather data identification. It comprises an agency-aircraft indicator followed by a CARCAH-assigned mission-system indicator.

**Reconnaissance Aircraft Sortie.** A flight that meets the requirements of the winter storm plan of the day.

**Sleet.** One form of ice pellet. Generally, solid grains of ice that form from the freezing of raindrops or the refreezing of largely melted snowflakes. Sleet, like small hail, usually bounces when hitting a hard surface. Heavy sleet is a fairly rare event in which the ground is covered to a depth of significance to motorists and others.

**Winter Storm Outlook.** This product may be issued when there is a good chance of a major winter storm beyond the point normally covered by a watch. The intent of an outlook is to provide information to those who need considerable lead time to prepare for the event (i.e. 36 to 72 hours).

**Winter Storm Plan of the Day.** A coordinated mission plan that tasks operational weather reconnaissance requirements during the next 1100Z to 1100Z day; describes reconnaissance flights committed to satisfy operational requirements and identifies possible reconnaissance requirements for the succeeding 24-hour period.

**Winter Storm Warning.** A Winter Storm Warning is a headline carried in NWS forecasts and special statements. It is issued when hazardous weather or a hydrologic event is occurring, is imminent, or has a very high probability of occurrence. A warning is used for conditions posing a threat to life or property. The warning is issued for the same events (except for blizzard conditions) that serve as a basis for the issuance of a winter storm watch. An exception may be made in three special situations: one is the heavy snowfall that often occurs along the lee of the Great Lakes, two is locally heavy orographic snowfall in mountainous terrain, and the third when freezing precipitation is the only element expected. When any of these conditions cannot be directly connected to a synoptic-scale winter storm, the headlines Heavy Snow Warning and Ice Storm Warning may be used in forecasts.

**Winter Storm Watch.** A Winter Storm Watch is a headline carried in NWS forecasts and special statements. It is used when the risk of a hazardous weather or hydrologic event has increased significantly, but its occurrence, location, and/or timing is still uncertain. It is intended to provide enough lead time so those who need to set their plans in motion can do so. The watch will cover the possible occurrence of the following elements, either separately or in combination: blizzard conditions, heavy snow (or light snow in areas where snow is relatively rare), accumulations of freezing rain or freezing drizzle, and/or heavy sleet.

**Winter Weather Advisories.** Event-specific advisories are used to describe conditions that do not constitute a serious enough hazard to warrant a warning for the general public but; nevertheless, pose a significant threat to specified users. They are highlighted in forecasts and statements. These types of advisories include snow (less than 4 in), blowing snow, wind chill, freezing rain, dense fog, etc.



**APPENDIX D**

**RECCO FORM, CODE TABLES AND REGULATIONS**

DATE			ORGANIZATION				MISSION IDENTIFIER												
OBSERVATION NUMBER	g	RECCO INDICATOR SPECIFYING TYPE OF OBSERVATION <i>Table 1</i>	g	TIME OF OBSERVATION (Hours and Minutes) (GMT)	Y	DAY OF WEEK SUN-1	L <sub>o</sub>	LONGITUDE DEGREES AND TENTHS (Note 4)	h <sub>a</sub>	PRESSURE ALTITUDE OF AIRCRAFT REPORTED TO THE NEAREST DECAMETER	d	WIND DIRECTION AT FLIGHT LEVEL (Tens of deg. true.)	T	TEMPERATURE WHOLE °C (Note 6)	/	INDICATOR			
	X		Q		OCTANT <i>Table 3</i>	L <sub>o</sub>	h <sub>a</sub>		d		T		J		INDEX TO HHH <i>Table 9</i>				
	X		g		L <sub>a</sub>	LATITUDE DEGREES AND TENTHS	L <sub>o</sub>		h <sub>a</sub>		f		WIND SPEED AT FLIGHT LEVEL (Knots)		T <sub>d</sub>		DEW POINT WHOLE °C (Note 6)	H	GEOPOTENTIAL HEIGHT/D-VALUE OR SLP PER INDEX (Note 8)
	X		g		L <sub>a</sub>		g		TURBULENCE <i>Table 4</i>		d <sub>t</sub>				f			T <sub>d</sub>	
	g		i <sub>d</sub>		DEW POINT INDICATOR <i>Table 2</i>	L <sub>a</sub>	TENTHS		f <sub>c</sub>		FLIGHT COND <i>Table 3</i> (Note 5)		d <sub>a</sub>		METHOD OF OBTAINING WIND <i>Table 7</i>		f	w	PRESENT WEATHER (Note 7 <i>Table 8</i> )
1		2		3		4		5		6		7		8					
REMARKS																			

TYPE AIRCRAFT				CALL SIGN				METEOROLOGIST							
1	INDICATOR	C	CLOUD TYPE <i>Table 11</i>	C	CLOUD TYPE <i>Table 11</i>	C	CLOUD TYPE <i>Table 11</i>	1	INDICATOR	C	CLOUD TYPE <i>Table 11</i>	C	CLOUD TYPE <i>Table 11</i>	C	CLOUD TYPE <i>Table 11</i>
k <sub>n</sub>	NR OF CLOUD LAYERS (Note 9)	h <sub>s</sub>	ALTITUDE OF BASE <i>Table 12</i>	h <sub>s</sub>	ALTITUDE OF BASE <i>Table 12</i>	h <sub>s</sub>	ALTITUDE OF BASE <i>Table 12</i>	K <sub>n</sub>	NR OF CLOUD LAYERS (Note 9)	h <sub>s</sub>	ALTITUDE OF BASE <i>Table 12</i>	h <sub>s</sub>	ALTITUDE OF BASE <i>Table 12</i>	h <sub>s</sub>	ALTITUDE OF BASE <i>Table 12</i>
N <sub>s</sub>	AMOUNT OF CLOUDS (Note 9) <i>Table 10</i>	h <sub>s</sub>	ALTITUDE OF TOP <i>Table 12</i>	H <sub>t</sub>	ALTITUDE OF TOP <i>Table 12</i>	H <sub>t</sub>	ALTITUDE OF TOP <i>Table 12</i>	N <sub>s</sub>	AMOUNT OF CLOUDS (Note 9) <i>Table 10</i>	h <sub>s</sub>	ALTITUDE OF TOP <i>Table 12</i>	H <sub>t</sub>	ALTITUDE OF TOP <i>Table 12</i>	H <sub>t</sub>	ALTITUDE OF TOP <i>Table 12</i>
N <sub>s</sub>		H <sub>t</sub>	ALTITUDE OF TOP <i>Table 12</i>	H <sub>t</sub>	ALTITUDE OF TOP <i>Table 12</i>	H <sub>t</sub>	ALTITUDE OF TOP <i>Table 12</i>	N <sub>s</sub>		H <sub>t</sub>	ALTITUDE OF TOP <i>Table 12</i>	H <sub>t</sub>	ALTITUDE OF TOP <i>Table 12</i>	H <sub>t</sub>	ALTITUDE OF TOP <i>Table 12</i>
9		10		11		12		13		14		15		16	
REMARKS															

RECCO RECORDING WORKSHEET															
4	INDICATOR	6	INDICATOR (Note 11)	6	INDICATOR (Note 11)	7	INDICATOR	7	INDICATOR	8	INDICATOR	8	INDICATOR	9	INDICATOR
d	DIRECTION OF SFC WIND (Tens of deg. true)	W <sub>s</sub>	SIGNIFICANT WEATHER CHANGES <i>Table 14</i>	W <sub>s</sub>	SIGNIFICANT WEATHER CHANGES <i>Table 14</i>	I <sub>r</sub>	RATE OF ICING <i>Table 17</i>	h <sub>i</sub>	ALT OF BASE OF ICING STRATUM (Note 12) <i>Table 12</i>	d <sub>r</sub>	BEARING OF ECHO CENTER (Tens of Deg. True)	E <sub>w</sub>	ECHO WIDTH OR DIAMETER <i>Table 19</i>	V <sub>i</sub>	INFLIGHT VISIBILITY <i>Table 23</i>
d		S <sub>s</sub>	DISTANCE OF OCCURENCE OF W <sub>s</sub> <i>Table 15</i>	S <sub>s</sub>	DISTANCE OF OCCURENCE OF W <sub>s</sub> <i>Table 15</i>	I <sub>t</sub>	TYPE OF ICING <i>Table 18</i>	h <sub>i</sub>	ALTITUDE OF TOP OF ICING STRATUM (Note 12) <i>Table 12</i>	d <sub>r</sub>	BEARING OF ECHO CENTER <i>Table 19</i>	E <sub>i</sub>	LENGTH OF MAJ AXIS <i>Table 19</i>	T <sub>w</sub>	SEA SURFACE TEMPERATURE DEGREES AND TENTHS
f	W <sub>d</sub>	DISTANT WEATHER <i>Table 16</i>	W <sub>d</sub>	DISTANT WEATHER <i>Table 16</i>	S <sub>b</sub>	DISTANCE TO BEGINNING OF ICING <i>Table 15</i>	H <sub>i</sub>	ALTITUDE OF TOP OF ICING STRATUM (Note 12) <i>Table 12</i>	S <sub>r</sub>	DISTANCE TO ECHO CENTER <i>Table 19</i>	c <sub>e</sub>	CHARACTER OF ECHO <i>Table 21</i>	T <sub>w</sub>		
f	d <sub>w</sub>	BEARING OF W <sub>d</sub> <i>Table 13</i>	d <sub>w</sub>	BEARING OF W <sub>d</sub> <i>Table 13</i>	S <sub>a</sub>	DISTANCE TO ENDING OF ICING <i>Table 15</i>	H <sub>i</sub>	ALTITUDE OF TOP OF ICING STRATUM (Note 12) <i>Table 12</i>	O <sub>e</sub>	ORIENTATION OF ELLIPSE <i>Table 20</i>	i <sub>e</sub>	INTENSITY OF ECHO <i>Table 22</i>	T <sub>w</sub>		
17		18		19		20		21		22		23		24	
REMARKS															

Figure D-1. Reconnaissance code recording form.

## Table D-1. Reconnaissance code tables.

**TABLE 1** XXX

- 222 Sec One Observation without radar capability
- 555 Sec Three (intermediate) observation with or without radar capability
- 777 Sec One Observation with radar capability

**TABLE 2**  $i_d$

- 0 No dew point capability/acft below 10,000 meters
- 1 No dew point capability/acft at or above 10,000 meters
- 2 No dew point capability/acft below 10,000 meters and flight lvl temp -50°C or colder
- 3 No dew point capability/acft at or above 10,000 meters and flight lvl temp -50°C or colder
- 4 Dew point capability/acft below 10,000 meters
- 5 Dew point capability/acft at or above 10,000 meters
- 6 Dew point capability/acft below 10,000 meters and flight lvl temp -50°C or colder
- 7 Dew point capability/acft at or above 10,000 meters and flight lvl temp -50°C or colder

**TABLE 3** Q

- |   |              |          |
|---|--------------|----------|
| 0 | 0° - 90° W   | Northern |
| 1 | 90° W - 180° | Northern |
| 2 | 180° - 90° E | Northern |
| 3 | 90° - 0° E   | Northern |
| 4 | Not Used     |          |
| 5 | 0° - 90° W   | Southern |
| 6 | 90° W - 180° | Southern |
| 7 | 180° - 90° E | Southern |
| 8 | 90° - 0° E   | Southern |

**TABLE 4** B

- 0 None
- 1 Light turbulence
- 2 Moderate turbulence in clear air, infrequent
- 3 Moderate turbulence in clear air, frequent
- 4 Moderate turbulence in cloud, infrequent
- 5 Moderate turbulence in cloud, frequent
- 6 Severe Turbulence in clear air, infrequent
- 7 Severe Turbulence in clear air, frequent
- 8 Severe Turbulence in cloud, infrequent
- 9 Severe Turbulence in cloud, frequent

**TABLE 5**  $f_c$

- 0 In the clear
- 8 In and out of clouds
- 9 In clouds all the time (continuous IMC)
- / Impossible to determine due to darkness or other cause

**TABLE 6**  $d_t$

- 0 Spot of Wind
- 1 Average wind
- / No wind reported

**TABLE 7**  $d_a$

- 0 Winds obtained using doppler radar or inertial systems
- 1 Winds obtained using other navigation equipment and/or techniques
- / Navigator unable to determine or wind not compatible

**TABLE 8** w

- 0 Clear
- 1 Scattered (trace to 4/8 cloud coverage)
- 2 Broken (5/8 to 7/8 cloud coverage)
- 3 Overcast/undercast
- 4 Fog, thick dust or haze
- 5 Drizzle
- 6 Rain (continuous or intermittent precip - from stratiform clouds)
- 7 Snow or rain and snow mixed
- 8 Shower(s) (continuous or intermittent precip - from cumuliform clouds)
- 9 Thunderstorm(s)
- / Unknown for any cause, including darkness

**TABLE 9** j

- 0 Sea level pressure in whole millibars (thousands fig if any omitted)
- 1 Altitude 200 mb surface in geopotential decameters (thousands fig if any omitted)
- 2 Altitude 850 mb surface in geopotential meters (thousands fig omitted)
- 3 Altitude 700 mb surface in geopotential meters (thousands fig omitted)
- 4 Altitude 500 mb surface in geopotential decameters
- 5 Altitude 400 mb surface in geopotential decameters
- 6 Altitude 300 mb surface in geopotential decameters
- 7 Altitude 250 mb surface in geopotential decameters (thousands fig if any omitted)
- 8 D - Value in geopotential decameters; if negative 500 is added to HHH
- 9 Altitude 925 mb surface in geopotential meters
- / No absolute altitude available or geopotential data not within ± 30 meters/4 mb accuracy requirements

**TABLE 10**  $N_s$

- 0 No additional cloud layers (place holder)
- 1 1 okta or less, but not zero (1/8 or less sky covered)
- 2 2 oktas (or 2/8 of sky covered)
- 3 3 oktas (or 3/8 of sky covered)
- 4 4 oktas (or 4/8 of sky covered)
- 5 5 oktas (or 5/8 of sky covered)
- 6 6 oktas (or 6/8 of sky covered)
- 7 7 oktas or more but not 8 oktas
- 8 8 oktas or sky completely covered
- 9 Sky obscured (place holder)

**TABLE 11** C

- 0 Cirrus (Ci)
- 1 Cirrocumulus (Cc)
- 2 Cirrostratus (Cs)
- 3 Altcumulus (Ac)
- 4 Altostratus (As)
- 5 Nimbostratus (Ns)
- 6 Stratocumulus (Sc)
- 7 Stratus (St)
- 8 Cumulus (Cu)
- 9 Cumulonimbus (Cb)
- / Cloud type unknown due to darkness or other analogous phenomena

**TABLE 12**  $h_s h_t h_i h_j$

- 00 Less than 100
- 01 100 ft
- 02 200 ft
- 03 300 ft
- etc, etc
- 49 4,900 ft
- 50 5,000 ft
- 51-55 Not used
- 56 6,000 ft
- 57 7,000 ft
- etc, etc
- 79 29,000 ft
- 80 30,000 ft
- 81 35,000 ft
- 82 40,000 ft
- etc, etc
- 89 Greater than 70,000 ft
- // Unknown

**TABLE 13**  $d_w$

- |   |           |                  |
|---|-----------|------------------|
| 0 | No report | 5 SW             |
| 1 | NE        | 6 W              |
| 2 | E         | 7 NW             |
| 3 | SE        | 8 N              |
| 4 | S         | 9 all directions |

**TABLE 14**  $W_s$

- 0 No change
- 1 Marked wind shift
- 2 Beginning or ending or marked turbulence
- 3 Marked temperature change (not with altitude)
- 4 Precipitation begins or ends
- 5 Change in cloud forms
- 6 Fog or ice fog bank begins or ends
- 7 Warm front
- 8 Cold Front
- 9 Front, type not specified

**TABLE 15**  $S_b S_e S_s$

- 0 No report
- 1 Previous position
- 2 Present position
- 3 30 nautical miles
- 4 60 nautical miles
- 5 90 nautical miles
- 6 120 nautical miles
- 7 150 nautical miles
- 8 180 nautical miles
- 9 More than 180 nautical miles
- / Unknown (not used for  $S_s$ )

Table D-1. Reconnaissance code tables (continued)

TABLE 16  $w_d$

- 0 No report
- 1 Signs of a tropical cyclone
- 2 Ugly threatening sky
- 3 Duststorm or sandstorm
- 4 Fog or ice fog
- 5 Waterspout
- 6 Cirrostratus shield or bank
- 7 Altostratus or altocumulus shield or bank
- 8 Line of heavy cumulus
- 9 Cumulonimbus heads or thunderstorms

TABLE 17  $I_r$

- 7 Light
- 8 Moderate
- 9 Severe
- / Unknown or contrails

TABLE 18  $I_t$

- 0 None
- 1 Rime ice in clouds
- 2 Clear ice in clouds
- 3 Combination rime and clear ice in clouds
- 4 Rime ice in precipitation
- 5 Clear ice in precipitation
- 6 Combination rime and clear ice in precip
- 7 Frost (icing in clear air)
- 8 Nonpersistent contrails (less than 1/4 nautical miles long)
- 9 Persistent contrails

TABLE 19  $S_r, E_w, E_l$

- 0 ONM      5 50NM
- 1 10NM     6 60-80NM
- 2 20NM     7 80-100NM
- 3 30NM     8 100-150NM
- 4 40NM     9 Greater than 150NM
- / Unknown

TABLE 20  $O_e$

- 0 Circular
- 1 NNE - SSW
- 2 NE - SW
- 3 ENE - WSW
- 4 E - W
- 5 ESE - WNW
- 6 SE - NW
- 7 SSE - NNW
- 8 S - N
- / Unknown

TABLE 21  $c_e$

- 1 Scattered Area
- 2 Solid Area
- 3 Scattered Line
- 4 Solid Line
- 5 Scattered, all quadrants
- 6 Solid, all quadrants
- / Unknown

TABLE 22  $i_e$

- 2 Weak
- 5 Moderate
- 8 Strong
- / Unknown

TABLE 23  $V_i$

- 1 Inflight visibility 0 to and including 1 nautical mile
- 2 Inflight visibility greater than 1 and not exceeding 3 nautical miles
- 3 Inflight visibility greater than 3 nautical miles

RECCO SYMBOLIC FORM

SECTION ONE (MANDATORY)

9XXX9 GGggi<sub>d</sub> YQL<sub>a</sub>L<sub>a</sub>L<sub>a</sub> L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>Bf<sub>c</sub> h<sub>a</sub>h<sub>a</sub>h<sub>a</sub>d<sub>t</sub>d<sub>a</sub>

ddfff TTT<sub>d</sub>T<sub>d</sub>w /jHHH

SECTION TWO (ADDITIONAL)

1k<sub>n</sub>N<sub>s</sub>N<sub>s</sub>N<sub>s</sub> Ch<sub>s</sub>h<sub>s</sub>H<sub>t</sub>H<sub>t</sub> ..... 4ddff

6W<sub>s</sub>S<sub>s</sub>W<sub>d</sub>d<sub>w</sub> 7I<sub>r</sub>I<sub>t</sub>S<sub>b</sub>S<sub>e</sub> 7h<sub>i</sub>h<sub>i</sub>H<sub>i</sub>H<sub>i</sub> 8d<sub>r</sub>d<sub>r</sub>S<sub>r</sub>O<sub>e</sub>

8E<sub>w</sub>E<sub>i</sub>c<sub>e</sub>i 9V<sub>i</sub>T<sub>w</sub>T<sub>w</sub>T<sub>w</sub>

SECTION THREE (INTERMEDIATE)

9XXX9 GGggi<sub>d</sub> YQL<sub>a</sub>L<sub>a</sub>L<sub>a</sub> L<sub>o</sub>L<sub>o</sub>L<sub>o</sub>Bf<sub>c</sub> h<sub>a</sub>h<sub>a</sub>h<sub>a</sub>d<sub>t</sub>d<sub>a</sub>

ddfff TTT<sub>d</sub>T<sub>d</sub>w /jHHH

**Table D-2. Reconnaissance code regulations.**

1. At the time of the observation the aircraft observing platform is considered to be located on the axis of a right vertical cylinder with a radius of 30 nautical miles bounded by the earth's surface and the top atmosphere. Present weather, cloud amount and type, turbulence, and other subjective elements are reported as occurring within the cylinder. Flight level winds, temperature, dew point, and geopotential values are sensed or computed and reported as occurring at the center of the observation circle. Radar echoes, significant weather changes, distant weather, and icing are phenomena that may also be observed/reported. Code groups identifying these phenomena may be reported as necessary to adequately describe met conditions observed.
2. The intermediate observation (Section Three) is reported following Section One (or Section Two if appended to Section One) in the order that it was taken.
3. Plain language remarks may be added as appropriate. These remarks follow the last encoded portion of the horizontal or vertical observation and will clearly convey the intended message. Vertical observations will not include meteorological remarks. These remarks must begin with a letter or word-e.g. "FL TEMP" vice "700 MB FL TEMP." The last report plain language remarks are mandatory, i.e., "LAST REPORT. OBS 01 thru 08 to KNHC, OBS 09 and 10 to KBIX."
4. The hundreds digit of longitude is omitted for longitudes from 100° to 180°.
5. Describe conditions along the route of flight actually experienced at flight level by aircraft.
6. TT, T<sub>d</sub>T<sub>d</sub>. When encoding negative temperatures, 50 is added to the absolute value of the temperature with the hundreds figure, if any, being omitted. A temperature of -52°C is encoded as 02, the distinction between -52°C and 2°C being made from i<sub>d</sub>. Missing or unknown temperatures are reported as //. When the dew point is colder than -49.4°C, Code T<sub>d</sub>T<sub>d</sub> as // and report the actual value as a plain language remark - e.g. "DEW POINT NEG 52°C".
7. When two or more types of w co-exist, the type with the higher code figure will be reported. Code Figure 1, 2 and 3 are reported based on the total cloud amount through a given altitude, above or below the aircraft, and when other figures are inappropriate. The summation principle applies only when two or more cloud types share a given altitude.
8. When j is reported as a /, HHH is encoded as ///.
9. If the number of cloud layers reported exceeds 3, k<sub>n</sub> in the first 1-group reports the total number of cloud layers. The second 1-group reports the additional number of layers being reported exclusive of those previously reported. In those cases where a cloud layer(s) is discernible, but a descriptive cloud picture of the observation circle is not possible, use appropriate remarks such as "Clouds Blo" or "As Blo" to indicate the presence of clouds. In such cases, coded entries are not made for group 9. The sequence in which cloud amounts are encoded depends upon type of cloud, cloud base, and vertical extent of the cloud. The cloud with the largest numerical value of cloud type code (C) is reported first, regardless of coverage, base, or vertical extent. Among clouds of the same cloud type code, sharing a common base, the cloud of greatest vertical extent is reported first. The summation principle is not used; each layer is treated as though no other clouds were present. The total amount of clouds through one altitude shared by several clouds will not exceed 8 oktas. Only use code figure 0 as a place holder when you can determine that no additional cloud layers exist. In case of undercast, overcast, etc., use code figure 9 as a placeholder.
10. Due to limitations in the ability to distinguish sea state features representative of wind speeds above 130 knots, surface wind speeds in excess of 130 knots will not be encoded. Wind speeds of 100 to 130 knots inclusive will be encoded by deleting the hundreds figure and adding 50 to dd. For wind speeds above 130 knots, dd is reported without adding 50 and ff is encoded as // with a plain language remark added, i.e., "SFC WIND ABOVE 130 KNOTS."
11. Significant weather changes which have occurred since the last observation along the track are reported for W<sub>s</sub>.
12. When aircraft encounters icing in level flight, the height at which the icing occurred will be reported for h<sub>i</sub>h<sub>i</sub>. The H<sub>i</sub>H<sub>i</sub> will be reported as //.

## APPENDIX E

### TEMP DROP CODE

EXTRACT FROM: WMO-No. 306 MANUAL ON CODES

FM 37-IX Ext. TEMP DROP - Upper-level pressure, temperature, humidity and wind report from a sonde released by carrier balloons or aircraft. Figure E-1 is an example TEMP DROP message.

#### CODE FORM:

#### PART A

SECTION 1     $M_i M_j M_j M_j$      $YYGGI_d$      $99L_a L_a L_a$      $Q_c L_o L_o L_o L_o$      $MMMU_{L_a} U_{L_o}$

SECTION 2     $99P_o P_o P_o$      $T_o T_o T_{ao} D_o D_o$      $d_o d_o f_o f_o f_o$

$P_1 P_1 h_1 h_1 h_1$      $T_1 T_1 T_{a1} D_1 D_1$      $d_1 d_1 f_1 f_1 f_1$

$P_n P_n h_n h_n h_n$      $T_n T_n T_{an} D_n D_n$      $d_n d_n f_n f_n f_n$

SECTION 3     $88P_t P_t P_t$      $T_t T_t T_{at} D_t D_t$      $d_t d_t f_t f_t f_t$   
or  
88999

SECTION 4     $77P_m P_m P_m$      $d_m d_m f_m f_m f_m$      $(4v_b v_b v_a v_a)$   
or  
 $66P_m P_m P_m$      $d_m d_m f_m f_m f_m$      $(4v_b v_b v_a v_a)$   
or  
77999

SECTION 9    51515 (through 59595) Code groups to be developed regionally.

SECTION 10    61616 (through 69696) Code groups to be developed nationally.

#### PART A

#### SECTION 1 - IDENTIFICATION AND POSITION

$M_i M_j$     Identification letters of the report = XX

$M_j M_j$     Identification letters of the part of the report = AA

YY    Day of the month (GMT). When wind data are included 50 is added to YY.

GG    Actual time of the observation, to the nearest whole hour (GMT).

$I_d$     Highest mandatory level for which wind is available. 7=700 mb, 5=500 mb, etc. If flight level is above a standard surface, for example 495, report a 5 for 500 mb in the  $I_d$  group.

*Note the following clarification was approved at the 52d IHC:  $I_d$  will specify in hundreds of mb (Part A) or tens of mb (Part C) the highest mandatory isobaric level for which the wind is reported. For example, in Part A,  $I_d = 7$  indicates 700 mb, but in Part C,  $I_d = 7$  indicates 70 mb.  $I_d = 0$  refers to the 1000 mb level. The surface wind group should always be present.*

- (1) The wind group shall be omitted at all levels above the level specified by  $I_a$ , except as noted in (3) and (4) below.
- (2) The wind group shall be present at all levels at and below the level specified by  $I_a$ . At levels below that specified by  $I_a$  for which the wind is missing, encode the wind group as "////".
- (3) When the highest mandatory level for which the wind is reported is 250 mb, encode  $I_a$  as 2. If other information is available above 250 mb, encode the 200 mb wind group as "////".
- (4) When the highest mandatory level for which the wind is reported is 150 mb, encode  $I_a$  as 1. If other information is available above 150 mb, encode the 100 mb wind group as "////".
- (5) When no winds are reported for any level, encode  $I_a$  as "/", encode the surface wind group as "////", and omit all wind groups above the surface.

99 Indicator for data on position follow.

$L_a L_a L_a$  Latitude, in tenths of a degree.

$Q_c$  Quadrant of the globe. The earth is divided by the Greenwich meridian and the equator into quadrants. The code figure reported depends on the latitude and longitude of the observation position.

$L_o L_o L_o L_o$  Longitude, in tenths of a degree.

MMM Marsden square. The number of the marsden square for aircraft position at the time of the observation is reported for MMM. Always report three digits for MMM, with zeros reported for the hundreds and tens digits when required. When an observation is within a depicted 10 degree square, report the number of that square. When on an even 10 degree latitude or longitude circle, the marsden square for MMM is obtained by moving in the direction of larger latitude and/or longitude. EXAMPLE: Assuming a position of 18.1N, 131.4W, MMM is 050; assuming a position of 30.0N, 140.0E, MMM is 130. At the equator or on the prime meridian, report the marsden square compatible with the  $Q_c$  reported.

$U_{La}$  Units digit in the reported latitude.

$U_{Lo}$  Units digit in the reported longitude.

## SECTION 2 - SURFACE AND STANDARD ISOBARIC SURFACES

99 Indicator for data for the surface level follow.

$P_o P_o P_o$  Pressure of specified levels in whole millibars, thousands digits omitted. ( $P_o P_o P_o$  is always surface level.)

$P_1 P_1$  Pressure of standard isobaric surfaces in units of tens of millibars. (1000mbs=00,  
 $P_n P_n$  925mbs=92, 850mbs=85, 700mbs=70, etc.)

$h_1 h_1 h_1$  Height of the standard pressure level in geopotential meters or decameters above the surface. Encoded  
 $h_n h_n h_n$  in meters up to but not including 500mbs. Encoded in decameters at and above 500mbs omitting, if necessary, the thousands or tens of thousands digits. Add 500 to hhh for negative 1000mb heights. Report 1000mb groups as 00/// //// when surface pressure is less than 950mbs.

$T_o T_o$  Tens and units digit of air temperature (not rounded off) in degrees Celsius, at specified

T <sub>1</sub> T <sub>1</sub> T <sub>n</sub> T <sub>n</sub>	levels beginning with surface.
T <sub>ao</sub> T <sub>al</sub> T <sub>an</sub>	Approximate tenths value and sign (plus or minus) of the air temperature. Even = plus; Odd = minus.
D <sub>o</sub> D <sub>o</sub> D <sub>1</sub> D <sub>1</sub> D <sub>n</sub> D <sub>n</sub>	Dewpoint depression (with respect to water) at standard isobaric surfaces beginning with surface level. When the depression is 4.9C or less encode the units and tenths digits of the depression. Encode depressions of 5.0C through 5.4C as 50. Encode depressions of 5.5C through 5.9C as 56. Dewpoint depressions of 6.0C and above are encoded in tens and units with 50 added. Dewpoint depressions for relative humidities less than 20% are encoded as 80. When air temperature is below -40C report D <sub>n</sub> D <sub>n</sub> as two solidi.
d <sub>o</sub> d <sub>o</sub> d <sub>1</sub> d <sub>1</sub> d <sub>n</sub> d <sub>n</sub>	True direction from which wind is blowing rounded to nearest 5 degrees. Report hundreds and tens digits. The unit digit (0 or 5) is added to the hundreds digit of wind speed.
f <sub>o</sub> f <sub>o</sub> f <sub>o</sub> f <sub>1</sub> f <sub>1</sub> f <sub>1</sub> f <sub>n</sub> f <sub>n</sub> f <sub>n</sub>	Wind speed in knots. Hundreds digit is sum of hundreds digit of speed and unit digit of direction, i.e. 295° at 125 kts encoded as 29625. (Notes 1&2)

NOTE: 1. When flight level is just above a standard surface and in the operator's best meteorological judgement, the winds are representative of the winds at the standard surface, then the operator may encode the standard surface winds using the data from flight level. If the winds are not representative, then encode /////.

2. The wind group relating to the surface level (d<sub>o</sub>d<sub>o</sub>f<sub>o</sub>f<sub>o</sub>) will be included in the report; when the corresponding wind data are not available, the group will be encoded/////.

### SECTION 3 - DATA FOR TROPOPAUSE LEVELS

88	Indicator for data for tropopause level(s) follow.
P <sub>t</sub> P <sub>t</sub> P <sub>t</sub>	Pressure at the tropopause level reported in whole millibars.
T <sub>t</sub> T <sub>t</sub>	Air temperature in whole degrees Celsius, at the tropopause level.
T <sub>at</sub>	Approximate tenths value and sign (plus or minus) of the air temperature at the tropopause level.
D <sub>t</sub> D <sub>t</sub>	Dew point depression at the tropopause level.
d <sub>t</sub> d <sub>t</sub>	True direction at the tropopause level rounded to nearest 5 degrees. Report hundreds and tens digits. The unit digit (0 or 5) is added to the hundreds digit of wind speed.
f <sub>t</sub> f <sub>t</sub> f <sub>t</sub>	Wind speed in knots. Hundreds digit is sum of hundreds digit of speed and unit digit of direction, i.e. 295° at 125 kts encoded as 29625.
88999	Indicator that tropopause data have not been observed.



## SECTION 4 - MAXIMUM WIND DATA

- 66 Indicator that data for maximum wind level and for vertical wind shear follow when max wind occurs at flight level.
- 77 Indicator that data for maximum wind level and for vertical wind shear follow when max wind level does not coincide with flight level.
- $P_m P_m P_m$  Pressure at maximum wind level in whole millibars.
- $d_m d_m$  True direction from which wind is blowing at the maximum wind level rounded to nearest 5 degrees. Report hundreds and tens digits. The unit digit (0 or 5) is added to the hundreds digit of wind speed.
- $f_m f_m f_m$  Wind speed in knots. Hundreds digit is sum of hundreds digit of speed and unit digit of direction, i.e.  $295^\circ$  at  $125$  kts encoded as  $29625$ .
- 4 Data for vertical wind shear follow.
- $v_b v_b$  Absolute value of vector difference between max wind and the wind 3000 feet BELOW the level of maximum wind, reported to the nearest knot. Use "/" if missing and 4 group is reported. A vector difference of 99 knots or more is reported with the code figure "99".
- $v_a v_a$  Absolute value of vector difference between max wind and the wind 3000 feet ABOVE the level of maximum wind, reported to the nearest knot. Use "/" if missing and 4 group is reported. A vector difference of 99 knots or more is reported with the code figure "99".
- 77999 Indicator that maximum wind data have not been observed.

## SECTION 10 - NATIONAL PRACTICES

- 61616 Mission identifier followed by the observation number and the four-letter ICAO identifier for the station that copied and disseminated the observation (e.g., 61616 NOAA9 0403A CLAUDETTE OB 01 KWBC)
- 62626 National practice group indicator preceding a free form character string containing specific sonde or mission-related remarks; e.g., EYEWALL, SST28.2, SFC WND AT 7M. Other types of remarks include:

EYE	(sonde released above surface center)
EYEWALL 030	(sonde released in the eyewall at the 3 digit bearing from the eye fix)
FLT LVL CEN	(sonde released at the flight level center)
RAINBAND	(sonde released in a rainband)
SPL 2030N 6220W	(splash location of the sonde)
LAST REPORT OBS 01 THRU 30 TO KNHC	(last observation report for this mission)

**CODE FORM:**

**PART B**

SECTION 1     $M_i M_j M_k M_l$     YYGG/    99 $L_a L_a L_a$      $Q_c L_o L_o L_o$      $MMM U_{L_a} U_{L_o}$

SECTION 5     $n_o n_o P_o P_o P_o$      $T_o T_o T_{ao} D_o D_o$

$n_1 n_1 P_1 P_1 P_1$      $T_1 T_1 T_{a1} D_1 D_1$

$n_n n_n P_n P_n P_n$      $T_n T_n T_{an} D_n D_n$

SECTION 6    21212     $n_o n_o P_o P_o P_o$   $d_o d_o f_o f_o f_o$

$n_1 n_1 P_1 P_1 P_1$      $d_1 d_1 f_1 f_1 f_1$

$n_n n_n P_n P_n P_n$      $d_n d_n f_n f_n f_n$

SECTION 7    31313     $s_r r_a r_a s_a s_a$  8GGgg

SECTION 9    51515    101 $A_{df} A_{df}$     or

              101 $A_{df} A_{df}$     0 $P_n P_n P'_n P'_n$     or

              101 $A_{df} A_{df}$      $P_n P_n h_n h_n h_n$

SECTION 10    61616    Repeat national practice encoded in Part A.

              62626    Repeat national practice encoded in Part A.

**PART B**

**SECTION - 1 IDENTIFICATION AND POSITION**

$M_j M_k$     Identification letters of the part of the report = BB.

/         Filler figure for last digit of YYGG group. No wind groups reported for any of the significant isobaric surfaces.

All other groups are the same as reported in Part A - Section 1

**SECTION 5 - DATA FOR SIGNIFICANT TEMPERATURE AND RELATIVE HUMIDITY LEVELS**

$n_o n_o$     Number of level, starting with surface level. Only surface level will be numbered as "00."

$n_1 n_1$     When a standard level is also selected as significant, repeat the level in section 5. Encode significant levels to indicate missing data as nn/// /////.

$P_o P_o P_o$     Pressure at specified levels in whole millibars, beginning with surface.

$P_1 P_1 P_1$

$P_n P_n P_n$

Temperature and humidity data groups are reported in the same manner as the temperature and humidity data in Part A - Section 2.

### SECTION 6 - DATA FOR SIGNIFICANT WIND LEVELS

21212 Data for significant levels with respect to wind follow. Wind data groups are reported in the same manner as the wind data in Part A - Section 2.

### SECTION 7 - SOUNDING SYSTEM INDICATION

31313 Data on sounding system.

$s_r$  Identifies solar and infrared radiation correction. Always report as zero--no correction.  
 $r_a r_a$  Identifies dropsonde/sounding system used. Always report as "96"--descending radiosonde.  
 $s_a s_a$  Identifies tracking technique/status of system used. Reported as "00" or "08."  
"0" - Aircraft system has no windfinding capability.  
"8" - Automatic satellite navigation.

8 Indicator for time of observation.  
GGgg Actual time of dropsonde launch in hours (GG) and minutes (gg) UTC.

### SECTION 9 - ADDITIONAL DATA GROUPS

101A<sub>df</sub> A<sub>df</sub> Specifications of regional additional data being reported.

0 Group indicator.

$P_n P_n$  Pressure of specified levels in tens of millibars. (1007 mb=01, 945 mb=95, 726 mb=73).

$P'_n P'_n$

$P_n P_n h_n h_n h_n$  Data reported in the same manner as in Part A - Section 2.

51515 Additional data in regional code follow.

10166 Geopotential data are doubtful between the following levels,  $0P_n P_n P'_n P'_n$ . This code figure is used only when geopotential data are doubtful from a level to termination of the descent. NOTE: When radar altimeter is inoperative and surface reference is used, or if the ARWO advises that geopotential platform data is doubtful, a 10166 is reported for the entire run.

10167 Temperature data are doubtful between the following levels:  $0P_n P_n P'_n P'_n$ . This code figure shall be reported when only temperature data are doubtful for a portion of the descent. If a 10167 group is reported a 10166 will also be reported. EXAMPLE: Temperature is doubtful from 540mbs to 510mbs. SLP is 1020mbs. The additional data groups would be: 51515 10166 00251 10167 05451.

10190 Extrapolated altitude data follows:

1. When the sounding begins within 25mbs below a standard surface, the height of the surface is reported in the format 10190  $P_n P_n h_n h_n h_n$ . The temperature group is not reported. EXAMPLE: Assume the release was made from 310mbs, and the 300mb height was 966 decameters. The last reported standard level in Part A is the 400mb level. The data for the 300mb level is reported in Part B as 10190 30966.

2. When the sounding does not reach surface but terminates within 25mbs of a standard surface, the

height of the standard surface is reported in Part A of the code in standard format and in Part B of the code in the format 10190 P<sub>n</sub>P<sub>n</sub>h<sub>n</sub>h<sub>n</sub>h<sub>n</sub>. EXAMPLE: Assume termination occurred at 980mbs, and the extrapolated height of the 1000mb level was 115 meters. The 1000mb level would be reported in Part A of the code as 00115 ///// and in Part B as 10190 00115.

10191 Extrapolated surface pressure precedes. Extrapolated surface pressure is only reported when the termination occurs between 850mbs and surface. Surface pressure is reported in Part A as 99P<sub>o</sub>P<sub>o</sub>P<sub>o</sub> ///// and in Part B as 00P<sub>o</sub>P<sub>o</sub>P<sub>o</sub> //. When surface pressure is extrapolated, the 10191 group is the last additional data group reported in Part B.

**FIGURE E-1. Example TEMP DROP Message.**

---

UZNT13 KWBC 141910  
XXAA 64193 99272 70775 08077 99017 27657 11003 00146 26456 07505 92829 20844 03501 85557 16659  
00000 70183 07260 ///// 50587 08156 23007 40757 19166 22014 30965 34964 17018 25089 45163 20234  
579// 88999 77999  
61616 NOAA9 0403A CLAUDETTE OB 01 KWBC  
62626 EYEWALL, SST28.2, SFC WIND AT 7M

XXBB 6419/ 99272 70775 08077 00017 27657 11956 22837 22872 17650 33832 16063 44789 12444 55704  
07458 66692 06867 77658 04062 88640 03070 99598 00956 11588 01363 22578 02336 33559 04327 44528  
06350 55520 06961 66513 07347 77492 08759 88482 09957 99460 11759 11410 17957 22401 18966 33393  
20162 44381 21569 55361 24364 66353 25570 77318 31359 88302 34564 99238 47962 11192 605//  
21212 00017 11003 11435 22512 22419 20510 33397 22014 44330 16017 55292 18017 66270 16521 77192  
19014  
31313 09608 81833  
61616 NOAA9 0403A CLAUDETTE OB 01 KWBC  
62626 EYEWALL, SST28.2, SFC WIND AT 7M  
NNNN

## APPENDIX F

### EAST AND GULF COAST STORM TRACKS

#### NOTES TO APPENDIX F, EAST AND GULF COAST STORM TRACKS:

- Flight Plans and maps depicted are for planning only; they are not to be used for navigation. Flight crews are responsible for *most current condition* flight plans and fuel computations.
- Flight Plans labeled with the suffix "R" are flown in reverse of the corresponding numbered missions.
- No-wind Fuel Load requirements for **CORONET COAST** missions are as follows:

<u>TRACK #</u>	<u>FUEL LOAD (x 1,000 #)</u>
COAST 01	50
COAST 01R	50
COAST 02	50
COAST 02R	50
COAST 03	50
COAST 03R	50
COAST 04	45
COAST 04R	45
COAST 05	45
COAST 05R	45
COAST 06	36
COAST 06R	36

#### **Flight Crews must recompute fuel requirements prior to flight.**

- Compare flight plan with Altitude Reservation (ALTRV) and resolve discrepancies prior to flight.
- Tasked dropsonde release points may differ from those printed in this Appendix.

Table F-1a. No-Wind Flight Plan for route CORONET COAST 01. (These plans are for planning purposes only. Do not use for navigation.)

FPM VERSION: 3.040 WC-130H Date: 6 OCT 98  
 ROUTE NAME: C:\PFPS\data\ROUTES\98CST01.rte  
 AC EMPTY WT=84300 STORE WT=0 FUEL WT (INT/EXT):44000 6000

TP DTD#	Fix/Point Description	Latitude Longitude	Elev Var	A/S Bank	Alt Wind	*Temp FF	MH MC	Time	Dist	Fuel
1	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 0.6E		10M	+15C	360 360	00+00 00:00	0 0	1000 49000
2	KSJI/R SEMME	N 30 43.56 W088 21.56	190 0.1E	N/A	15736M	-16C	056 7317 056	00+11 00:11	35 35	1303 47697
3	KMG/R MONTGOMERY	N 32 13.34 W086 19.18	270 1.6W	280	19000M	-23C	049 4800 049	00+30 00:41	138 173	2503 45194
4	AJFEB/W (AJFEB)	N 33 38.42 W084 10.23	unk 3.5W	280	19000M	-23C	053 4771 053	00+30 01:10	138 310	2346 42848
5	KSPA/R SPARTANBURG	N 35 02.02 W081 55.62	910 5.6W	280	19000M	-23C	056 4742 056	00+30 01:40	139 450	2355 40493
6	KGSO/R GREENSBORO	N 36 02.74 W079 58.58	879 7.4W	280	25000M	-35C	063 4154 063	00+26 02:06	113 563	1963 38530
7	KFKN/R FRANKLIN	N 36 42.85 W077 00.74	90 9.8W	280	25000M	-35C	081 4123 081	00+32 02:38	149 711	2189 36341
8	KORF/R NORFOLK	N 36 53.51 W076 12.02	20 10.4W	280	25000M	-35C	084 4098 084	00+09 02:47	40 752	592 35749
9	SAWED/W SAWED	N 37 32.01 W075 51.49	unk 10.9W	280	25000M	-35C	033 4087 033	00+09 02:56	42 793	611 35138
10	KALDA/W KALDA	N 37 50.51 W075 37.59	unk 11.1W	280	25000M	-35C	042 4079 042	00+05 03:00	22 815	314 34824
11	KSWL/R SNOW HILL	N 38 03.40 W075 27.84	40 11.3W	280	25000M	-35C	042 4075 042	00+03 03:04	15 830	218 34606
12	KSIE/R SEA ISLE	N 39 05.73 W074 48.02	10 12.1W	280	25000M	-35C	038 4064 038	00+15 03:18	70 900	1011 33595
13	MANTA/W MANTA	N 39 54.11 W073 32.53	unk 13.3W	280	25000M	-35C	062 4046 062	00+16 03:35	76 975	1094 32501
14	KHTO/R236018 HAMPTON	N 40 41.96 W072 35.19	unk 14.2W	280	25000M	-35C	055 4029 055	00+14 03:49	65 1040	933 31568
15	ACK/W KACK/E	N 41 16.91 W070 01.60	unk 16.0W	280	30000M	-44C	088 3729 088	00+28 04:16	121 1161	1852 29716
16	.SAILE/DROP SAILE WP	N 41 11.14 W067 53.74	unk 17.0W	280	30000M	-44C	109 3702 109	00+21 04:37	96 1258	1273 28443
17	.SLATN/DROP SLATN	N 39 07.01 W066 59.96	unk 16.6W	280	30000M	-44C	178 3668 178	00+28 05:05	131 1388	1713 26730
18	.FLANN/DROP FLANN	N 38 20.01 W069 56.96	unk 14.9W	280	30000M	-44C	269 3628 269	00+31 05:36	146 1534	1890 24840
19	CHAMP/W CHAMP	N 37 31.00 W071 41.00	unk 13.6W	280	30000M	-44C	255 3594 255	00+20 05:57	96 1630	1227 23613
20	.ZIBUT/DROP ARTCC/WASHTN	N 36 56.30 W072 39.97	unk 12.8W	280	30000M	-44C	247 3573 247	00+13 06:09	58 1688	745 22868
21	CROAK/W CROAK	N 36 56.31 W073 00.00	unk 12.6W	280	30000M	-44C	283 3564 283	00+03 06:13	16 1704	204 22664
22	OUTES/W OUTES	N 36 55.69 W074 26.06	unk 11.6W	280	30000M	-44C	283 3553 283	00+15 06:27	69 1773	873 21791
23	ATLIC/W ATLIC	N 36 55.06 W075 12.79	unk 11.1W	280	30000M	-44C	281 3539 281	00+08 06:35	37 1810	472 21319
24	KORF/R NORFOLK	N 36 53.51 W076 12.02	20 10.4W	280	30000M	-44C	280 3528 280	00+10 06:46	47 1858	597 20722
25	KFKN/R FRANKLIN	N 36 42.85 W077 00.74	90 9.8W	280	30000M	-44C	265 3517 265	00+09 06:54	40 1898	508 20214
26	KGSO/R GREENSBORO	N 36 02.74 W079 58.58	879 7.4W	280	30000M	-44C	265 3494 265	00+32 07:26	149 2047	1856 18358
27	KSPA/R SPARTANBURG	N 35 02.02 W081 55.62	910 5.6W	280	30000M	-44C	245 3463 245	00+24 07:50	113 2160	1397 16961
28	AJFEB/W (AJFEB)	N 33 38.42 W084 10.23	unk 3.5W	280	30000M	-44C	239 3435 239	00+30 08:20	139 2299	1706 15255
29	KMG/R MONTGOMERY	N 32 13.34 W086 19.18	270 1.6W	280	30000M	-44C	236 3405 236	00+30 08:50	138 2437	1674 13581
30	KSJI/R SEMME	N 30 43.56 W088 21.56	190 0.2E	N/A	8027M	-1C	231 0 231	00+24 09:14	138 2574	115 13466
31	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 0.6E	N/A	2000M	+11C	237 0 237	00+06 09:20	35 2609	0 13466
32	KBIX/A KEESLER AFB	N 30 24.68 W088 55.42	34 0.6E		34M	+15C	050 050	00+15 09:35	0 2610	500 12966

Table F- 1b. No-Wind Flight Plan for route CORONET COAST 01R. (These plans are for planning purposes only. Do not use for navigation.)

FPM VERSION: 3.040 WC-130H Date: 6 OCT 98  
 ROUTE NAME: C:\PFPS\data\ROUTES\98CST01R.rte  
 AC EMPTY WT=84300 STORE WT=0 FUEL WT (INT/EXT):44000 6000

TP DTD#	Fix/Point Description	Latitude Longitude	Elev Var	A/S Bank	Alt Wind	*Temp FF	MH MC	Time	Dist	Fuel
1	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 0.6E		10M	+15C	360 360	00+00 00:00	0	1000 49000
2	KSJI/R SEMME	N 30 43.56 W088 21.56	190 5.0E	N/A	15736M	-16C	056 056	00+11 00:11	35 35	1303 47697
3	KMGH/R MONTGOMERY	N 32 13.34 W086 19.18	270 3.0E	290	19000M	-23C	049 049	00+29 00:40	138 173	2554 45143
4	AJFEB/W (AJFEB)	N 33 38.42 W084 10.23	unk 3.4W	290	19000M	-23C	048 048	00+28 01:08	138 310	2403 42740
5	KSPA/R SPARTANBURG	N 35 02.02 W081 55.62	910 2.0W	290	19000M	-23C	056 056	00+29 01:37	139 450	2415 40325
6	KGSO/R GREENSBORO	N 36 02.74 W079 58.58	879 3.0W	290	25000M	-35C	063 063	00+25 02:03	113 563	1980 38345
7	KFKN/R FRANKLIN	N 36 42.85 W077 00.74	90 9.0W	290	25000M	-35C	076 076	00+31 02:33	149 711	2225 36120
8	KORF/R NORFOLK	N 36 53.51 W076 12.02	20 7.0W	290	25000M	-35C	083 083	00+08 02:42	40 752	602 35518
9	ATLIC/W ATLIC	N 36 55.06 W075 12.79	unk 11.1W	N/A	29898M	-44C	095 095	00+12 02:54	47 799	880 34638
10	OUTES/W OUTES	N 36 55.69 W074 26.06	unk 11.6W	290	30000M	-44C	100 100	00+08 03:01	37 836	515 34123
11	CROAK/W CROAK	N 36 56.31 W073 00.00	unk 12.6W	290	30000M	-44C	101 101	00+14 03:16	69 905	945 33178
12	.ZIBUT/DROP .FIR KZNY	N 36 56.30 W072 39.97	unk 12.8W	290	30000M	-44C	103 103	00+03 03:19	16 921	219 32959
13	CHAMP/W .NY CENTER	N 37 31.00 W071 41.00	unk 13.6W	290	30000M	-44C	066 066	00+12 03:31	58 980	797 32162
14	.FLANN/DROP FLANN	N 38 20.01 W069 56.96	unk 14.8W	290	30000M	-44C	072 072	00+20 03:51	96 1075	1296 30866
15	.SLATN/DROP SLATN	N 39 07.01 W066 59.96	unk 16.6W	290	30000M	-44C	085 085	00+30 04:21	146 1221	1960 28906
16	.SAILE/DROP SAILE	N 41 11.14 W067 53.74	unk 17.0W	290	30000M	-44C	359 359	00+27 04:48	131 1352	1739 27167
17	KACK/E NANTUCKET	N 41 16.91 W070 01.60	100 15.0W	290	30000M	-44C	291 291	00+20 05:08	96 1448	1271 25896
18	KHTO/R236018 HAMPTON	N 40 41.96 W072 35.19	unk 14.2W	290	30000M	-44C	269 269	00+25 05:33	121 1569	1585 24311
19	MANTA/W MANTA	N 39 54.11 W073 32.53	unk 13.3W	290	30000M	-44C	237 237	00+13 05:46	65 1634	843 23468
20	KSIE/R SEA ISLE	N 39 05.73 W074 48.02	10 9.0W	290	30000M	-44C	244 244	00+16 06:02	76 1710	980 22488
21	KSWL/R SNOW HILL	N 38 03.40 W075 27.84	40 8.0W	290	30000M	-44C	216 216	00+14 06:17	70 1779	898 21590
22	KALDA/W KALDA	N 37 50.51 W075 37.59	unk 11.1W	290	30000M	-44C	219 219	00+03 06:20	15 1794	193 21397
23	SAWED/W SAWED	N 37 32.01 W075 51.49	unk 10.8W	290	30000M	-44C	222 222	00+04 06:24	22 1816	276 21121
24	KORF/R NORFOLK	N 36 53.51 W076 12.02	20 7.0W	290	30000M	-44C	214 214	00+09 06:33	42 1858	536 20585
25	KFKN/R FRANKLIN	N 36 42.85 W077 00.74	90 9.0W	290	30000M	-44C	262 262	00+08 06:41	40 1898	517 20068
26	KGSO/R GREENSBORO	N 36 02.74 W079 58.58	879 3.0W	290	30000M	-44C	264 264	00+31 07:12	149 2047	1889 18179
27	KSPA/R SPARTANBURG	N 35 02.02 W081 55.62	910 2.0W	290	30000M	-44C	241 241	00+23 07:35	113 2160	1423 16756
28	AJFEB/W (AJFEB)	N 33 38.42 W084 10.23	unk 3.4W	290	30000M	-44C	236 236	00+29 08:04	139 2299	1740 15016
29	KMGH/R MONTGOMERY	N 32 13.34 W086 19.18	270 3.0E	N/A	26600M	-38C	233 233	00+28 08:32	138 2437	1464 13552
30	KSJI/R SEMME	N 30 43.56 W088 21.56	190 5.0E	N/A	3000M	+9C	227 227	00+24 08:55	138 2574	0 13552
31	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 1.0E	290	2000M	+11C	232 232	00+07 09:03	35 2609	988 12564
32	KBIX/T APPR KEESLER	N 30 24.41 W088 55.80	10 1.0E		10M	+15C	236 236	00+15 09:18	0 2609	500 12064

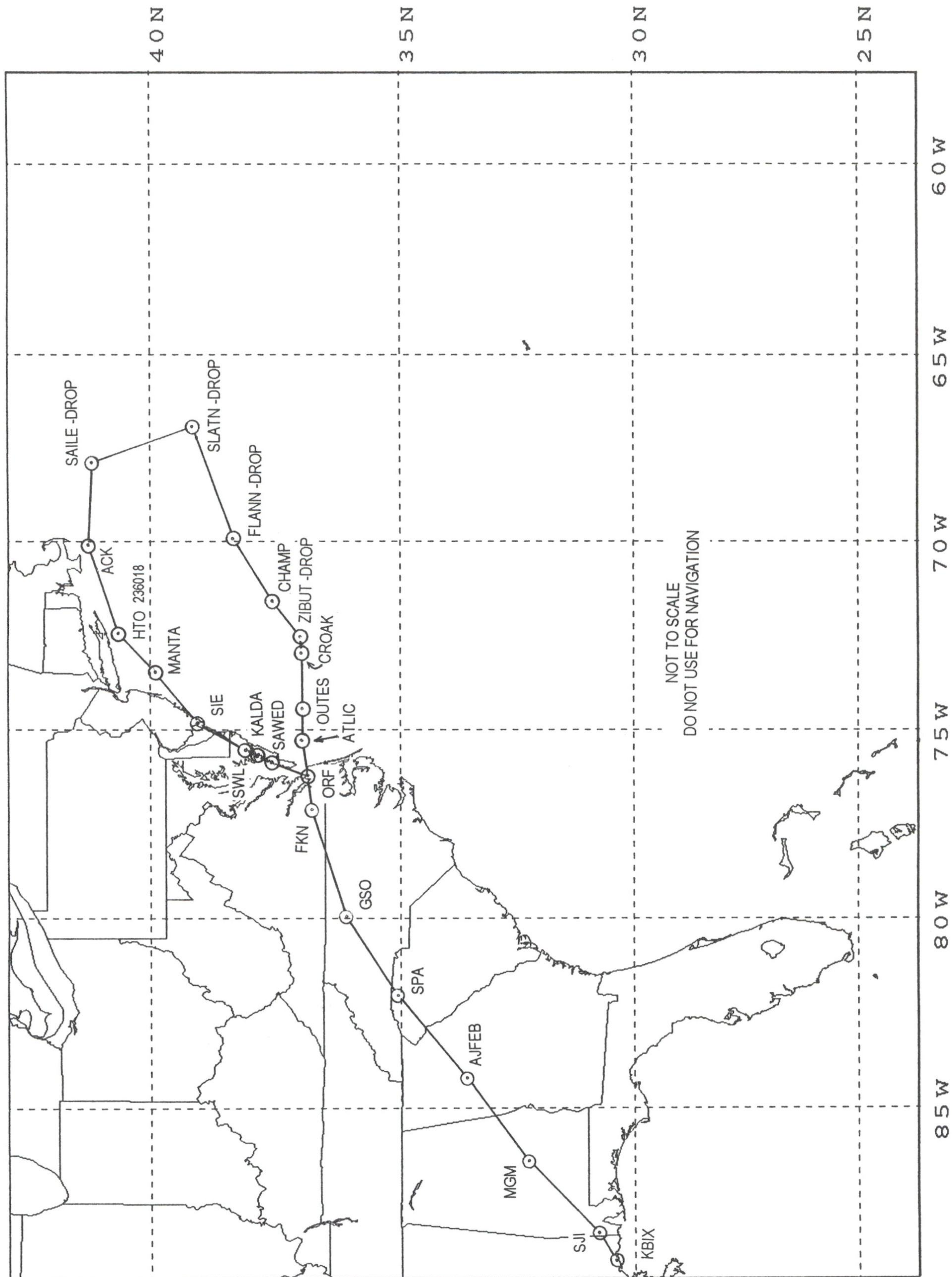


Figure F-1. Air Force track CORONET COAST 01/01R



Table F-2a. No-Wind Flight Plan for route CORONET COAST 02. (These plans are for planning purposes only. Do not use for navigation.)

FPM VERSION: 3.040 WC-130H Date: 8 OCT 98  
 ROUTE NAME: C:\FFPS\data\ROUTES\9RCST02.rte  
 AC EMPTY WT=84300 STORE WT=0 FUEL WT (INT/EXT):44000 6000

TP DTD#	Fix/Point Description	Latitude Longitude	Elev Var	A/S Bank	Alt Wind	*Temp FF	MH MC	Time	Dist	Fuel
1	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 1.0E		10M	+15C	360 360	00+00+00 00:00:00	0.0 0.0	1000 49000
2	SJI/W KSJI/R	N 30 43.56 W088 21.56	unk 0.1E	N/A	15736M	-16C 7317	056 056	00+10+41 00:10:41	35.2 35.2	1303 47697
	.level off	N 30 52.29 W088 09.93	unk 0.1W	N/A	19000M	-23C 7045	049 049	00+03+35 00:14:16	13.3 48.4	371 47326
3	KMGW/R MONTGOMERY	N 32 13.34 W086 19.18	270 3.0E	280	19000M	-23C 4800	049 049	00+26+39 00:40:55	124.4 172.8	2132 45194
4	AJFEB/W (AJFEB)	N 33 38.42 W084 10.23	unk 3.6W	280	19000M	-23C 4771	048 048	00+29+30 01:10:25	137.7 310.5	2346 42848
5	KSPA/R SPARTANBURG	N 35 02.02 W081 55.62	910 2.0W	280	19000M	-23C 4742	056 056	00+29+48 01:40:13	139.1 449.6	2355 40493
	.level off	N 35 19.35 W081 22.89	unk 6.1W	N/A	25000M	-35C 5304	059 059	00+08+36 01:48:49	31.9 481.4	760 39733
6	KGSO/R GREENSBORO	N 36 02.74 W079 58.58	879 3.0W	280	25000M	-35C 4154	063 063	00+17+22 02:06:11	81.1 562.5	1203 38530
7	KFKW/R FRANKLIN	N 36 42.85 W077 00.74	90 9.0W	280	25000M	-35C 4123	076 076	00+31+52 02:38:03	148.7 711.2	2189 36341
8	KORF/R NORFOLK	N 36 53.51 W076 12.02	20 7.0W	280	25000M	-35C 4098	083 083	00+08+40 02:46:43	40.4 751.6	592 35749
9	SAWED/W SAWED	N 37 32.01 W075 51.49	unk 10.9W	280	25000M	-35C 4087	030 030	00+08+58 02:55:41	41.8 793.5	611 35138
10	KALDA/W KALDA	N 37 50.51 W075 37.59	unk 11.2W	280	25000M	-35C 4079	042 042	00+04+37 03:00:18	21.5 815.0	314 34824
11	KSWL/R SNOW HILL	N 38 03.40 W075 27.84	40 8.0W	280	25000M	-35C 4075	042 042	00+03+13 03:03:31	15.0 830.0	218 34606
12	KSIE/R SEA ISLE	N 39 05.73 W074 48.02	10 9.0W	280	25000M	-35C 4064	034 034	00+14+56 03:18:27	69.7 899.7	1011 33595
13	MANTA/W MANTA	N 39 54.11 W073 32.53	unk 13.3W	280	25000M	-35C 4046	059 059	00+16+14 03:34:41	75.7 975.4	1094 32501
14	KHIO/R236018 HAMPTON	N 40 41.96 W072 35.19	unk 14.2W	280	25000M	-35C 4029	055 055	00+13+53 03:48:34	64.8 1040.2	933 31568
	.level off	N 40 54.10 W071 43.80	unk 14.8W	N/A	30000M	-44C 4464	087 087	00+10+31 03:59:05	40.8 1081.0	782 30786
15	ACK/W NANTUCKET	N 41 16.91 W070 01.60	100 15.0W	280	30000M	-44C 3729	088 088	00+17+13 04:16:18	80.3 1161.3	1070 29716
16	LACKS/W LACKS	N 40 00.00 W068 11.96	unk 16.4W	280	30000M	-44C 3699	147 147	00+24+17 04:40:35	113.3 1274.6	1497 28219
17	.SLATN/W .FIR KZNY	N 39 07.01 W066 59.96	unk 16.6W	280	30000M	-44C 3671	150 150	00+16+27 04:57:02	76.7 1351.3	1006 27213
18	BRUNZ/W DROP	N 39 00.00 W065 00.00	unk 17.3W	280	30000M	-44C 3646	110 110	00+20+01 05:17:03	93.4 1444.7	1216 25997
19	.TURNPOINT DROP	N 37 05.45 W067 10.51	unk 15.8W	280	30000M	-44C 3611	240 240	00+32+59 05:50:02	153.9 1598.6	1985 24012
20	CLXTN/W CLXTN	N 35 43.38 W068 33.36	unk 14.7W	280	30000M	-44C 3575	235 235	00+22+40 06:12:42	105.7 1704.4	1350 22662
21	DANER/W DROP	N 35 16.00 W069 04.00	unk 14.3W	280	30000M	-44C 3557	237 237	00+07+56 06:20:38	37.0 1741.4	470 22192
22	ODEAL/W DROP	N 33 25.85 W071 28.93	unk 12.4W	280	30000M	-44C 3531	242 242	00+34+51 06:55:29	162.6 1904.0	2051 20141
23	BURIT/W DROP	N 31 40.13 W073 12.96	unk 10.9W	280	30000M	-44C 3494	233 233	00+29+26 07:24:55	137.3 2041.4	1714 18427
24	TROUT/W DROP/JAX CTR	N 30 23.00 W077 00.00	unk 8.0W	280	30000M	-44C 3454	260 260	00+44+51 08:09:46	209.3 2250.6	2582 15845
25	CARFS/W CARFS	N 30 24.48 W077 45.00	unk 7.6W	280	30000M	-44C 3426	280 280	00+08+19 08:18:05	38.8 2289.5	475 15370
26	OZENA/W OZENA	N 30 25.17 W078 20.90	unk 7.2W	280	30000M	-44C 3419	279 279	00+06+38 08:24:43	31.0 2320.5	378 14992
27	TORRY/W TORRY	N 30 25.33 W078 51.83	unk 6.8W	280	30000M	-44C 3412	278 278	00+05+43 08:30:26	26.7 2347.1	325 14667
28	DINNS/W KJA/N	N 30 27.91 W081 48.08	unk 4.6W	280	30000M	-44C 3394	279 279	00+32+34 09:03:00	152.0 2499.1	1842 12825
29	TAY/W KTAY/R	N 30 30.28 W082 33.17	unk 4.1W	280	30000M	-44C 3374	278 278	00+08+21 09:11:21	38.9 2538.0	469 12356
30	CAPPS/W CAPPS	N 30 32.72 W083 54.30	unk 3.1W	280	30000M	-44C 3364	276 276	00+14+59 09:26:20	69.9 2607.9	840 11516
31	SZW/W KSZW/R	N 30 33.37 W084 22.44	unk 2.7W	280	30000M	-44C 3354	275 275	00+05+12 09:31:32	24.2 2632.2	290 11226
32	OJHAF/W (OJHAF)	N 30 47.63 W085 08.24	unk 2.2W	280	30000M	-44C 3348	293 293	00+08+59 09:40:31	41.9 2674.1	501 10725
	.descent pt	N 30 48.59 W085 52.61	unk 1.8W	280	30000M	-44C 3341	274 274	00+08+10 09:48:41	38.1 2712.2	455 10270
33	DEFUN/W DEFUN	N 30 48.86 W086 07.89	unk 1.6W	N/A	27750M	-40C 0	273 273	00+02+15 09:50:56	13.1 2725.3	0 10270
34	KCEW/R CRESTVIEW	N 30 49.57 W086 40.75	254 3.0E	N/A	22910M	-30C 0	273 273	00+04+50 09:55:46	28.2 2753.6	0 10270
35	SJI/W KSJI/R	N 30 43.56 W088 21.56	unk 0.1E	N/A	8027M	-1C 0	263 263	00+14+53 10:10:39	86.8 2840.4	0 10270
36	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 1.0E	N/A	2000M	+11C 0	237 237	00+06+02 10:16:41	35.2 2875.5	0 10270
37	KBIX/A KEESLER AFB	N 30 24.68 W088 55.42	34 0.5E		34M	+15C	050 050	00+15+00 10:31:41	0.4 2876.0	500 9770

Table F-2b. No-Wind Flight Plan for route CORONET COAST 02R. (These plans are for planning purposes only. Do not use for navigation.)

FPM VERSION: 3.040 WC-130H Date: 8 OCT 98  
 ROUTE NAME: C:\FFPS\data\ROUTES\98CST02R.rte  
 AC EMPTY WT=84300 STORE WT=0 FUEL WT (INT/EXT):44000 6000

TP DTD#	Fix/Point Description	Latitude Longitude	Elev Var	A/S Rank	Alt Win-1	*Temp FF	MH MC	Time	Dlat	Fuel
1	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 1.0E	280	2000M	+11C 0	056 056	00+00+00 00:00:00	0.0 0.0	0 50000
2	SJI/W KSJI/R	N 30 43.56 W088 21.56	unk 0.1E	N/A	16309M	-17C 7048	056 056	00+10+32 00:10:32	35.2 35.2	1237 48763
	.level off	N 30 44.41 W088 08.49	unk 0.1W	N/A	19000M	-23C 6871	086 086	00+03+01 00:13:33	11.3 46.4	315 48448
3	KCEW/R CRESTVIEW	N 30 49.57 W086 40.75	254 3.0E	280	19000M	-23C 4820	086 086	00+16+11 00:29:44	75.6 122.0	1301 47147
4	DEFUN/W DEFUN	N 30 48.86 W086 07.89	unk 1.6W	280	19000M	-23C 4808	088 088	00+06+03 00:35:47	28.2 150.2	485 46662
5	OJHAP/W (OJHAP)	N 30 47.63 W085 08.24	unk 2.2W	280	19000M	-23C 4799	093 093	00+10+59 00:46:46	51.2 201.5	878 45784
	.level off	N 30 35.15 W084 28.09	unk 2.7W	N/A	25000M	-35C 5251	112 112	00+09+50 00:56:36	36.7 238.2	860 44924
6	SZW/W KSZW/R	N 30 33.37 W084 22.44	unk 2.7W	280	25000M	-35C 4265	113 113	00+01+07 00:57:43	5.2 243.3	79 44845
7	CAPPS/W CAPPS	N 30 32.72 W083 54.30	unk 3.1W	280	25000M	-35C 4261	094 094	00+05+12 01:02:55	24.2 267.6	369 44476
8	TAY/W KTAY/R	N 30 30.28 W082 33.17	unk 4.1W	280	25000M	-35C 4247	095 095	00+14+59 01:17:54	69.9 337.5	1060 43416
9	DINNS/W KJA/N	N 30 27.91 W081 48.08	unk 4.6W	280	25000M	-35C 4230	097 097	00+08+21 01:26:15	38.9 376.4	588 42828
10	TORRY/W TORRY	N 30 25.33 W078 51.83	unk 6.8W	280	25000M	-35C 4202	095 095	00+32+34 01:58:49	152.0 528.4	2281 40547
11	OZENA/W OZENA	N 30 25.17 W078 20.90	unk 7.2W	280	25000M	-35C 4177	097 097	00+05+43 02:04:32	26.7 555.1	398 40149
12	CARPS/W CARPS	N 30 24.48 W077 45.00	unk 7.6W	280	25000M	-35C 4168	098 098	00+06+38 02:11:10	31.0 586.1	461 39688
13	TROUT/W DROP / KZNY	N 30 23.00 W077 00.00	unk 8.0W	280	25000M	-35C 4159	100 100	00+08+19 02:19:29	38.8 624.9	577 39111
14	BURTT/W DROP	N 31 40.13 W073 12.96	unk 10.9W	280	25000M	-35C 4125	075 075	00+44+51 03:04:20	209.3 834.2	3083 36028
15	ODEAL/W DROP	N 33 25.85 W071 28.93	unk 12.4W	280	25000M	-35C 4080	050 050	00+29+26 03:33:46	137.3 971.5	2001 34027
16	DANER/W DROP	N 35 16.00 W069 04.00	unk 14.3W	280	25000M	-35C 4043	059 059	00+34+51 04:08:37	162.6 1134.1	2348 31679
17	CLXTN/W CLXTN	N 35 43.38 W068 33.36	unk 14.7W	280	25000M	-35C 4019	056 056	00+07+56 04:16:33	37.0 1171.2	532 31147
	.level off	N 36 14.44 W068 02.10	unk 15.1W	N/A	30000M	-44C 4469	054 054	00+10+22 04:26:55	40.1 1211.2	771 30376
18	.TURNPOINT DROP	N 37 05.00 W067 10.00	unk 15.8W	280	30000M	-44C 3722	054 054	00+14+03 04:40:58	65.6 1276.8	872 29504
19	BRUNZ/W DROP	N 39 00.00 W065 00.00	unk 17.3W	280	30000M	-44C 3688	057 057	00+33+00 05:13:58	154.0 1430.8	2028 27476
20	.SLATN/W NEW YORK CTR	N 39 07.01 W066 59.96	unk 16.6W	280	30000M	-44C 3652	292 292	00+20+01 05:33:59	93.4 1524.2	1218 26258
21	LACKS/W LACKS	N 40 00.00 W068 11.96	unk 16.4W	280	30000M	-44C 3627	331 331	00+16+27 05:50:26	76.7 1600.9	994 25264
22	ACK/W NANTUCKET	N 41 16.91 W070 01.60	100 15.0W	280	30000M	-44C 3601	330 330	00+24+17 06:14:43	113.3 1714.2	1457 23807
23	KHIO/R236018 HAMPTON	N 40 41.96 W072 35.19	unk 14.2W	280	30000M	-44C 3569	269 269	00+25+57 06:40:40	121.1 1835.3	1543 22264
24	MANTA/W MANTA	N 39 54.11 W073 32.53	unk 13.3W	280	30000M	-44C 3545	237 237	00+13+53 06:54:33	64.8 1900.1	821 21443
25	KSIE/R SEA ISLE	N 39 05.73 W074 48.02	10 9.0W	280	30000M	-44C 3527	244 244	00+16+14 07:10:47	75.7 1975.9	954 20489
26	KSWL/R SNOW HILL	N 38 03.40 W075 27.84	40 8.0W	280	30000M	-44C 3509	216 216	00+14+56 07:25:43	69.7 2045.5	873 19616
27	KALDA/W KALDA	N 37 50.51 W075 37.59	unk 11.2W	280	30000M	-44C 3499	219 219	00+03+13 07:28:56	15.0 2060.5	187 19429
28	SAWED/W SAWED	N 37 32.01 W075 51.49	unk 10.9W	280	30000M	-44C 3494	222 222	00+04+37 07:33:33	21.5 2082.1	269 19160
29	KORF/R NORFOLK	N 36 53.51 W076 12.02	20 7.0W	280	30000M	-44C 3487	214 214	00+08+58 07:42:31	41.8 2123.9	521 18639
30	KEKN/R FRANKLIN	N 36 42.85 W077 00.74	90 9.0W	280	30000M	-44C 3477	262 262	00+08+40 07:51:11	40.4 2164.3	502 18137
31	KGSO/R GREENSBORO	N 36 02.74 W079 58.58	879 3.0W	280	30000M	-44C 3455	264 264	00+31+52 08:23:03	148.7 2313.0	1835 16302
32	KSPA/R SPARTANBURG	N 35 02.02 W081 55.62	910 2.0W	280	30000M	-44C 3426	241 241	00+24+12 08:47:15	112.9 2426.0	1382 14920
33	AJFEB/W (AJFEB)	N 33 38.42 W084 10.23	unk 3.6W	280	30000M	-44C 3399	236 236	00+29+48 09:17:03	139.1 2565.0	1688 13232
34	KMGW/R MONTGOMERY	N 32 13.34 W086 19.18	270 3.0E	280	30000M	-44C 3371	236 236	00+29+30 09:46:33	137.7 2702.7	1658 11574
35	SJI/W KSJI/R	N 30 43.56 W088 21.56	unk 0.1E	280	30000M	-44C 3345	227 227	00+29+30 10:16:03	137.7 2840.4	1644 9930
36	KBIX/I KEESLER	N 30 24.41 W088 55.80	10 1.0E		10M	+15C	237 237	00+08+00 10:24:03	35.2 2875.5	500 9430
37	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 1.0E		10M	+15C	236 236	00+15+00 10:39:03	0.0 2875.5	500 8930

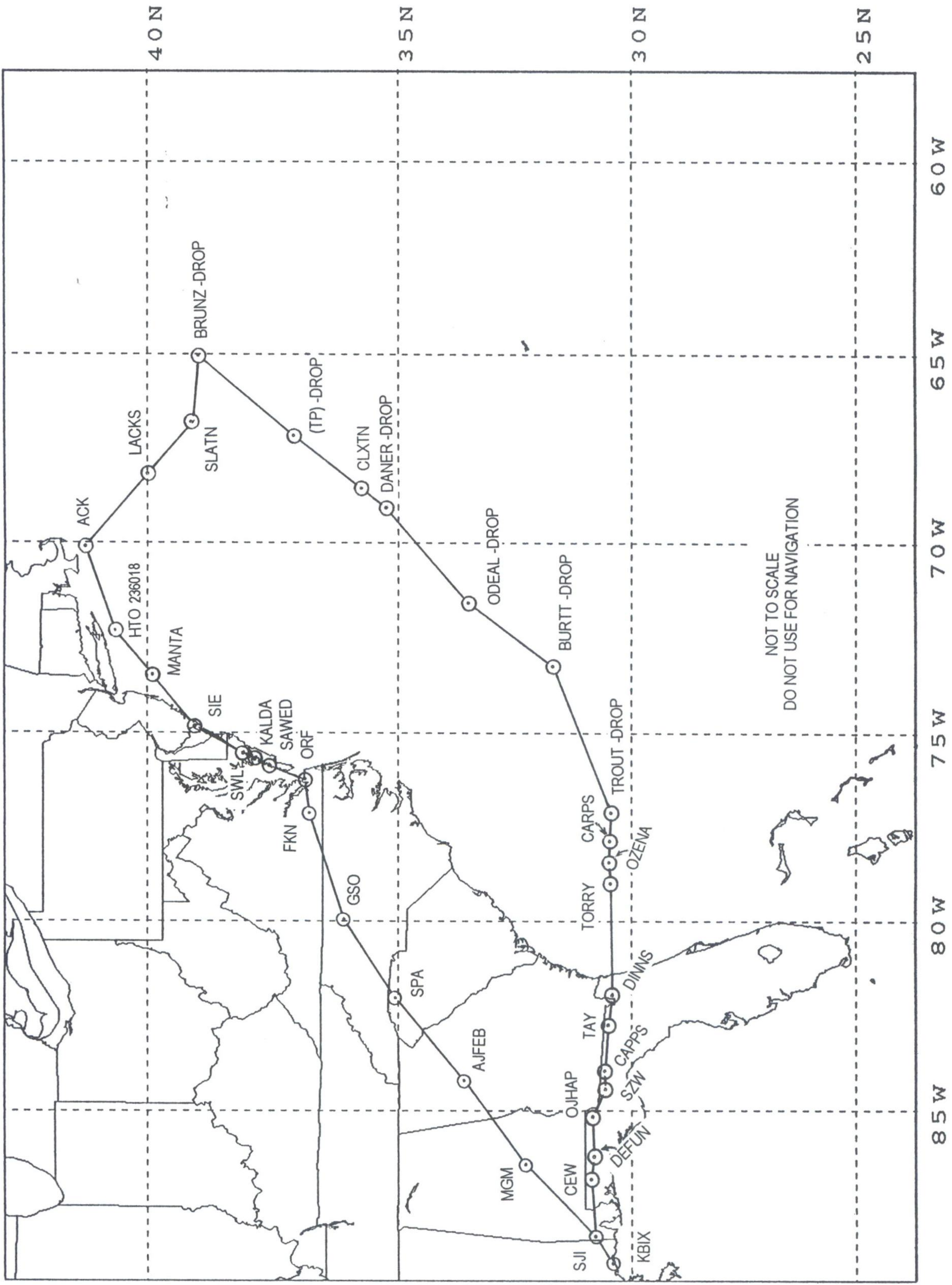


Figure F-2. Air Force track CORONET COAST 02/02R.

Table F-3a. No-Wind Flight Plan for route CORONET COAST 03. (These plans are for planning purposes only. Do not use for navigation.)

FPM VERSION: 3.040 WC-130H Date: 8 OCT 98  
 ROUTE NAME: C:\PFPS\data\ROUTES\98CST03.rte  
 AC EMPTY WT=84300 STORE WT=0 FUEL WT (INT/EXT):44000 6000

TP DTD#	Fix/Point Description	Latitude Longitude	Elev Var	A/S Bank	Alt Wind	*Temp FF	MH MC	Time	Dist	Fuel
1	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 1.0E		10M	+15C	360 360	00+00+00 00:00:00	0.0 0.0	1000 49000
2	SJI/W KSJI/R	N 30 43.56 W088 21.56	unk 0.1E	N/A	15736M	-16C	056 056	00+10+41 00:10:41	35.2 35.2	1303 47697
	.level off	N 30 52.29 W088 09.93	unk 0.1W	N/A	19000M	-23C	049 049	00+03+35 00:14:16	13.3 48.4	371 47326
3	KMG/R MONTGOMERY	N 32 13.34 W086 19.18	270 3.0E	280	19000M	-23C	049 4800	00+26+39 00:40:55	124.4 172.8	2132 45194
4	AJFEB/W (AJFEB)	N 33 38.42 W084 10.23	unk 3.6W	280	19000M	-23C	048 4771	00+29+30 01:10:25	137.7 310.5	2346 42848
5	KSPA/R SPARTANBURG	N 35 02.02 W081 55.62	910 2.0W	280	19000M	-23C	056 4742	00+29+48 01:40:13	139.1 449.6	2355 40493
	.level off	N 35 19.35 W081 22.89	unk 6.1W	N/A	25000M	-35C	059 5304	00+08+36 01:48:49	31.9 481.4	760 39733
6	KGSO/R GREENSBORO	N 36 02.74 W079 58.58	879 3.0W	280	25000M	-35C	063 4154	00+17+22 02:06:11	81.1 562.5	1203 38530
7	KFKN/R FRANKLIN	N 36 42.85 W077 00.74	90 9.0W	280	25000M	-35C	076 4123	00+31+52 02:38:03	148.7 711.2	2189 36341
8	KORF/R NORFOLK	N 36 53.51 W076 12.02	20 7.0W	280	25000M	-35C	083 4098	00+08+40 02:46:43	40.4 751.6	592 35749
9	SAWED/W SAWED	N 37 32.01 W075 51.49	unk 10.9W	280	25000M	-35C	030 4087	00+08+58 02:55:41	41.8 793.5	611 35138
10	KALDA/W KALDA	N 37 50.51 W075 37.59	unk 11.2W	280	25000M	-35C	042 4079	00+04+37 03:00:18	21.5 815.0	314 34824
11	KSWL/R SNOW HILL	N 38 03.40 W075 27.84	40 8.0W	280	25000M	-35C	042 4075	00+03+13 03:03:31	15.0 830.0	218 34606
12	KSIE/R SEA ISLE	N 39 05.73 W074 48.02	10 9.0W	280	25000M	-35C	034 4064	00+14+56 03:18:27	69.7 899.7	1011 33595
13	MANTA/W MANTA	N 39 54.11 W073 32.53	unk 13.3W	280	25000M	-35C	059 4046	00+16+14 03:34:41	75.7 975.4	1094 32501
14	KHTO/R236018 HAMPTON	N 40 41.96 W072 35.19	unk 14.2W	280	25000M	-35C	055 4029	00+13+53 03:48:34	64.8 1040.2	933 31568
	.level off	N 40 54.10 W071 43.80	unk 14.8W	N/A	30000M	-44C	087 4464	00+10+31 03:59:05	40.8 1081.0	782 30786
15	ACK/W NANTUCKET	N 41 16.91 W070 01.60	100 15.0W	280	30000M	-44C	088 3729	00+17+13 04:16:18	80.3 1161.3	1070 29716
16	LACKS/W	N 40 00.00 W068 11.96	unk 16.4W	280	30000M	-44C	147 3699	00+24+17 04:40:35	113.3 1274.6	1497 28219
17	SLATN/W DROP	N 39 07.01 W066 59.96	unk 16.6W	280	30000M	-44C	150 3671	00+16+27 04:57:02	76.7 1351.3	1006 27213
18	CREEQ/W DROP	N 37 10.32 W069 19.12	unk 14.8W	280	30000M	-44C	240 3636	00+34+17 05:31:19	160.0 1511.3	2077 25136
19	DWNT/W	N 35 54.96 W070 44.49	unk 13.6W	280	30000M	-44C	238 3600	00+21+50 05:53:09	101.9 1613.2	1310 23826
20	KATHY/W DROP	N 35 07.22 W071 36.90	unk 12.9W	280	30000M	-44C	236 3577	00+13+43 06:06:52	64.0 1677.2	818 23008
21	FAIRR/W	N 33 43.86 W073 41.09	unk 11.2W	280	30000M	-44C	244 3551	00+28+18 06:35:10	132.1 1809.3	1675 21333
22	.RELEASE PT DROP	N 33 18.00 W074 18.00	unk 10.7W	280	30000M	-44C	241 3529	00+08+37 06:43:47	40.2 1849.5	507 20826
23	JAINS/W JAINS	N 31 21.33 W077 00.00	unk 8.3W	280	30000M	-44C	241 3502	00+38+32 07:22:19	179.8 2029.3	2250 18576
24	CARPS/W CARPS	N 30 24.48 W077 45.00	unk 7.6W	280	30000M	-44C	223 3473	00+14+44 07:37:03	68.7 2098.0	852 17724
25	OZENA/W OZENA	N 30 25.17 W078 20.90	unk 7.2W	280	30000M	-44C	279 3461	00+06+38 07:43:41	31.0 2129.0	383 17341
26	TORRY/W TORRY	N 30 25.33 W078 51.83	unk 6.8W	280	30000M	-44C	278 3455	00+05+43 07:49:24	26.7 2155.7	329 17012
27	DINNS/W KJA/N	N 30 27.91 W081 48.08	unk 4.6W	280	30000M	-44C	279 3435	00+32+34 08:21:58	152.0 2307.7	1864 15148
28	TAY/W KTAY/R	N 30 30.28 W082 33.17	unk 4.1W	280	30000M	-44C	278 3414	00+08+21 08:30:19	38.9 2346.6	475 14673
29	CAPPS/W CAPPS	N 30 32.72 W083 54.30	unk 3.1W	280	30000M	-44C	276 3402	00+14+59 08:45:18	69.9 2416.5	850 13823
30	SZW/W KSZW/R	N 30 33.37 W084 22.44	unk 2.7W	280	30000M	-44C	275 3393	00+05+12 08:50:30	24.2 2440.7	294 13529
31	OJHAP/W (OJHAP)	N 30 47.63 W085 08.24	unk 2.2W	280	30000M	-44C	293 3386	00+08+59 08:59:29	41.9 2482.6	507 13022
	.descent pt	N 30 47.67 W085 18.48	unk 2.2W	280	30000M	-44C	274 3381	00+01+53 09:01:22	8.8 2491.4	106 12916
32	DEFUN/W DEFUN	N 30 48.86 W086 07.89	unk 1.6W	N/A	22723M	-30C	274 0	00+07+17 09:08:39	42.5 2533.9	0 12916
33	KCEW/R CRESTVIEW	N 30 49.57 W086 40.75	254 3.0E	N/A	17883M	-20C	273 0	00+04+50 09:13:29	28.2 2562.1	0 12916
34	SJI/W KSJI/R	N 30 43.56 W088 21.56	unk 0.1E	N/A	3000M	+9C	263 0	00+14+53 09:28:22	86.8 2648.9	0 12916
35	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 1.0E	280	2000M	+11C	237 7572	00+07+32 09:35:54	35.2 2684.1	951 11965
36	KBIX/A KEESLER AFB	N 30 24.68 W088 55.42	34 0.5E		34M	+15C	050 050	00+15+00 09:50:54	0.4 2684.5	500 11465

Table F-3b. No-Wind Flight Plan for route CORONET COAST 03R. (These plans are for planning purposes only. Do not use for navigation.)

FPM VERSION: 3.040 WC-130H Date: 8 OCT 98  
 ROUTE NAME: C:\FFPS\data\ROUTES\98CST03R.rte  
 AC EMPTY WT-84300 STORE WT-0 FUEL WT (INT/EXT):44000 6000

TP DTD#	Fix/Point Description	Latitude Longitude	Elev Var	A/S Bank	Alt Wind	*Temp FF	MH MC	Time	Dist	Fuel
1	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 1.0E	280	10M	+15C 0	056 056	00+00+00 00:00:00	0.0 0.0	0 50000
2	SJI/W KSJI/R	N 30 43.56 W088 21.56	unk 0.1E	N/A	15580M	-16C 7333	056 056	00+10+41 00:10:41	35.2 35.2	1306 48694
	.level off	N 30 44.63 W088 05.08	unk 0.1W	N/A	19000M	-23C 7043	086 086	00+03+49 00:14:30	14.2 49.4	396 48298
3	KCEW/R CRESTVIEW	N 30 49.57 W086 40.75	254 3.0E	280	19000M	-23C 4819	086 086	00+15+34 00:30:04	72.6 122.0	1250 47048
4	DEFUN/W DEFUN	N 30 48.86 W086 07.89	unk 1.6W	280	19000M	-23C 4807	088 088	00+06+03 00:36:07	28.2 150.2	485 46563
5	OJHAP/W (OJHAP)	N 30 47.63 W085 08.24	unk 2.2W	280	19000M	-23C 4798	093 093	00+10+59 00:47:06	51.2 201.5	878 45685
	.level off	N 30 35.18 W084 28.20	unk 2.7W	N/A	25000M	-35C 5252	112 112	00+09+48 00:56:54	36.6 238.1	858 44827
6	SZW/W KSZW/R	N 30 33.37 W084 22.44	unk 2.7W	280	25000M	-35C 4263	113 113	00+01+08 00:58:02	5.3 243.3	80 44747
7	CAPPS/W CAPPS	N 30 32.72 W083 54.30	unk 3.1W	280	25000M	-35C 4259	094 094	00+05+12 01:03:14	24.2 267.6	369 44378
8	TAY/W KTAY/R	N 30 30.28 W082 33.17	unk 4.1W	280	25000M	-35C 4245	095 095	00+14+59 01:18:13	69.9 337.5	1060 43318
9	DINNS/W KJA/N	N 30 27.91 W081 48.08	unk 4.6W	280	25000M	-35C 4228	097 097	00+08+21 01:26:34	38.9 376.4	588 42730
10	TORRY/W TORRY	N 30 25.33 W078 51.83	unk 6.8W	280	25000M	-35C 4200	095 095	00+32+34 01:59:08	152.0 528.4	2280 40450
11	OZENA/W OZENA	N 30 25.17 W078 20.90	unk 7.2W	280	25000M	-35C 4175	097 097	00+05+43 02:04:51	26.7 555.1	398 40052
12	CARPS/W CARPS	N 30 24.48 W077 45.00	unk 7.6W	280	25000M	-35C 4167	098 098	00+06+38 02:11:29	31.0 586.1	461 39591
13	.JAINS / DROP	KZ N 31 21.33 W077 00.00	unk 8.3W	280	25000M	-35C 4153	042 042	00+14+44 02:26:13	68.7 654.8	1019 38572
14	.RELEASE PT DROP	N 33 18.00 W074 18.00	unk 10.7W	280	25000M	-35C 4119	057 057	00+38+32 03:04:45	179.8 834.6	2646 35926
15	FAIRR/W FAIRR	N 33 43.86 W073 41.09	unk 11.2W	N/A	29271M	-43C 4434	060 060	00+10+30 03:15:15	40.2 874.8	776 35150
	.level off	N 33 49.98 W073 32.22	unk 11.3W	N/A	30000M	-44C 4405	061 061	00+01+56 03:17:11	9.6 884.4	137 35013
16	KATHY/W DROP	N 35 07.22 W071 36.90	unk 12.9W	280	30000M	-44C 3825	062 062	00+26+15 03:43:26	122.5 1006.9	1673 33340
17	DOWNT/W DOWNT	N 35 54.96 W070 44.49	unk 13.6W	280	30000M	-44C 3793	054 054	00+13+43 03:57:09	64.0 1070.9	867 32473
18	CREEQ/W DROP	N 37 10.32 W069 19.12	unk 14.8W	280	30000M	-44C 3766	055 055	00+21+50 04:18:59	101.9 1172.8	1371 31102
19	SLATN/W DROP	N 39 07.01 W066 59.96	unk 16.6W	280	30000M	-44C 3724	057 057	00+34+17 04:53:16	160.0 1332.8	2128 28974
20	LACKS/W LACKS	N 40 00.00 W068 11.96	unk 16.4W	280	30000M	-44C 3688	331 331	00+16+27 05:09:43	76.7 1409.5	1011 27963
21	ACK/W NANTUCKET	N 41 16.91 W070 01.60	100 15.0W	280	30000M	-44C 3660	330 330	00+24+17 05:34:00	113.3 1522.8	1481 26482
22	KHTO/R236018 HAMPTON	N 40 41.96 W072 35.19	unk 14.2W	280	30000M	-44C 3626	269 269	00+25+57 05:59:57	121.1 1643.9	1568 24914
23	MANTA/W MANTA	N 39 54.11 W073 32.53	unk 13.3W	280	30000M	-44C 3600	237 237	00+13+53 06:13:50	64.8 1708.7	833 24081
24	KSIE/R SEA ISLE	N 39 05.73 W074 48.02	10 9.0W	280	30000M	-44C 3581	244 244	00+16+14 06:30:04	75.7 1784.4	968 23113
25	KSWL/R SNOW HILL	N 38 03.40 W075 27.84	40 8.0W	280	30000M	-44C 3562	216 216	00+14+56 06:45:00	69.7 1854.1	886 22227
26	KALDA/W KALDA	N 37 50.51 W075 37.59	unk 11.2W	280	30000M	-44C 3551	219 219	00+03+13 06:48:13	15.0 1869.1	190 22037
27	SAWED/W SAWED	N 37 32.01 W075 51.49	unk 10.9W	280	30000M	-44C 3546	222 222	00+04+37 06:52:50	21.5 1890.6	273 21764
28	KORF/R NORFOLK	N 36 53.51 W076 12.02	20 7.0W	280	30000M	-44C 3538	214 214	00+08+58 07:01:48	41.8 1932.5	528 21236
29	KFKN/R FRANKLIN	N 36 42.85 W077 00.74	90 9.0W	280	30000M	-44C 3527	262 262	00+08+40 07:10:28	40.4 1972.9	509 20727
30	KGSO/R GREENSBORO	N 36 02.74 W079 58.58	879 3.0W	280	30000M	-44C 3504	264 264	00+31+52 07:42:20	148.7 2121.6	1861 18866
31	KSPA/R SPARTANBURG	N 35 02.02 W081 55.62	910 2.0W	280	30000M	-44C 3473	241 241	00+24+12 08:06:32	112.9 2234.5	1401 17465
32	AJFEB/W (AJFEB)	N 33 38.42 W084 10.23	unk 3.6W	280	30000M	-44C 3444	236 236	00+29+48 08:36:20	139.1 2373.6	1711 15754
	.descent pt	N 32 25.73 W086 00.86	unk 1.9W	280	30000M	-44C 3416	236 236	00+25+15 09:01:35	117.8 2491.4	1438 14316
33	KMGH/R MONTGOMERY	N 32 13.34 W086 19.18	270 3.0E	N/A	26600M	-38C 0	233 233	00+03+24 09:04:59	19.8 2511.3	0 14316
34	SJI/W KSJI/R	N 30 43.56 W088 21.56	unk 0.1E	N/A	3000M	+9C 0	227 227	00+23+36 09:28:35	137.7 2648.9	0 14316
35	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 1.0E		10M	+15C 0	237 237	00+15+00 09:43:35	35.2 2684.1	500 13816

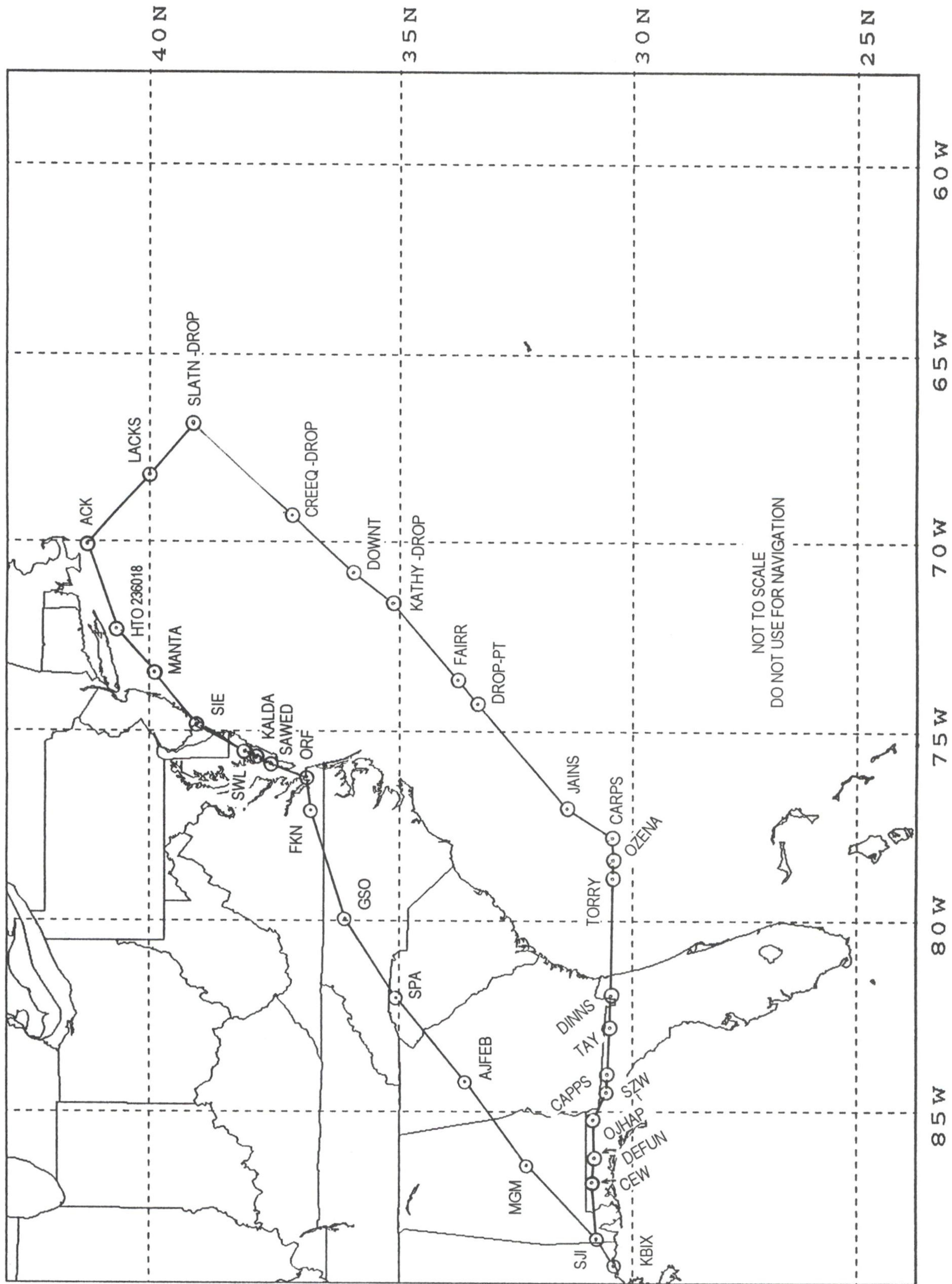


Figure F-3. Air Force track CORONET COAST 03/03R

Table F-4a. No-Wind Flight Plan for route **CORONET COAST 04**. (These plans are for planning purposes only. Do not use for navigation.)

FPM VERSION: 3.040 WC-130H Date: 8 OCT 98  
 ROUTE NAME: C:\PFPS\data\ROUTES\98CST04.rte  
 AC EMPTY WT=84300 STORE WT=0 FUEL WT (INT/EXT):39000 6000

TP DTD#	Fix/Point Description	Latitude Longitude	Elev Var	A/S Bank	Alt Wind	*Temp FF	MH MC	Time	Dist	Fuel
1	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 1.0E		10M	+15C	360 360	00+00+00 00:00:00	0.0 0.0	1000 44000
2	SJI/W KSJI/R	N 30 43.56 W088 21.56	unk 0.1E	N/A	16498M	-18C	056 7249 056	00+10+41 00:10:41	35.2 35.2	1291 42709
	.level off	N 30 49.49 W088 13.67	unk 0	N/A	19000M	-23C	049 7054 049	00+02+29 00:13:10	9.0 44.2	257 42452
3	KMGW/R MONTGOMERY	N 32 13.34 W086 19.18	270 3.0E	280	19000M	-23C	049 4738 049	00+27+34 00:40:44	128.7 172.8	2177 40275
4	AJFEB/W (AJFEB)	N 33 38.42 W084 10.23	unk 3.6W	280	19000M	-23C	048 4711 048	00+29+30 01:10:14	137.7 310.5	2316 37959
5	KSPA/R SPARTANBURG	N 35 02.02 W081 55.62	910 2.0W	280	19000M	-23C	056 4685 056	00+29+48 01:40:02	139.1 449.6	2327 35632
	.level off	N 35 17.27 W081 26.85	unk 6.1W	N/A	25000M	-35C	059 5312 059	00+07+39 01:47:41	28.0 477.6	677 34955
6	KGSO/R GREENSBORO	N 36 02.74 W079 58.58	879 3.0W	280	25000M	-35C	063 4068 063	00+18+12 02:05:53	84.9 562.5	1234 33721
7	KFKN/R FRANKLIN	N 36 42.85 W077 00.74	90 9.0W	280	25000M	-35C	076 4040 076	00+31+52 02:37:45	148.7 711.2	2145 31576
8	KORF/R NORFOLK	N 36 53.51 W076 12.02	20 7.0W	280	25000M	-35C	083 4017 083	00+08+40 02:46:25	40.4 751.6	580 30996
9	SAWED/W SAWED	N 37 32.01 W075 51.49	unk 10.9W	280	25000M	-35C	030 4007 030	00+08+58 02:55:23	41.8 793.5	599 30397
10	KALDA/W KALDA	N 37 50.51 W075 37.59	unk 11.2W	280	25000M	-35C	042 4000 042	00+04+37 03:00:00	21.5 815.0	308 30089
11	KSWL/R SNOW HILL	N 38 03.40 W075 27.84	40 8.0W	280	25000M	-35C	042 3996 042	00+03+13 03:03:13	15.0 830.0	214 29875
12	KSIE/R SEA ISLE	N 39 05.73 W074 48.02	10 9.0W	280	25000M	-35C	034 3986 034	00+14+56 03:18:09	69.7 899.7	992 28883
	.level off	N 39 29.25 W074 11.70	unk 12.7W	N/A	30000M	-44C	059 4488 059	00+09+37 03:27:46	36.7 936.3	719 28164
13	MANTA/W MANTA	N 39 54.11 W073 32.53	unk 13.3W	280	30000M	-44C	063 3675 063	00+08+22 03:36:08	39.1 975.4	513 27651
14	OWENZ/W DROP	N 39 49.40 W072 49.83	unk 13.7W	280	30000M	-44C	111 3664 111	00+07+06 03:43:14	33.1 1008.5	433 27218
15	BERGH/W DROP	N 39 07.96 W072 03.19	unk 13.9W	280	30000M	-44C	152 3651 152	00+11+46 03:55:00	54.9 1063.4	716 26502
16	.CHAMP/ KZNY DROP	N 37 31.00 W071 41.00	unk 13.6W	280	30000M	-44C	184 3629 184	00+21+07 04:16:07	98.5 1161.9	1277 25225
17	KATHY/W DROP	N 35 07.22 W071 36.90	unk 12.9W	280	30000M	-44C	192 3596 192	00+30+49 04:46:56	143.8 1305.7	1847 23378
18	FAIRR/W DROP	N 33 43.86 W073 41.09	unk 11.2W	280	30000M	-44C	244 3559 244	00+28+18 05:15:14	132.1 1437.8	1679 21699
19	.RELEASE PT DROP	N 32 30.00 W075 30.00	unk 9.7W	280	30000M	-44C	243 3527 243	00+25+09 05:40:23	117.4 1555.1	1478 20221
20	JAINS/W JAX CTR	N 31 21.33 W077 00.00	unk 8.3W	280	30000M	-44C	238 3500 238	00+22+01 06:02:24	102.7 1657.9	1284 18937
21	CARPS/W DROP	N 30 24.48 W077 45.00	unk 7.6W	280	30000M	-44C	223 3479 223	00+14+44 06:17:08	68.7 1726.6	854 18083
22	OZENA/W OZENA	N 30 25.17 W078 20.90	unk 7.2W	280	30000M	-44C	279 3468 279	00+06+38 06:23:46	31.0 1757.6	384 17699
23	TORRY/W TORRY	N 30 25.33 W078 51.83	unk 6.8W	280	30000M	-44C	278 3461 278	00+05+43 06:29:29	26.7 1784.2	330 17369
24	DINNS/W KJA/N	N 30 27.91 W081 48.08	unk 4.6W	280	30000M	-44C	279 3441 279	00+32+34 07:02:03	152.0 1936.2	1868 15501
25	TAY/W KTAY/R	N 30 30.28 W082 33.17	unk 4.1W	280	30000M	-44C	278 3420 278	00+08+21 07:10:24	38.9 1975.1	475 15026
26	CAPPS/W CAPPS	N 30 32.72 W083 54.30	unk 3.1W	280	30000M	-44C	276 3408 276	00+14+59 07:25:23	69.9 2045.1	851 14175
27	SZW/W KSZW/R	N 30 33.37 W084 22.44	unk 2.7W	280	30000M	-44C	275 3399 275	00+05+12 07:30:35	24.2 2069.3	294 13881
28	OJHAP/W (OJHAP)	N 30 47.63 W085 08.24	unk 2.2W	280	30000M	-44C	293 3392 293	00+08+59 07:39:34	41.9 2111.2	507 13374
	.descent pt	N 30 47.87 W085 18.48	unk 2.2W	280	30000M	-44C	274 3387 274	00+01+53 07:41:27	8.8 2120.0	106 13268
29	DEFUN/W DEFUN	N 30 48.86 W086 07.89	unk 1.6W	N/A	22723M	-30C	274 0 274	00+07+17 07:48:44	42.5 2162.4	0 13268
30	KCEW/R CRESTVIEW	N 30 49.57 W086 40.75	254 3.0E	N/A	17883M	-20C	273 0 273	00+04+50 07:53:34	28.2 2190.7	0 13268
31	SJI/W KSJI/R	N 30 43.56 W088 21.56	unk 0.1E	N/A	3000M	+9C	263 0 263	00+14+53 08:08:27	86.8 2277.5	0 13268
32	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 1.0E	280	2000M	+11C	237 7571 237	00+07+32 08:15:59	35.2 2312.6	951 12317
33	KBIX/A KEESLER AFB	N 30 24.68 W088 55.42	34 0.5E		34M	+15C	050 050	00+15+00 08:30:59	0.4 2313.1	500 11817

Table F-4b. No-Wind Flight Plan for route CORONET COAST 04R. (These plans are for planning purposes only. Do not use for navigation.)

FPM VERSION: 3.040 WC-130H Date: 8 OCT 98  
 ROUTE NAME: C:\PFPS\data\ROUTES\98CST04R.rte  
 AC EMPTY WT=84300 STORE WT=0 FUEL WT (INT/EXT):39000 6000

TP DTD#	Fix/Point Description	Latitude Longitude	Elev Var	A/S Bank	Alt Wind	+Temp FF	MH MC	Time	Dist	Fuel
1	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 1.0E	280	34M	+15C 7571	056 056	00+00+00 00:00:00	0.0 0.0	0 45000
2	SJI/W KSJI/R	N 30 43.56 W088 21.56	unk 0.1E	N/A	16345M	-17C 7259	056 056	00+10+41 00:10:41	35.2 35.2	1292 43708
	.level off	N 30 44.30 W088 10.20	unk 0.1W	N/A	19000M	-23C 7050	086 086	00+02+41 00:13:22	9.8 44.9	278 43430
3	KCEW/R CRESTVIEW	N 30 49.57 W086 40.75	254 3.0E	280	19000M	-23C 4755	086 086	00+16+30 00:29:52	77.0 122.0	1308 42122
4	DEFUN/W DEFUN	N 30 48.86 W086 07.89	unk 1.6W	280	19000M	-23C 4744	088 088	00+06+03 00:35:55	28.2 150.2	478 41644
5	OJHAP/W (OJHAP)	N 30 47.63 W085 08.24	unk 2.2W	280	19000M	-23C 4736	093 093	00+10+59 00:46:54	51.2 201.5	867 40777
	.level off	N 30 36.72 W084 33.11	unk 2.7W	N/A	25000M	-35C 5302	112 112	00+08+39 00:55:33	32.1 233.6	765 40012
6	SZW/W KSZW/R	N 30 33.37 W084 22.44	unk 2.7W	280	25000M	-35C 4169	113 113	00+02+06 00:57:39	9.8 243.3	146 39866
7	CAPES/W CAPP	N 30 32.72 W083 54.30	unk 3.1W	280	25000M	-35C 4164	094 094	00+05+12 01:02:51	24.2 267.6	360 39506
8	TAY/W KTAY/R	N 30 30.28 W082 33.17	unk 4.1W	280	25000M	-35C 4151	095 095	00+14+59 01:17:50	69.9 337.5	1037 38469
9	DINNS/W KJA/N	N 30 27.91 W081 48.08	unk 4.6W	280	25000M	-35C 4136	097 097	00+08+21 01:26:11	38.9 376.4	575 37894
10	TORRY/W TORRY	N 30 25.33 W078 51.83	unk 6.8W	280	25000M	-35C 4111	095 095	00+32+34 01:58:45	152.0 528.4	2231 35663
11	OZENA/W OZENA	N 30 25.17 W078 20.90	unk 7.2W	280	25000M	-35C 4088	097 097	00+05+43 02:04:28	26.7 555.1	389 35274
12	CARPS/W DROP	N 30 24.48 W077 45.00	unk 7.6W	280	25000M	-35C 4080	098 098	00+06+38 02:11:06	31.0 586.1	451 34823
13	JAINS/W KZNY	N 31 21.33 W077 00.00	unk 8.3W	280	25000M	-35C 4068	042 042	00+14+44 02:25:50	68.7 654.8	998 33825
14	.RELEASE PT DROP	N 32 30.00 W075 30.00	unk 9.7W	280	25000M	-35C 4047	056 056	00+22+01 02:47:51	102.7 757.5	1484 32341
	.level off	N 32 56.68 W074 51.27	unk 10.2W	N/A	30000M	-44C 4456	060 060	00+10+48 02:58:39	42.1 799.6	802 31539
15	FAIRR/W A700	N 33 43.86 W073 41.09	unk 11.2W	280	30000M	-44C 3748	061 061	00+16+08 03:14:47	75.3 874.9	1007 30532
16	KATHY/W DROP	N 35 07.22 W071 36.90	unk 12.9W	280	30000M	-44C 3715	061 061	00+28+18 03:43:05	132.1 1006.9	1752 28780
17	.CHAMP/ W NYCTR/ DROP	N 37 31.00 W071 41.00	unk 13.6W	280	30000M	-44C 3673	012 012	00+30+49 04:13:54	143.8 1150.7	1887 26893
18	BERGH/W A300	N 39 07.96 W072 03.19	unk 13.9W	280	30000M	-44C 3638	004 004	00+21+07 04:35:01	98.5 1249.3	1280 25613
19	OWENZ/W DROP	N 39 49.40 W072 49.83	unk 13.7W	280	30000M	-44C 3616	333 333	00+11+46 04:46:47	54.9 1304.2	709 24904
20	MANTA/W MANTA	N 39 54.11 W073 32.53	unk 13.3W	280	30000M	-44C 3604	292 292	00+07+06 04:53:53	33.1 1337.3	426 24478
21	KSIE/R SEA ISLE	N 39 05.73 W074 48.02	10 9.0W	280	30000M	-44C 3589	244 244	00+16+14 05:10:07	75.7 1413.0	971 23507
22	KSWL/R SNOW HILL	N 38 03.40 W075 27.84	40 8.0W	280	30000M	-44C 3570	216 216	00+14+56 05:25:03	69.7 1482.7	888 22619
23	KALDA/W KALDA	N 37 50.51 W075 37.59	unk 11.2W	280	30000M	-44C 3559	219 219	00+03+13 05:28:16	15.0 1497.7	191 22428
24	SAWED/W SAWED	N 37 32.01 W075 51.49	unk 10.9W	280	30000M	-44C 3554	222 222	00+04+37 05:32:53	21.5 1519.2	273 22155
25	KORF/R NORFOLK	N 36 53.51 W076 12.02	20 7.0W	280	30000M	-44C 3546	214 214	00+08+58 05:41:51	41.8 1561.0	530 21625
26	KFKN/R FRANKLIN	N 36 42.85 W077 00.74	90 9.0W	280	30000M	-44C 3535	262 262	00+08+40 05:50:31	40.4 1601.4	511 21114
27	KGSO/R GREENSBORO	N 36 02.74 W079 58.58	879 3.0W	280	30000M	-44C 3512	264 264	00+31+52 06:22:23	148.7 1750.1	1865 19249
28	KSPA/R SPARTANBURG	N 35 02.02 W081 55.62	910 2.0W	280	30000M	-44C 3480	241 241	00+24+12 06:46:35	112.9 1863.1	1404 17845
29	AJFEB/W (AJFEB)	N 33 38.42 W084 10.23	unk 3.6W	280	30000M	-44C 3451	236 236	00+29+48 07:16:23	139.1 2002.2	1714 16131
	.descent pt	N 32 25.73 W086 00.86	unk 1.9W	280	30000M	-44C 3423	236 236	00+25+15 07:41:38	117.8 2120.0	1440 14691
30	KMGM/R MONTGOMERY	N 32 13.34 W086 19.18	270 3.0E	N/A	26600M	-38C 0	233 233	00+03+24 07:45:02	19.8 2139.8	0 14691
31	SJI/W KSJI/R	N 30 43.56 W088 21.56	unk 0.1E	N/A	3000M	+9C 0	227 227	00+23+36 08:08:38	137.7 2277.5	0 14691
32	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 1.0E	290	2000M	+11C 8150	237 237	00+07+16 08:15:54	35.2 2312.6	988 13703
33	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 1.0E		10M	+15C	236 236	00+15+00 08:30:54	0.0 2312.6	500 13203



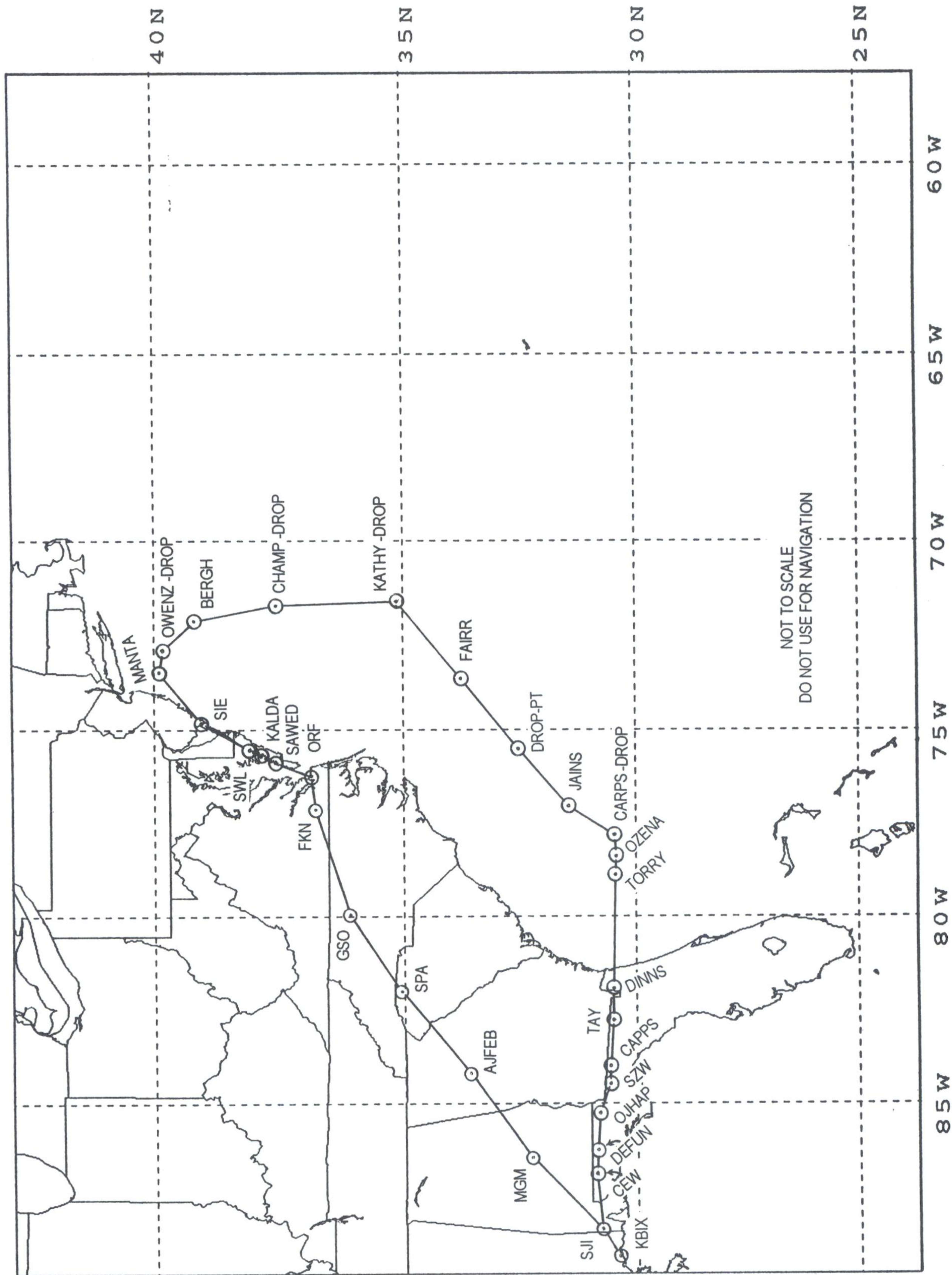


Figure F-4. Air Force track CORONET COAST 04/04R

Table F-5a. No-Wind Flight Plan for route CORONET COAST 05. (These plans are for planning purposes only. Do not use for navigation.)

FPM VERSION: 3.040 WC-130H Date: 8 OCT 98  
 ROUTE NAME: C:\PFPS\data\ROUTES\98CST05.rte  
 AC EMPTY WT=84300 STORE WT=0 FUEL WT (INT/EXT):39000 6000

TP DTD#	Fix/Point Description	Latitude Longitude	Elev Var	A/S Bank	Alt Wind	+Temp FF	MH MC	Time	Dist	Fuel
1	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 1.0E		10M	+15C	360 360	00+00+00 00:00:00	0.0 0.0	1000 44000
2	SJI/W KSJI/R	N 30 43.56 W088 21.56	unk 0.1E	N/A	16498M	-18C 7249	056 056	00+10+41 00:10:41	35.2 35.2	1291 42709
	.level off	N 30 49.49 W088 13.67	unk 0	N/A	19000M	-23C 7054	049 049	00+02+29 00:13:10	9.0 44.2	257 42452
3	KMGW/R MONTGOMERY	N 32 13.34 W086 19.18	270 3.0E	280	19000M	-23C 4738	049 049	00+27+34 00:40:44	128.7 172.8	2177 40275
4	AJFEB/W (AJFEB)	N 33 38.42 W084 10.23	unk 3.6W	280	19000M	-23C 4711	048 048	00+29+30 01:10:14	137.7 310.5	2316 37959
5	IRQ/W KIRQ/R	N 33 42.44 W082 09.72	unk 5.1W	280	19000M	-23C 4688	091 091	00+21+30 01:31:44	100.4 410.9	1680 36279
6	CAE/W KCAE/R	N 33 51.43 W081 03.23	unk 6.0W	280	19000M	-23C 4674	086 086	00+12+00 01:43:44	56.0 466.8	935 35344
	.level off	N 34 00.14 W080 31.38	unk 6.5W	N/A	25000M	-35C 5311	078 078	00+07+36 01:51:20	27.8 494.7	672 34672
7	FLO/W KFLO/R	N 34 13.98 W079 39.43	unk 7.1W	280	25000M	-35C 4068	078 078	00+09+41 02:01:01	45.2 539.9	657 34015
8	ISO/W KISO/R	N 35 22.25 W077 33.50	unk 9.0W	280	25000M	-35C 4047	063 063	00+26+33 02:27:34	123.9 663.8	1791 32224
9	OHPEA/W OHPEA	N 35 51.45 W075 39.08	unk 10.5W	280	25000M	-35C 4021	081 081	00+20+53 02:48:27	97.5 761.2	1400 30824
	.level off	N 35 24.15 W075 03.90	unk 10.8W	N/A	30000M	-44C 4472	144 144	00+10+15 02:58:42	39.5 800.8	764 30060
10	BACUS/W KZNY / DROP	N 34 26.01 W073 50.98	unk 11.3W	280	30000M	-44C 3712	145 145	00+17+52 03:16:34	83.4 884.2	1106 28954
11	FAIRR/W R763	N 33 43.86 W073 41.09	unk 11.2W	280	30000M	-44C 3692	180 180	00+09+12 03:25:46	42.9 927.1	566 28388
12	BURTT/W R763 DROP	N 31 40.13 W073 12.96	unk 10.9W	280	30000M	-44C 3667	180 180	00+27+00 03:52:46	126.0 1053.1	1650 26738
13	JESSE/W DCT DROP	N 29 30.00 W075 04.00	unk 9.2W	280	30000M	-44C 3626	228 228	00+34+36 04:27:22	161.5 1214.5	2091 24647
14	SARJE/W DCT	N 29 07.17 W075 47.61	unk 8.6W	280	30000M	-44C 3597	248 248	00+09+30 04:36:52	44.4 1258.9	570 24077
15	LOUIZ/W A699 MIAMI CTR	N 28 28.39 W076 59.98	unk 7.6W	280	30000M	-44C 3581	247 247	00+15+56 04:52:48	74.3 1333.2	951 23126
16	NUCAR/W A699 DROP	N 28 07.55 W077 37.97	unk 7.1W	280	30000M	-44C 3566	246 246	00+08+27 05:01:15	39.4 1372.6	502 22624
17	STIFF/W A699	N 27 36.29 W078 38.79	unk 6.3W	280	30000M	-44C 3553	247 247	00+13+20 05:14:35	62.2 1434.8	789 21835
18	PERMT/W A699	N 27 24.85 W078 56.84	unk 6.0W	280	30000M	-44C 3542	241 241	00+04+13 05:18:48	19.7 1454.5	249 21586
19	PBI/W A699	N 26 40.80 W080 05.19	unk 5.1W	280	30000M	-44C 3530	240 240	00+16+06 05:34:54	75.1 1529.7	947 20639
20	PHK/W DCT	N 26 46.96 W080 41.49	unk 4.6W	280	30000M	-44C 3517	286 286	00+07+04 05:41:58	33.0 1562.7	414 20225
21	LBV/W DCT KLBV/R	N 26 49.69 W081 23.49	unk 4.2W	280	30000M	-44C 3508	279 279	00+08+03 05:50:01	37.6 1600.2	471 19754
22	ROGAN/W J86	N 27 15.05 W081 53.57	unk 3.9W	280	30000M	-44C 3499	318 318	00+07+54 05:57:55	36.9 1637.1	461 19293
23	SRQ/W J86 KSRQ/R	N 27 23.87 W082 33.26	unk 3.5W	280	30000M	-44C 3490	288 288	00+07+47 06:05:42	36.3 1673.5	453 18840
24	BOXKR/W J58	N 27 35.16 W083 17.93	unk 3.0W	280	30000M	-44C 3481	290 290	00+08+50 06:14:32	41.2 1714.7	512 18328
25	COVIA/W J58 DROP	N 27 56.18 W084 44.16	unk 2.0W	280	30000M	-44C 3467	289 289	00+16+58 06:31:30	79.2 1793.8	980 17348
26	OJVAB/W J58	N 28 26.15 W086 55.21	unk 0.6W	280	30000M	-44C 3444	287 287	00+25+34 06:57:04	119.3 1913.2	1468 15880
27	NEPTA/W J58 DROP	N 28 36.62 W087 38.47	unk 0.1W	280	30000M	-44C 3427	286 286	00+08+27 07:05:31	39.4 1952.6	482 15398
	.descent pt	N 28 39.16 W087 43.18	unk 0.1W	280	30000M	-44C 3422	302 302	00+01+02 07:06:33	4.8 1957.4	59 15339
28	SEDAN/W J58	N 29 07.55 W088 36.40	unk 0.5E	N/A	20645M	-26C 0	302 302	00+09+21 07:15:54	54.6 2012.0	0 15339
29	KHRV/R111029 DCT HARVEY	N 29 39.62 W089 29.46	unk 1.0E	N/A	11000M	-7C 0	304 304	00+09+39 07:25:33	56.3 2068.3	0 15339
	.descent pt	N 29 40.41 W089 28.88	unk 1.0E	280	11000M	-7C 5748	032 032	00+00+12 07:25:45	0.9 2069.2	19 15320
30	KBIX/T DCT KEESLER	N 30 24.41 W088 55.80	10 1.0E	N/A	2000M	+11C 0	032 032	00+09+00 07:34:45	52.5 2121.7	0 15320
31	KBIX/A APPR KEESLER AFB	N 30 24.68 W088 55.42	34 0.5E		34M	+15C	050 050	00+15+00 07:49:45	0.4 2122.1	500 14820

Table F-5b. No-Wind Flight Plan for route **CORONET COAST 05R**. (These plans are for planning purposes only. Do not use for navigation.)

FPM VERSION: 3.040 WC-130H Date: 8 OCT 98  
 ROUTE NAME: C:\PFPS\data\ROUTES\98CST05R.rte  
 AC EMPTY WT=84300 STORE WT=0 FUEL WT (INT/EXT):39000 6000

TP DTD#	Fix/Point Description	Latitude Longitude	Elev Var	A/S Bank	Alt Wind	*Temp FF	MH MC	Time	Dist	Fuel
1	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 1.0E		10M	+15C	359 359	00+00+00 00:00:00	0.0 0.0	1300 43700
	.level off	N 29 47.60 W089 23.50	unk 0.9E	N/A	19000M	-23C 7054	212 212	00+13+06 00:13:06	43.9 43.9	1540 42160
2 DCT	KHRV/R111029 HARVEY	N 29 39.62 W089 29.46	unk 1.0E	280	19000M	-23C 4746	212 212	00+02+02 00:15:08	9.5 53.4	161 41999
3 DCT	SEDAN/W DROP	N 29 07.55 W088 36.40	unk 0.5E	280	19000M	-23C 4740	124 124	00+12+03 00:27:11	56.3 109.7	952 41047
4 J58	NEPTA/W DROP	N 28 36.62 W087 38.47	unk 0.1W	280	19000M	-23C 4728	121 121	00+12+44 00:39:55	59.4 169.1	1003 40044
5 J58	OJVAB/W DROP	N 28 26.15 W086 55.21	unk 0.6W	280	19000M	-23C 4718	105 105	00+08+27 00:48:22	39.4 208.5	664 39380
	.level off	N 28 18.57 W086 21.09	unk 1.0W	N/A	25000M	-35C 5310	105 105	00+08+22 00:56:44	31.0 239.5	740 38640
6 J58	COVIA/W DROP	N 27 56.18 W084 44.16	unk 2.0W	280	25000M	-35C 4133	105 105	00+18+56 01:15:40	88.4 327.9	1304 37336
7 J58	BOXKR/W DROP	N 27 35.16 W083 17.93	unk 3.0W	280	25000M	-35C 4110	107 107	00+16+58 01:32:38	79.2 407.0	1162 36174
8 J58	SRQ/W KSRQ/R	N 27 23.87 W082 33.26	unk 3.5W	280	25000M	-35C 4095	109 109	00+08+50 01:41:28	41.2 448.2	603 35571
9 J86	ROGAN/W ROGAN	N 27 15.05 W081 53.57	unk 3.9W	280	25000M	-35C 4085	107 107	00+07+47 01:49:15	36.3 484.6	530 35041
10 J86	LBV/W KLBV/R	N 26 49.69 W081 23.49	unk 4.2W	280	25000M	-35C 4076	137 137	00+07+54 01:57:09	36.9 521.5	537 34504
11 DCT	PHK/W DROP	N 26 46.96 W080 41.49	unk 4.6W	280	25000M	-35C 4066	098 098	00+08+03 02:05:12	37.6 559.0	546 33958
12 DCT	PBI/W DROP	N 26 40.80 W080 05.19	unk 5.1W	280	25000M	-35C 4057	105 105	00+07+04 02:12:16	33.0 592.0	478 33480
	.level off	N 27 06.83 W079 25.02	unk 5.7W	N/A	30000M	-44C 4442	059 059	00+11+16 02:23:32	44.3 636.3	834 32646
13 A699	PERMT/W DROP	N 27 24.85 W078 56.84	unk 6.0W	280	30000M	-44C 3782	060 060	00+06+37 02:30:09	30.9 667.2	417 32229
14 A699	STIFF/W DROP	N 27 36.29 W078 38.79	unk 6.3W	280	30000M	-44C 3773	060 060	00+04+13 02:34:22	19.7 686.9	265 31964
15 A699	NUCAR/W DROP	N 28 07.55 W077 37.97	unk 7.1W	280	30000M	-44C 3760	066 066	00+13+20 02:47:42	62.2 749.1	835 31129
16 A699	LOUIZ/W KZNY	N 28 28.39 W076 59.98	unk 7.6W	280	30000M	-44C 3744	065 065	00+08+27 02:56:09	39.4 788.5	527 30602
17 A699	SARJE/W DROP	N 29 07.17 W075 47.61	unk 8.6W	280	30000M	-44C 3726	066 066	00+15+56 03:12:05	74.3 862.8	989 29613
18 DCT	JESSE/W DROP	N 29 30.00 W075 04.00	unk 9.2W	280	30000M	-44C 3707	067 067	00+09+30 03:21:35	44.4 907.2	587 29026
19 DCT	BURIT/W DROP	N 31 40.13 W073 12.96	unk 10.9W	280	30000M	-44C 3676	045 045	00+34+36 03:56:11	161.5 1068.6	2120 26906
20 R763	FAIRR/W DROP	N 33 43.86 W073 41.09	unk 11.2W	280	30000M	-44C 3634	360 360	00+27+00 04:23:11	126.0 1194.6	1635 25271
21 R763	BACUS/W WASH / DROP	N 34 26.01 W073 50.98	unk 11.3W	280	30000M	-44C 3611	360 360	00+09+12 04:32:23	42.9 1237.5	554 24717
22 AR-8	OHPEA/W DROP	N 35 51.45 W075 39.08	unk 10.5W	280	30000M	-44C 3598	326 326	00+26+21 04:58:44	122.9 1360.5	1575 23142
23 DCT	ISO/W KINSTON	N 35 22.25 W077 33.50	unk 9.0W	280	30000M	-44C 3559	264 264	00+20+53 05:19:37	97.5 1457.9	1239 21903
24 DCT	FLO/W FLORENCE	N 34 13.98 W079 39.43	unk 7.1W	280	30000M	-44C 3530	246 246	00+26+33 05:46:10	123.9 1581.8	1562 20341
25 J4	CAE/W COLUMBIA	N 33 51.43 W081 03.23	unk 6.0W	280	30000M	-44C 3506	260 260	00+15+39 06:01:49	73.0 1654.9	914 19427
26 J4	IRQ/W COLLIERS	N 33 42.44 W082 09.72	unk 5.1W	280	30000M	-44C 3490	267 267	00+12+00 06:13:49	56.0 1710.8	698 18729
27 J4	AJFEB/W TURNPT	N 33 38.42 W084 10.23	unk 3.6W	280	30000M	-44C 3472	273 273	00+21+30 06:35:19	100.4 1811.2	1244 17485
28 J37	KMG/M MONTGOMERY	N 32 13.34 W086 19.18	270 3.0E	280	30000M	-44C 3445	236 236	00+29+30 07:04:49	137.7 1948.9	1694 15791
	.descent pt	N 32 07.21 W086 27.75	unk 1.5W	280	30000M	-44C 3428	227 227	00+02+02 07:06:51	9.5 1958.4	116 15675
29 J37	SJI/W KSJI/R	N 30 43.56 W088 21.56	unk 0.1E	N/A	8027M	-1C 0	231 231	00+21+58 07:28:49	128.2 2086.5	0 15675
30 DCT	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 1.0E	N/A	2000M	+11C 0	237 237	00+06+02 07:34:51	35.2 2121.7	0 15675
31 APPR	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 1.0E		10M	+15C	236 236	00+15+00 07:49:51	0.0 2121.7	500 15175

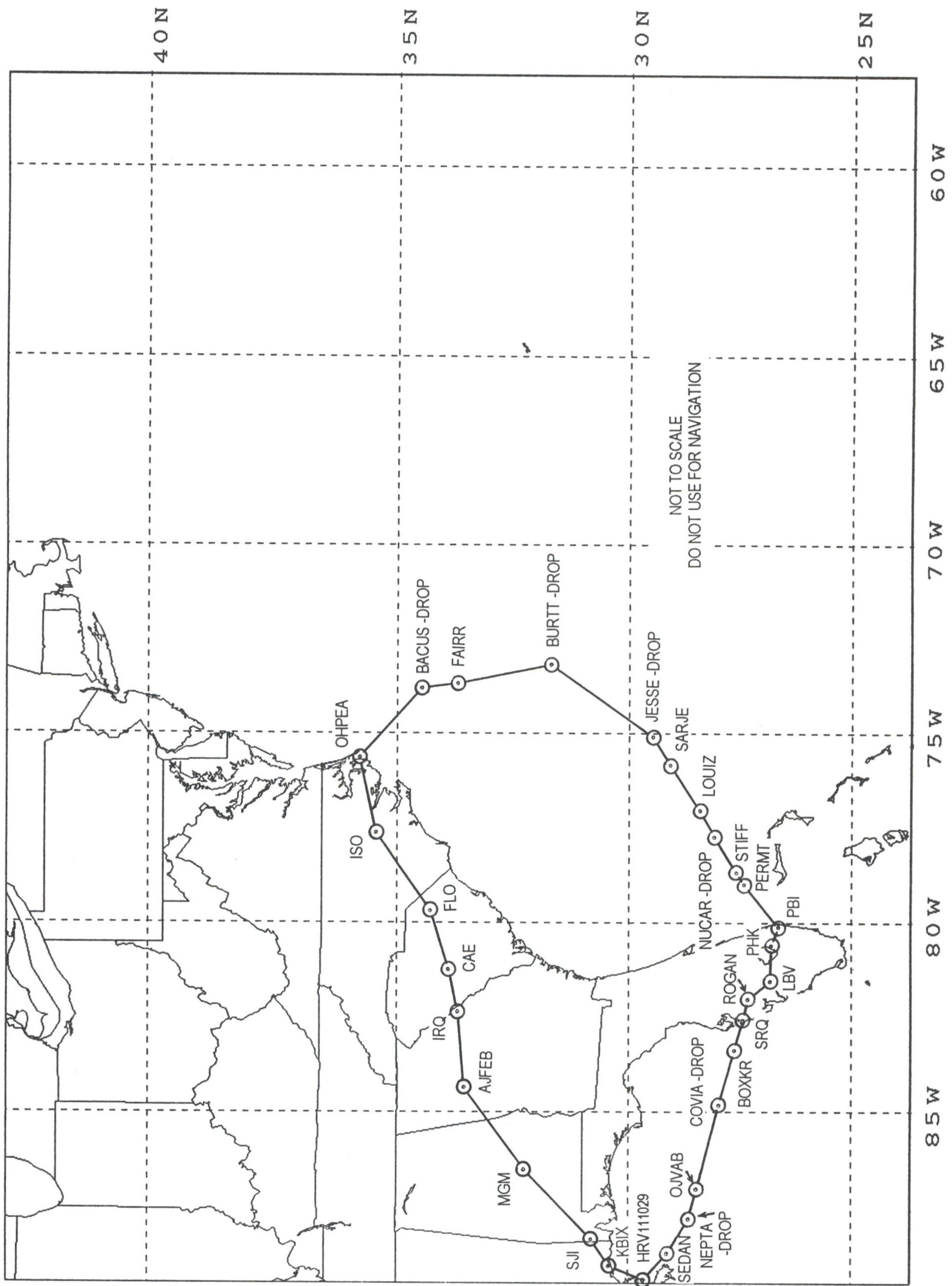


Figure F-5. Air Force track CORONET COAST 05/05R

**Table F-6a. No-Wind Flight Plan for route CORONET COAST 06. (These plans are for planning purposes only. Do not use for navigation.)**

FPM VERSION: 3.040 WC-130H Date: 8 OCT 98  
 ROUTE NAME: C:\PFPS\data\ROUTES\98CSTO6.rte  
 AC EMPTY WT=84300 STORE WT=0 FUEL WT (INT/EXT):36000 0

TP DTD#	Fix/Point Description	Latitude Longitude	Elev Var	A/S Bank	Alt Wind	*Temp FF	MH MC	Time	Dist	Fuel
1	STTO KBIX/L	N 30 24.68 W088 55.42	0 0.8E	20	0M	+15C	360 360	00+00+00 00:00:00	0.0 0.0	1000 35000
2	HRV111029 DCT	N 29 39.63 W089 29.46	0 1.3E	N/A 20	22971M	-31C 6437	209 209	00+15+37 00:15:37	57.8 57.8	1802 33198
	.level off	N 29 11.44 W088 43.22	unk 0.5E	N/A	30000M	-44C 5593	121 121	00+12+56 00:28:33	50.1 107.9	1000 32198
3	SEDAN/W DCT	N 29 07.55 W088 36.40	unk 0.5E	280 20	30000M	-44C 3775	123 123	00+01+31 00:30:04	7.1 115.0	96 32102
4	NEPTA/W J58 DROP	N 28 36.62 W087 38.47	unk 0.1W	280 20	30000M	-44C 3764	121 121	00+12+44 00:42:48	59.4 174.4	799 31303
5	OJVAB/W J58	N 28 26.15 W086 55.21	unk 0.6W	280 20	30000M	-44C 3748	105 105	00+08+27 00:51:15	39.4 213.8	528 30775
6	COVIA/W J58	N 27 56.18 W084 44.16	unk 2.0W	280 20	30000M	-44C 3723	105 105	00+25+34 01:16:49	119.3 333.2	1587 29188
7	CIGAR/W DCT DROP	N 27 28.02 W084 47.99	unk 2.0W	280 20	30000M	-44C 3700	195 195	00+06+24 01:23:13	29.9 363.1	395 28793
8	.FIR/ADIZ A758 KZNY	N 26 30.00 W085 37.00	0 0.8W	280 20	30000M	-44C 3684	219 219	00+15+34 01:38:47	72.7 435.7	956 27837
9	MINOW/W A758	N 26 02.79 W085 58.98	unk 0.9W	280 20	30000M	-44C 3668	217 217	00+07+12 01:45:59	33.6 469.3	440 27397
10	ELIOM/W A509 DROP	N 25 03.46 W087 41.03	unk 0.4E	280 20	30000M	-44C 3647	239 239	00+23+29 02:09:28	109.6 578.9	1427 25970
11	SWORD/W A509	N 24 30.00 W088 37.00	unk 1.1E	280 20	30000M	-44C 3623	236 236	00+13+02 02:22:30	60.8 639.7	787 25183
12	KEHLI/W DCT KEHLI	N 24 29.17 W089 50.42	unk 1.8E	280 20	30000M	-44C 3605	269 269	00+14+20 02:36:50	66.9 706.6	862 24321
13	.SONDE DCT DROP	N 24 30.00 W090 30.00	unk 2.2E	280 20	30000M	-44C 3591	270 270	00+07+43 02:44:33	36.0 742.7	462 23859
14	MARTE/W DCT	N 24 30.03 W091 47.00	unk 3.0E	280 20	30000M	-44C 3577	268 268	00+15+01 02:59:34	70.1 812.7	895 22964
15	COKER/W DCT	N 24 58.02 W093 53.30	unk 4.2E	280 20	30000M	-44C 3552	281 281	00+25+18 03:24:52	118.1 930.8	1498 21466
16	.SONDE DCT DROP	N 25 20.00 W094 30.00	unk 4.5E	280 20	30000M	-44C 3532	300 300	00+08+32 03:33:24	39.9 970.7	503 20963
17	.SONDE DCT DROP	N 28 15.00 W095 00.00	0 4.8E	280 20	30000M	-44C 3505	347 347	00+38+00 04:11:24	177.3 1148.0	2220 18743
18	MUSYL/W DCT	N 28 10.23 W094 07.75	unk 4.1E	280 20	30000M	-44C 3478	096 096	00+10+32 04:21:56	49.1 1197.1	610 18133
19	KLAMS/W DCT HOUSTON	N 28 15.00 W092 49.66	unk 3.3E	280 20	30000M	-44C 3464	082 082	00+14+47 04:36:43	69.0 1266.1	854 17279
20	.SONDE DCT DROP	N 28 15.00 W091 30.00	unk 2.5E	280 20	30000M	-44C 3448	086 086	00+15+02 04:51:45	70.2 1336.3	864 16415
21	LEV DCT	N 29 10.52 W090 06.25	2 1.8E	280 20	30000M	-44C 3430	050 050	00+19+46 05:11:31	92.2 1428.5	1130 15285
22	KBIX/L DCT	N 30 24.68 W088 55.42	0 0.8E	280	30000M	-44C 3410	038 038	00+20+39 05:32:10	96.3 1524.8	1173 14112
23	KBIX/A APPR KEESLER AFB	N 30 24.68 W088 55.42	34 0.5E		34M	+15C	149 149	00+15+00 05:47:10	0.0 1524.8	500 13612

Table F-6b. No-Wind Flight Plan for route **CORONET COAST 06R**. (These plans are for planning purposes only. Do not use for navigation.)

FPM VERSION: 3.040 WC-130H Date: 8 OCT 98  
 ROUTE NAME: C:\PFPS\data\ROUTES\98CST06R.rte  
 AC EMPTY WT=84300 STORE WT=0 FUEL WT (INT/EXT):36000 0

TP DTD#	Fix/Point Description	Latitude Longitude	Elev Var	A/S Bank	Alt Wind	*Temp FF	MH MC	Time	Dist	Fuel
1 DCT	KBIX/L STTO	N 30 24.68 W088 55.42	0 0.8E		OM	+15C	358 358	00+00+00 00:00:00	0.0 0.0	1300 34700
2 DCT	LEV	N 29 10.52 W090 06.25	2 1.8E	N/A 20	29009M	-42C 5719	219 219	00+27+26 00:27:26	96.3 96.3	2614 32086
	.level off	N 29 04.11 W090 15.97	unk 1.6E	N/A	30000M	-44C 5596	231 231	00+02+16 00:29:42	10.6 107.0	159 31927
3 DCT	.SONDE DROP	N 28 15.00 W091 30.00	unk 2.5E	280 20	30000M	-44C 3756	232 232	00+17+27 00:47:09	81.4 188.4	1092 30835
4 DCT	KLAMS/W KZNY	N 28 15.00 W092 49.66	unk 3.3E	280 20	30000M	-44C 3732	268 268	00+15+04 01:02:13	70.3 258.7	937 29898
5 DCT	MUSYL/W	N 28 10.23 W094 07.75	unk 4.1E	280 20	30000M	-44C 3710	263 263	00+14+47 01:17:00	69.0 327.7	914 28984
6 DCT	.SONDE DROP	N 28 15.00 W095 00.00	0 4.8E	280 20	30000M	-44C 3693	272 272	00+09+55 01:26:55	46.3 374.0	610 28374
7 DCT	.SONDE DROP	N 25 20.00 W094 30.00	unk 4.5E	280 20	30000M	-44C 3659	165 165	00+38+31 02:05:26	179.8 553.8	2349 26025
8 DCT	COKER/W	N 24 58.02 W093 53.30	unk 4.2E	280 20	30000M	-44C 3627	117 117	00+08+36 02:14:02	40.1 593.9	520 25505
9 DCT	MARTE/W	N 24 30.03 W091 47.00	unk 3.0E	280 20	30000M	-44C 3605	099 099	00+25+18 02:39:20	118.1 712.0	1521 23984
10 DCT	.SONDE DROP	N 24 30.00 W090 30.00	unk 2.2E	280 20	30000M	-44C 3580	087 087	00+15+01 02:54:21	70.1 782.1	896 23088
11 DCT	KEHLI/W KEHLI	N 24 29.17 W089 50.42	unk 1.8E	280 20	30000M	-44C 3565	089 089	00+07+43 03:02:04	36.0 818.1	459 22629
12 DCT	SWORD/W	N 24 30.00 W088 37.00	unk 1.1E	280 20	30000M	-44C 3552	087 087	00+14+19 03:16:23	66.8 884.9	848 21781
13 A509	ELIOM/W DROP	N 25 03.46 W087 41.03	unk 0.4E	280 20	30000M	-44C 3536	055 055	00+13+04 03:29:27	60.9 945.9	770 21011
14 A509	MINOW/W	N 26 02.79 W085 58.98	unk 0.9W	280 20	30000M	-44C 3514	056 056	00+23+28 03:52:55	109.5 1055.4	1375 19636
15 A758	.FIR/ADIZ MIAMI CTR	N 26 30.00 W085 37.00	0 0.8W	280 20	30000M	-44C 3497	036 036	00+07+12 04:00:07	33.6 1089.0	420 19216
16 A758	CIGAR/W DROP	N 27 28.02 W084 47.99	unk 2.0W	280 20	30000M	-44C 3484	038 038	00+15+34 04:15:41	72.6 1161.6	904 18312
17 DCT	COVIA/W	N 27 56.18 W084 44.16	unk 2.0W	280 20	30000M	-44C 3472	008 008	00+06+06 04:21:47	28.4 1190.1	353 17959
18 J58	OJVAB/W	N 28 26.15 W086 55.21	unk 0.6W	280 20	30000M	-44C 3455	286 286	00+25+52 04:47:39	120.7 1310.8	1489 16470
19 J58	NEPTA/W DROP	N 28 36.62 W087 38.47	unk 0.1W	280 20	30000M	-44C 3437	286 286	00+08+27 04:56:06	39.4 1350.2	484 15986
	.descent pt	N 28 41.18 W087 47.17	unk 0.1W	280	30000M	-44C 3432	302 302	00+01+54 04:58:00	8.9 1359.1	109 15877
20 J58	SEDAN/W	N 29 07.55 W088 36.40	unk 0.5E	N/A 20	21338M	-27C 0	302 302	00+08+40 05:06:40	50.5 1409.6	0 15877
21 DCT	HRV111029	N 29 39.63 W089 29.46	0 1.3E	N/A 20	11683M	-8C 0	304 304	00+09+39 05:16:19	56.3 1465.9	0 15877
22 DCT	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 1.0E	N/A 20	2000M	+11C 0	035 035	00+09+41 05:26:00	55.4 1521.3	0 15877
23 APPR	KBIX/T KEESLER	N 30 24.41 W088 55.80	10 1.0E	20	10M	+15C	036 036	00+15+00 05:41:00	0.0 1521.3	500 15377

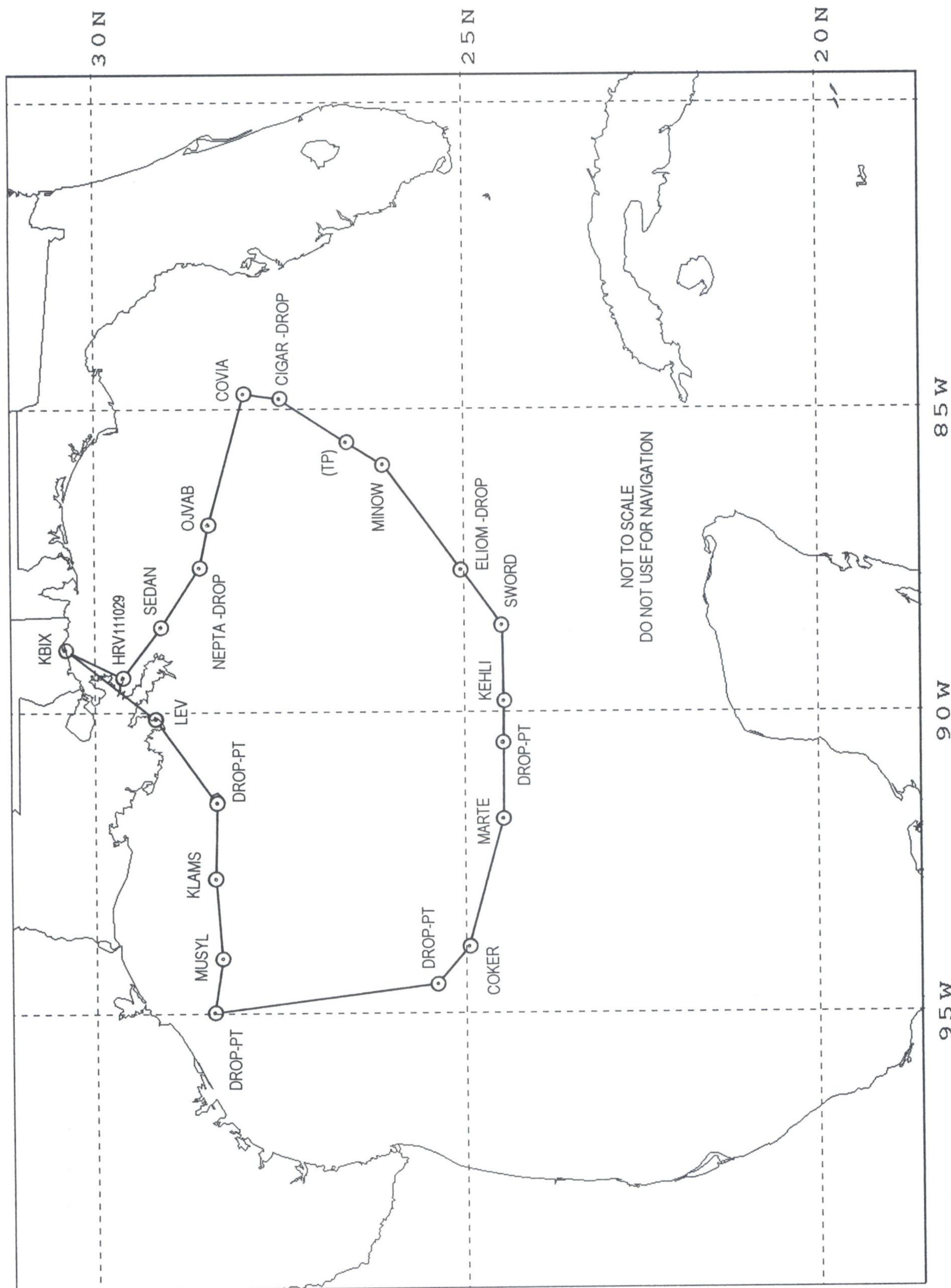


Figure F-6. Air Force track CORONET COAST 06/06R

## APPENDIX G

DEPARTMENT OF THE AIR FORCE  
UNITED STATES AIR FORCE RESERVE COMMAND

7 July 98

### MEMORANDUM FOR CARCAH

FROM: 53 WRS/DON (601) 377-2929 (Lt Col Katz)

SUBJECT: Air Traffic Control Clearances

CARCAH (alternate CARCAH/53WRS Operations) is authorized to relay Air Traffic Control (ATC) clearances to 53WRS aircraft using satellite communications (SATCOM). References for this authority are the Federal Aviation Administration/Air Force Reserve (FAA/AFRES) Memorandum of Agreement, SUBJECT: METEOROLOGICAL RECONNAISSANCE FLIGHTS, and the National Hurricane Operations Plan, paragraph 5.5.4 entitled Air Traffic Control Clearances.

#### PROCEDURES:

1. Clearance Request by TEAL Aircraft

- o Air Crews will send a SATCOM message to CARCAH and will provide the following information: present position and altitude/flight level, estimate to next navigation checkpoint and route of flight/altitude desired. Include any additional pertinent information. Use the following format:

Please contact Houston ARTCC with the following clearance request:

TEAL 40 PRESENTLY AT 25N 97W, ESTIMATE COKER 1430Z, LEVEL FIVE THOUSAND FT RQST DCT DOLPH DCT LEV DCT BIX, FL180.

NOTE: If mission conditions warrant, crews may request Priority Handling. Use the following format:

TEAL 40 PRESENTLY OVER LULIS FL180B190. RQST DCT 25N 92W, THEN FLT PLN RTE RQST PRIORITY HANDLING DUE TO NHOP MISSION TIMING TO HURRICANE FIRPO.

- o CARCAH will contact the appropriate ATC Center (see attachment for phone numbers) and speak to the Oceanic Supervisor (primary) or Military Missions Coordinator (secondary). Calls to these numbers are generally automatically recorded. When the clearance is issued to CARCAH, CARCAH must transmit the clearance to the aircraft verbatim, since it may differ from the requested clearance. CARCAH must preface the clearance with the words, "ATC clears..." such as in the example:

ATC CLEARS TEAL 40 TO KEESLER AFB VIA DIRECT COKER DIRECT DOLPH DIRECT LEV DIRECT. CLIMB AND MAINTAIN FL180. CONTACT HOUSTON CENTER ON 123.4 CROSSING 26 DEGREES NORTH.

2. Clearances Relay Request from ATC

- o ATC Centers may contact CARCAH (305-229-4474) or alternate CARCAH/53WRS Operations (601) 377-2409/1939 to request a message relay to a TEAL aircraft. CARCAH will then relay the message or clearance, as appropriate.

ROBERT A. KATZ, Lt Col, USAF  
Airspace Manager

Attachment:  
ATC Phone Numbers and Distribution List



## PHONE NUMBERS AND DISTRIBUTION LIST

### PHONE NUMBERS:

	OCEANIC SUPERVISOR	MISSIONS COORDINATOR
BOSTON ARTCC	N/A	(603) 836-7663 (DSN 881-1635)
HONOLULU ARTCC	(808) 739-7600 FAX (808) 739-7604	
HOUSTON ARTCC	(281) 230-5552	(281) 230-5563 (DSN 729-1491)
JACKSONVILLE ARTCC	(904) 549-1549 (GULF OF MEXICO) -1547 (ATLANTIC, S. OF JAX, All Altitudes) -1546 (ATLANTIC, N. OF JAX, FL240/BELOW) -1545 (ATLANTIC, N. OF JAX, ABOVE FL240)	DSN 434-3744
OAKLAND ARTCC	(501) 745-3342 / 3000 (SWITCHBOARD) FAX (510) 797-6519	
MIAMI ARTCC	(305) 716-1581 (GULF OF MEXICO) (305) 716-1584 (ATLANTIC)	(305) 716-1588 (DSN 434-1910)
NEW YORK ARTCC	(516) 468-1404	(516) 468-1429 (DSN 234--3730)
PIARCO Control	(809) 664-4852	(809) 664-4806
SAN JUAN ARTCC	(809) 253-8664	(809) 253-8650 (Weekdays only)
WASHINGTON ARTCC	N/A	(703) 771-3472 (DSN 937-1420)

ATC SYSTEM COMMAND CENTER: (703) 708-5144

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### DISTRIBUTION LIST:

OFCM

#### FEDERAL AVIATION ADMINISTRATION

FAA/ATO-100  
FAA/ATO-130  
FAA/ATO-200  
FAA/ASO-500 (AFREP)  
BOSTON ARTCC  
HONOLULU ARTCC  
HOUSTON ARTCC  
JACKSONVILLE ARTCC  
MIAMI ARTCC  
NEW YORK ARTCC  
OAKLAND ARTCC  
SAN JUAN ARTCC  
WASHINGTON ARTCC

#### AIR FORCE RESERVE

HQ AFRES/DO  
HQ AFRES/DOTSA  
HQ 22AF/DO  
403OG/CC  
53WRC/DO/SOF/ARWO

## APPENDIX H

DEPARTMENT OF THE AIR FORCE  
UNITED STATES AIR FORCE RESERVE COMMAND

28 November 1998

MEMORANDUM FOR FAA/CARF

FROM: 53 WRS/DON

SUBJECT: Altitude Reservation Approval Request

ALTRV APREQ CORONET COAST 04

- A. TEAL 02
- B. WC130/I
- C. KBIX
- D. ((PR FL250 [ALTRV BEGINS] SIE 0000 DCT CLMB FL290B310 PREPI 0015 OWENZ 0020  
LVLOFF BY BERGH 0030 A300 CHAMP 0050 G437 MERCI 0120 A700 [3240N 7436W 0205]  
TROUT 0250 AR5 DINNS 0405 [ALTRV ENDS] IFPPF
- E. KBIX
- F. ETD ALTRV BEGINS OVER SIE AT 29 NOV/2245Z. AVANA 2345Z
- G. TAS 250KTS/300KTS  
PROJECT OFFICER: MAJ MADDOX DSN 597-5518  
ALTERNATE PROJECT OFFICER: LT COL KATZ DSN 597-2929

ADDITIONAL INFORMATION: WX RECON MISSION IN SUPPORT OF NWS AND NWSOP. DROPSONDE RELEASE POINTS OWENZ CHAMP MERCI 3240N 7436W TROUT. AIRCREW WILL ADJUST AIRSPEED TO REACH CONTROL POINT MERCI AT 30 NOV/0000Z PLUS/MINUS 30 MINUTES. THE FOLLOWING IFPPF ROUTINGS ARE FOR INFO ONLY AND DO NOT CONSTITUTE AN ATC CLRNC OR PART OF THIS ALTRV REQ: KBIX DCT SJI J37 SPA DCT RDU J209 TYI DCT SWL DCT SIE (ALTRV). REQ: JA DCT TAY J2 SJI DCT BIX LAND (KBIX). NOTE: AFTER CROSSING 3240N 7436W CREW MAY BE RELEASED AND WILL END ALTRV AND REQ CLRNC TO KBIX. REQ ALTRV APVL FAX TO (601) 377-1923.

ROBERT A. KATZ, Lt Col, USAFR  
Airspace Manager

SAMPLE

SAMPLE

(ROUTING MAY BE INCORRECT)  
(USE AS REFERENCE FOR FORMAT ONLY - SEE FAA Handbook 7610.4)

## APPENDIX I

### OFFICIAL INTERAGENCY AGREEMENTS

The following enclosures are Memorandum of Agreement (MOA) between the Air Force Reserve (AFRES) and the National Oceanic and Atmospheric Administration (NOAA), dated May 4, 1992; Letter of Agreement (LOA) between the AFRES, Federal Aviation Administration and NOAA, dated February 16, 1996; and a Letter of Agreement (LOA) between the AFRES and NOAA Corps Air Operations, dated August 3, 1993. The purpose of these MOAs and LOAs is to establish policies, principles, and procedures under which the FAA, AFRES and NOAA Corps will provide aircraft weather reconnaissance to NOAA. Although the AFRES/NOAA LOA only mentions tropical storms, the procedures will be followed for winter storms.

MEMORANDUM OF AGREEMENT

BETWEEN

THE UNITED STATES AIR FORCE RESERVE

AND

THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

**PURPOSE:** The National Oceanic and Atmospheric Administration (NOAA) does not have the capability to fully support all operational requirements in support of tropical storm reconnaissance. This memorandum establishes policies, principles, and procedures under which the Air Force Reserve (AFRES) will provide aircraft weather reconnaissance support to NOAA.

1. REFERENCES:

a. SAF/PAT Message, 312020Z JUL 90, Subj: Deactivation of WC-130 Mission

b. National Hurricane Operations Plan (NHOP)

2. BACKGROUND: The Air Force Reserve will maintain an aircraft weather reconnaissance force of 12 WC-130s (currently 8 PAA and 4 BAI, planned to become 10 PAA and 2 BAI with congressional approval) to meet the Department of Commerce (DOC) requirements for aircraft reconnaissance. NOAA has a requirement for up to five sorties per day in support of the NHOP. The Office of Management and Budget determined that the Department of Defense (DOD) should provide support to NOAA, and DOD will bear all costs directly attributable to providing this reconnaissance support. This support will be limited to congressional funding for hours of aircraft flying time per year.

3. IMPLEMENTATION: Implementation details are contained in "GENERAL PROVISION".

4. GENERAL PROVISION:

a. AFRES agrees:

(1) To meet NOAA's requirement to conduct, within the limits of military capability, aerial weather reconnaissance for purposes of providing tropical cyclone warning services.

(a) Total flying hours will not exceed 1600 hours annually. To date, Congress has fully funded 1600 hours for FY 92 only. Unless the congressional budget language is permanently changed for FY 93 and beyond, the flying hour program will consist of 1000 fully funded weather hours in addition to another 600 hours that may be taken from the tactical airlift program, as required.

(b) The operational area for AFRES weather reconnaissance will include the Atlantic Ocean, Gulf of Mexico, the Caribbean Sea, and the North

Pacific Ocean. AFRES will be able to support two deployed locations simultaneously with the required maximum of five sorties daily.

(2) To provide an aircraft operations interface [Chief, Aerial Reconnaissance Coordination, All Hurricanes (CARCAH)] with NOAA at the National Hurricane Center. To date, funding for the CARCAH position has not been forthcoming from HQ USAF. AFRES is prepared to provide the manpower positions out-of-hide through 1 Oct 92. AFRES reserves the right to review periodically the CARCAH function in order to see if we can save government funds by consolidating manpower positions and moving the operational functions of CARCAH to Keesler AFB.

b. NOAA agrees to notify AFRES promptly for flight scheduling in accordance with this implementing agreement. Tasking will be through the Director, National Hurricane Center.

c. AFRES has no obligation to support winter storm or other weather operations. However, subject to aircraft and aircrew availability, the 403 AW/CC may, at NOAA request, approve specific winter storm or other weather-related missions. These missions will fall under the purview and limitations of this agreement; i.e., 1600 hours annually for all weather reconnaissance, etc.

5. MOBILIZATION: This memorandum remains in effect during periods of mobilization subject to aircraft and Reserve personnel availability, in accordance with 33 U.S.C. 855. There is no wartime tasking for the 815 WOP. Upon mobilization, however, aircrews will be limited to the six primary assigned weather crews. In addition, maintenance support could be sharply limited. Therefore, after mobilization, weather operations may be severely curtailed or eliminated.

6. EFFECTIVE AND TERMINATION DATES: This memorandum is effective the date signed by the last approving official and will be reviewed every three years from the effective date. Changes or revisions to this memorandum require the approval of both parties involved.

FOR THE UNITED STATES  
AIR FORCE RESERVE

  
JACK W. BLAIR, JR, Colonel, USAFR  
Deputy Chief of Staff, Operations

Date

19 Jan 92

FOR THE NATIONAL OCEANIC AND  
ATMOSPHERIC ADMINISTRATION

  
JENNIFER JOY WILSON  
Asst Secretary and Deputy Administrator  
for Oceans and Atmosphere

Date

MAY 4 1992

1 Atch  
Distribution List

FEDERAL AVIATION ADMINISTRATION (FAA)  
UNITED STATES AIR FORCE RESERVE (AFRES)  
NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION (NOAA)

LETTER OF AGREEMENT

EFFECTIVE:

SUBJECT: METEOROLOGICAL RECONNAISSANCE FLIGHTS

1. PURPOSE: Establishes procedures to be used by the 53rd Weather Reconnaissance Squadron (53 WRS), the NOAA Aircraft Operations Center (AOC), and the FAA during Winter storm missions in support of the NWSOP, and during hurricane/tropical cyclone missions in support of the NHOP.

2. CANCELLATION: This Letter of Agreement (LOA) remains in effect for 5 years from the date of the last signature hereon, unless expressly canceled by one of the participating agencies with 30 days' notification.

3. REFERENCES:

- a. National Hurricane Operations Plan (NHOP)
- b. National Winter Storm Operations Plan (NWSOP)

4. SCOPE: The responsibilities and procedures outlined herein are for use in the conduct of weather reconnaissance flights in support of the NHOP and the NWSOP within the airspace for which the FAA provides air traffic control (ATC) services.

5. RESPONSIBILITIES:

a. Aircraft commanders are the sole responsible party for all dropsonde or other sensor releases.

b. The aircraft commander is responsible for determining the content and duration of a broadcast concerning the release of a dropsonde or other sensor.

c. The FAA will provide ATC services and separation from nonparticipating aircraft to 53 WRS and AOC aircraft operating in other than Class G airspace. It is the responsibility of the aircraft commander to remain clear of obstacles and nonparticipating aircraft when operating in Class G airspace.

d. The 53 WRS and AOC are responsible for ensuring that air traffic clearances and messages are relayed to/from the FAA in an accurate manner when those relays are initiated by 53 WRS or AOC and are routed through other than Aeronautical Radio (ARINC). Aircraft conducting weather reconnaissance flights in support of the NHOP and the NWSOP may communicate directly with the FAA via Satellite Communications (SATCOM) when practicable.

## 6. PROCEDURES:

a. The 53 WRS Current Operations (53 WRS/DOO) or the AOC Flight Operations Division, as appropriate, will contact the FAA Central Altitude Reservation Function (CARF) and submit an Altitude Reservation Approval Request (ALTRV APREQ) at least 12 hours prior to an NWSOP mission, and pass the information specified in the NWSOP within the paragraph entitled "Prior Coordination." Individual exceptions may be made to the 12 hour requirement on a case-by-case basis through coordination between the 53rd WRS, AOC and CARF.

b. CARF will process the ALTRV APREQ, accomplishing coordination with impacted facilities. The 53rd WRS and AOC shall coordinate with scheduling/using agencies to transit Special Use Airspace (restricted, warning, etc.) along their route of flight.

c. The 53 WRS/DOO and the AOC Flight Operations Division will contact the Air Traffic Control System Command Center (ATCSCC) as soon as possible prior to an NHOP mission and provide information specified in the NHOP in the paragraph entitled "Prior Coordination." The ATCSCC will then coordinate this information with all FAA facilities impacted.

d. The 53 WRS shall only use the call sign "TEAL," and AOC shall only use the call sign "NOAA," and will only be given priority handling when specifically requested.

e. Tracks flown in support of the NWSOP shall be defined in supplements to this LOA. Changes, additions and deletions to these tracks shall be coordinated between the 53 WRS, AOC (if and when AOC is tasked to fly NWSOP missions) and CARF. These tracks shall be reviewed annually, no later than June 1.

f. During NHOP and NWSOP missions, dropsonde instrument releases shall be coordinated with ATC by advising of a pending drop at least 10 minutes prior to drop when in direct radio contact with ATC. When contact with ATC is via ARINC, dropsonde release coordination shall be included with the position report prior to the point where the dropsonde will be released. EXAMPLE: "TEAL 63, SLATN at 1215, FL310, estimating FLANN at 1250, CHAMP next. Weather instrument release at FLANN."

g. During NHOP and NWSOP missions, commencing 5 minutes prior to release of dropsondes from FL 190 or higher, the aircraft commander will broadcast in the blind on 121.5 and 243.0 to advise any traffic in the area of the pending drop.

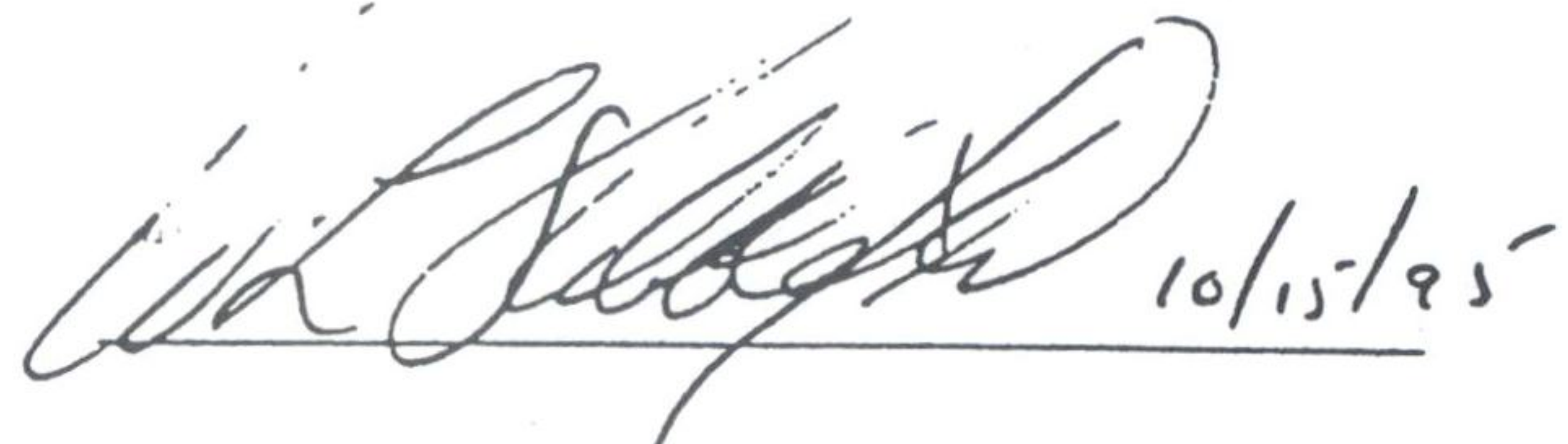
h. When 53 WRS and AOC flights are unable to contact ATC to request an en route clearance, a clearance request may be relayed through the Chief, Aerial Reconnaissance

Coordination, All Hurricanes (CARCAH). This relay may only be used to preclude an emergency or safety-related situation.

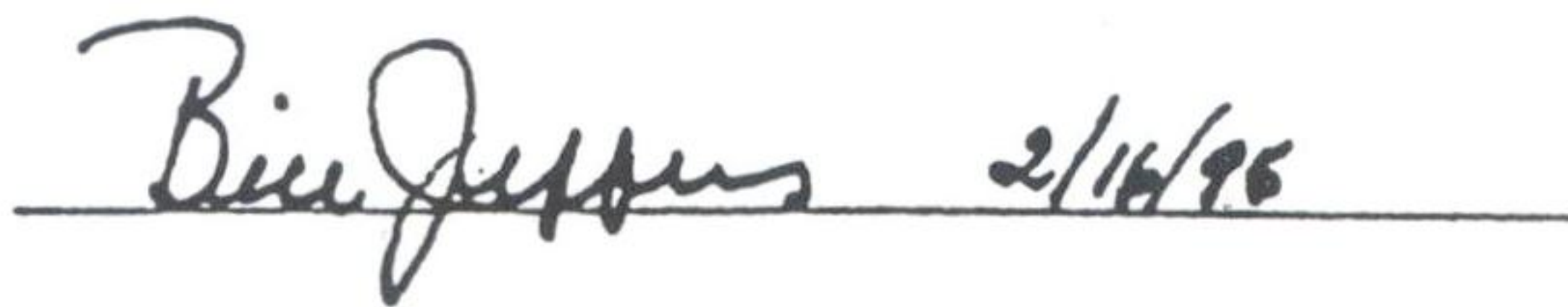
i. ATC may request that CARCAH relay information to/from a mission aircraft when other methods of communications are not possible.



United States Air Force Reserve  
Director of Operations



National Oceanic & Atmospheric Administration  
Director, NOAA Corps Operations



Federal Aviation Administration  
Director of Air Traffic



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS 403d AIRLIFT WING (AFRES)  
KEESLER AIR FORCE BASE MISSISSIPPI 39534-5000

LETTER OF AGREEMENT

1. PURPOSE: This Letter of Agreement (LOA) establishes procedures whereby 815th Weather Squadron (815WS) and/or National Oceanic and Atmospheric Administration (NOAA) aircraft can operate within the same general airspace while conducting weather reconnaissance or weather research in a real or suspected tropical disturbance.

2. DEFINITIONS (for purposes of this LOA):

a. WEATHER RECONNAISSANCE and WEATHER RESEARCH will be considered synonymous terms during missions for the purpose of entering airspace defined below as an AREA OF INTEREST.

b. PARTICIPATING AIRCRAFT - those aircraft which operate under the parameters established by the National Hurricane Operations Plan (NHOP). NOAA aircraft will use the callsign "NOAA" such as "NOAA 42" and 815WS aircraft will use the callsign "TEAL" such as "TEAL 14."

c. CONTROLLING AGENCY - Air Traffic Control (ATC) facility issuing clearances to participating aircraft.

d. CARCAH - Chief, Aerial Reconnaissance Coordination, All Hurricanes.

e. AREA OF INTEREST - An area defined by latitude and longitude coordinates as a center point to include all airspace within a 250 nautical mile radius around that point and extending from the surface to 24,000 feet (AGL). Center coordinates are published by CARCAH in the TROPICAL CYCLONE PLAN OF THE DAY (TCPOD), item "E".

f. ALTITUDE CONFLICT - A flight condition during which participating aircraft operate within an AREA OF INTEREST within 2,000 feet (vertical separation) of each other.

g. QUADRANT OF OPERATIONS - Geographic area within the AREA OF INTEREST defined as Northeast, Southeast, Southwest or Northwest from the center coordinates. One-fourth of the AREA OF INTEREST.

3. RESPONSIBILITIES AND PROCEDURES:

a. The 815WS and/or NOAA will be tasked to fly a particular mission by CARCAH, or if not tasked, will advise CARCAH of intent to operate within the AREA OF INTEREST. Such advice should be given CARCAH at least twelve (12) hours before intended take-off and in no case less than three (3) hours before intended takeoff. Such advice shall include number of aircraft scheduled to fly, callsigns, scheduled takeoff times, estimated arrival time in the AREA OF INTEREST, altitudes to be flown, and estimated departure time from the AREA.

b. CARCAH will determine if a potential ALTITUDE CONFLICT exists and will advise the 815 WS and NOAA Operations centers and any airborne PARTICIPATING AIRCRAFT of the altitudes to be flown. PARTICIPATING AIRCRAFT will comply with the provisions of paragraphs 3d and 3e of this LOA to insure safe altitude separation.

c. CARCAH will advise the 815WS and NOAA operations centers whenever more than one PARTICIPATING AIRCRAFT will be in the AREA OF INTEREST at one time. Respective operations centers will advise the affected air crews. If notification by CARCAH occurs less than one hour before takeoff, CARCAH will advise the affected crew(s) by any means available.

d. PARTICIPATING AIRCRAFT crews will comply with the NHOP Chapter 5, AIRCRAFT RECONNAISSANCE. When advised that another PARTICIPATING AIRCRAFT will be operating within the same AREA OF INTEREST, crews will follow procedures in paragraph 5.9.3, AIR-TO-AIR COMMUNICATIONS.

e. PARTICIPATING AIRCRAFT crews will set 29.92 (inches hg) in at least one pressure altimeter. When contact is made with other PARTICIPATING AIRCRAFT, crews will confirm other aircraft's pressure altitude and geographic position as well as planned QUADRANT OF OPERATIONS and true heading. Crews will not deviate from the briefed QUADRANT and will not fly within 2,000 feet (vertical) of other participants without the concurrence of other PARTICIPATING AIRCRAFT.

f. PARTICIPATING AIRCRAFT experiencing loss of all radio communications will follow standard "LOST COMM" procedures.

4. EFFECTIVE AND TERMINATION DATES: This LOA is effective at 2359 (ZULU) on the date signed by the last approving official and will remain in effect until terminated in writing by either party. Changes to this LOA must be agreed to in writing by both parties.

FOR THE 403d AIRLIFT WING

  
JOE L. CAMPBELL, Brig Gen, USAFR  
Commander

Date 29 Jul 93

FOR THE NATIONAL OCEANIC AND  
ATMOSPHERIC ADMINISTRATION,  
AIRCRAFT OPERATIONS CENTER

  
F.D. MORAN, RADM, NOAA  
Director

Date 3 Aug 93

1 Atch  
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