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DEPARTMENT OF COMMERCE National Oceanic and Atmospheric Administration

FEDERAL COORDINATOR FOR
METEOROLOGICAL SERVICES
AND SUPPORTING RESEARCH



**National East Coast Winter
Storms Operations Plan**

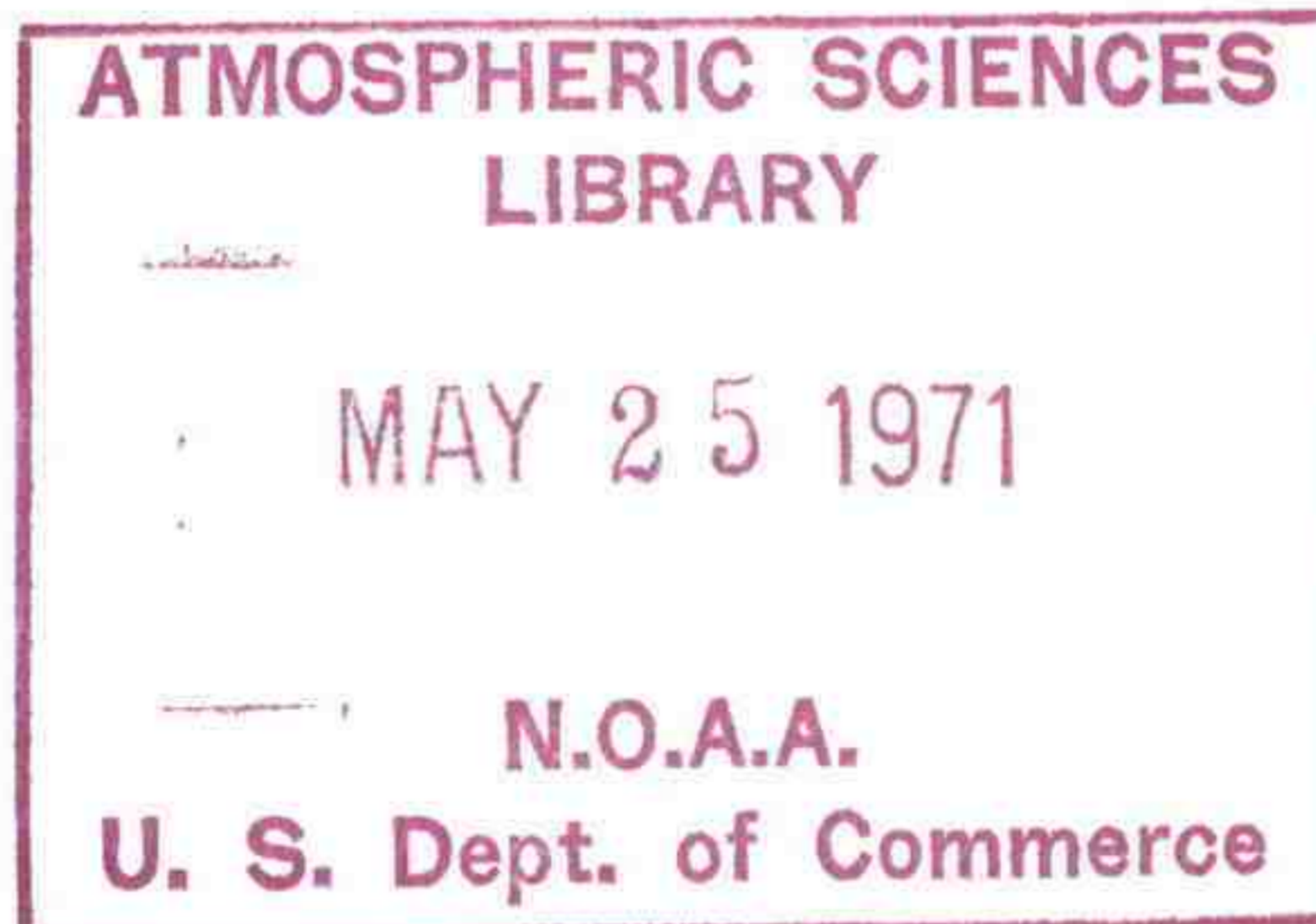
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Washington, D.C.
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NATIONAL EAST COAST WINTER STORMS
OPERATIONS PLAN



Washington, D. C.
November, 1970

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NATIONAL EAST COAST WINTER STORMS

OPERATIONS PLAN

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FOREWORD

In a memorandum dated October 23, 1969, the Chairman, Interdepartmental Committee for Meteorological Services (ICMS), established an Ad Hoc Group to function under the purview of the Subcommittee on Basic Meteorological Services (SC/BMS). The task of the Group was to develop an Operations Plan designed to furnish weather observations for use in predicting and providing adequate and timely warnings of severe and crippling winter storms along the east coast of the United States. This Plan was to consider use of surface platforms, aircraft, and satellites. Arrangements, if practical, were to be made to meet the data requirements of research facilities.

The following National East Coast Winter Storms Operations Plan was developed to meet this request.

ACKNOWLEDGMENTS

The Ad Hoc Group of the Subcommittee on Basic Meteorological Services gratefully appreciates the time and effort of the following member agencies in the development of this Plan.

Department of Commerce:

National Oceanic and Atmospheric Administration

National Weather Service
National Environmental Satellite Service
Research Laboratories, Research Flight Facility

Department of Defense:

Deputy Director for Operations, Joint Chiefs of Staff
(Environmental Services)
U.S. Air Force
U.S. Navy

Department of Transportation:

Federal Aviation Administration
U.S. Coast Guard

RESPONSIBILITIES OF COOPERATING AGENCIES1. The National Weather Service. It shall provide:

a. Basic surface, upper air, and radar observations from its network of stations making such observations.

b. Basic analyses and forecast charts through the National Meteorological Center (NMC), Suitland, Md.

c. Special Winter Weather Bulletins (or Marine Bulletins) to the general public and to all concerned interests through the Warning Coordination Centers (WCCI) at Washington, D.C., Boston, Mass., and Miami, Fla.

d. Statements on local warnings through Weather Service Forecast Offices (WSFO) and local Weather Service Offices (WSO) along the eastern seaboard.

e. Advice on aircraft reconnaissance requirements forwarded through the National Hurricane Center (NHC) to the Chief, Aerial Reconnaissance Coordination, Atlantic Hurricanes (CARCAH), from the experimental Regional Weather Center (RWC), New York, N.Y. -- the central coordinating office for this program.

f. Additional observations, when required, making available all reports to any requesting agency.

g. Personnel and any special meteorological equipment needed to observe and report various weather phenomena on the Ocean Weather Station HOTEL.

2. The National Environmental Satellite Service (NESS). It shall:

a. Operate satellite systems capable of providing coverage of the east coast of the United States during the winter storms season.

b. Coordinate with the National Aeronautics and Space Administration (NASA) to obtain pertinent meteorological data from NASA research and development experimental satellites.

c. Receive and respond to requirements for coverage of specific areas and times from the NMC, Suitland; RWC New York; and the WCCs at Washington, Boston, and Miami.

d. Be available for conferences with personnel of the NMC and other WSFOs either in person or by telephone.

CHAPTER I

e. Provide data in the form of pictures for selected situations to authorized research facilities.

3. The Environmental Research Laboratories' Research Flight Facility (RFF). It shall:

a. Furnish aircraft to support the reconnaissance and research objectives of the National East Coast Winter Storms program.

(1) Primary Objective is to participate and provide additional real-time meteorological data to operational forecasters in an attempt to improve the quality of forecasts associated with winter coastal storms.

(2) Secondary Objective is to provide data that will permit analyses and a better understanding of the structure and dynamics of these winter storm systems.

4. The Department of Defense (DOD). It shall:

a. Furnish to the National Weather Service such aircraft reconnaissance observations and other special observations detailed in Chapter 4 of this Plan that are within its capabilities and are in accord with established reconnaissance priorities.

b. Designate the CARCAH as the primary point of contact for coordination with the RWC New York for aircraft reconnaissance required in support of this Plan.

c. Provide warnings to all DOD facilities and military units of weather factors which threaten to inhibit their operations or to damage their installations.

5. The Federal Aviation Administration (FAA). It shall provide for:

a. Air traffic control, communication, and flight assistance services as appropriate in support of this Plan.

b. Dissemination of Pilot Reports (PIREPS).

c. Flight Service Station (FSS) and Tower surface observations.

6. The U.S. Coast Guard. It shall:

a. Interrogate surface ships of opportunity for special weather observations through the Automated Merchant Vessel Reporting (AMVER) system, as requested by the National Weather Service.

b. Relay to the WSOs marine meteorological data as received through the AMVER system from Coast Guard ships and stations or from other government and commercial reporting stations, including both routine and special observations.

c. Disseminate warnings, watches, and forecasts to marine interests.

d. Furnish regular and special surface weather observations taken by Coast Guard land stations.

e. Provide oceanographic and meteorological surface data obtained from the Offshore Buoy Deployment (XERB-1).

f. Operate the vessels and relay all observations taken by National Weather Service personnel aboard en route Coast Guard Ocean Station Vessels (OSV) and the Ocean Weather Station HOTEL in the vicinity of latitude 38°N. and longitude 71°W.

CHAPTER 2

DEFINITIONS

The following definitions will apply for the purposes of this Plan and its appendices:

1. EAST COAST WINTER STORMS SEASON: The portion of the year having a relatively high incidence of winter storms along the east coast will be regarded as the period from November 1 to March 31.
2. EAST COAST AREA: The geographic area of concern will range from latitudes 30°N. to 48°N., west of longitude 65°W., and will extend about 150 miles inland along the eastern coast of the United States (fig. 2-1).
3. BLIZZARD WARNING: The term will be used to indicate that the following conditions are expected to prevail for an extended period (for 3 hours or or longer):
 - a. Wind speeds of 35 miles an hour or more.
 - b. Considerable falling and/or blowing snow,
 - c. Temperature of 20°F or lower.

The term "severe" will be used to indicate the following:

- a. Wind speeds of 45 miles an hour or more.
 - b. Great density of falling and/or blowing snow.
 - c. Temperatures of 10° F or lower.
4. HEAVY SNOW WARNING: The term will generally be used to mean:
 - a. A fall of 4 inches or more is expected to occur in 12 hours, or
 - b. A fall of 6 inches or more is expected to occur in 24 hours.
 5. ICE STORM OR FREEZING RAIN (OR DRIZZLE) WARNING: The terms will be used to describe the freezing of rain or drizzle on objects as it strikes them. When this condition occurs for a period of time, it results in a coating of ice on such objects as the ground, streets, trees, buildings, and wires. The qualifying term "heavy" will be used to indicate an ice storm of exceptional severity when a great deal of damage is expected from falling trees, wires, etc.
 6. HIGH WIND WARNING: Warnings will be issued along the coast whenever wind speeds of 39 miles an hour or more are forecast or are presently occurring. The expected speed in miles an hour shall be specified.

7. STORM TIDE WARNING. The term will be used to indicate that tidal flooding is expected along the coastal area. The tidal departure in feet above normal, as well as the expected degree of flooding, wave or surf battering, and significant beach erosion will be included in the forecasts.
8. GALE WARNING: The term will be used in marine warnings to indicate that winds within the range of 39 to 54 miles an hour (34 to 47 knots) are forecast or are occurring.
9. STORM WARNINGS: The term will be used in marine warnings to indicate that winds 55 miles an hour (48 knots) and above are forecast or are occurring.
10. THREAT SITUATION: The term will be used to indicate the atmospheric circulation and temperature patterns which precede by 6 to 24 hours the development of east coast winter storms.
11. STORM SITUATION: The term will be used to indicate the atmospheric circulation pattern associated with significant weather, such as heavy precipitation (snow or rain), strong winds, or high tides which are affecting, or are expected to affect within the next 6 hours, the east coast area.

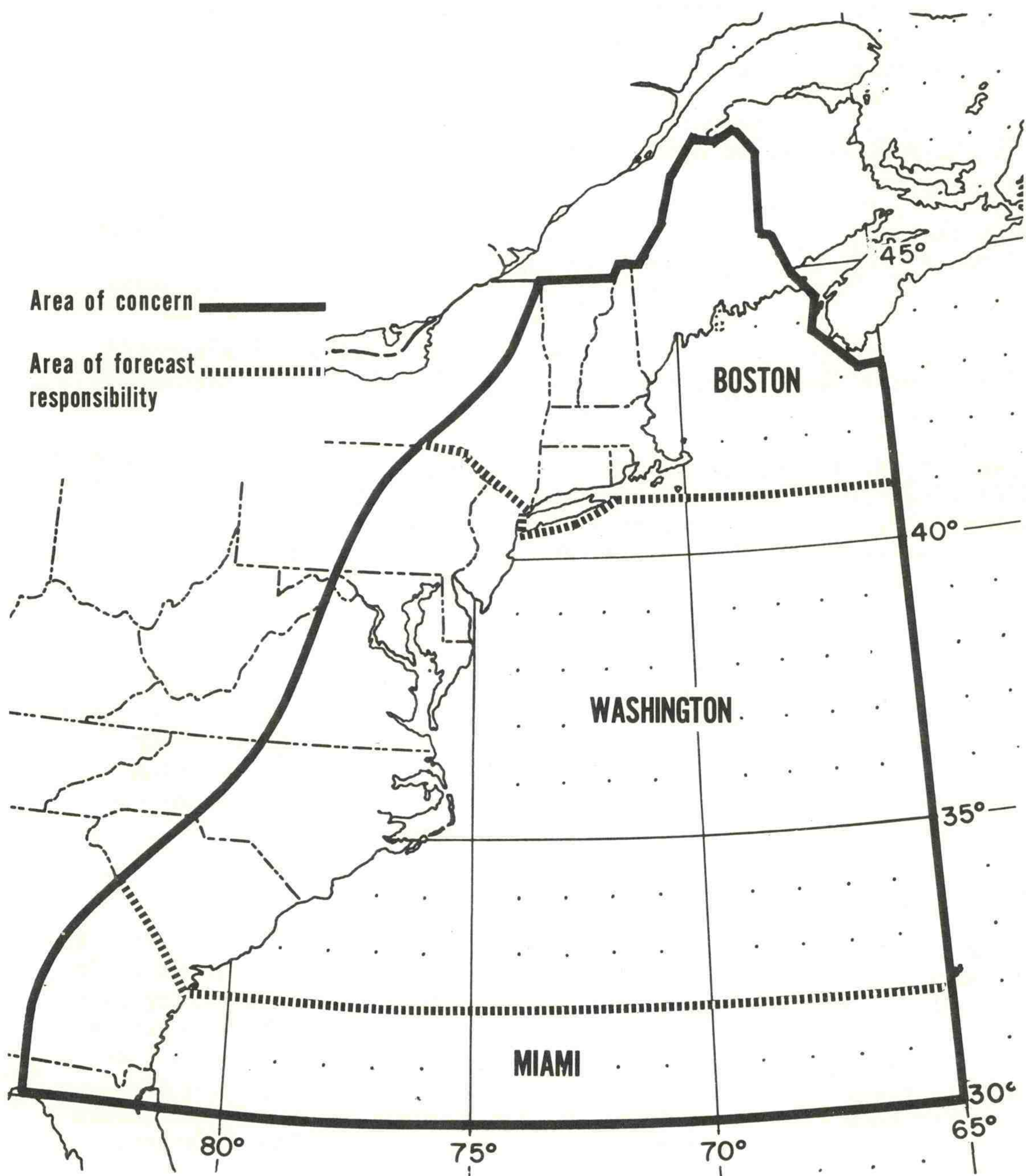


FIGURE 2-1. EAST COAST WINTER STORMS AREA OF CONCERN

FORECAST AND WARNINGS1. National Weather Service.a. Warning Responsibilities.

(1) National Meteorological Center (NMC). The NMC is the central data processing center responsible for the issuance of prognostic charts, discussions, and other material which may be helpful in calling the attention of the WSFOs to situations which require issuance of warnings. The NMC issues heavy snow guidance and probability forecasts on the National Weather Facsimile Network. The depiction is an outline of the area expected to receive heavy snow (4 or more inches in the specified 12-hour periods).

(2) Warning Coordination Center (WCC). Each WCC has the responsibility for issuance of Special Weather Bulletins for the entire storm if the storm center is located in the WCC area shown in figure 2-1. Each Center will coordinate the warnings issued by the WSFOs within its area of responsibility and will provide guidance to these offices as needed.

(3) Weather Service Forecast Office (WSFO) and Weather Service Office (WSO). The WSFO issues and disseminates to the public forecasts and statements of winter weather watches or warnings for its area of responsibility. The WSO assists in the dissemination and includes warnings in local forecasts and statements. Each WSFO should use the guidance material from the NMC in making warning decisions and should coordinate with the RWC and the WCC before issuance. Other WSOs should follow the warning issued by the WSFO in their area of responsibility.

b. Winter Weather Releases.

(1) Special Weather Bulletins. Special Weather Bulletins will be prepared and released to the press, radio, and television by the WCC. The decision to issue a Bulletin will depend not only on the probability that the expected conditions will occur, but also on their potential severity. Such Bulletins serve to alert the general public and all interests concerned to the possibilities of severe weather occurrence, to warn of severe conditions which are imminent or have already begun, and to inform all concerned of the storm's extent, intensity, and probable duration.

(a) Watch. This alert places the public on guard to the possibility of severe weather conditions and is used in the same context as in the Hurricane and Severe Local Storms Warning Services. The storm can be forecast to develop or can be a well-developed storm with uncertainty as to the timing, track, intensity, and associated weather.

(b) Warning. This alert warns of severe weather conditions, as defined and listed in Chapter 2, which are imminent or have already begun.

CHAPTER 3

(2) Special Weather Statements (Local Warnings). Special releases issued by the WSFOs or WSOs are labeled "Statements" to distinguish them from the overall Special Weather Bulletins. Such Statements will normally be considered as a supplement to the Bulletins and will usually be issued immediately following the Bulletin. Frequent local Statements at 2- or 3-hour intervals are important in providing an effective service to the public during severe warning situations, even at times when there is little new to report except the latest actual weather conditions. In a case where a warning situation is of a local nature, Statements will be issued even though no Special Weather Bulletin has been released. The contents of Statements will normally include the items listed under Bulletins in a more localized and specific manner.

(3) State, Zone, or Local Forecasts. The word "warning" and the type of warning will be highlighted in a separate line immediately preceding the normal text.

(4) Time and Circumstances of Issue of Bulletins.

(a) Scheduled Bulletins. The first Bulletin will be released as soon as warranted and subsequent routine Bulletins near 0500, 1100, 1700, and 2300 Greenwich Mean Time (GMT).

(b) Special Bulletins. Scheduled Bulletins will be supplemented by Special Bulletins whenever any significant change in severity, type of weather, direction, or speed of movement is indicated.

(5) Content of Bulletin.

(a) Heading on Message.

1 Special Weather Bulletin.

2 Number of Bulletin (Separate series for each storm system).

3 Issuing office.

4 Time, day of the week, and date.

(b) Body of Message.

- 1 Type of Watch or Warning.
- 2 Storm intensity and timing.
- 3 Area to be affected.
- 4 Movement of storm.
- 5 Current weather associated with storm.
- 6 Time of issuance and office to issue next Bulletin.
- 7 Forecaster's name and office.

c. Backup Plan. If the WCC Washington is incapacitated because of a communication failure or other cause, the WCC Boston will take over all WCC warning responsibilities with respect to this Plan. If RWC New York is incapacitated with respect to its reconnaissance coordination responsibilities, the WCC Washington will take over this responsibility.

2. U.S. Navy Warning Responsibility.

The U.S. Navy, through the Naval Weather Service Command, is responsible for issuance of gale, storm, and high seas warnings for fleet operations and Navy shore installations within the east coast area.

3. U.S. Air Force Warning Responsibility.

The U.S. Air Force, through the Air Force Global Weather Central, Offutt Air Force Base (AFB), Nebr., is responsible for the issuance of military weather warning advisories and point warnings to all Air Force and Army (including Reserve and National Guard) installations, facilities, and operations on those hazardous phenomena related to east coast storms.

CHAPTER 4

AIRCRAFT RECONNAISSANCE

1. Responsibility.

a. U.S. Navy.

(1) In support of Naval requirements, the Navy will fly meteorological and oceanographic reconnaissance flights, up to three a week, through the area of concern. These flights are subject to diversion, with supplementary flights flown in response to additional storm threats. Information on scheduled Navy oceanographic reconnaissance flights through the area of concern will be reported to CARCAH in time for inclusion in the POD. Requests by RWC for diversion of these flights or supplementary flights for specific storms or storm threats will be made through CARCAH.

(2) Navy flights will normally be conducted at low levels (1500 feet or below) to facilitate oceanographic data collection and to allow observation of surface meteorological conditions.

b. U.S. Air Force. Two Air Weather Service (AWS) WC-130 sorties will normally be available from an east coast location each day to provide synoptic data over the Atlantic Ocean and Gulf of Mexico. During the threat or storm situation, these sorties can be diverted to selected storm reconnaissance tracks. All Air Force AWS sorties will be assigned through Plan of the Day (POD) issued by the Chief, Aerial Reconnaissance Coordination, Atlantic Hurricanes (CARCAH).

c. Research Flight Facility.

(1) The RFF aircraft flights will be available on request for a "storm," "threat" situations, or storms of research interest (as specified in paragraph 3.d.(3) of this Chapter) through a negotiated agreement between the National Weather Service and the Environmental Research Laboratories.

(2) The RFF aircraft will be used as available as backup for DOD aircraft reconnaissance.

2. Operational Control of Aircraft. Operational control of reconnaissance aircraft will be exercised by the agency to which the aircraft is assigned.

3. Reconnaissance Planning and Flight Notification.

a. Requirements. The RWC New York will coordinate reconnaissance requirements with NMC and will forward aircraft reconnaissance needs to CARCAH for tasking within responsibilities stated above in the POD. Requirements for the following day will be provided CARCAH by 1830 GMT daily. (Amendments will be passed as required.)

(1) Changes to the POD will be accepted up to 4 hours before the scheduled aircraft departure provided:

(a) Track changes are limited to substitution of one track or pattern for another.

(b) Departure delay plus the sortie flight plan time does not exceed 14 hours.

(c) Early departures are not requested.

(2) On rare occasions, the RWC may place a requirement on CARCAH for a reconnaissance flight into a rapidly developing storm 4 hours before the departure time. Fulfillment of this unforeseen requirement will of necessity be subject to availability of DOD or RFF resources for tasking or diversion at the time required.

(3) The DOD will supply reconnaissance aircraft in support of this program beyond the March 31 date provided sufficient notification time is given to DOD. Sufficient time is defined as being between 15 and 30 days depending on aircraft maintenance status at the time.

b. Flight Levels. Personnel filing flight plans will specify an altitude or flight level to be flown. Any change in a cruising altitude or flight level during the flight in controlled air space will require approval by the appropriate FAA Air Route Traffic Control Center (ARTCC).

c. Dropsondes. Dropsonde releases will be coordinated with the appropriate ARTCC at least 10 minutes before drop time.

d. Flight Planning.

(1) General Storm Tracks.

(a) Storm situation reconnaissance tracks and altitudes to be flown by DOD or RFF aircraft are indicated in Appendix 4-A. Air Force tracks Gull DELTA and Gull GOLF shown in Appendix 4-B will also be flown during a storm situation.

(b) The Gull JULIET track will be flown by the Air Force in support of a threat situation.

(c) Daily synoptic reconnaissance tracks Gull BRAVO and Gull NAN will be flown by the Air Force.

CHAPTER 4

(2) Air Force.

(a) Preplanned Air Force tracks and altitude in the east coast area are indicated in Appendix 4-B.

(b) RWC New York will provide CARCAH with the following data:

1. On storm situations requiring flight patterns 1A-1D or 2A-2D.

a. Flight pattern desired (1A-1D or 2A-2D).

b. Control point forecast position in coordinates: (point #3 on pattern 1A-1D or 2A-2D).

c. Control point time: Time aircraft desired on station over control point (Forecast Position).

d. Forecast movement of control point: degrees and knots.

e. Requirements for succeeding day.

2. On standard synoptic named Gull tracks.

a. Track desired.

b. Take off Time, if different from normal scheduled time.

c. Requirements for succeeding day.

(c) CARCAH will provide the following Plan of the Day information: (Appendix 4-F).

1. Aircraft Call Sign: (for example: Air Force Gull Bravo, etc., for standard tracks; Air Force Gull No. # Storm, for pattern missions).

2. Take off time: for pattern missions.

3. Departure point.

4. Destination.

5. Negative Plans of the Day will be disseminated.

(3) Navy.

(a) The track to be flown by Navy aircraft will approximate one of those indicated in Appendix 4-C and will be determined by Navy requirements. Navy flights will normally be made on Mondays, Wednesdays, and Fridays, with the initial departure point on Monday and final arrival point on Friday at the Naval Air Station (NAS) Jacksonville, Fla. Intermediate staging fields include: NAS Norfolk, Va., Naval Air Facility (NAF) Andrews, Md., NAS Quonset Point, R.I., and NAS Bermuda.

(b) Notification of specific Navy flight tracks will be made by priority flight advisory message from Weather Reconnaissance Squadron 4 (VW-4), Jacksonville, by 1200 local time on the day preceding the flight. National Weather Service Communications (WBC) Washington and CARCAH will be included in the distribution of these messages.

(c) Direct discussion on weather situations between Navy and the RWC is encouraged with respect to a storm or threat situation. Navy point of contact is the FWC Norfolk Forecast Duty Officer and the optimum time is between 1100 and 1130 local time. Any tasking by RWC resulting from these discussions will be through CARCAH.

(4) Research Flight Facility.

(a) Meteorological situations selected for RFF aircraft monitoring will be investigated while the storms are in the vicinity of preselected routes. In the event that these routes do not provide the desired data, the RFF will provide the National Weather Service Controller, RWC New York, the additional capability of requesting en route pattern changes (within the endurance capability of the aircraft and airspace restrictions).

(b) Coordination of pattern changes will be directed to the senior meteorologist on the RFF aircraft from the flight mission monitor designated by RWC New York.

(c) Requests for RFF aircraft will originate with the RWC New York after coordination with NMC and will normally be transmitted to CARCAH, Coral Gables, Fla. These requests will be included in the POD. In the event that a "short-notice" requirement for reconnaissance is made after the POD has already been published, the RFF may be contacted directly by the RWC. In this event, RFF will coordinate the mission requirements and notify CARCAH of its intentions to fly; RFF will also furnish CARCAH enough information to amend the POD.

(d) The RFF plans to conduct its missions primarily from Miami. It will accomplish this task by remaining on an alert or standby status during the period agreed to by National Weather Service and Environmental Research Laboratories. After the completion of a given mission, however, RFF may be requested to recover at an advanced staging base. It will remain there for a period of a few days if the RFF expects to have a mission requirement from that area within the specified time period.

CHAPTER 4

(e) During standby status (in Miami), RFF will establish a daily conference call procedure with RWC New York for planning purposes, for preparing operations that may be required late the same day or early the next day, and for handling emergency requests in the event that RFF is required to serve as backup for the DOD.

(f) Besides these backup or emergency requests, the RFF may be called upon for entry into "threat" situations and for flights into those storms that are of interest for research purposes only.

(g) Minimum leadtime notification: A 24-hour notice is desirable for most missions, but not necessary. Minimum practical limitations require at least 4- to 6-hours notification. All flights are to be conducted within RFF's Standing Operating Procedures (SOP) which specify minimum turn around (15 hours) and maximum crew duty times (16 hours per day).

(5) Plan of the Day (POD). Utilizing requirements stated by RWC New York and the planned flights reported by the Navy, the CARCAH will prepare the POD daily throughout the season in coordination with Navy, Air Force, and RFF to effect maximum useful data from available resources.

(a) Coordination contacts are:

1. CARCAH, FTS 305-350-5547 or commercial 305-666-3912.
2. USAF 53rd Weather Reconnaissance Squadron, Task Force Alfa, Patrick AFB, Fla. Call through base operator Autovon 305-854-1110 or commercial 305-494-113.
3. USN FLEWEACEN, Norfolk, Autovon 690-7750 (or 2436) or commercial 703-244-7750 (or 2436).
4. RFF (Miami International Airport), FTS 305-350-4139 (or 4130) or commercial 305-887-9591 (or 9592).
5. RWC New York, FTS 212-971-5627 (or 7556).
6. WCC Miami, FTS 305-350-5547 or commercial 305-284-4253.
WCC Washington, FTS 301-440-7291 or commercial 301-736-7727.
WCC Boston, FTS 617-223-3110 or commercial 617-567-1718.
7. USAF 9th Weather Reconnaissance Wing Command Post, McClellan AFB, California, Autovon 633-5040 (5041, 5045), or Area Code 916-643-5040 (5041, 5045).

(b) Tracks.

1. Initial Air Force and RFF track selection will be made at the discretion of RWC New York after coordination with NMC to provide maximum essential data based on the existing and anticipated meteorological situations.

2. Changes to standard winter storms reconnaissance tracks within controlled airspace must be passed to FAA ARTCCs at San Juan, P.R., Miami, Jacksonville, Washington, New York, and Boston, allowing at least 30 days time before implementation of the changes.

3. Within operational limitations and with prior approval of FAA, airborne diversions deemed advisable by the aircraft meteorological officer may be made from these tracks to investigate storms.

(c) Format. The POD format to be followed is indicated in Appendix 4-F.

(d) Dissemination. The CARCAH will disseminate the POD to WCC's and RWC New York (over circuit 7072) and to FAA, RFF, Navy, Eastern Sea Frontier, Air Force, and other appropriate addressees by 2000 GMT on the day preceding the planned missions. Amendments will be disseminated as required.

4. Data Requirements.

a. Data requirements are defined in Table 4-1. Pending full satisfaction of the requirements, National Weather Service desires to obtain all information possible with existing resources.

b. Navy aircraft will transmit weather reconnaissance reports in standard reconnaissance format (Appendix 4-D) at least hourly, and at least 30 minutes on flights of threat or storm situation. Data logging system (DALIS) information may also be available upon request on 100 words per minute (WPM) RATT in the format as listed in appendix G to this chapter. Air Force and RFF aircraft will transmit weather reconnaissance reports, including wind and temperature at the midpoint, at least once every 30 minutes.

c. A dropsonde will be released approximately every 300 miles during flights at 500 mb or higher over water. Data will be coded and transmitted as detailed in Appendix 4-E.

5. RFF Research Data.

RFF research data include the following standard information: time, position, wind speed and direction, ambient temperature, ambient pressure, ambient vapor density, humidity, and visual observations, additional cloud physics data as required (and available), liquid-water content, total water content, icing detection, cloud construction, nuclei count, sea-surface temperature, radar data (3.2 cm cross-section presentation; 5.6 cm Plan - Position - Indicator (PPI); and 10.2 cm PPI radar data available), and special cloud photography (as required). Meteorological data are recorded digitally on magnetic tape in binary-coded decimal form at one complete sample per second; radar and cloud photography are provided as required by the researcher. Dropsonde data are also normally available as required.

CHAPTER 4

6. Communication Procedures.

a. Navy communications procedures are contained in Appendix 6-B of this Plan.

b. Air Force communications procedures are contained in Appendix 6-A of this Plan.

c. RFF communications procedures are contained in Appendix 6-C of this Plan.

d. RWC communications procedures with DOD aircraft are contained in Appendix 6-D of this Plan.

TABLE 4-1. REQUIREMENT FOR AIRCRAFT RECONNAISSANCE DATA

Data required	Altitudes at which data are required	Areal portion of cyclone or environment in which data are needed	Time and frequency of observations	Accuracy required
Location of center.	850-mb height or any lower level.	At center (by pressure, wind, or radar).	Every 6 hours at 0000Z, 0600Z, 1200Z, and 1800Z. Occasionally, upon request, every 3 hours for special situations.	10 n.mi.
Central pressure or height.	850-mb height and surface	At center.	Every 6 hours at 0000Z, 0600Z, 1200Z and 1800Z. Occasionally, upon request, every 3 hours for special situations.	+ 2 mb + 20 m
Storm data--winds, pressure (heights) temperature, moisture (dew point), clouds, and weather-- for forecasting storm movement, development, and associated weather.	500-mb and 850-mb heights supplemented by dropsondes from 500 mb.	At 500-mb, all quadrants at a radius of about 180 n.mi., and dropsondes about every hour. At 850 mb, southern, western, and northern quadrants at radius of about 120 n.mi., and also along two diameters of the storm oriented NE-SW and NW-SE.	Twice daily at 0000Z and 1200Z.	+ 5kt, + 10° (Dir) + 1°C + 20 m
Peripheral data for short-range forecasting and movement of storm.	500-mb and 850-mb heights with dropsondes.	Plan of the Day - Threat Tracks.	Twice daily at 0000Z and 1200Z during threat situations.	+ 5 kt, + 10° (Dir) + 1°C + 20 m

TABLE 4-1. REQUIREMENT FOR AIRCRAFT RECONNAISSANCE DATA (Cont'd)

Data required	Altitudes at which data are required	Areal portion of cyclone or environment in which data are needed	Time and frequency of observations	Accuracy required
Synoptic data-- pressure (heights), temperature, moisture, and winds--for national weather prediction and medium-range forecasting.	500-mb height with dropsondes.	Throughout the marine portion of east coast area as defined in Chapter 2.	Routinely; twice daily at 0000Z and 1200Z.	+ 5 kt, + 10° (Dir) + 1°C + 20m
Location and strength of radar echoes.	Any level.	All sectors.	When available.	+ 20 mi
Ocean wave heights and wave lengths.	Sea surface.	All quadrants.	Every 6 hours.	+ 10% (height) + 10 ft (length)

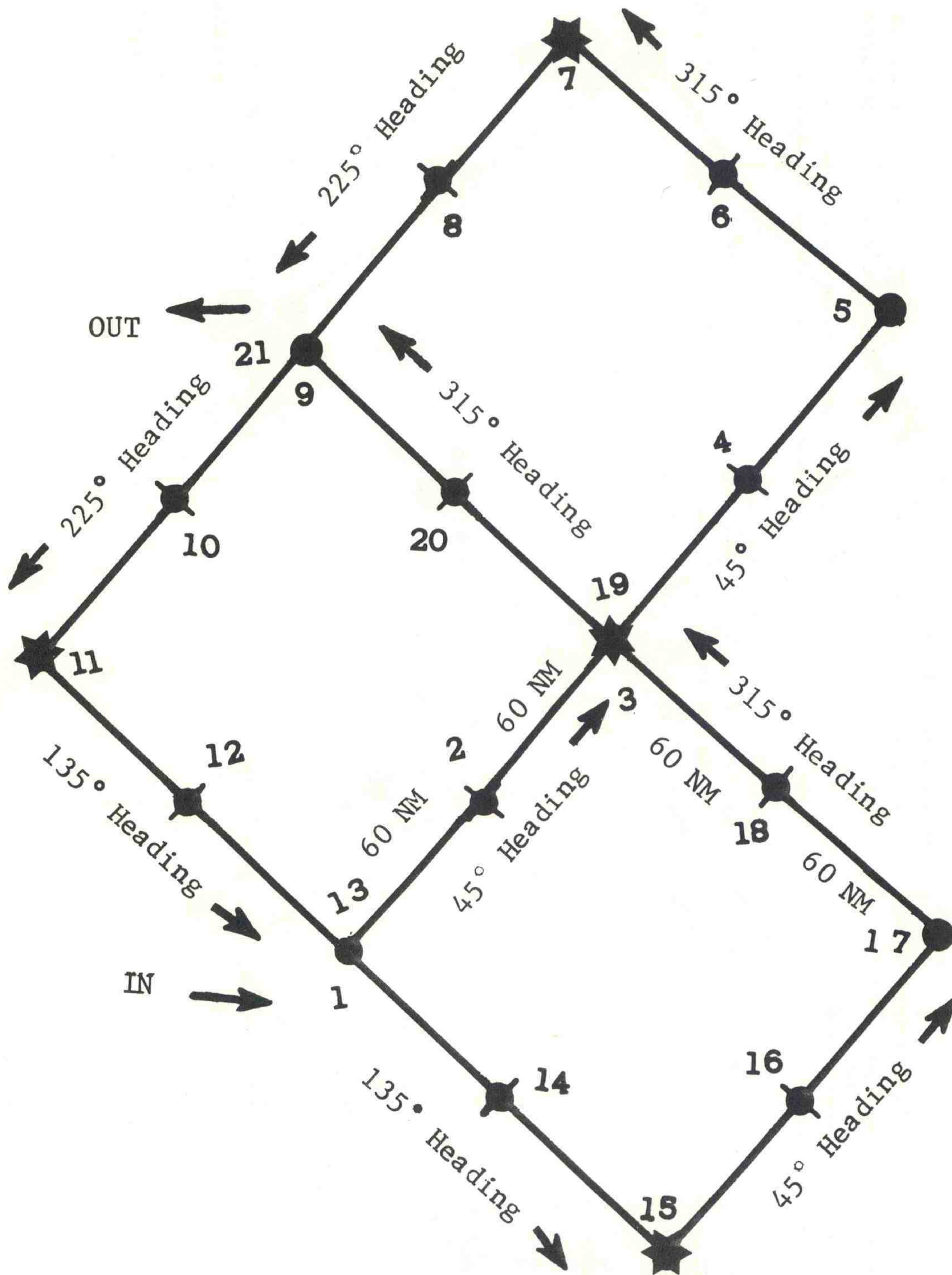


FIGURE 4A-1. STORM SITUATION RECONNAISSANCE TRACKS 1A-1D FOR STORM CENTERS SOUTH OF LATITUDE 35° NORTH

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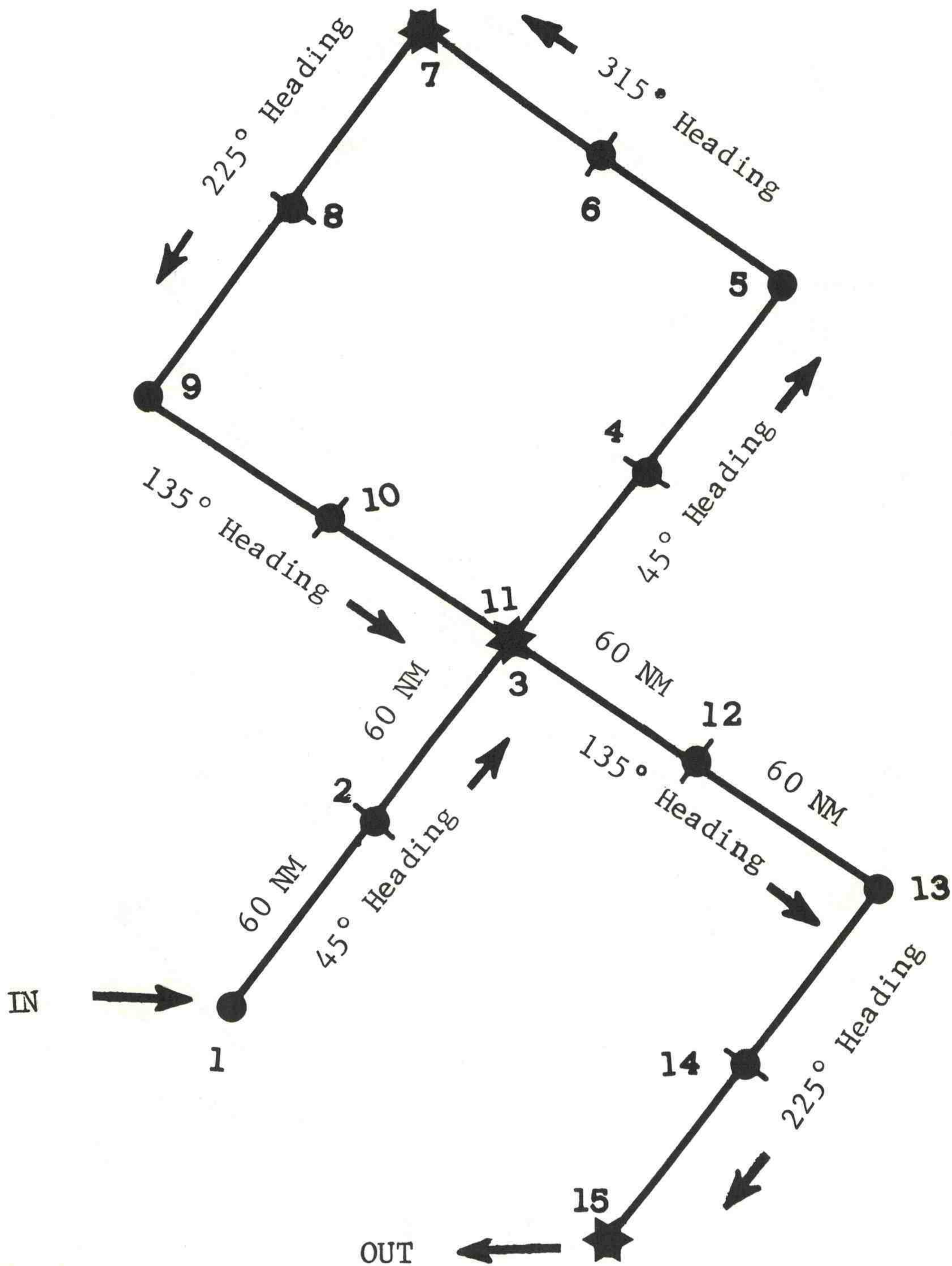


FIGURE 4A-2. STORM SITUATION RECONNAISSANCE TRACKS 2A-2D FOR STORM CENTERS NORTH OF LATITUDE 35° NORTH

LEGEND FOR FIGURES 4A-1 and 4A-2

Numbers indicate observation points in consecutive order. Point 1, the key position, will be given by the requesting agency. All other observation points are 60 n.mi. apart with headings from point-to-point as indicated. (Point 1 will always be 120 n.mi. southwest of expected position of storm center. Expected position of storm center will be at the observation Point 3.)

Figures 4A-1 and 4A-2

- Indicates complete observation to be taken. Dropsonde to be taken also if flight level is at or higher than 700 mb in Figure 4A-1 (Points 1, 5, 9, 13, 17, and 21) and in Figure 4A-2 (Points 1, 5, 9, and 13).
- ★ Indicates complete observation to be taken in Figure 4A-1 (Points 3, 7, 11, 15, and 19) and in Figure 4A-2 (Points 3, 7, 11 and 15).
- ⊙ Indicates abbreviated observation (winds and temperature only) to be taken in Figure 4A-1 (Points 2, 4, 6, 8, 10, 12, 14, 16, 18, and 20) and in Figure 4A-2 (Points 2, 4, 6, 8, 10, 12 and 14).

The proposed patterns for investigation of actual storms can be provided by AWS except as limited by air traffic control and warning areas through which flight approval cannot be obtained. The 1200 miles of pattern 1 and 840 miles of pattern 2 also mean the WC-130 will be limited to the following operating radius from the operating location for each pattern.

<u>Pattern</u>	<u>Flight Level</u>	<u>Operating Radius (Center of Storm)</u>
1A	1,500 ft.	650 n.mi.
1B	5,000 ft.	700 n.mi.
1C	10,000 ft.	775 n.mi.
1D	18,000 ft.	880 n.mi.
2A	1,500 ft.	890 n.mi.
2B	5,000 ft.	925 n.mi.
2C	10,000 ft.	975 n.mi.
2D	18,000 ft.	1010 n.mi.

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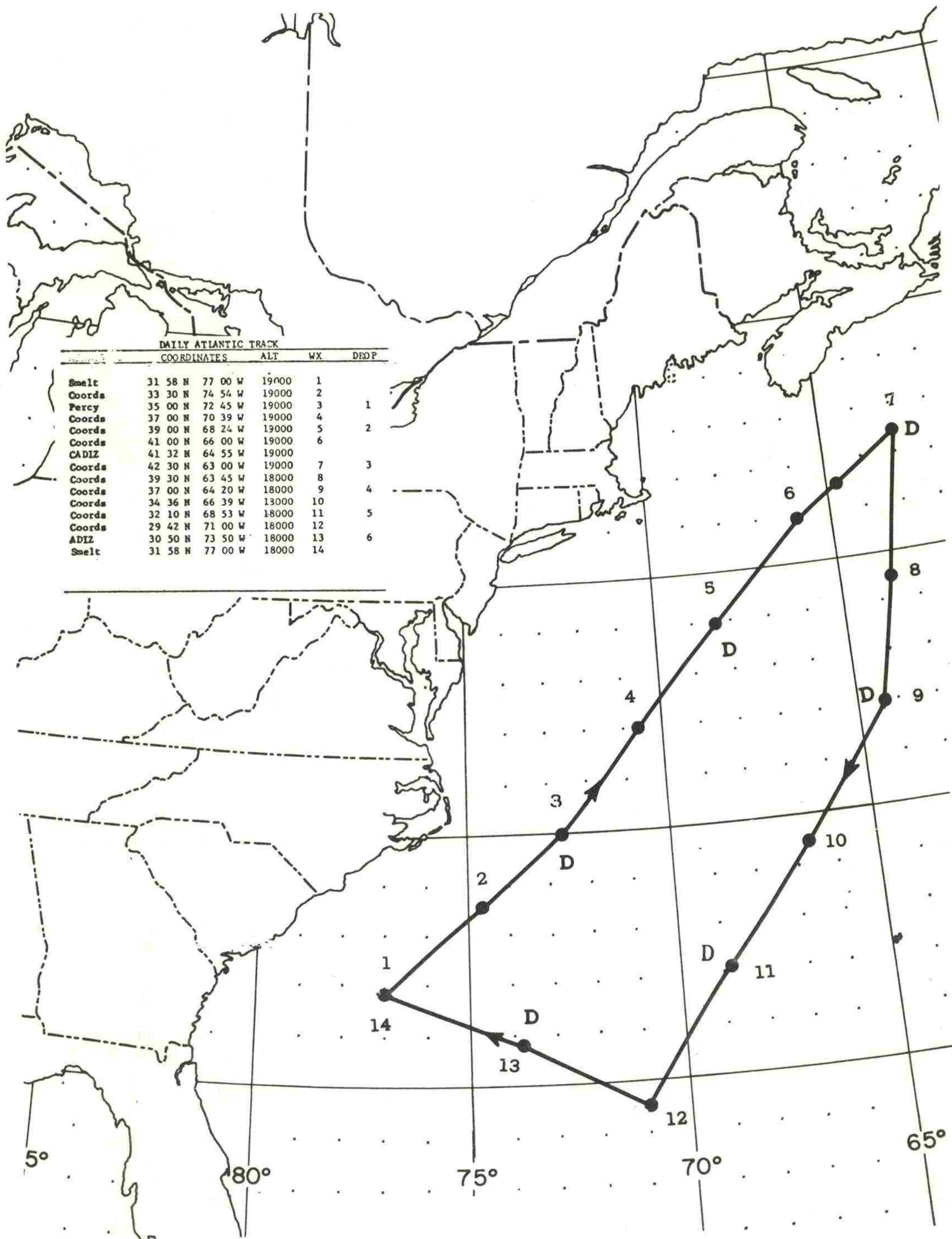


FIGURE 4B-1. AIR FORCE TRACK GULL BRAVO

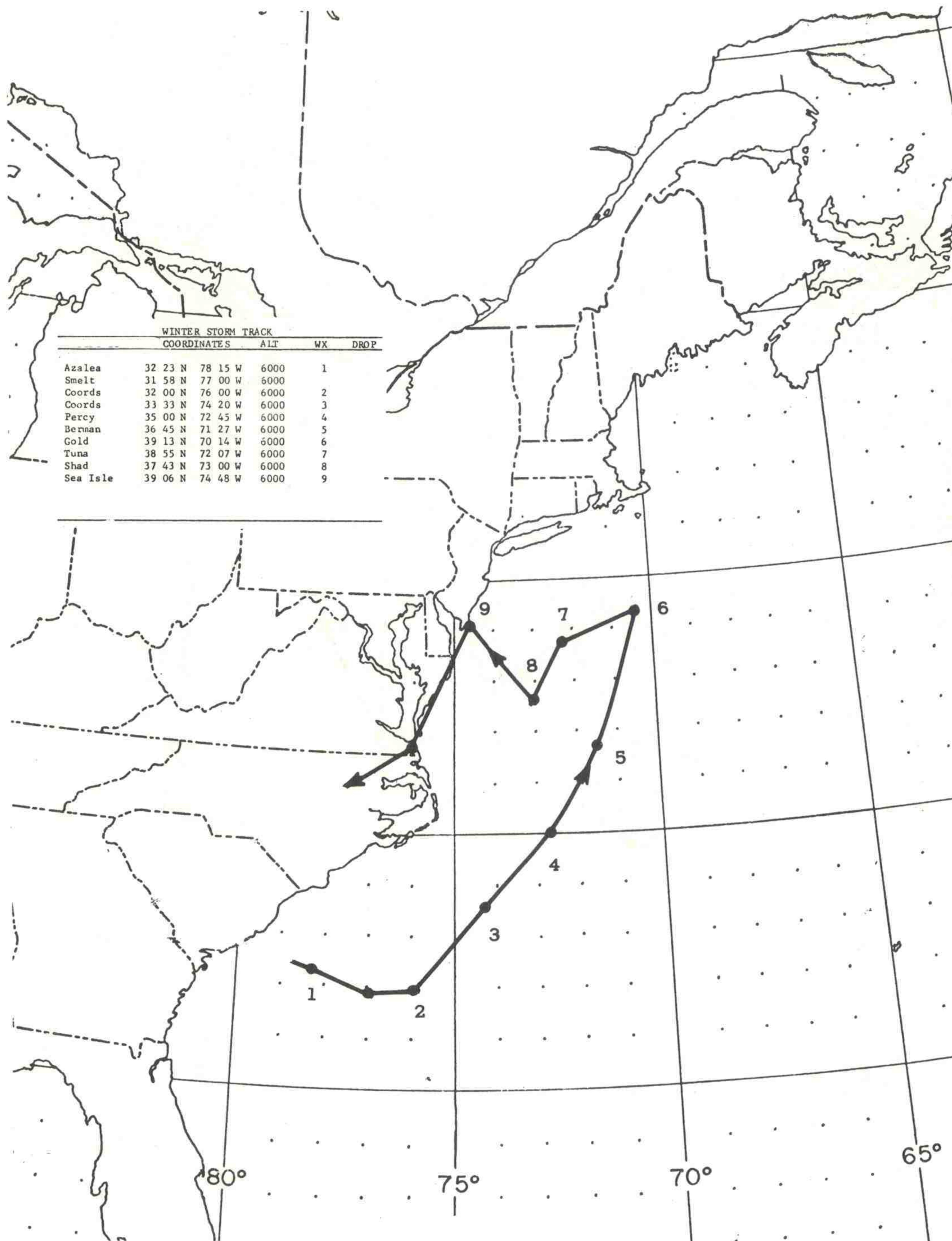


FIGURE 4B-2. AIR FORCE TRACK GULL DELTA

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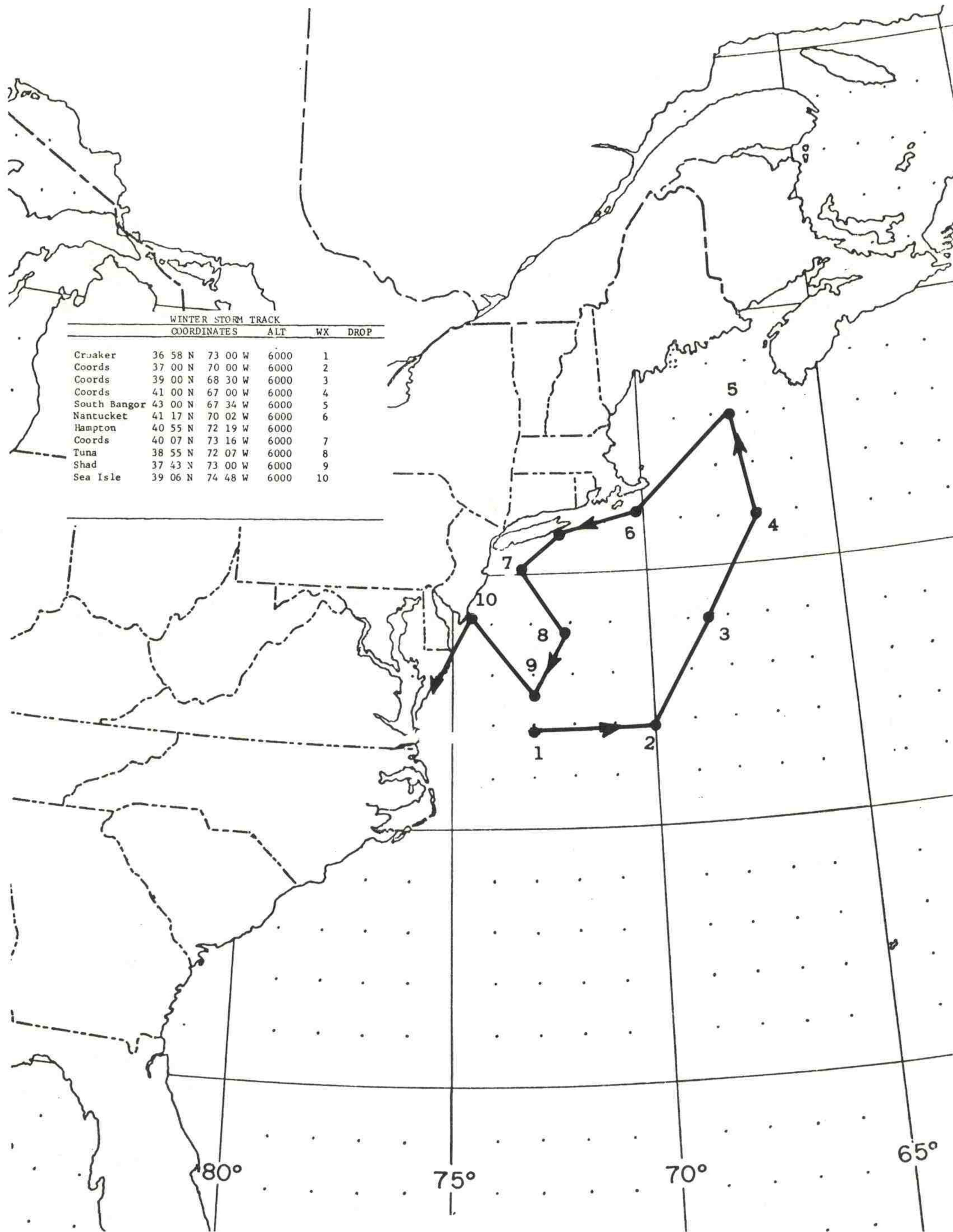


FIGURE 4B-3. AIR FORCE TRACK GULL GOLF

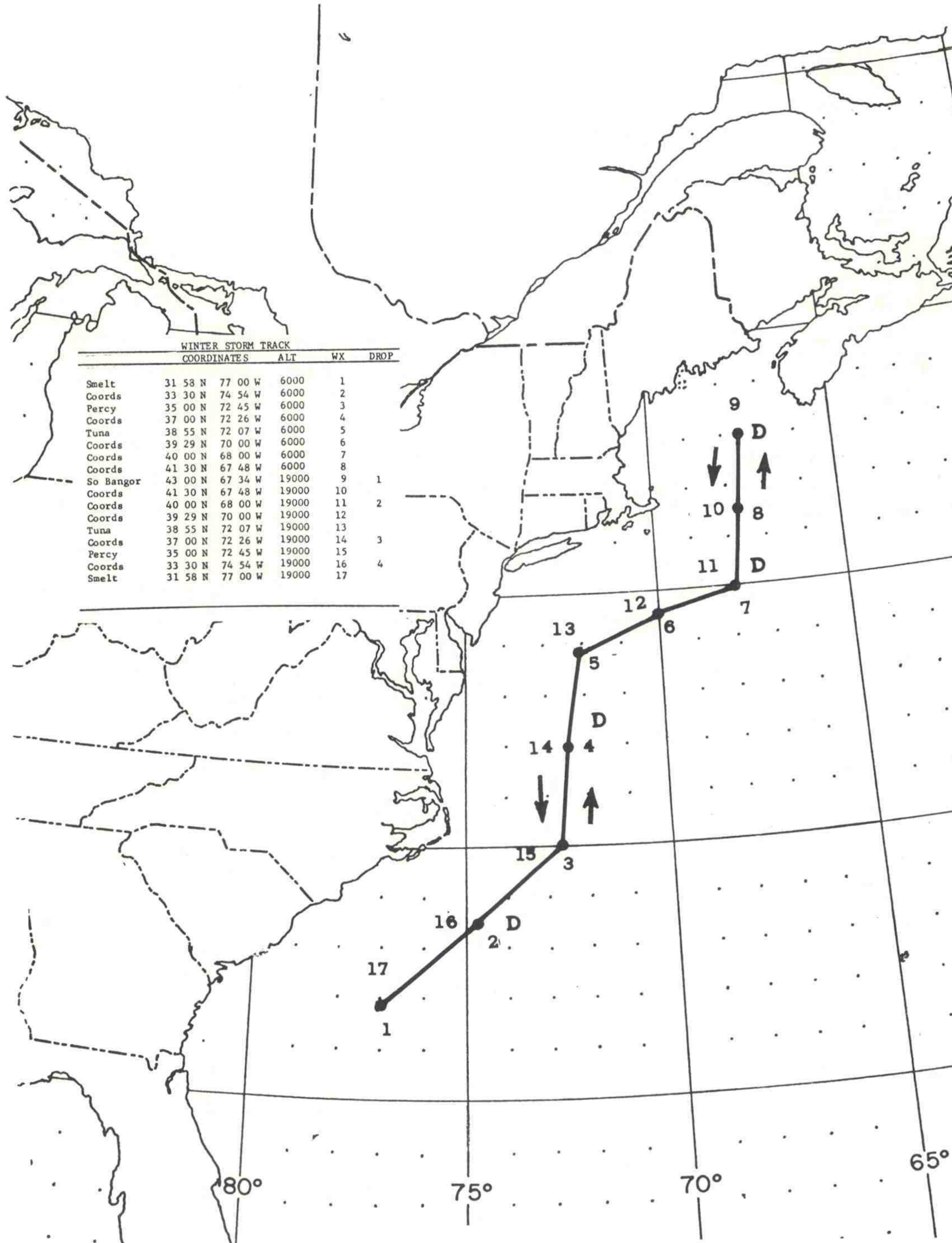


FIGURE 4B-4. AIR FORCE TRACK GULL JULIET

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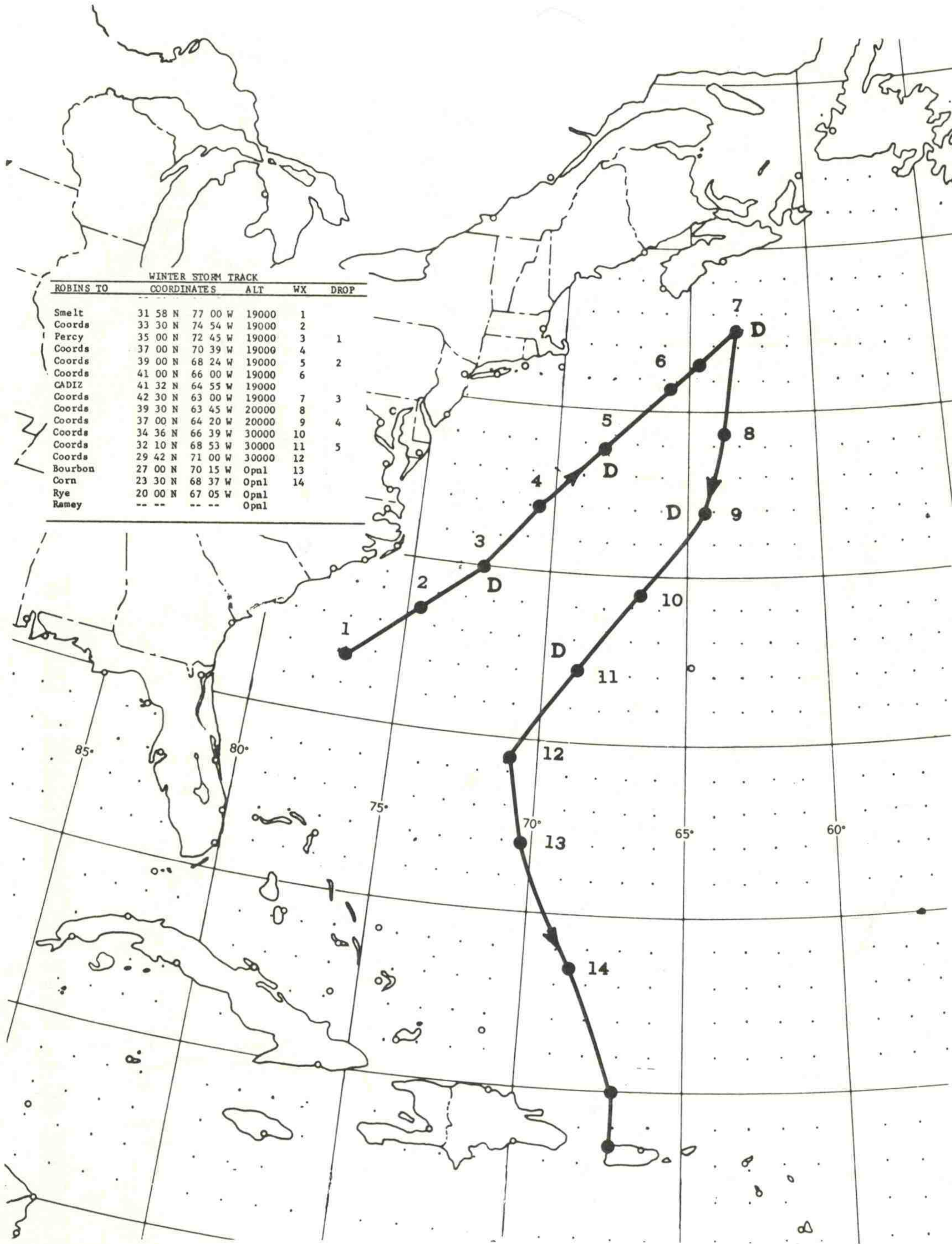


FIGURE 4B-5. AIR FORCE TRACK GULL NAN

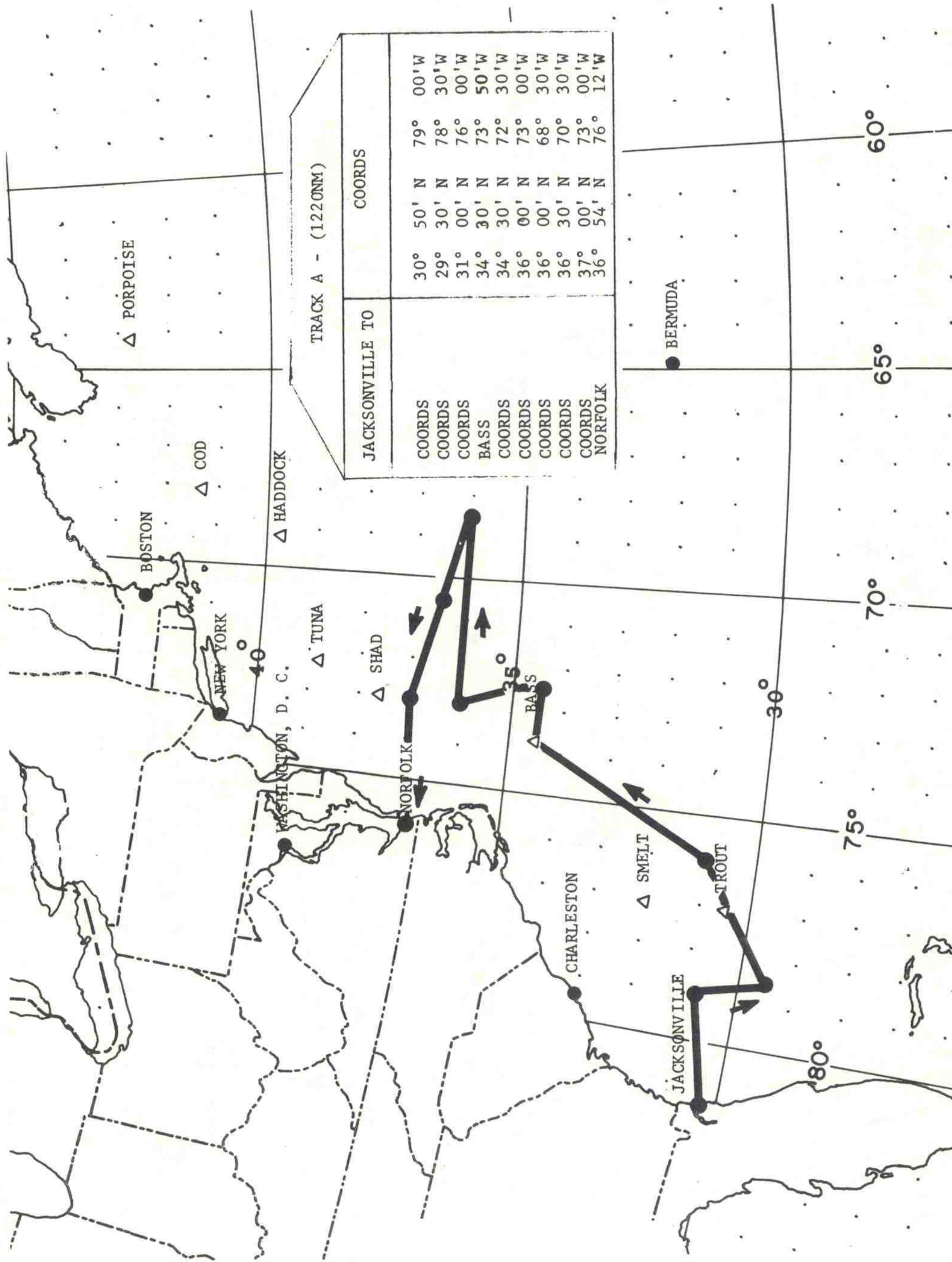


FIGURE 4C-1. NAVY RECONNAISSANCE TRACK A

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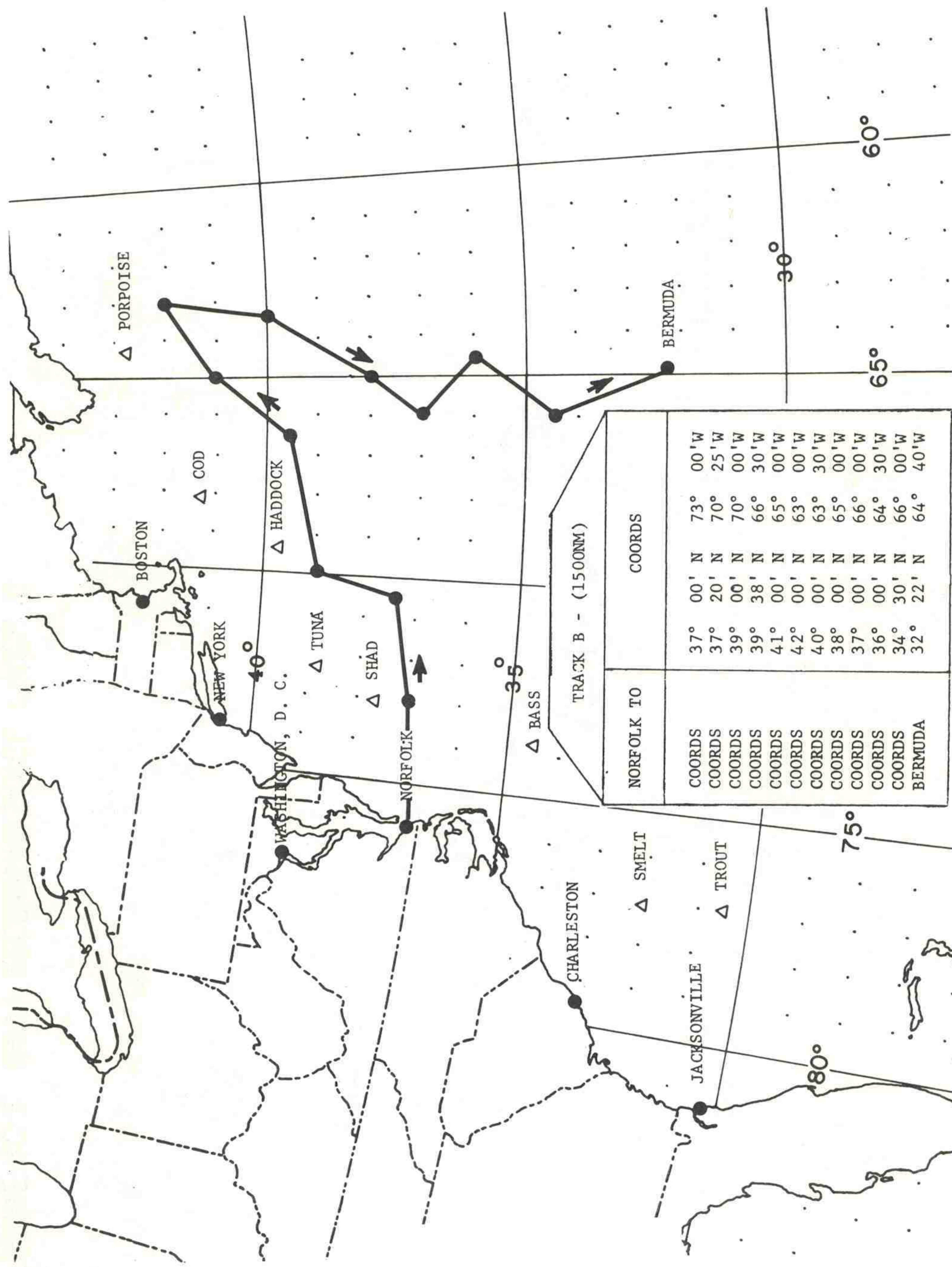


FIGURE 4C-2. NAVY RECONNAISSANCE TRACK B

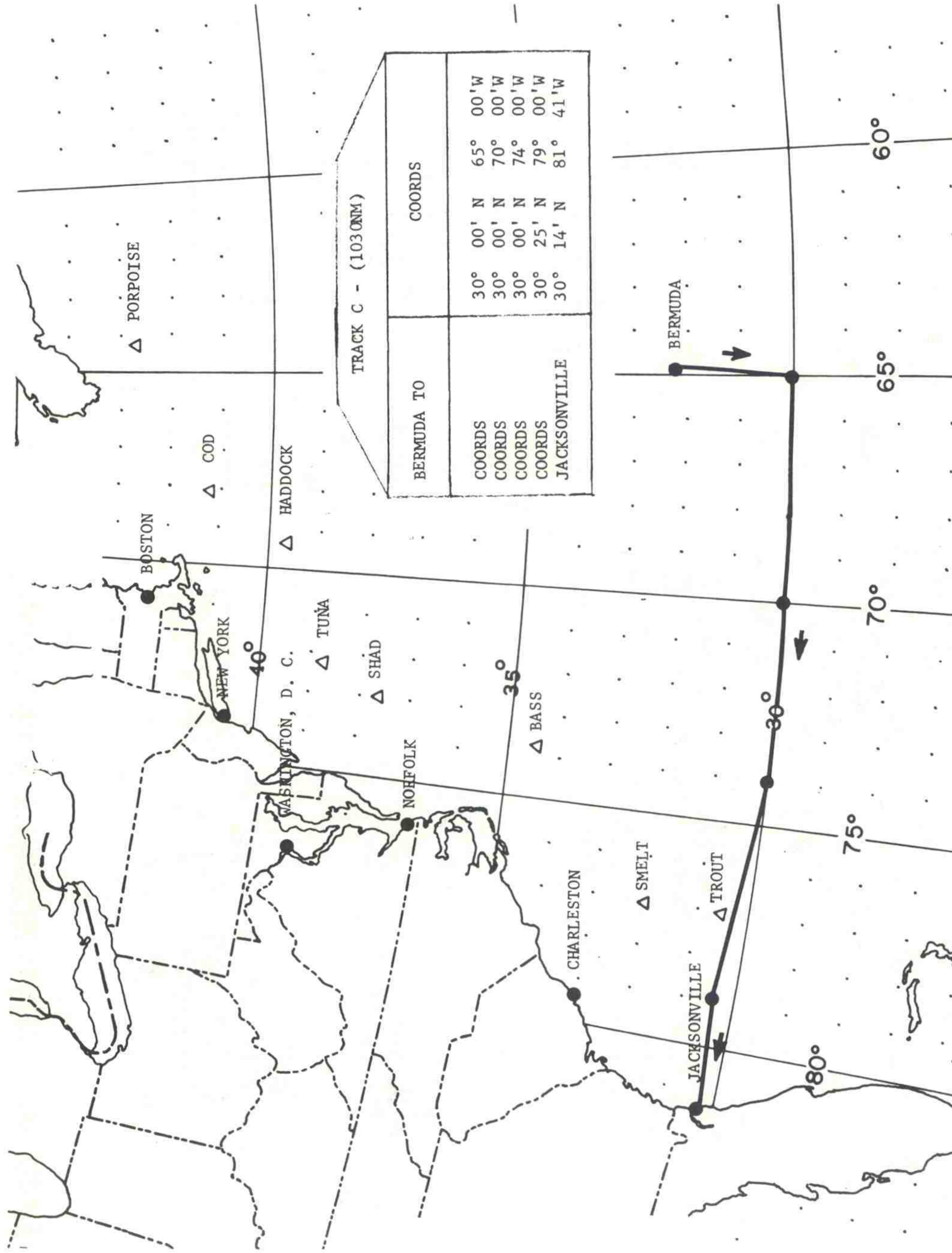


FIGURE 4C-3. NAVY RECONNAISSANCE TRACK C

CHAPTER 4

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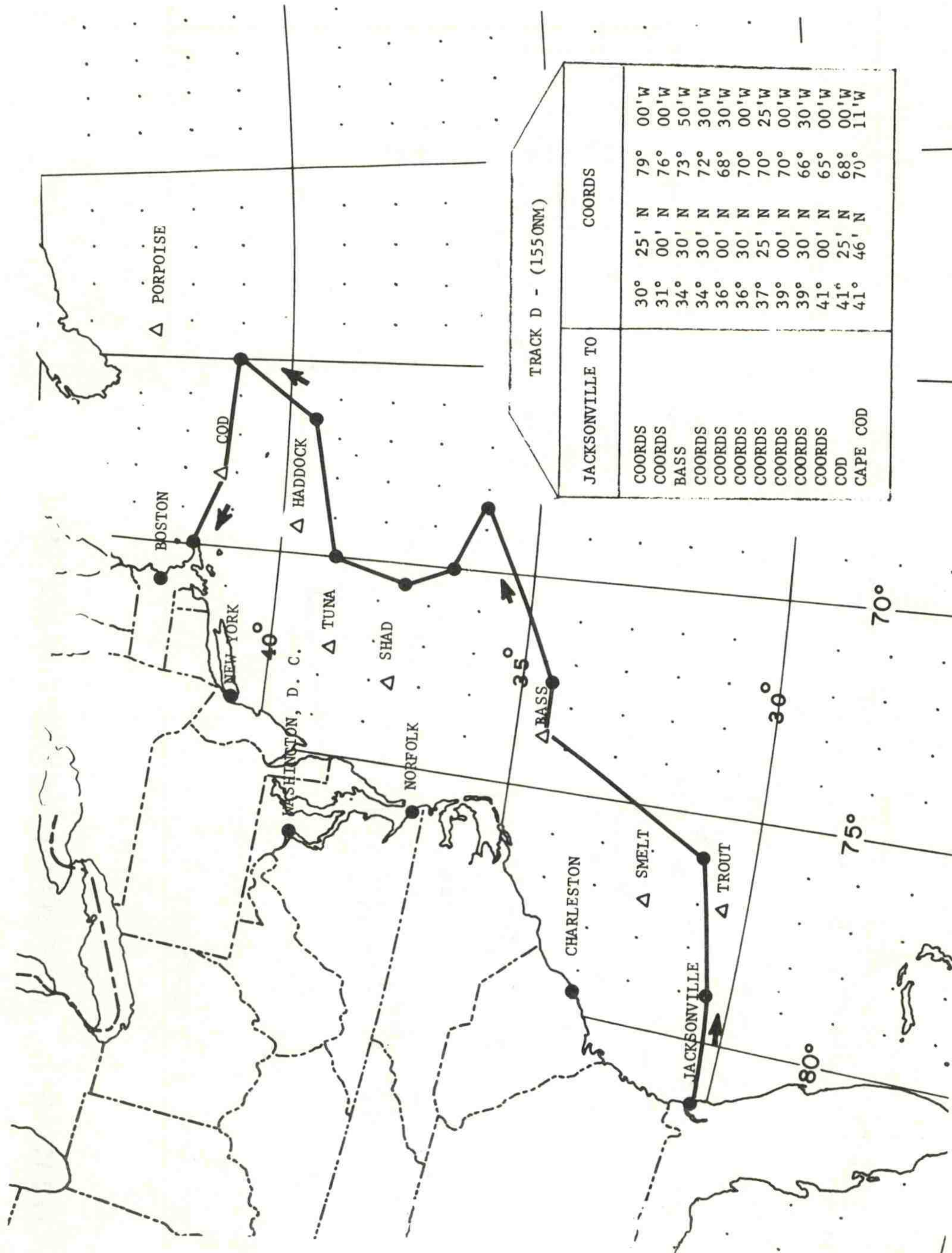


FIGURE 4C-4. NAVY RECONNAISSANCE TRACK D

U. S. DEPARTMENT OF COMMERCE		RECCO CODE (Aerial Meteorological Reconnaissance Reporting Code)		Section 1 - MANDATORY		Section 2 - OPTIONAL	
1-64 (Effective January 1, 1964)							
Group	9 xxx 9	GGgg	2 3 4	Q	Lo Lo L _o Lo L _o Lo	Lo L _o Lo L _o Lo L _o Lo	Lo L _o Lo L _o Lo L _o Lo
	1						
Time (GCT) of Observation (hours and minutes)		iu Y					
Humidity Indicator							
Day of Week							
Ocean of Globe							
Latitude							
Longitude							
Turbulence							
Flight Conditions							
True Altitude of Aircraft (1000 ft. or decimeters above m. s. l.)		hhh	d ₁ d ₂	dd			
Type of Wind at Flight Altitude							
Reliability of Wind at Flight Altitude							
Wind Direction at Altitude (100 of degrees, true)		fff					
Wind Speed at Altitude (knots)		TT	T _d T _d w	m j	HHH		
Remarks on Present Weather							
Index pertaining to HHH							
Altitude and Other Data							
Group Indicator		I k _n N ₁ N ₂ N ₃ C	hh hh hh	hh hh	hh hh	hh hh	hh hh
Total Number of Cloud Layers Reported		12 13 14	13 14	13 14	13 14	13 14	13 14
Cloud Amount (1st. layer)							
Cloud Amount (2nd. layer)							
Cloud Amount (3rd. layer)							
Ascending Order							
Altitude of Base of Cloud Type Reported by C							
Altitude of Top of Cloud Type Reported by C							
Cloud Type							
Altitude of Base of Cloud Type Reported by C							
Altitude of Top of Cloud Type Reported by C							
Cloud Type							
Altitude of Base of Cloud Type Reported by C							
Altitude of Top of Cloud Type Reported by C							
Cloud Type							
Wind Speed at Surface (100 of degrees, true)							
Group Indicator							
Direction of Surface Wind							
Force of Surface Wind							
State of Sea							
Direction of SWELL							
Plain Language Remarks							
SEE TABLE							
SEE NOTE							
	8	9	9	9	10	10	10
					11	11	11
					12	12	12
					13	13	13
					14	14	14
					15	15	15
					16	16	16
					17	17	17
					18	18	18
					19	19	19
					20	20	20
					21	21	21
					22	22	22
					23-25	23-25	23-25
					23-25	23-25	23-25
					26	26	26
					27	27	27
					28	28	28
					26 29 30	26 29 30	26 29 30
					31	31	31

FIGURE 4D-1. STANDARD RECONNAISSANCE CODE

DROPSONDE CODE

Dropsonde. Sounding data observed from a dropsonde released from an aircraft shall be reported by means of the World Meteorological Organization (WMO) code form FM 36.D (TEMP SHIP). The dropsonde data may be added either to the flight level report or sent as a separate report.

- a. When the dropsonde data are added to Section 2 of RECCO, the indicator group 71717 precedes the coded sounding data (FM 36.D). In this instance, two minor alterations are made in FM 36.D -- the $M_i M_i$ group is omitted from the report and CG is reported to the nearest quarter hour. The nearest quarter of an hour is indicated by adding 25, 50, or 75 to the actual number of hours.

When the minute lies between 52 1/2 and 07 1/2 minutes, nothing is added to the hour; for example, times between 0152 1/2 to 0207 1/2 are coded 02. When the minute lies between 07 1/2 and 22 1/2 minutes, 25 is added to the hour; for example, times between 0307 1/2 to 0322 1/2 are coded 28. When the minute lies between 22 1/2 and 37 1/2 minutes, 50 is added to the hour; for example, times between 1122 1/2 to 1137 1/2 are coded 61. When the minute lies between 37 1/2 to 52 1/2 minutes, 75 is added to the hour; for example, times between 2037 1/2 to 2052 1/2 are coded 95.

- b. When the dropsonde data are sent as a separate report, the TEMP SHIP form of message (FM 36.D) is preceded by the key group 9xxx9 and 71717.
- c. The location and time (to the nearest quarter hour) at which the dropsonde was ejected from the aircraft shall be given in the $YQL_a L_a L_a$ and $L_o L_o L_o Bf'_c$ groups.

Following are general notes which apply to the coding of sounding data obtained by aircraft.

- a. Whenever practicable, extrapolated data are reported for $P_o P_o P_o$, $T_o T_o$, and $T_{do} T_{do}$. If extrapolated data are not available for these elements, the surface groups are omitted from the report.
- b. If tenths values of air and dew point temperatures are not reported, a zero is coded for T_{x0} , T_{x1} , T_{x2} , etc.

WINTER STORM PLAN OF THE DAY FORMAT

FM: OL-G HQ AWS CARCAH/RUCLEFA CORAL GABLES FLA.
 TO: HOMESTEAD AFB FLA DIAL TWX #305-248-0151 (AIG #8368)
 O/ _____ AFB, _____
 O/EASTERN SEA FRONTIER
 GT22117
 30GT2352
 7072

UNCLAS CARCAH SENDS _____

AMENDMENT NO. _____ TO

WINTER STORM
 RECON POD FROM _____ Z _____ TO _____ Z _____ FOLLOWS

1. _____ 2. _____ 3. _____ 4. _____

CONTROL POINT
 TIME A. _____ / _____ Z _____ / _____ Z _____ / _____ Z _____

CALL SIGN
 (TRACK/STORM
 OCEANO) B. _____

ETD C. _____ / _____ Z _____ / _____ Z _____ / _____ Z _____

DEPARTURE PT D. _____

ENROUTE ALT E. _____

CONTROL POINT
 FCST PSN F. _____ N _____ W _____ N _____ W _____ N _____ W _____

DESTINATION G. _____

TRACK/FLT PAT-
 TERN H. _____

FCST MOVEMENT I. _____ / _____ / _____ / _____

SUCCEEDING DAY J. _____

REMARKS K. _____

REQUIREMENTS PRIOR TO 1830Z
 DISSEMINATE PRIOR TO 2000Z

CHAPTER 4
APPENDIX G

NAVY DATA LOGGING SYSTEM

Channel	Parameter	Recorded Increments	Limits	Source
00	Date	Month, Day, Year	0 to 12319	Metro
01	Time	Hrs., Min., 10 Secs.	0 to 23:59:5	Clock
02	Latitude & Quadrant	Degrees, Min., Quad.	0 to 90:00:3	ASN-41
03	Longitude	Degrees, Min.	0 to 180:00	ASN-41
04	Absolute Altitude	10 feet	0 to 29990	APN-159
05	Pressure Altitude	10 feet	0 to 20000	XDucer
06	Ambient Pressure	Tenths of Millibars	500.0 to 1050.0	XDucer
07	Ambient Temperature	Tenths of Deg Centigrade	-40.0 to +99.99	DY 2801A
08	Dew Point	Tenths of Deg Centigrade	-50.0 to +50.0	DEW POINTER
09	Wind Direction	1 Degree	0 to 359	ASN-41
10	Wind Speed	1 Knot	0 to 359	ASN-41
11	Sea Surface Temperature	Tenths of Deg Centigrade	-10 to +40	ART-4A
*12	Wave Height	Nearest foot	0 to 99	APN-159
*13	Wave Period	Nearest Second	0 to 999	APN-159
14	True Air Speed	1 Knot	0 to 359	AX-606
15	True Heading	1 Degree	0 to 359	ASN-41
16	Ground Speed	1 Knot	0 to 359	APN-153
17	Drift Angle	1 Degree	+60	APN-153
*18	Ice Rate	1 Degree	0 to 250	XDucer
19	Cloud Group	RECCO Code	0 to 99999	Metro
20	Cloud Group	RECCO Code	0 to 99999	Metro
21	Cloud Group	RECCO Code	0 to 99999	Metro
22	Cloud Group	RECCO Code	0 to 99999	Metro
23	Cloud Group	RECCO Code	0 to 99999	Metro
24	Surface Winds	RECCO Code	0 to 99999	Metro
25	Sea Condition Group	RECCO Code	0 to 99999	Metro
26	Icing Group	RECCO Code	0 to 99999	Metro
27				
*28	Rocketsonde			
29	Bathythermograph	10 Ft. Tenths of Deg F	0025.0 to 9995.0	APR-51

*Not Operational

RADIO TELETYPEWRITER SYSTEM

A 100 word per minute airborne radio-teletypewriter system consisting of a teletypewriter, tape perforators, data convertor, tape distributor and HF transmitter has been installed on WC-121N aircraft in conjunction with the data logging system. This system provides nearly instantaneous collection and dissemination of various meteorological and oceanographic parameters. The teletypewriter is mounted at the Flight Meteorologist's station.

OBSERVATIONS

1. Surface Weather Observational Network. To provide the basic weather data for analysis purposes, all available surface data are used. The following stations provide data:

a. Weather Service Offices (WSO) and Automatic Meteorological Observing Stations (AMOS).

b. FAA weather reporting stations (FSS and Towers).

c. Supplementary weather reporting stations including: Supplementary Aviation Weather Reporting Stations (SAWRS); part-time, paid, and cooperative aviation and synoptic weather reporting stations; and Coast Guard facilities. In addition, surface observations are made by the Cooperative Hurricane Reporting Network (CHURN) shown in figure 5-1. On request, CHURN stations will report on a specified schedule (hourly when required). These CHURN reports are transmitted on Radar Report and Warning Coordination Circuit (RAWARC) 23420 or 23421 and/or Circuit 7072.

d. DOD weather reporting stations. These stations take observations and transmit coded observational data at regularly scheduled intervals. Transmissions are made hourly and even more frequently for aviation purposes, every 3 and 6 hours for synoptic map preparation, and daily for climatological purposes.

e. Cooperative Ship Observations (Moving Ships), Ocean Weather Station HOTEL (4YH), and the Coast Guard Buoy XERB-1. Appendix 5-A contains the details.

2. Radiosonde/Rawinsonde Observing Stations.

a. Rawinsonde observations are scheduled twice daily, 0000Z and 1200Z, at stations in the domestic radiosonde network (fig. 5-2). These stations also take special observations when required and requested by the agency concerned. Evaluated data from the routine soundings are transmitted over the Service C and Comet II teletypewriter systems in the regulation radiosonde code. Data from special soundings requested for potential or existing severe weather situations are transmitted by means of RAWARC and other appropriate communications circuits.

b. The Naval Weather Service Environmental Detachment (NWSED), Lakehurst, N.J., takes unscheduled rawinsonde observations which might be a potential source of data under certain conditions. Observations may be requested from NWSED, Autovon 624-2334 or commercial 201-323-2334. Requests for special upper air observations will be limited to one or two soundings during any particular weather situation.

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c. Low-level radiosonde soundings (to 700 mb) are scheduled twice daily, Monday through Friday, near sunrise and noon by the Environmental Meteorological Support Units (EMSU) at WSFO Philadelphia, Pa., WSO New York City, and WSFO Washington. These EMSUs will take special observations upon request by the responsible Weather Service Forecast Office (WSFO). Regular observations are scheduled for transmission over the Service C teletypewriter system, and specials are transmitted over the RAWARC.

d. Rawinsonde observations are scheduled at 00 and 12 GMT and rawins at 06 and 18 GMT from the Ocean Weather Station HOTEL, and special observations can be requested from Coast Guard OSVs en route to assigned patrols in the mid-Atlantic.

3. Radar Observing and Reporting Plans.

a. Radar data for use in support of this Plan are available from radars of the National Weather Service Radar Network (fig. 5-3) located in the area of concern. This network, composed mainly of WSR-57 radars, is also supplemented by Navy and Air Force weather radars (Appendix 5-B). Selection of radars for the Network was made on the basis of attaining the maximum required data and coverage with a minimum number of radars.

(1) National Weather Service radar observations are transmitted hourly on RAWARC at H+45 in the Weather Bureau - Air Force - Navy (WBAN) Radar Report (RAREP) code. More frequent observations are taken and transmitted in severe weather situations.

(2) At approximately the same time (H+45), RAREPs are available from AWS stations.

(3) The National Weather Service, Navy, and Air Force have other radars which are not a part of the national network. These radars are mainly used for local warning purposes, but on occasion they do enter reports on communication circuits (Figure 5-3 shows other National Weather Service radars).

(4) A number of WSOs in the Plan's area of responsibility have remote displays from nearby radars of the National Weather Service Radar Network. These displays are within about 75 n. mi. of the radar site and contain information on heights, intensity, and velocity of the radar echoes. Some WSFOs have the dial-call capability to permit receipt of radar data from any radar station within the area of forecast responsibility. These WSFOs may obtain radar data when needed to assist with specific weather forecast problems.

b. A number of Air Defense Command (ADC) radar sites are capable of detecting and interpreting weather echoes. Operational commitments permitting, these sites will provide supplementary reports upon request.

c. The FAA has a number of ARTCCs that also participate in this program. National Weather Service radar meteorologists possessing proper security clearance are permitted access to ARTCCs for the purpose of recording and transmitting radar observations (Appendix 5-C).

d. Procedures for taking radar observations will be those given in the Weather Radar Manual (WBAN).

e. A list of participating National Weather Service, Navy, Air Force, Cooperators, ARTCCs, ADC, and Aircraft Control and Warning (AC&W) radar stations is included in Appendix 5-B.

4. Cooperative Marine Observing Program. Observational data are required from marine areas to complete meteorological analysis. Synoptic observations are taken aboard cooperative merchant ships of U.S. registry and of other maritime nations when they are at sea. Many of these ships transmit reports by radio to shore-based communication centers where the data are entered on meteorological circuits. The WSFOs at Boston, New York, Philadelphia, Washington, Columbia, S.C., Raleigh-Durham, N.C., Atlanta, Ga., and Miami may obtain special ship reports. (Details for procedures to obtain these reports are listed in Weather Bureau Operations Manual, Chapter B-90). The following procedures are used:

a. Requesting radio shore stations to make a direct call for ship reports in a given area.

b. Including request in NSS Marine Broadcast,

c. Initiating a request from local Coast Guard offices to the AMVER system in New York for listing of ships in the WSFO's area.

d. Sending of an individual message to a ship requesting observation.

5. Tide Height Reporting Network. Coastal offices have arranged for cooperative tide observations from stations of the Tide Height Reporting Network (figure 5-4 and table 5-2) during potential or actual warning situations. The WSOs initiate calls to cooperative tide stations and to cooperative coastal observing stations for observations whenever needed. Supplemental observations are placed on RAWARC or phoned to the appropriate WSFO. Table 5-3 indicates these WSOs are equipped with tide recorders and tide gage from which they receive their information.

6. Satellite Observations.

a. The TIROS Operational Satellite (TOS)/Improved TOS (ITOS) environmental satellite systems provide a minimum of three observations a day over the east coast of the United States. One observation is from the Scanning Radiometer (SR) on the ITOS in direct readout and stored from near 0300 local time. Another is from the Automatic Picture Transmission (APT) system of Environmental Survey Satellite (ESSA) 8 at about 0900 local time. The third is from the Advanced Vidicon Camera System (AVCS) or the SR on the ITOS at near 1500 local time. The ITOS system also provides APT at 1500 local time.

Data from several NASA research and development satellites are available for surveillance of storms. The Direct Readout Image Dissector (DIRD) data from either Nimbus-3 or Nimbus-4 are received in APT format at near

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local noon, and the Direct Readout Infrared (DRIR) data from these satellites are available at near local midnight. Short interval pictures from the geostationary Applications Technology Satellite (ATS)-3, are available for operational use. For the winter of 1970-1971, the ATS-3 will be located near longitude 47°W. and will give coverage of the east coast of the United States.

These various types of data are summarized in Table 5-1.

b. All satellite data for the east coast are available at the National Environmental Satellite Service (NESS). The APT and DRIR data are available to the WSFOs directly. The AVCS data and SR data are transmitted in digitized mapped format on regular facsimile circuits.

c. Meteorologists of the NESS Analysis Branch confer in person with the meteorologists of the NMC and the WSFO Washington. Other east coast WSFOs may contact the NESS Analysis Branch by telephone to discuss satellite observations of storm situations (commercial 301-440-7146).

7. Aircraft Pilot Reports (PIREPS).

a. Federal Aviation Administration (FAA).

(1) The present FAA Instrument Flight Rules (IFR) regulation (91.125, radio communications, section b.) requires pilots to report "(b) Any unforecast weather conditions encountered;and ..."

(2) The ARTCCs are requested to pass PIREPS to FSSs which are required to place them on the Area B Circuit for distribution (Fig. 6-6).

(3) The following significant information should be included in PIREPS whenever it is observed:

- (a) Moderate or greater turbulence.
- (b) Moderate or greater icing.
- (c) Hail encountered.
- (d) Location of lines of thunderstorms observed on the airborne radar.
- (e) Related maximum observed cloud tops of thunderstorms.

TABLE 5-1. SATELLITES AND SATELLITE DATA AVAILABILITY

Satellite	Type of data	Time of observation	NESS product	Product Distribution
ESSA 9	AVCS (stored).	1500	1. Gridded analog pictures. 2. Mapped digitized video. 3. Manual nephanalyses 4. Moisture analyses.	1. Facsimile. 2. Telephone.
ESSA 8	APT (direct).	0900	1. APT video signal.	1. FOFAX.
ITOS-1	AVCS (stored). APT (direct). IR (stored). DRIR (direct).	1500 1500 0300 - 1500 0300	1. Same as above plus similar products from IR data and the DRIR signal.	1. Facsimile. 2. Telephone. 3. FOFAX.
Nimbus-3 (Nimbus-4 if 3 becomes inoperative).	APT (DRID). HRIR* (stored). DRIR (direct).	1200 0000 0000	1. Direct readout signals.	1. Telephone.
ATS-3	SSCC	1400 - 2100Z	1. Mapped imagery. 2. Movie loops for dynamics study and wind extraction.	1. Facsimile. 2. WEFAX. 3. Telephone.
APT - Automatic Picture Transmission ATS - Applications Technology Satellite AVCS - Advanced Vidicon Camera System DRID - Direct Readout Image Dissector DRIR - Direct Readout Infrared ESSA - Environmental Survey Satellite Table 5-1.				

* Data from this sensor on Nimbus-3 and Nimbus-4 may be available for research only.

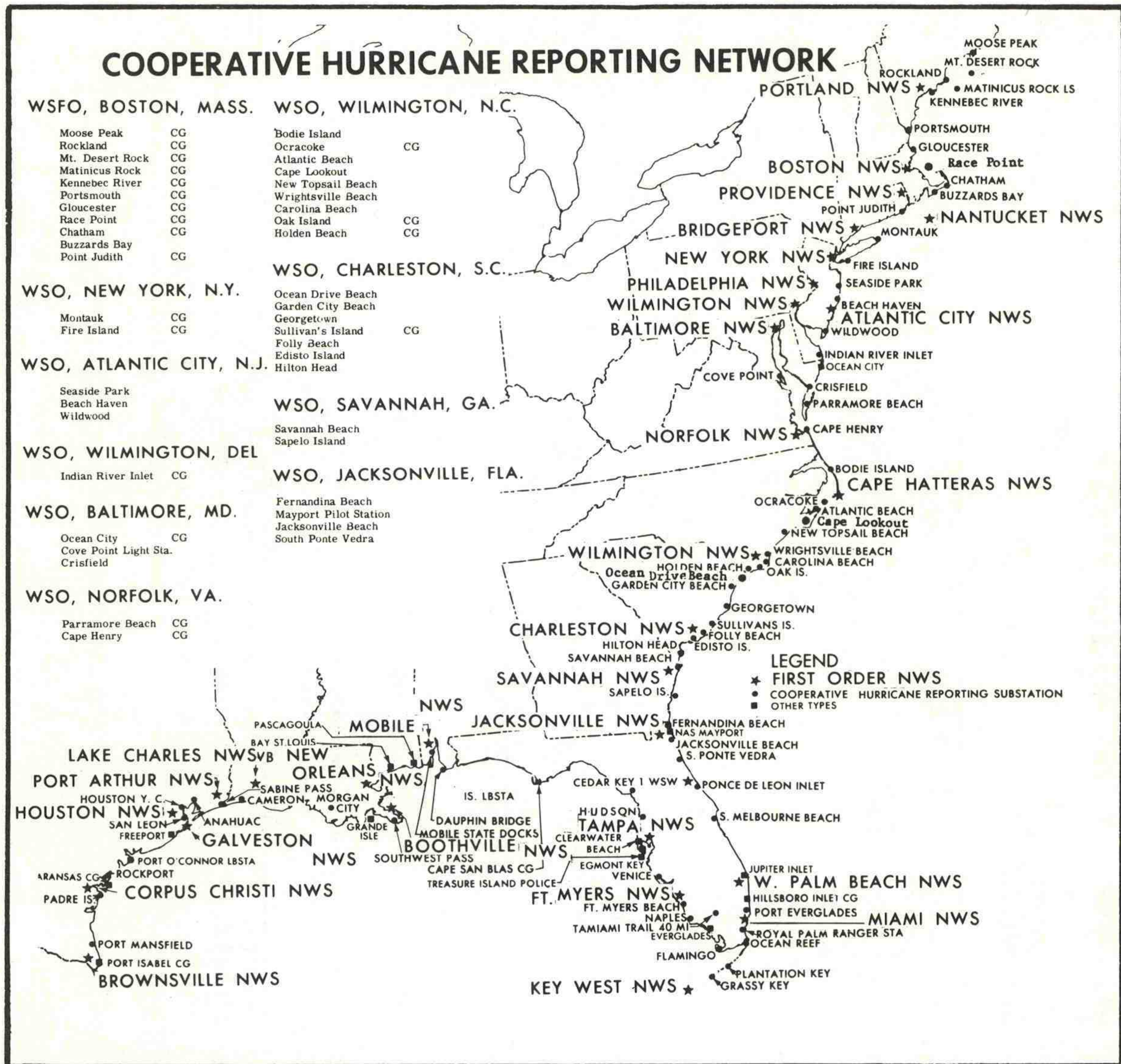


FIGURE 5-1. CHURN NETWORK

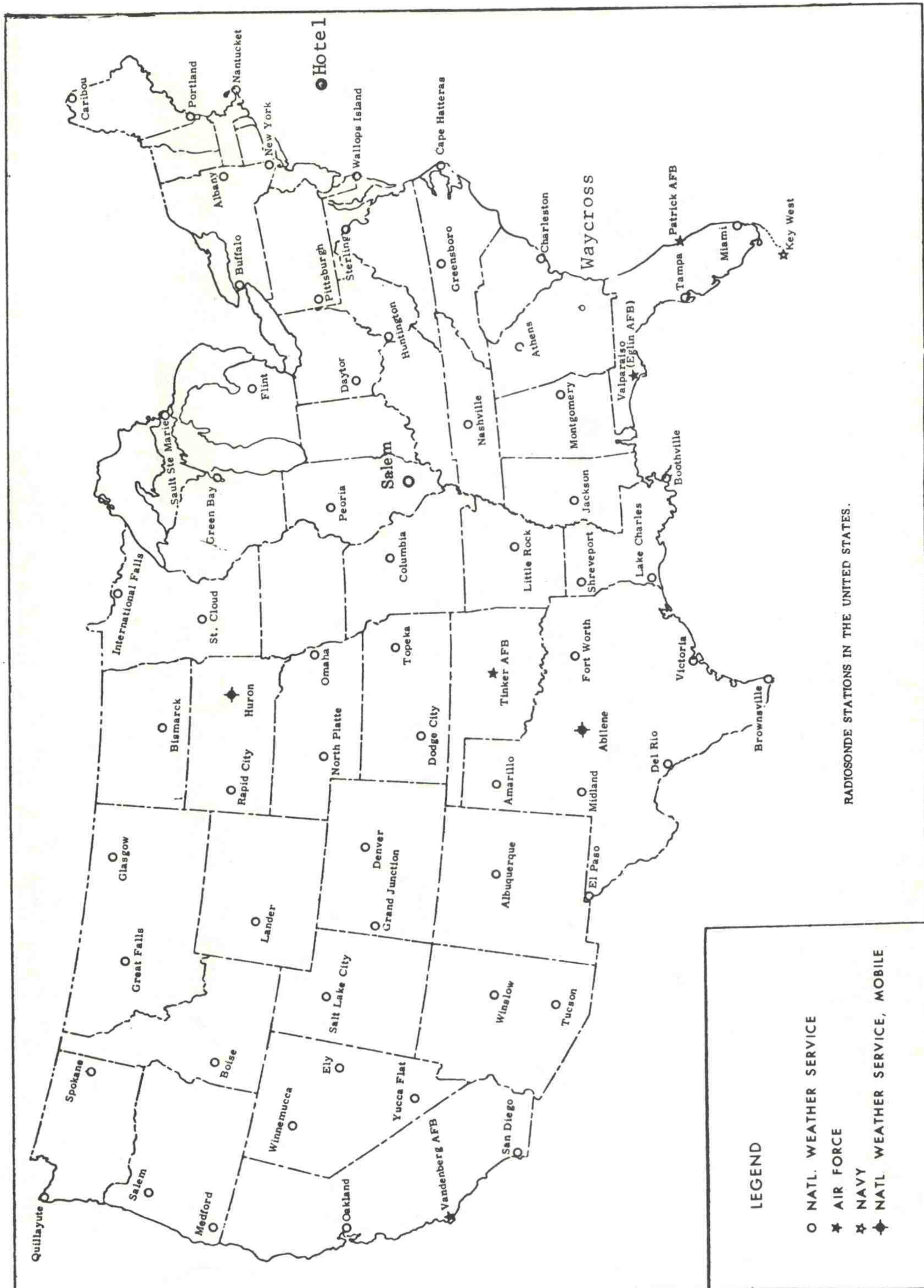


FIGURE 5-2. NATIONAL WEATHER SERVICE AND MILITARY UPPER AIR NETWORK

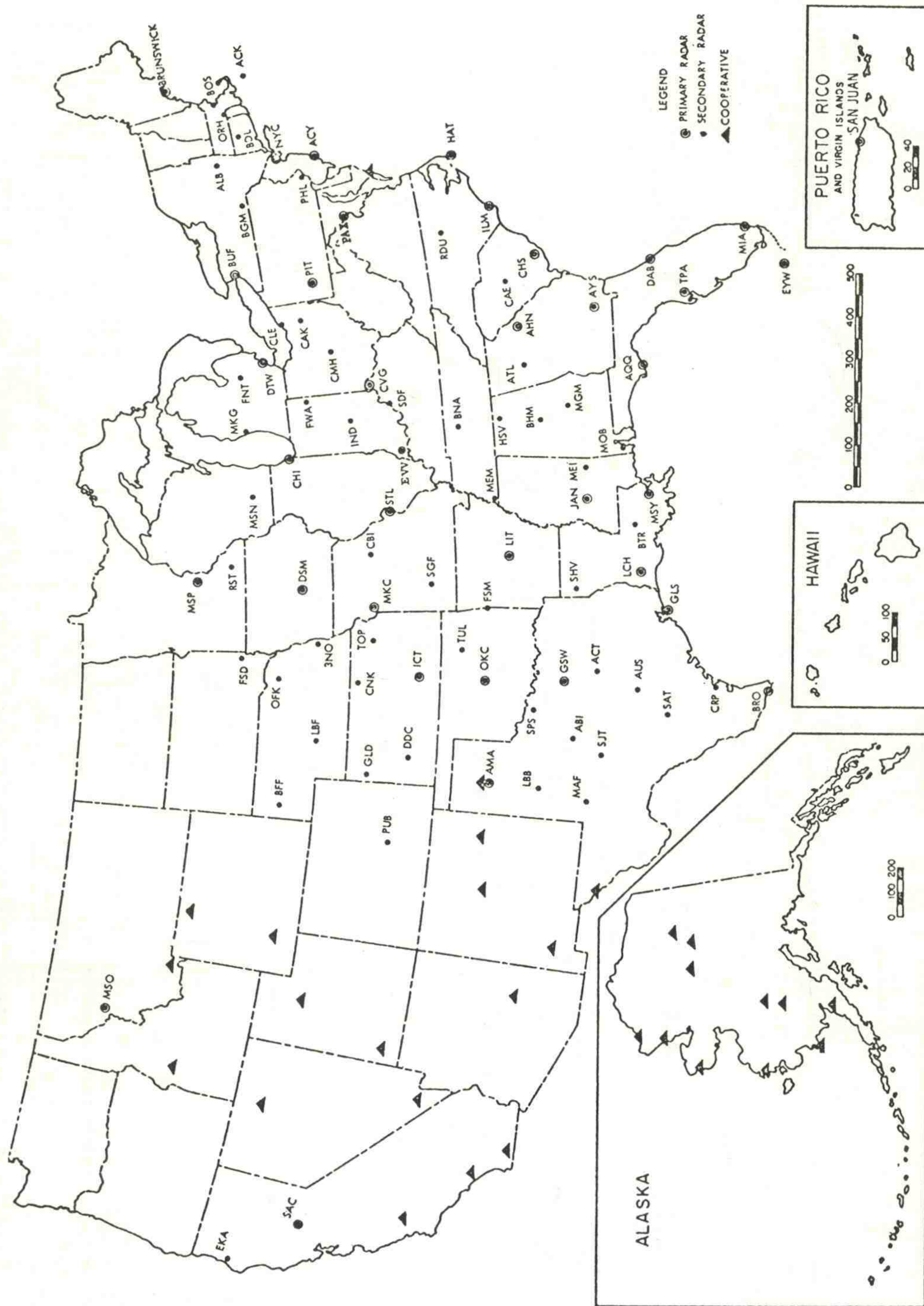


FIGURE 5-3. NATIONAL WEATHER SERVICE RADAR NETWORK

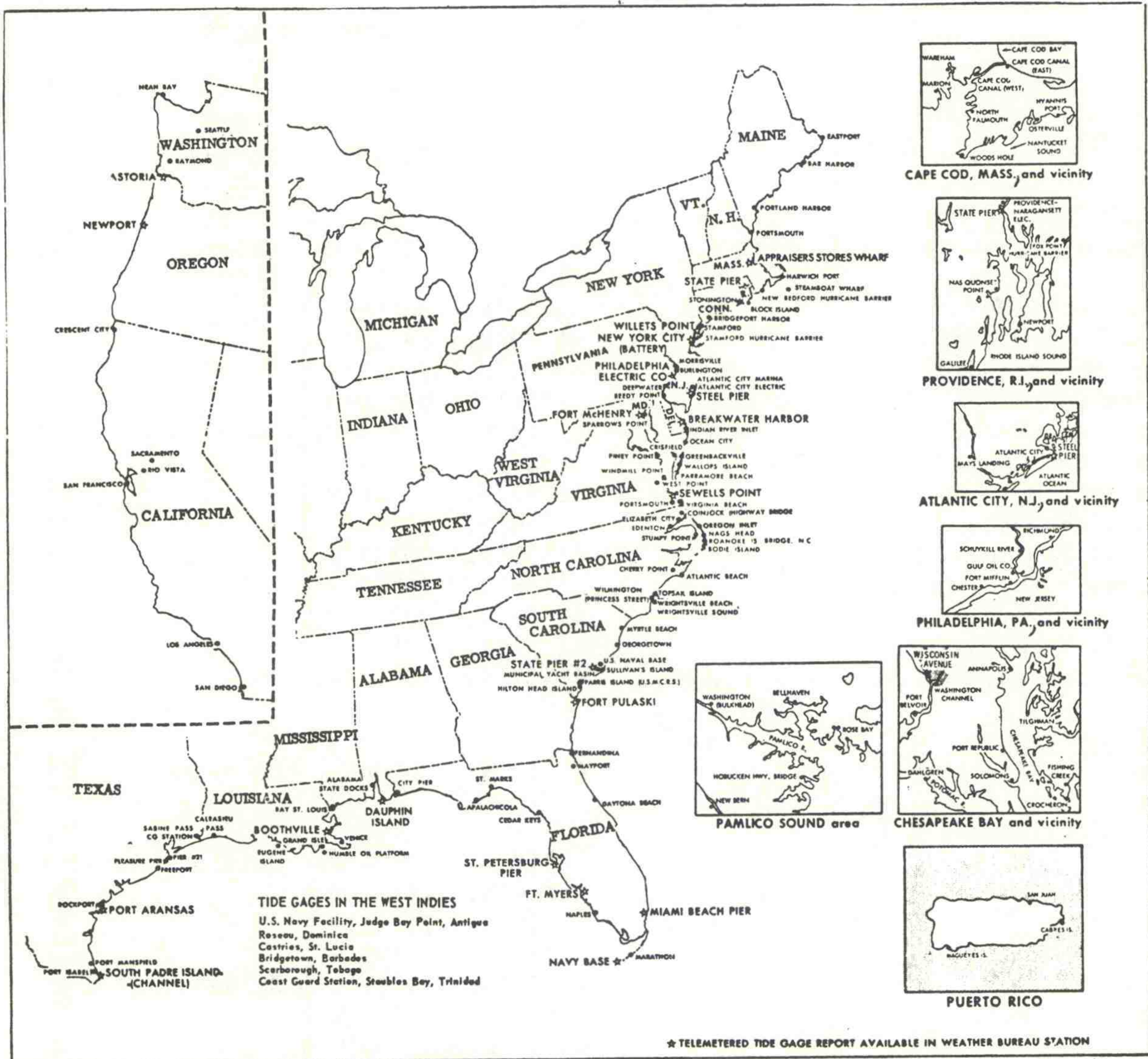


FIGURE 5-4. TIDE HEIGHT REPORTING NETWORK

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TABLE 5-2. TIDE HEIGHT REPORTING NETWORK STATIONS

<u>WSO Portland, Maine</u> Portland Harbor	43°40'N.	70°15'W.	On request.
<u>WSFO Boston, Mass.</u> Appraisers Store Wharf, Mass.	42°21'N.	71°03'W.	Bristol Recorder- WSFO
Eastport, Maine	44°54'N.	66°59'W.	} On Request.*
Bar Harbor, Maine	44°23'N.	68°12'W.	
Portsmouth, N.H.	43°05'N.	70°44'W.	
Cape Cod Canal (East), Mass.	41°46'N.	70°30'W.	
Wareham, Mass.	41°45'N.	70°43'W.	
Cape Cod Canal (West), Mass.	41°44'N.	70°37'W.	
Marion, Mass.	41°42'N.	70°46'W.	
Harwich Port, Mass.	41°40'N.	70°04'W.	
North Falmouth, Mass.	41°39'N.	70°39'W.	
Hyannis Port, Mass.	41°38'N.	70°18'W.	
Osterville, Mass.	41°37'N.	70°24'W.	
Woods Hole, Mass.	41°31'N.	70°40'W.	
New Bedford Hurricane Barrier, Mass.	41°37'N.	70°54'W.	
<u>WSO Nantucket, Mass.</u> Steamboat Wharf, Mass.	41°17'N.	70°06'W.	On request.*
<u>WSO Providence, R.I.</u> State Pier, R.I.	41°48'N.	71°24'W.	Bristol Recorder-WSO.
Providence-Narragansett Elec., R.I.	41°49'N.	71°24'W.	} On Request*
Fox Point Hurricane Barrier, R.I.	41°49'N.	71°24'W.	
NAS Quonset Point, R.I.	41°35'N.	71°25'W.	
Newport, R.I.	41°30'N.	71°20'W.	
Galilee, R.I.	41°23'N.	71°31'W.	
Stonington, Conn.	41°20'N.	71°54'W.	
Block Island, R.I.	41°10'N.	71°33'W.	
<u>WSO Bridgeport, Conn.</u> Bridgeport Harbor, Conn.	41°11'N.	73°11'W.	On request.*
<u>WSO New York, N.Y.</u> New York City (Battery), N.Y.	40°42'N.	74°11'W.	Bristol Recorder-WSO.
Willets Point, N.Y.	40°48'N.	73°47'W.	Bristol Recorder-WSMO (LGA).
Stamford, Conn.	41°03'N.	73°33'W.	On request.*
Stamford Hurricane Barrier, Conn.	41°03'N.	73°33'W.	On request.*

TABLE 5-2. TIDE HEIGHT REPORTING NETWORK STATIONS (Cont'd)

<u>WSO Atlantic City, N.J.</u>			
Steel Pier (Atlantic City)	39°21'N.	74°25'W.	Bristol Recorder-WSO.
Mays Landing, N.J.	39°27'N.	74°44'W.	} On request.* Recorder at A.C. Elec. Co.
Atlantic City Marina, N.J.	39°22'N.	74°26'W.	
Atlantic City Electric Co., N.J.	39°22'N.	74°26'W.	
<u>WSFO Philadelphia, Pa.</u>			
Breakwater Harbor, Del.	38°47'N.	75°06'W.	Bristol Recorder-WSFO.
Philadelphia Electric Co., Pa.	39°57'N.	75°08'W.	Bristol Recorder-WSFO.
Reedy Point, Del.	39°34'N.	75°34'W.	Recorder Phila. Elec. Co.
Morrisville, Pa.	40°10'N.	74°45'W.	} On request.*
Burlington, N.J.	40°05'N.	74°52'W.	
Richmond, Pa.	39°59'N.	75°05'W.	
Schuylkill River, Pa.	39°57'N.	75°12'W.	
Gulf Oil Co., Pa.	39°54'N.	75°13'W.	
Fort Mifflin, Pa.	39°52'N.	75°13'W.	
Chester, Pa.	39°51'N.	75°21'W.	
Deepwater, N.J.	39°41'N.	75°30'W.	
<u>WSO Baltimore, Md.</u>			
Fort McHenry, Md.	39°16'N.	76°35'W.	Bristol Recorder-WSO.
Sparrows Point, Md.	39°13'N.	76°29'W.	} On request.*
Annapolis, Md.	38°59'N.	75°34'W.	
Tilghman Island, Md.	38°43'N.	76°20'W.	
Indian River Inlet, Del.	38°37'N.	75°04'W.	
Port Republic, Md.	38°30'N.	76°30'W.	0800-1700 E.
Ocean City, Md.	38°20'N.	75°06'W.	0800-1700 E.*
Fishing Creek, Md.	38°19'N.	76°03'W.	0600-2000 E.
Solomons, Md.	38°19'N.	76°28'W.	0730-1700 E.*
Crocheron, Md.	38°15'N.	76°03'W.	0800-1700 E.
Piney Point, Md.	38°08'N.	76°32'W.	0800-1700 E.
Greenbackville, Va.	38°00'N.	75°23'W.	0800-1600 E.
Crisfield, Md.	37°59'N.	75°52'W.	0800-1700 E.
<u>WSFO Washington, D.C.</u>			
Wisconsin Avenue, D.C.	38°54'N.	77°04'W.	On request.*
Washington Channel, D.C.	38°52'N.	77°01'W.	Report at given criteria.
Fort Belvoir, Va.	38°41'N.	77°08'W.	} On request.*
Dahlgren, Va.	38°19'N.	77°02'W.	
<u>WSO Norfolk Va.</u>			
<u>Tide Height Reporting Stations with Recorders.</u>			
Sewells Point, Va. (Norfolk)	36°57'N.	76°20'W.	Esterline Angus..WSO.
Portsmouth, Va. (Shipyard)	36°49'N.	76°18'W.	" " (on call - Navy).
Portsmouth, Va.	36°49'N.	76°18'W.	Esterline Angus (on call from NOS).
Virginia Beach, Va.	36°50'N.	75°58'W.	Esterline Angus (on call from NOS).

CHAPTER 5

TABLE 5-2. TIDE HEIGHT REPORTING NETWORK STATIONS (Cont'd)

West Point, Va.	37°32'N.	76°49'W.	Foxboro (Chesapeake Corp., on call).
Nags Head, N.C. (Whalebone)	34°48'N.	75°25'W.	Recorder-Army Corps of Eng.
Ocracoke, N.C.	35°07'N.	75°59'W.	Recorder-Army Corps of Eng.

TABLE 5.2 TIDE HEIGHT REPORTING NETWORK STATIONS (Cont'd)

Stations with Staff Tidal Gages, heights available on call when needed.

Paramore Beach, Va. (CG)	37°30'N.	75°45'W.	
Windmill Point, Va. (CHURN)	37°27'N.	76°17'W.	
Coinjock, N.C. (Army Eng.)	36°21'N.	75°58'W.	
Elizabeth City, N.C. (City)	36°18'N.	76°13'W.	
Edenton, N.C. (Displayman)	36°04'N.	76°37'W.	
Roanoke Island Bridge, N.C.	35°54'N.	75°38'W.	(Corps of Army Eng.)
Bodie Island, N.C.	35°48'N.	75°33'W.	(Nat'l. Park Serv.)
Wallops Island, Va. (WSO)	37°51'N.	75°29'W.	Bristol Recorder.
Cape Hatteras, N.C.	35°15'N.	75°32'W.	(Corps of Army Eng.).
<u>WSO Wilmington, N.C.</u>			
Stumpy Point, N.C.	35°42'N.	75°46'W.	} On request.*
Washington, N.C.	35°33'N.	77°04'W.	
Bellhaven, N.C.	35°32'N.	76°38'W.	
Rose Bay, N.C.	35°27'N.	76°24'W.	
Hobucken Hwy., Bridge, N.C.	35°15'N.	76°35'W.	
New Bern, N.C.	35°06'N.	77°03'W.	
Cherry Point, N.C.	34°56'N.	76°52'W.	
Core Creek Highway Bridge N.C.	34°49'N.	76°42'W.	
Atlantic Beach, N.C.	34°42'N.	76°44'W.	
Topsail Island, N.C.	34°22'N.	77°38'W.	
Wilmington (Princess Street , N.C.)	34°14'N.	77°57'W.	
Wrightsville Beach, N.C.	34°13'N.	77°47'W.	
Wrightsville Sound, N.C.	34°13'N.	77°48'W.	
<u>WSO Charleston, S.C.</u>			
State Pier #2, S.C.	32°47'N.	79°55'W.	Bristol Recorder-WSO.
Myrtle Beach, S.C.	33°41'N.	78°53'W.	} On Request.*
Georgetown, S.C.	33°22'N.	79°17'W.	
U.S. Naval Base, S. C.	32°52'N.	79°58'W.	
Municipal Yacht Basin, S.C.	32°47'N.	79°57'W.	
Sullivan's Island, S.C.	32°46'N.	79°52'W.	
Parris Island (USMCRC), S.C.	32°20'N.	80°40'W.	
Hilton Head Island, S.C.	32°13'N.	80°44'W.	
<u>WSO Savannah, Ga.</u>			
Fort Pulaski, Ga.	32°02'N.	80°54'W.	Bristol Recorder-WSO.
<u>WSO Jacksonville, Fla.</u>			
Fernandina, Fla.	30°40'N.	81°28'W.	On request.*
Mayport, Fla.	30°24'N.	81°26'W.	Bristol Recorder-WSO.

* On request during daylight hours and on a 24-hour basis during storms.

CHAPTER 5

TABLE 5-3. WEATHER SERVICE OFFICES EQUIPPED WITH REMOTED TIDE RECORDERS

<u>WEATHER SERVICE OFFICE (WSO)</u>	<u>LOCATION OF TIDE GAGE</u>
1. Boston, Mass.	South Boston Docks
2. Providence, R.I.	State Pier
3. New York, N.Y.	
(a) City Office	Battery
(b) La Guardia Airport	Willets Point
4. Atlantic City, N.J.	Steel Pier
5. Philadelphia, Pa.	(1) Breakwater Harbor
	(2) Delaware River (owned by Philadelphia Electric Co.)
6. Baltimore, Md.	Fort McHenry
7. Norfolk, Va.	Sewells Point
8. Charleston, S.C.	State Pier No. 2
9. Savannah, Ga.	Fort Pulaski (Cockspur Island)
10. Jacksonville, Fla.	Mayport
11. Daytona Beach, Fla.	Daytona Beach
12. Miami, Fla.	Miami Beach Pier

U.S. COAST GUARD OBSERVATIONS

1. Coast Guard meteorological data will originate from the following four observational sources:

- o Certain Atlantic seacoast land stations.
- o Experimental ocean data buoy (XERB-1).
- o Special duty offshore weather ship (Ocean Weather Station HOTEL).
- o Special observations by OSVs en route to patrol.

Detail of each of these sources are discussed below.

a. Atlantic Seacoast Land Reporting Stations.

(1) Cooperative Network. Many Coast Guard stations along the east coast are part of the National Weather Service cooperative station network; many north of Cape Hatteras, N.C. also serve as the Cooperative Hurricane Reporting Network (CHURN) stations. Still other offshore light towers and lightships are reporting stations.

(2) Scope of Network. Observations from the above Cooperative Network are collected by Coast Guard District Offices (field commands) and passed to local WSOs as follows:

<u>Station Locations</u>		<u>U.S. Coast Guard District Office</u>		<u>Weather Service Facility</u>
Maine to Rhode Island	-	First (Boston)	-	WSFO Boston
Connecticut to Delaware	-	Third (New York City)	-	WSO New York
Maryland to North Carolina	-	Fifth (Norfolk)	-	WSO Norfolk
South Carolina to Florida	-	Seventh (Miami)	-	NHC Miami

(3) Nature of Observations. Both climatological and synoptic reports are associated with the above Cooperative Network.

(4) Requests for Reports. Because arrangements for specific observations have been delegated to local levels, the request for special reports should be originated by the responsible WSO and WSFO and transmitted to the appropriate supervising Coast Guard District Office. In turn, the latter will request designated substations to report on a specified schedule.

CHAPTER 5
APPENDIX A

b. Deployment of Weather Buoy (XERB-1).

(1) Description. A 40-foot discus buoy, deployed at latitude 36.5°N. and longitude 73.5°W. provides scheduled surface and limited sub-surface information.

(2) Environmental Data. Meteorological and oceanographic parameters are measured every hour and stored on magnetic tape. Present shore interrogation of buoy data is once every 6 hours, but the system is capable of more frequent interrogation. The meteorological and oceanographic elements sampled and stored aboard the buoy consist of the following:

- o barometric pressure
- o wind direction and speed
- o air temperature
- o dew point temperature
- o sea-surface temperature
- o insolation
- o precipitation (amount)
- o wave heights
- o surface current vector
- o water temperatures

(3) Mission. The principal objective of this buoy consists of gathering needed engineering and environmental data to aid development of more sophisticated prototype data buoys. The buoy, designated XERB-1, is basically experimental in nature; data will be telemetered to a Coast Guard communications station. Upon decoding, the meteorological data will be transmitted into the National Weather Service communication network in WMO FM 21D ship code in near real-time. No upper air capability is presently available.

c. Special Duty Offshore Weather Ship (Ocean Weather Station HOTEL--4YH).

(1) Description. A Coast Guard cutter is deployed to man the Atlantic Ocean Weather Station HOTEL in the vicinity of latitude 38°N. and longitude 71°W. (approximately 205 miles south of Martha's Vineyard Island and 200 miles east of the Virginia Capes).

(2) Time of Manning Station. Ocean Weather Station HOTEL will be manned continuously during 8 months of the year (August through March) to cover both the east coast storm and hurricane seasons. During June and July, the weather ship will remain on a 24-hour standby status for emergency assignment to station. Thus, a total of 10 months coverage of Ocean Weather Station HOTEL is provided.

(3) Meteorological Data. Hourly surface and radar reports and 6-hourly upper air observations are planned similar to the Ocean Weather Station procedures; synoptic observations will be taken by National Weather Service personnel and will be transmitted to Coast Guard Radio Station Washington (NMH) where it will be placed on the National Weather Service 7072 Circuit.

d. Special Observations by Coast Guard Ocean Station Vessels (OSV).

Special surface or upper air observations taken by National Weather Service personnel aboard OSVs can be obtained when these ships are en route to or from assigned patrols in the mid-Atlantic. National Weather Service should address requests for available ships to Commander, Eastern Area, Communications, over the tie-line in Boston, New York, and Norfolk or through SARLANT WBC, Washington.

CHAPTER 5
APPENDIX B

RADAR OBSERVING STATION NETWORK

a. National Weather Service

	<u>Radar</u>	<u>Latitude</u>	<u>Longitude</u>
Atlantic City, N.J.	WSR-57	39° 27'N.	74° 34'W.
Brunswick NAS, Maine	WSR-57	43° 53'N.	69° 56'W.
Charleston, S.C.	WSR-57	32° 54'N.	80° 02'W.
Daytona Beach, Fla.	WSR-57	29° 11'N.	81° 03'W.
Hatteras, N.C.	WSR-57M	35° 16'N.	75° 33'W.
Miami, Fla.	WSR-57	25° 43'N.	80° 17'W.
New York, N.Y.	WSR-57	40° 46'N.	73° 59'W.
Patuxent, Md.	WSR-57	38° 17'N.	76° 25'W.
Waycross, Ga.	WSR-57M	31° 15'N.	82° 24'W.
Wilmington, N.C.	WSR-57	34° 17'N.	77° 55'W.

b. U.S. Navy

Jacksonville NAS, Fla.	FPS-68	30° 14'N.	81° 41'W.
Lakehurst NAS, N.J.	FPS-81	40° 02'N.	74° 20'W.
Norfolk FWF, Va.	FPS-81	36° 56'N.	76° 18'W.
Quonset Point FWF, R.I.	FPS-41	41° 35'N.	71° 25'W.
Kindley NAS, Bermuda	CPS-9	32° 22'N.	64° 41'W.

c. Air Weather Service

Andrews AFB, Md.	FPS-77	38° 49'N.	76° 51'W.
Loring AFB, Maine	FPS-77	46° 57'N.	67° 53'W.
McGuire AFB, N.J.	FPS-77	40° 01'N.	74° 35'W.
Otis AFB, Mass.	FPS-77	41° 39'N.	70° 31'W.
Pope AFB, N.C.	CPS-9	35° 11'N.	79° 01'W.
Robins AFB, Ga.	FPS-77	32° 38'N.	83° 36'W.
Seymour Johnson AFB, N.C.	FPS-77	35° 20'N.	77° 58'W.
Westover AFB, Mass.	FPS-77	42° 12'N.	83° 36'W.

d. Air Defense Command (ADC) Sites:

(1) 20 NORAD Region Control Centers

	<u>Latitude</u>	<u>Longitude</u>
* 645 Radar Sq., Patrick AFB, Fla.	28° 13'N.	80° 36'W.
* 679 Radar Sq., Jacksonville AFS, Fla.	30° 13'N.	81° 41'W.
691 Radar Sq., Cross City AFS, Fla.	29° 38'N.	83° 06'W.
702 Radar Sq., Hunter AFB, Ga.	32° 01'N.	81° 10'W.
861 Radar Sq., Aiken AFS, S.C.	33° 39'N.	81° 41'W.
632 Radar Sq., Roanoke Rapids AFS, N.C.	36° 27'N.	77° 44'W.
701 Radar Sq., Fort Fischer AFS, N.C.	33° 59'N.	77° 55'W.
770 Radar Sq., Fort George C. Meade RSI, Md.	39° 07'N.	76° 44'W.
* 771 Radar Sq., Cape Charles AFS, Va.	37° 08'N.	75° 57'W.
* 792 Radar Sq., North Charleston AFS, S.C.	32° 54'N.	80° 01'W.

(2) 21 NORAD Region Control Centers

* 648 Radar Sq., Benton AFS, Pa.	41° 21'N.	76° 18'W.
* 656 Radar Sq., Saratoga Springs, AFS, N.Y.	43° 01'N.	73° 41'W.
* 680 Radar Sq., Palermo AFS, N.J.	39° 13'N.	74° 41'W.
762 Radar Sq., North Truro AFS, Mass.	42° 02'N.	70° 03'W.
773 Radar Sq., Montauk AFS, N.Y.	41° 04'N.	71° 52'W.
907 Radar Sq., Buck's Harbor AFS, Maine	44° 38'N.	67° 24'W.

e. U.S. Marine Corps

	<u>Radar</u>	<u>Latitude</u>	<u>Longitude</u>
Beaufort MCAS, S.C.	FPS-41	32° 29'N.	80° 44'W.
Cherry Point MCAS, N.C.	FPS-81	34° 54'N.	76° 53'W.

* Remoted in FAA ARTCC.

CHAPTER 5
APPENDIX B

f. Air Route Traffic Control Centers (ARTCC)

	<u>FAA Radar Sites</u>	<u>Military Radar Sites</u>
New York ARTCC (Islip, N.Y.)	New York, N.Y. Trevose, Pa.	648 Radar Sq., Benton AFS, Pa.
Washington ARTCC (Leesburg, Va.)	Washington, D.C. Bedford, Va. Benson, N.C.	771 Radar Sq., Cape Charles AFS, Va.
Boston ARTCC (Nashua, N.H.)	Boston, Mass.	656 Radar Sq., Sara- toga Springs AFS, N.Y. 907 Radar Sq., Buck's Harbor AFS, Maine
Miami ARTCC (Miami, Fla.)	MacDill, Fla.	644 Radar Sq., Richmond AFS, Fla. 645 Radar Sq., Patrick AFB, Fla. 660 Radar Sq., Jack- sonville AFS, Fla.
Jacksonville ARTCC (Hilliard) (Jacksonville, Fla.)	Charleston, S.C.	678 Radar Sq., Tyndall AFB, Fla. 679 Radar Sq., Jack- sonville AFS, Fla. 792 Radar Sq., North Charleston AFS, S.C.

g. Cooperating Sites

	<u>Radar</u>	<u>Latitude</u>	<u>Longitude</u>
** Wallops Station, Va. (NASA)	MPS-19	37° 50'N.	75° 29'W.
	SPS-12,	37° 56'N.	75° 28'W.
	FPS-16	37° 50'N.	75° 29'W.
	FPQ-6	37° 52'N.	75° 31'W.

AFB - Air Force Base
AFS - Air Force Station
FWF - Fleet Weather Facility

MCAS - Marine Corps Air Station
NAS - Naval Air Station

** The Radar set used depends upon the location of the storm. The one in use will be properly identified.

PROCEDURES FOR DETAILING NATIONAL WEATHER SERVICE METEOROLOGISTS TO FAA
AIR ROUTE TRAFFIC CONTROL CENTERS

1. The National Weather Service has been authorized by the FAA to send radar meteorologists to ARTCCs during the winter storms season. These meteorologists will make, record, and transmit radar observations as well as act as a focal point to solicit and process PIREPS from the winter storms area.
2. Because of the limited facilities at the Centers, the National Weather Service agreed that no more than two persons will visit a Center at any given time. Each visit will normally be short, 1 or 2 days, but will depend upon the progress of the winter storm under observation.
3. Security clearances are required by the FAA of all personnel visiting the ARTCCs (par. 10 below).
4. Only those personnel listed in paragraph 10 are authorized to visit ARTCCs. Persons not listed in paragraph 10 will not be admitted to the Centers.
5. Should there be a need for other cleared personnel to be added to the list, it will be the responsibility of the National Weather Service Regional Headquarters to coordinate names of new radar meteorologists with the Investigation and Security Division of the responsible FAA Regional Office. These requests will be forwarded 2 weeks in advance of the anticipated utilization of such personnel.
6. The security clearance list in paragraph 10 will be updated each year by the National Weather Service.
7. To expedite and assure the granting of access to ARTCCs, the following will apply:
 - a. A copy of this Plan with personnel security clearance information shall be forwarded to ARTCCs.
 - b. A copy of this Plan which contains security clearance information (par. 10) on personnel authorized to visit ARTCCs shall be forwarded to the FAA Regional Investigation and Security Division and the Centers to assure that visiting access is accomplished.
8. The FAA Regional Investigation and Security Division will insure that appropriate ARTCCs are properly briefed.
9. The National Weather Service Regional Headquarters will keep themselves advised of the radar site locations and be prepared to detail radar meteorologists to the Centers if conditions warrant. The participating ARTCCs and their associated radar site locations are listed in Appendix 5-B. The ADC locations listed in Appendix 5-B are remoted to ARTCCs.

CHAPTER 5
APPENDIX C

10. The following National Weather Service personnel have secret security clearances and are authorized by the Air Force's ADC to visit ADC radar sites. These personnel have also been authorized by the FAA to visit ARTCCs listed in Appendix 5-B for the same purpose.

<u>NAME</u>	<u>INVESTIGATIVE AUTHORITY</u>	<u>DATE</u>
Baskerville, Robert W., Jr.	CSC	4-11-69
Benton, Davis	CSC	8-04-60
Bigler, Stuart G.	CSC**	12-01-59
Black, Dale A.	CSC	6-24-63
Bowser, Carl O., Jr.	CSC	4-14-69
Capo-Dominguez, Rafhel A.	CSC	3-14-67
Clay, Dale A.	CSC	5-15-63
Crouch, Billy J.	CSC	4-27-67
Dooley, J.T.	CSC	8-18-61
Drybala, Francis J.	CSC	5-28-68
Dunham, Hoye S.	CSC	10-31-60
Filian, Joseph	CSC	8-08-62
Fisher, Robert E.	CSC	1-07-66
Flanders, Allen F.	CSC	11-03-60
Foster, Harrie E., Jr.	OIS	10-26-56
Fuertsch, Francis E.	CSC	12-10-68
Hamilton, Robert E.	CSC	1-05-66
Harris, Gordon W.	OIS*	1-16-63
Hexter, Paul L., Jr.	CSC	10-27-59
Hull, Albert J.	CSC	11-06-59
Hurlbut, Sam R.	CSC	7-13-62
Johnson, Clyde C.	CSC	8-12-60
Keener, Robert W.	CSC	4-11-68
Kuhn, Ronald E.	CSC	5-07-69
Lee, John P.	OIS	3-01-63
Logan, Wendell B.	OIS	12-19-68
Lopez, Moses	OIS	7-29-69
Marier, Donald W.	CSC	11-28-62
McCaslin, Robert W.	OIS	5-26-70
Monroe, Harold J., Jr.	CSC	6-12-61
Myers, James C.	CSC	5-12-69
Oldmixon, Donald H.	CSC	7-29-60
Palmer, Cecil M.	CSC	12-01-60
Parrish, Samuel K.	CSC	11-25-60
Pentecost, Joseph B.	CSC	6-05-59
Phipps, Carl L.	CSC	3-17-61
Pruett, Jeter A.	CSC	10-22-64
Robinson, John M.	CSC	4-10-68
Sadowski, Alexander F.	CSC	8-06-59
Samet, Alvin M.	CSC	5-28-68
Sarnowski, Edward	CSC	9-16-65
Schonberger, Abram	CSC	11-15-60
Schulz, Walter A., Jr.	CSC	7-05-66

<u>NAME</u>	<u>INVESTIGATIVE AUTHORITY</u>	<u>DATE</u>
Sheffield, Richard K.	CSC	5-17-65
Smith, Robert L.	CSC	4-15-54
Steward, Eldyn L.	CSC	10-08-69
Teague, Jack L.	CSC	5-05-65
Thomas, Billy D.	CSC	8-03-60
Warden, John D.	CSC	6-17-60
Wells, Fred E.	CSC	10-22-59
Williams, Milton L.	CSC	7-20-60
Wilk, Kenneth E.	CSC	12-17-62
Whitehead, Robert E.	OIS	7-21-60

*OIS: Office of Investigation and Security.
**CSC: Civil Service Commission.

COMMUNICATIONS

1. National Weather Service. Collection and Distribution of Severe Winter Weather Information.

a. Systems Used.

(1) Weather Wire Service (WWS). The teletypewriter system makes around-the-clock weather services available to all mass dissemination media and to other selected users. The WWS consists of (a) local loops serving metropolitan areas, (b) statewide intrastate circuits, and (c) overlay circuits. The purpose of the WWS is to transmit consumer-oriented forecasts, watches, weather warnings, and meteorological data to the mass news media for broadcast to the public. Various specialized users also obtain drops on the WWS to meet their requirements. Each intrastate circuit has one Weather Service station designated as the State Relay Center (SRC). The SRC is also connected to the regional overlay interstate circuit and serves as the relay point for transmissions to other States through the SRCs. In each region, one station has been designated as a Regional Relay Center. This station is responsible for the relay of traffic between overlay circuits. Only WSOs (or certain other authorized offices) have direct entry on these circuits. The WSFOs furnish broad-scale information, while local WSOs enter local information. Relays between adjacent circuits are established as necessary to meet the requirements of the Weather Service's Severe Local Storm Warning Service and subscribers located along State or area borders. When urgent material such as a warning is transmitted, a prearranged bell signal is used to attract the attention of users to the transmission. Figure 6-1 shows the areas covered, SRC, regional over-lay circuits, and Regional Relay Centers.

(2) Very High Frequency (VHF) Radio Weather. The WSOs equipped with this type of radio can transmit weather warnings over a frequency of 162.55 MHz or 163.275 MHz (figure 6-2).

(3) RAREP (Radar Report) and Warning Coordination (RAWARC). The National Weather Service's internal teletypewriter system, a landline teletypewriter network consisting of five circuits which terminates at Kansas City, Mo., the network relay and monitoring station. Traffic on RAWARC is basically unscheduled and is handled according to a priority system. The only regularly scheduled operation on RAWARC is an hourly collection (H+45) of radar reports (SD). Special radar reports can be transmitted at any time the circuit is not in use (figure 6-3).

(4) Circuit 7072. This teletypewriter system is operated by the National Weather Service for transmission of weather information between the following Offices:

Station

1. WSO, (Hartford) Windsor Locks, Conn.
2. WCC/WSFO, East Boston, Mass.
3. WSO, Rockefeller Plaza, New York, N.Y.
4. RWC/WSFO Bronx, New York, N.Y.
5. WSO, Atlantic City, N.J.
6. WSFO, Philadelphia, Pa.
7. WSO, Baltimore, Md.
8. National Weather Service Headquarters, (NWSH), COMMS Operating Branch, Suitland, Md.
9. *NWSH WBC/WCC/WSFO, Suitland, Md.
10. U.S. Coast Guard, Alexandria, Va.
11. U.S. Navy Oceanographic Office, Washington, D.C.
12. *NWSH, COMMS Division, Silver Spring, Md.
13. *NWSH, WXAP, Silver Spring, Md.
14. WSO, Norfolk, Va.
15. *NHC, Miami, Fla.
16. *U.S. Air Force Carswell Automatic Digital Weather Switch (ADWS), Ft. Worth, Texas.

* Receive only.

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(5) Service C Teleprinter. All warnings included as a part of the regular State forecasts will be transmitted on Service C.

(6) National Warning System (NAWAS). A Civil Defense-operated telephone hot-line connecting Civil Defense warnings points within each warning area. Usually, one or more WSOs within each State has a drop on this System.

(7) Emergency Action Notification Attention Signal (EANS). When there is an urgent need to inform all concerned of existing dangerous weather conditions, radio and television stations covering a threatened area are requested to use the EANS. Use of EANS attracts radio and television listeners' attention to a warning and also makes it possible for anyone with a special receiver, or a special attachment to a conventional radio receiver, to receive the information. The use of EANS for this purpose is at the discretion of the individual radio and television stations.

(8) Miscellaneous. All other types of distribution methods are used, as appropriate, to make warnings available to the other WSOs and to the public as rapidly as possible. These other methods include:

- (a) Telephone (including NAWAS).
- (b) Radio and Teleprinter Networks.
- (c) Public Service Teleprinter Networks.
- (d) Press Associations and News Services.
- (e) Amateur radio.
- (f) State Police and Highway Radio and Teleprinter Networks.
- (g) State Civil Defense Teleprinter Networks.

b. Distribution of Special Winter Weather Watch and Warning Bulletins.
(fig. 6-4).

2. Department of Defense.

a. The Air Force's Comet II (fig. 6-5) circuit will be used for the collection and distribution of east coast winter storms information received from WCC Washington.

b. The USAF East Coast Winter Storms Reconnaissance Communication Support Plan is contained in Appendix 6-A.

c. The Navy East Coast Winter Storms Reconnaissance Communications Plan is contained in Appendix 6-B.

d. The Common Communication Capabilities of DOD and the Weather Bureau are contained in Appendix 6-E.

e. The U.S. Navy Backup/Transfer Procedures are contained in Appendix 6-F.

3. Federal Aviation Administration.

a. Service A (fig. 6-6) will be used for the collection and distribution of east coast storms information as follows:

(1) Hourly and special airway observations.

(2) Radar Summaries (SD-1).

(3) Airmen's Meteorological Information (AIRMETS) and Significant Meteorological Information (SIGMETS).

b. Area B Service will be used for distribution of PIREPS from FSS offices (fig. 6-7).

4. U.S. Coast Guard.

a. Weather Reporting and Data Collection. The Coast Guard operates numerous activities which routinely report or collect meteorological data. Those units which will provide data inputs for this program are as follows:

(1) Radio Stations.

(a) Coast Guard radio stations at Boston, New York, Portsmouth (Pungo), Va., Jacksonville (Jacksonville Beach), and Miami, collect AMVER and METEO Messages from merchant vessels on a routine basis. The METEO data are then passed directly to the NMC Suitland over Coast Guard Circuit GT 7990. Figure 6-8 shows the applicable east coast commands which have terminations on this Circuit.

(b) The Coast Guard radio station at Washington supports the Ocean Station Program by collecting all Atlantic Ocean station meteorological data. These data are passed directly to Suitland on Circuit GT-7072.

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(2) Weather Reporting Units.

(a) Coast Guard cutters with radiomen assigned make routine weather reports whenever more than 25 miles from the nearest regularly reporting station. These reports, when received at any of the Coast Guard radio stations listed in paragraph (1) above, may be passed to NMC Suitland in the same manner as other METEO traffic or may be sent to the local WSO only by a Coast Guard District Communication Center, as mutually agreed by those concerned.

(b) Numerous Coast Guard Search and Rescue (SAR) Stations, Light Vessels, and Manned Offshore Lights make routine weather reports as part of the east coast CHURH system of the Cooperative Coast Guard Network. The units shown in table 6-1 constitute the present reporting stations.

(c) Reporting times for all reporting units are at 0000, 0600, 1200, and 1800 GMT daily, or such other times that may be agreed upon by the Coast Guard and the National Weather Service.

(d) Reports made by the activities in paragraph (b) above are sent over Intra-Coast Guard teletypewriter circuits to the local District Communication Center. From there, they are relayed to the local WSO over the circuits shown in figure 6-9.

(e) In addition to the Coast Guard/National Weather Service circuits mentioned above, the Coast Guard has an AUTODIN terminal in all of its Communication Centers which can be used to relay weather data whenever traffic loads or higher priority traffic restrict the use of other circuits.

b. Weather Forecast Dissemination. To provide timely information for the maritime community on local environmental conditions, the Coast Guard has both a visual and radio dissemination program.

(1) Radio Dissemination.

(a) Weather information supplied by the National Weather Service is included in the Marine Information Broadcasts made by designated Coast Guard radio stations. The District Commander may also authorize additional stations to broadcast weather warnings to insure wide dissemination of information during severe weather. Table 6-2 lists those radio stations which have been designated to broadcast marine weather information.

(b) In addition to those stations which make regular broadcasts, unscheduled broadcasts will be made by those stations authorized to initiate smallcraft visual warning displays, based upon locally observed conditions, on 2182 kHz and 156.8 MHz. The broadcast will be made at the times smallcraft warnings are issued.

(2) Visual Dissemination. Coast Guard District Commanders in liaison with National Weather Service Regional Directors have designated certain Light Vessels, Light Towers, and SAR Stations as coastal warning display units. Selected display stations have been authorized by the National Weather Service to initiate smallcraft warnings.

TABLE 6-1. COAST GUARD WEATHER REPORTING UNITS

<u>1st District</u>	<u>Regular Reporting Times</u> <u>GMT</u>
<u>Maine</u>	
Fletchers Neck Station Eastern Point Light Matinicas Rock Light Kennebec River Station Moose Peak Light Mount Desert Light Portland Light Vessel Rockland Station Southwest Harbor	0000, 0600, 1200, 1800*
<u>New Hampshire</u>	
Portsmouth Harbor Station	
<u>Massachusetts</u>	
Merrimack River Station Race Point Station Boston Light Vessel Chatham Harbor Station Cape Cod Canal Station Buzzards Bay Entrance Light Gay Head Light Nantucket Light Vessel Scituate Station	0000, 0600, 1200, 1800*
<u>Rhode Island</u>	
Point Judith Station	

* Additional reports are filed at 0900, 1500, and 2100 GMT during the period from 1 July to 15 October.

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TABLE 6-1. COAST GUARD WEATHER REPORTING UNITS (Cont'd)

3rd District

Regular Reporting Times
GMT

Connecticut

Falkner Island Light
Little Gull Light
New London Ledge Light

New York

Execution Rocks Light
Rockaway Station
Short Beach Station
Fire Island Station
Montauk Station
Moriches Station
Stratford Shoal Light
Eatons Neck Station
Ambrose Light Tower

0000 and every
3 hours thereafter

{ 0500, 0900, 1100,
1700, 2100, 2300

New Jersey

Atlantic City Station
Manasquan Station
Sandy Hook Station
Miah Maul Shoal Light
Five Fathom Bank Light Vessel

0000 and every
3 hours thereafter

0500, 1100, 1700, 2300

Delaware

Harbor of Refuge

0000 and every
3 hours thereafter

Delaware Light Vessel

0500, 1100, 1700, 2300

TABLE 6-1. COAST GUARD WEATHER REPORTING UNITS (Cont'd)

<u>5th District</u>	<u>Regular Reporting Times</u> <u>GMT</u>
<u>Maryland</u>	
Ocean City Station	} 0000 and every 3 hours thereafter
Cove Point Light	
Thomas Point Light	
<u>Virginia</u>	
Chesapeake Light	} 0000, 0900, 1200, 1500, 1800, 2100
Wolf Trap Light	
Smith Point Light	
Parramore Beach Station	
Cape Henry Light	
<u>North Carolina</u>	
Oregon Inlet	} 0000 and every 3 hours thereafter
Diamond Shoal Light Tower	
Oak Island Station	
Frying Pan Light	
Cape Lookout Station	
<u>7th District</u>	
<u>South Carolina</u>	
Savannah Light	} 0000 and every 6 hours thereafter
Saint Simmons Island Station	
<u>Georgia</u>	
No reporting stations	
<u>Florida</u>	
No reporting stations in the east coast storms area	

CHAPTER 6

TABLE 6-2. COAST GUARD -- MARINE INFORMATION BROADCASTS

Abbreviations under Subject column:

WX - Weather	CW - Continuous Wave
SWW - Severe Weather Warning	6A3 - Double Side Band Voice
HD - Hydro Data	3A3H - Compatible Side Band Voice
NTM - <u>Notice to Mariners</u>	3A3J - Suppressed Carrier SSB Voice

All frequencies are in the kHz range.

Preliminary announcements of these broadcasts are made on 500 kHz (CW) or 2182 kHz (6A3/3A3H) as appropriate.

<u>1st District</u>	<u>Type</u>	<u>Time (GMT)</u>	<u>Subject</u>			
			WX	SWW	HD	NTM
<u>Boston(NMF)</u>						
(a) 472(CW)	Regular	0050 & 1650	X	X	X	X
	Safety	1st silent period after receipt		X	X	X
(b) 2670	Regular	0440	X	X	X	X
(6A3/3A3H)	Regular	1640		X	X	X
	Regular	1040 & 2240	X			
	Safety	Upon receipt		X	X	X
(c) 8765.4	Regular	0130, 0730, 1330, & 1930	X	X		
(3A3H/3A3J)	Safety	Upon receipt		X		
<u>3rd District</u>						
<u>New York(NMY)</u>						
(a) 486(CW)	Regular	0100 & 1700		X	X	X
	Safety	1st silent period after receipt		X	X	X
(b) 2670(6A3/ 3A3H)	Regular	0020 & 1220		X	X	X
	Safety	Upon receipt		X	X	X
	Special*	0020, 0920, 1220, 1520, 1820, & 2120	X	X		

*Special broadcasts are provided for boating safety during the period from 15 May through 15 October.

TABLE 6-2. COAST GUARD -- MARINE INFORMATION BROADCASTS (Cont'd)

<u>3rd District</u>	<u>Type</u>	<u>Time (GMT)</u>	<u>Subject</u>			
			WX	SWW	HD	NTM
<u>Cape May (NMK)</u>						
(a) 2670(6A3/ 3A3H)	Regular	1100 & 2300	X	X	X	X
	Safety	Upon receipt		X	X	X
	Special*	0945, 1245, 1545, 1845, 2145, & 0045	X	X		
<u>5th District</u>						
<u>Baltimore (NMX)</u>						
(a) 2670(6A3/ 3A3H)	Regular	1750	X	X	X	X
	Safety	Upon receipt		X	X	X
<u>Portsmouth (NMN)</u>						
(a) 466(CW)	Regular	0120 & 1620		X	X	X
	Safety	1st silent period after receipt		X	X	X
(b) 2670(6A3/ 3A3H)	Regular	0520 & 1720		X	X	X
	Safety	Upon receipt		X	X	X
<u>Fort Macon (NMN37)</u>						
(a) 2670(6A3/ 3A3H)	Regular	1130 & 1700	X	X	X	X
	Safety	Upon receipt		X	X	X
<u>7th District</u>						
<u>Charleston (NMB)</u>						
(a) 2670(6A3/ 3A3H)	Regular	0420 & 1620		X	X	X
	Safety	Upon receipt		X	X	X
<u>Jacksonville (NMV)</u>						
(a) 430(CW)	Regular	0125 & 1625		X	X	X
	Safety	1st silent period after receipt		X	X	X
(b) 2670(6A3/ 3A3H)	Regular	0620, 1120, 1320, 1520, & 1820	X	X	X	X
	Safety	Upon receipt		X	X	X

* Special broadcasts are provided for boating safety during the period from 15 May through 15 October.

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TABLE 6-2. COAST GUARD -- MARINE INFORMATION BROADCASTS (Cont'd)

<u>7th District</u>	<u>Type</u>	<u>Time (GMT)</u>	<u>Subject</u>			
			WX	SWW	HD	NMT
<u>Miami (NMA)</u>						
(a) 440(CW)	Regular	0100 & 1600		X	X	X
	Safety	1st silent period after receipt		X	X	X
(b) 2670(6A3/ 3A3H)	Regular	0450 & 1650	X	X	X	X
	Safety	Upon receipt		X	X	X
	Special*	0500, 0600, 0700, 0800, 0900, 1000, 1200, 1500, 1700, 2000, & 2400 (local time)	X	X		X

* Special broadcasts are provided for boating safety.

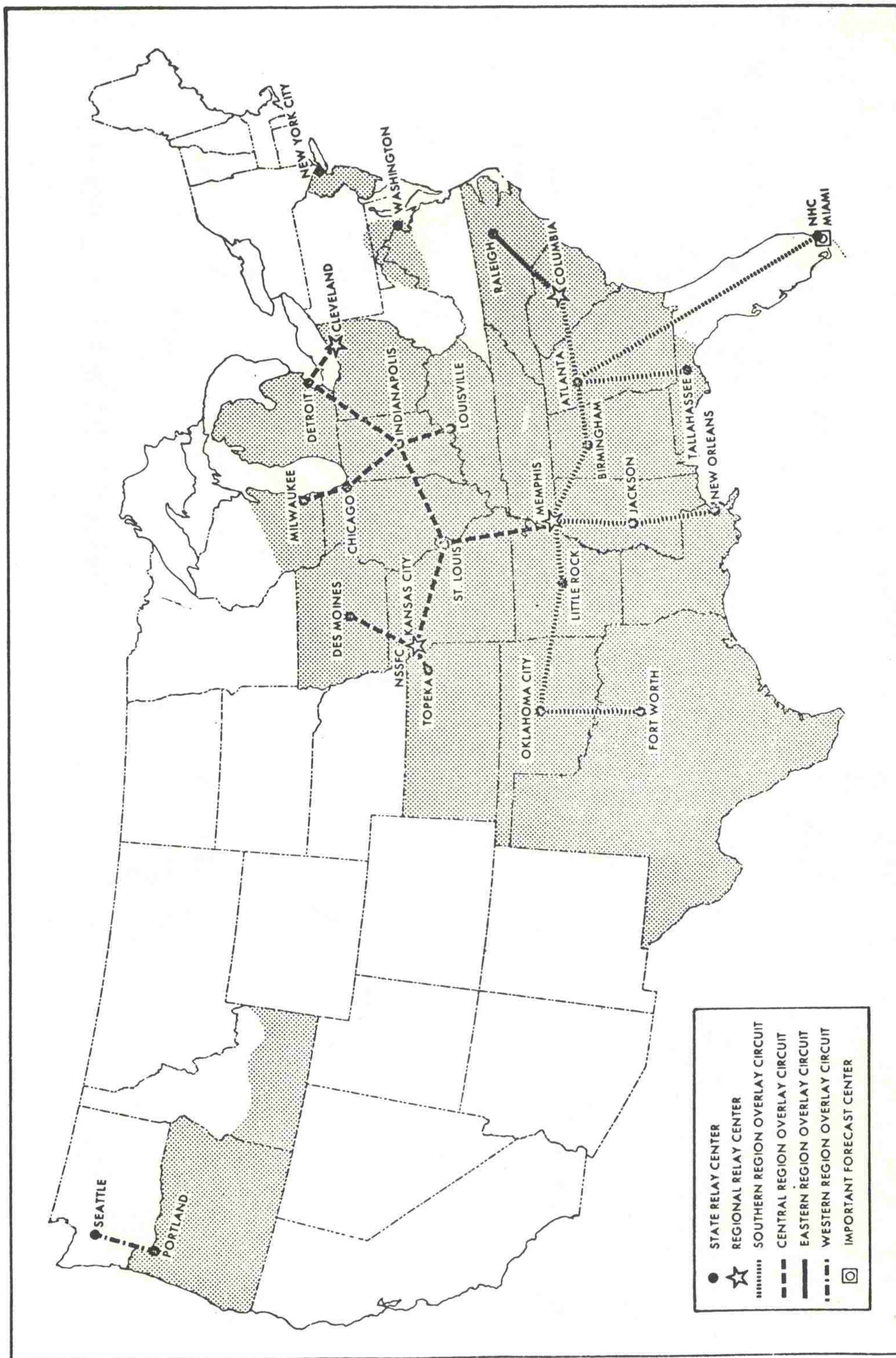


FIGURE 6-1. WEATHER WIRE SERVICE

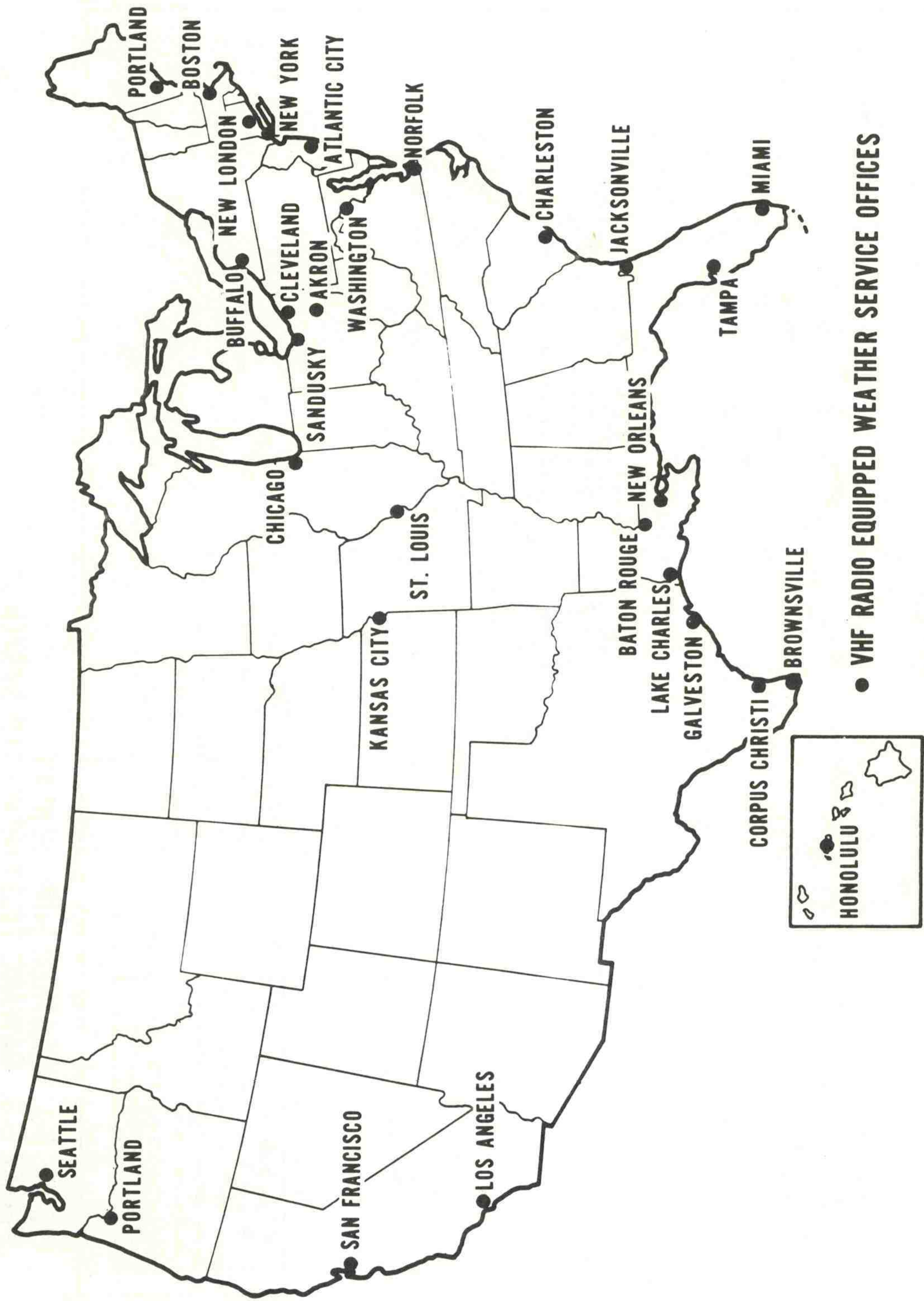


FIGURE 6-2. VHF CONTINUOUS TRANSMISSION SYSTEM

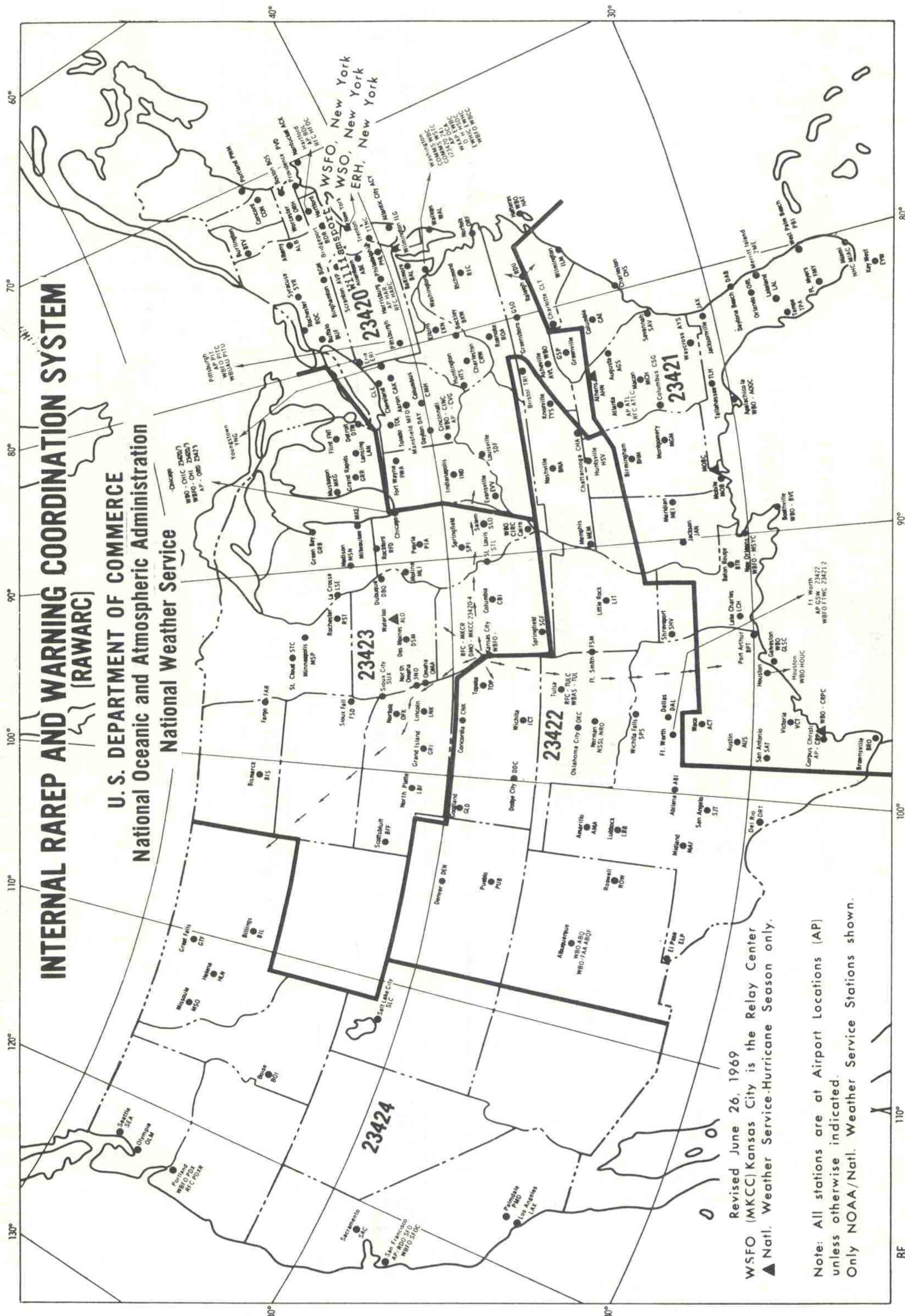


FIGURE 6-3. RAWARC TELETYPEWRITER SYSTEM

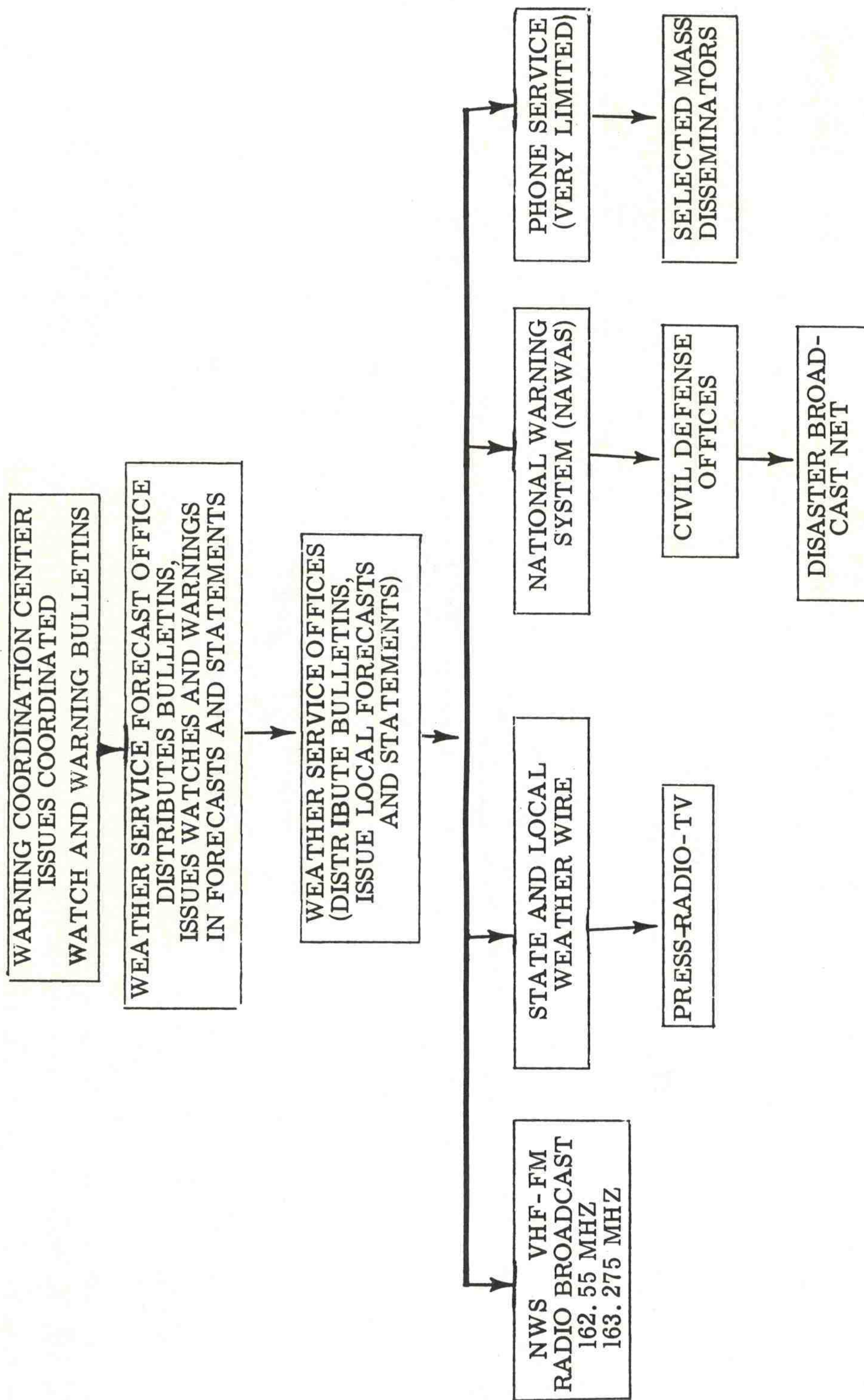


FIGURE 6-4. DISTRIBUTION OF SPECIAL WINTER WEATHER WATCH AND WARNING BULLETINS

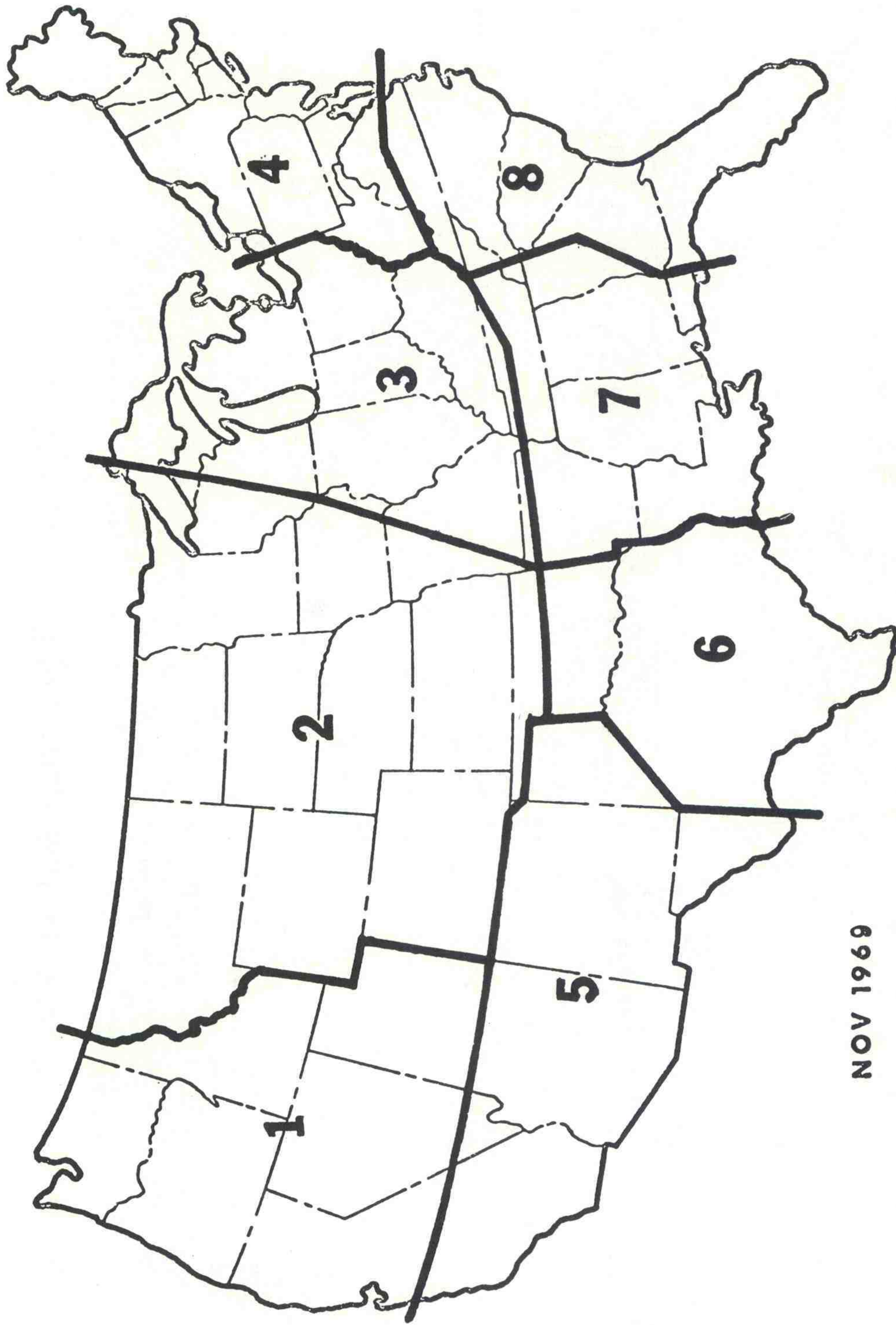


FIGURE 6-5. COMET COLLECTING AND DISSEMINATING SYSTEM
(COMET II)

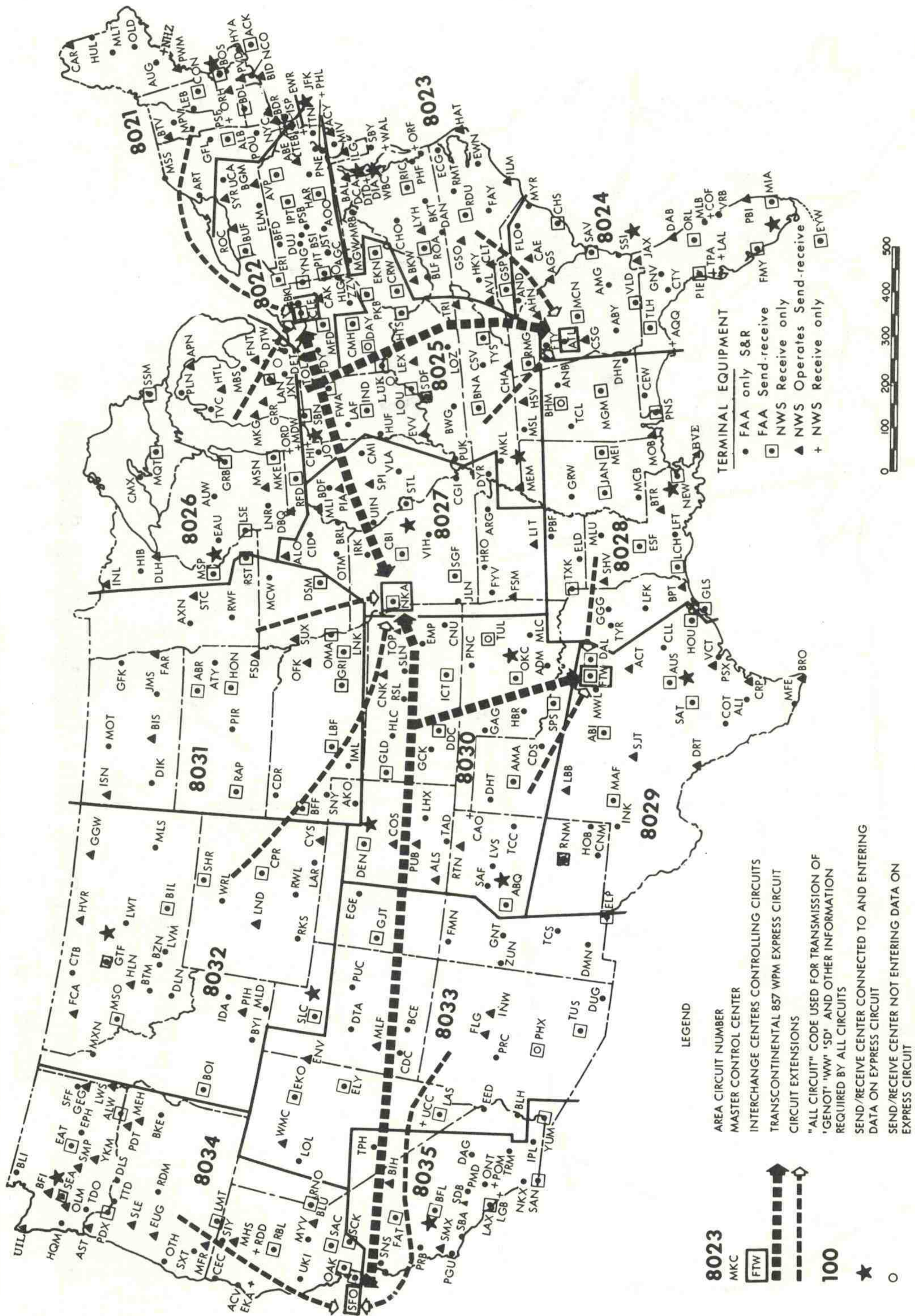


FIGURE 6-6. SERVICE A TELETYPEWRITER SYSTEM

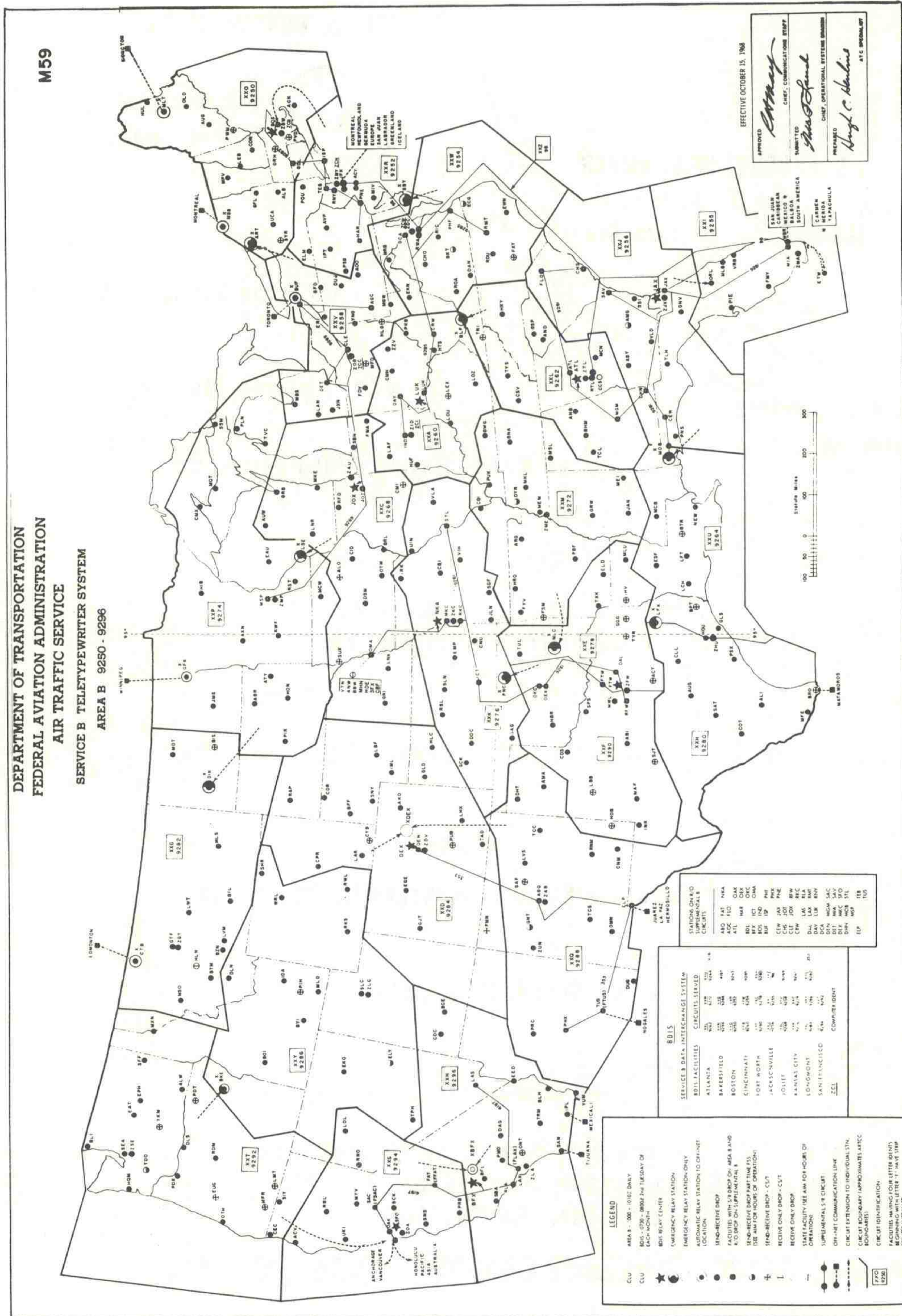
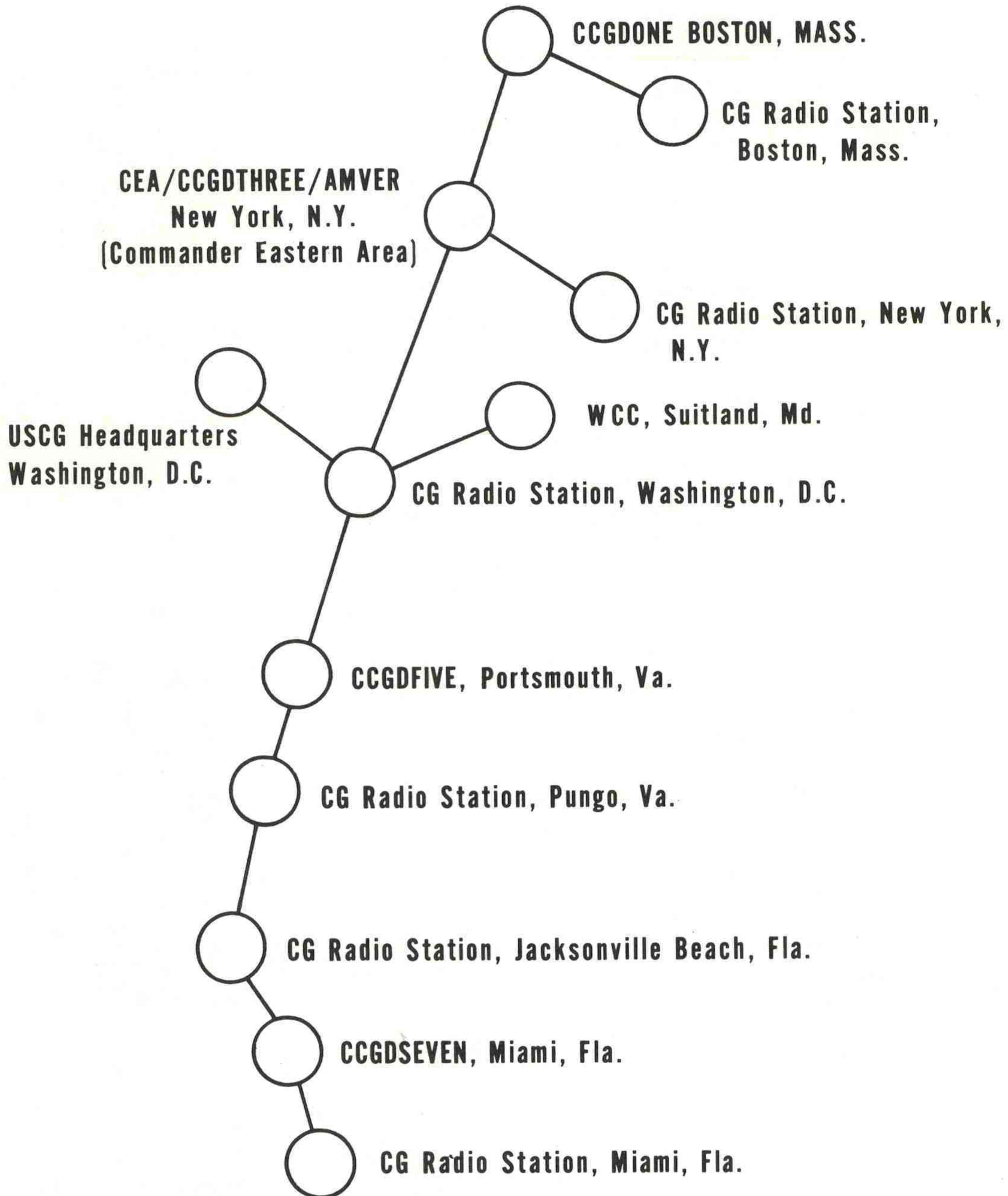


FIGURE 6-7. SERVICE "B" TELETYPEWRITER SYSTEM

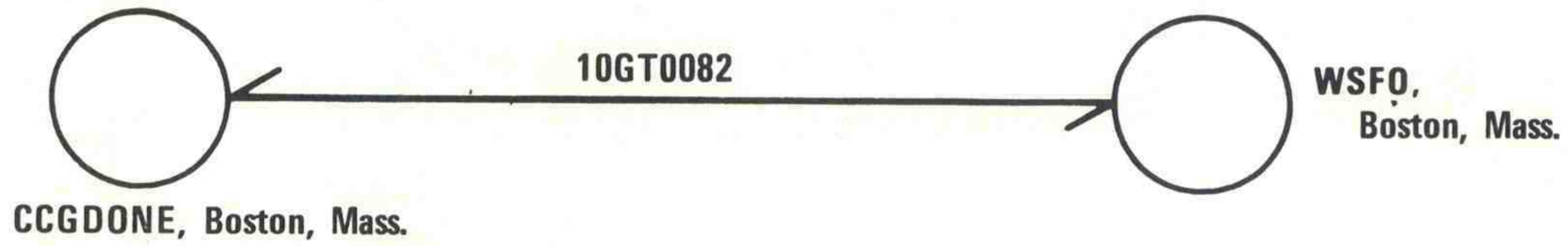
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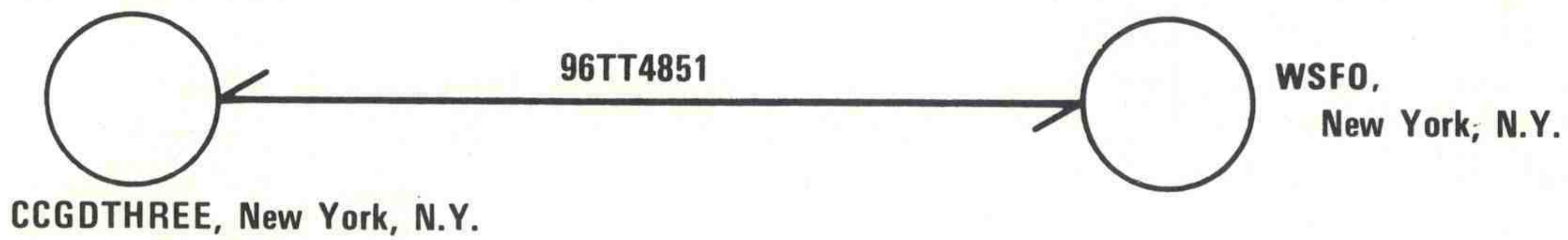
- Note 1. All stations have send/receive capabilities.
- Note 2. CCGD Commander, Coast Guard District.
- Note 3. CEA: Commander, Eastern Area.

FIGURE 6-8. SEARCH & RESCUE CIRCUIT (SARLANT) GT 7990

Communication Center



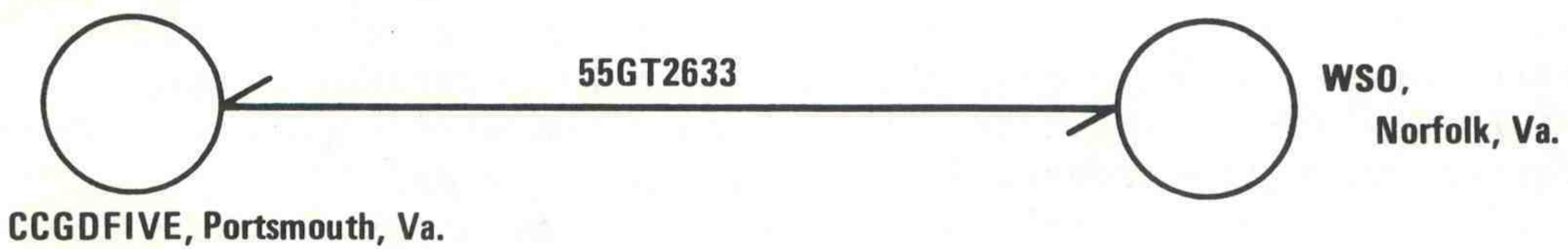
Communication Center



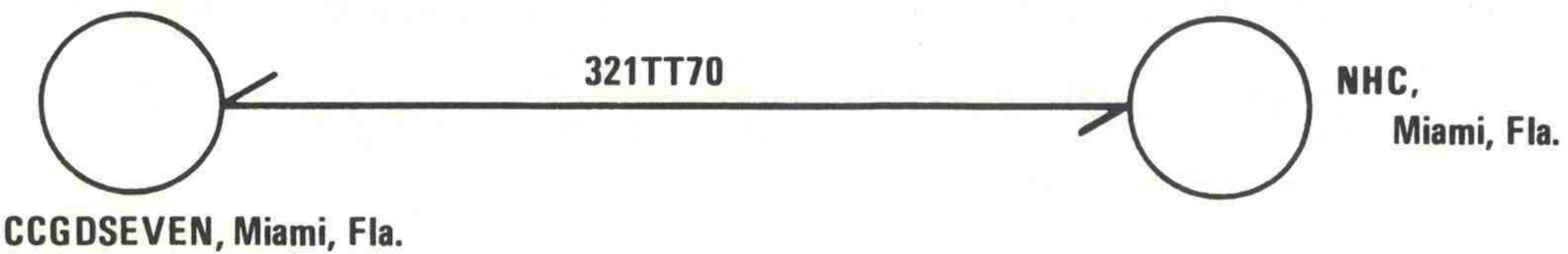
Coast Guard Radio Station



Communication Center



Communication Center



Note. CCGD: Commander Coast Guard District.

FIGURE 6-9. COAST GUARD/NATIONAL WEATHER SERVICE CIRCUITS

USAF EAST COAST WINTER STORMS

RECONNAISSANCE COMMUNICATIONS SUPPORT PLAN

1. General. The WC-130B type aircraft of the 53rd Weather Reconnaissance Squadron (53 WRS), Air Weather Service (AWS), will operate from Ramey AFB, P.R., and Patrick AFB, Fla., during the winter storms season. Reconnaissance observations initiated by these aircraft will be voice transmitted by means of high frequency single side band (HF/SSB) radio through the Air Force's Aeronautical Station complex to a Weather Monitor at Charleston AFB, S.C. The Weather Monitor will evaluate and edit the reports to insure meteorological and technical accuracy. The Monitor will relay the edited reports over landline teletypewriter facilities to the Chief, Aerial Reconnaissance Coordination, Atlantic Hurricanes (CARCAH) located within the National Hurricane Center (NHC) at the University of Miami, Coral Gables, Fla. The Monitor will also relay these reports to USAF Carswell ADWS by means of the COMET II Circuit for further distribution over military weather communication systems, as required. Teletypewriter facilities will be provided for coordinating the Plan of the Day (POD) and other aspects of the reconnaissance activities. The latter facilities will link CARCAH; 53 WRS at Ramey AFB; alternate CARCAH at Andrews AFB, Md.; Charleston Weather Monitor; and MacDill Fla., Aeronautical Stations. A diagram of the Air Force East Coast Winter Storms System is included as figure 6A-1.

2. Air/Ground (A/G) Communications.

a. Whenever possible, Air Force storm reconnaissance aircraft will relay reconnaissance reports through the Air Force Aeronautical Station at MacDill or Loring AFBs. Specific Station contacted will depend upon aircraft location and radio propagation conditions. The HF/SSB frequencies to be used for initial contact with each Aeronautical Station are listed in the appropriate DOD Flight Information Publication Enroute--Supplement. Subsequent to initial contact, the Aeronautical Station will assign a primary and secondary frequency for use by reconnaissance aircraft during each mission. Frequencies assigned may or may not be the same as frequencies published in the Enroute Supplement for the contacted Stations.

Whenever possible, frequencies will be assigned to reduce interference and congestion from other HF A/G traffic. When specifically requested by the aircrew and circuit conditions will permit, a direct voice phone patch between the aircraft and the Weather Monitor at Charleston AFB will be provided by the Aeronautical Station. The Air Force has authorized the use of "Immediate" precedence for transmission of storm reconnaissance reports. To further facilitate such voice patching, direct AUTOVON access lines have been provided. Specific methods of handling reconnaissance messages are listed below for each Station:

PRIMARY METHOD

FIRST ALTERNATE

SECOND ALTERNATE

MACDILL

AERONAUTICAL STATION

Direct phone patch between recon aircraft and Charleston Weather Monitor over AUTOVON.

A/G operator copy transmission from aircraft; relay by voice to Charleston over AUTOVON.

A/G operator copy from aircraft; relay to Charleston using com'1 long distance phone or direct teletypewriter circuit (GT 22117), whichever is faster.

LORING

AERONAUTICAL STATION

Direct phone patch between recon aircraft and Charleston Weather Monitor over AUTOVON.

A/G operator copy transmission from aircraft; relay by voice to Charleston over AUTOVON.

A/G operator copy from aircraft; relay to Charleston using direct teletypewriter circuit (WATS or commercial long distance).

b. The following is a typical sequence of actions required for passing an observation message from the aircraft, through the MacDill Aeronautical Station, to the receiving facility at Charleston AFB:

- (1) MACDILL - THIS IS AIR FORCE GULL 53 - ON FOUR SEVEN - OVER.
- (2) AIR FORCE GULL 53 - MACDILL - GO AHEAD.
- (3) MACDILL - AIR FORCE GULL 53 - REQUEST OPERATIONAL IMMEDIATE PHONE PATCH TO CHARLESTON WEATHER MONITOR - OVER.
- (4) AIR FORCE GULL 53 - MACDILL - STAND BY.

(5) The A/G operator then conditions his console for a ground subscriber call, selects the line associated with the station's AUTOVON line, and calls the Charleston addressee using the direct AUTOVON number. When the Charleston party answers, the operator advises:

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(6) THIS IS MACDILL - STAND BY FOR PHONE PATCH FROM AIR FORCE GULL 53 - OVER.

(7) ROGER - STANDING BY.

(8) The A/G operator then conditions his console for phone patch and advises the aircraft:

(9) AIR FORCE GULL 53 - THIS IS MACDILL - YOUR PATCH TO CHARLESTON IS READY. GO AHEAD.

(10) CHARLESTON - THIS IS AIR FORCE GULL 53 - MESSAGE FOLLOWS - BREAK - GULL DELTA OBSERVATION THREE TEXT TEXT - OVER.

(11) AIR FORCE GULL 53 - CHARLESTON - ROGER - OUT.

(12) AIR FORCE GULL 53 - OUT.

(13) The MacDill A/G operator then breaks the patch.

c. If, at Item 11 above, Charleston has any question or comment on the observation message, it will be resolved before discontinuation of the patch. If, at Item 3 above, phone patch cannot be provided, following sequence of actions would be typical:

(1), (2), and (3) - See paragraph 2.b. above.

(4) AIR FORCE GULL 53 - MACDILL - UNABLE TO PROVIDE PATCH AT THIS TIME - YOUR SIGNAL IS NOT PATCH QUALITY - I CAN PROVIDE RELAY TO ADDRESSEE - OVER.

(5) MACDILL - AIR FORCE GULL 53 - PASS TO CHARLESTON MONITOR - BREAK BREAK - GULL DELTA OBSERVATION THREE TEXT TEXT TEXT-OVER.

(6) MACDILL.

(7) The A/G operator then passes the copied message to the Coordinator for relay to Charleston Monitor over AUTOVON or teletypewriter (GT 22117) as appropriate.

3. Point-to-Point Teletypewriter Communications Capability.

a. Circuit GT 22117 (JQGCU 304) will be configured with send/receive terminals at CARCAH; 53WRS, Ramey AFB; Latin American Forecast Center, Charleston AFB; and MacDill Aeronautical Station. The NHC will have a receive-only reperforator on this Circuit to provide it with the reconnaissance reports for further relay over the FAA weather networks. The Charleston Monitor will act as net control station and maintain circuit discipline. Authorized uses of this Circuit are:

(1) Aircraft traffic reports received at Charleston by AUTOVON will be relayed to CARCAH over this Circuit for further transmission to the NHC.

(2) Coordination of POD and other related matters between CARCAH and 53WRSCP will be handled over this Circuit.

(3) MacDill Aeronautical Station will pass reports received from reconnaissance aircraft to Charleston whenever they cannot be handled by the primary or first alternate means. (See second alternate A/G procedures for MacDill.)

(4) In the event responsibility is transferred from WCC Washington to WCC Boston, traffic received at Charleston by AUTOVON will be relayed to the CARCAH over this Circuit for further transmission to WCC Boston over circuit 7072.

4. Miscellaneous Communications Services and Support.

a. Routine communications between weather reconnaissance aircraft and Air Force Aeronautical Stations for normal air traffic control services will be handled in accordance with SOPs. Where contact cannot be made with Aeronautical Stations, air traffic control communications may be conducted with the following facilities in priority as listed:

(1) FAA stations-- 6567 kHz (Miami, San Juan, and New York).

(2) U.S. Navy SSB stations-- 6723 kHz (Primary), 4711 kHz (Navy Jax).

(3) The ARINC Stations are contained in current DOD Flight Information Publication Enroute Supplement.

b. TWX messages for the CARCAH Coral Gables should be addressed in the heading of the message as follows: RUCLEFA/CARCAH HOMESTEAD AFB, FLA.

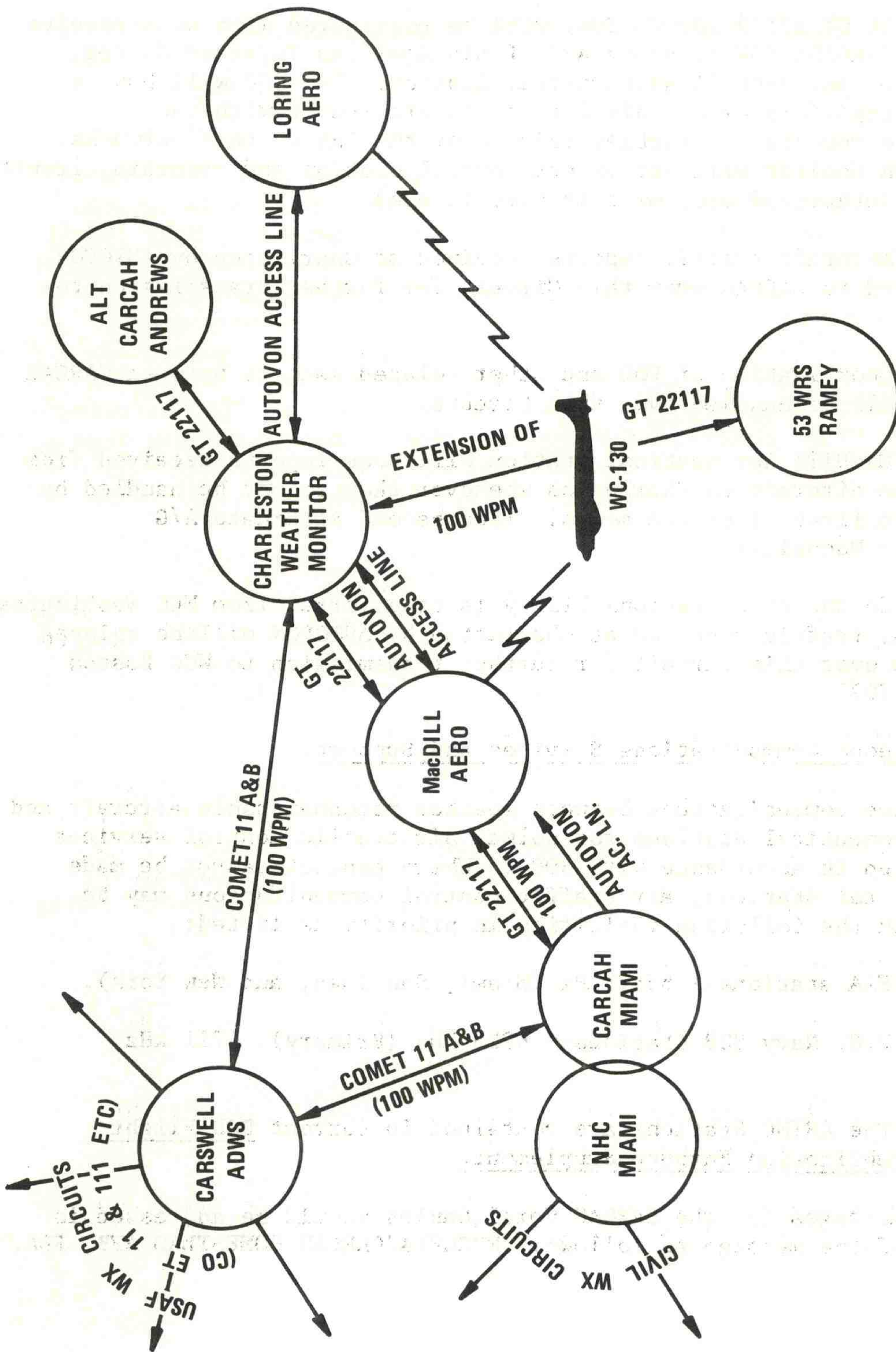


FIGURE 6A-1. USAF EAST COAST WINTER STORMS COMMUNICATION SYSTEM

NAVY EAST COAST WINTER STORMS RECONNAISSANCE

COMMUNICATIONS PLAN

1. General. When not engaged in hurricane reconnaissance, as defined in the National Hurricane Operations Plan, and during the period designated as the east coast winter storms season, Weather Reconnaissance Four (VW-4) aircraft will fly reconnaissance tracks off the eastern seaboard in support of the Atlantic Fleet. Reconnaissance reports from these aircraft are required by the WSOs to assist in forecasting east coast severe winter storms. Reconnaissance and oceanographic reports are also required by Fleet Weather Central (FLEWEACEN) Norfolk and Fleet Weather Facility (FLEWEAFAC) Quonset Point to support their assigned tasks. The following Communications Plan prescribes the means for: (a) relay of reports from recon aircraft, (b) maintenance of essential air-to-ground (A/G) communications guard, and (c) subsequent relay to interested activities of essential reports.

2. Resources.

a. A/G Communications Circuits.

(1) Primary A/G Circuit.

(a) Circuit E1001, as set forth in JANAP 195(), is the Primary A/G Communications Circuit to be used by VW-4 aircraft in transmitting aircraft reports, weather and other pertinent flight information while conducting east coast winter storms reconnaissance missions. The E1001 is a HF/SSB voice with alternate CW capability linking the VW-4 aircraft (voice calls are indicated) with:

- 1 FLEWEAFAC Jacksonville (Net Control Station).
- 2 FLEWEAFAC Suitland.
- 3 Roosevelt Roads, P.R.

(b) Circuit E1001 Frequencies.*

- 1 Alpha - 4701.5 kHz.
- 2 Bravo - 9011.5 kHz.
- 3 Charlie - 13222.5 kHz.

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4 Delta - 15082.5 kHz.

5 Echo - 23227.5 kHz.

(c) A/G radioteletypewriter (RTTY) communications can be maintained on following frequencies:*

1 E0300 - 3096.5 kHz.

2 E0300 - 11192.5 kHz.

3 E0300 - 18010.5 kHz.

* Note: The Suppressed Carrier (SSB) Voice frequency are located 1.5 kHz below the indicated frequency.

(2) Secondary A/G Circuit.

(a) The Air Force Aeronautical Stations, using HF/SSB Voice frequencies listed in latest DOD Flight Instruction Publication Enroute Supplement will provide secondary A/G communications. Recommended stations listed in order of preference:

1 Loring Aeronautical Station.

2 MacDill Aeronautical Station.

3 Albrook, C.Z., Aeronautical Station.

(3) Backup and Emergency A/G Circuits.

(a) International Flight Service Station (IFSS) -- FAA communications may be used to relay reconnaissance reports when the primary and secondary means have failed.

1 FAA stations--6567 kHz (Miami, San Juan, and New York).

(b) Navy Universal Air-to-Ground (CW) Circuit.

(c) Emergency and Distress frequencies:

<u>Frequency</u>	<u>Emission</u>	<u>Use</u>
500.0 kHz	CW	International distress and calling
2182.0 kHz	V	International distress and calling
5680.0 kHz	V	International HF search and rescue (SAR) control
5695.5 kHz	V/CW	SAR control (Navy)
8364.0 kHz	CW	International lifeboat, liferaft, and survival craft frequency
121.5 MHz	V	Emergency and distress for aircraft and ship SAR and Very High Frequency/Direction Finding (VHF/DF) primary
243.0 MHz	V	Military common emergency frequency, Ultra High Frequency (UHF)

b. Point-to-Point (Surface) Relay.

(1) Capabilities for exchanging and relaying reconnaissance reports by interested activities are indicated in Appendix 6-C in matrix form. Figures 6B-1 and 6B-2 graphically illustrate FLEWEAFAC Suitland and FLEWEAFAC Jacksonville communications.

3. Operations.

a. East Coast Winter Storm Reconnaissance Reports.

(1) Reports.

(a) Reconnaissance Reports will be encoded in the currently effective RECCO code in accordance with the National East Coast Winter Storms Operations Plan.

1 At the end of each RECCO message, the coded longitude, latitude, flight level, and surface wind groups will be reported for confirmation.

(b) Oceanographic data will be coded in accordance with Atlantic Fleet instructions as required by FLEWEACEN Norfolk.

(c) Data Acquisition and Logging System (DALIS). To the maximum extent possible, DALIS will be employed to report additional meteorological and oceanographic information between periodic RECCO reports.

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(d) Radar Reports and Post Flight Summaries may be transmitted in plain text.

(e) Instructions.

1 Message texts (reports) shall be preceded by "UR" (indicating routine surveillance), unit identification (for example, "Navy Weather"), and sequential message number (one, two, etc.), with "ONE" assigned to the departure report. If a specific Navy track (Chapter 4, Appendix "C") is being flown, the track letter identifier will be inserted after unit identification. The sequence will be continuous for all messages on each flight, including all coded messages, plain language messages, or a combination of both. The arrival report shall be the final report of the series. The DALS transmissions shall not be numbered within the same sequence of numbers.

(2) Communications Procedures. In formatting messages for transmission to the ground station, all activities shall use procedures outlined in Allied Communications Procedures (ACP) 125B with respect to message headings, date-time groups, and numbering systems external to the message text. Appropriate Joint Army, Navy, Air Force (JANAP) and ACP will be used in contacting A/G stations.

(3) Precedence:

<u>Message</u>	<u>Precedence</u>
Conditions less than indicated below	Priority (P)
RECCO reporting conditions of:	
Surface wind 25 knots or greater	Immediate (0)
Seas 12 feet or greater	Immediate (0)
Moderate or heavy precipitation	Immediate (0)
Moderate or severe icing	Immediate (0)
Moderate or severe turbulence	Immediate (0)
Significant changes in meteorological conditions as determined by flight METRO	Immediate (0)

(4) Classification. All meteorological and oceanographic reports shall be unclassified.

b. Primary Guard (Circuits E1001 and E0300).

(1) Net Operation and Control.

(a) This Circuit will operate as a FREE NET unless otherwise directed by the NET CONTROL Station, FLEWEAFAC Jacksonville. Reconnaissance data will be passed A/G on the Circuit to:

1 Primary RECCO Guard-- FLEWEAFAC Suitland.

2 Secondary RECCO Guard-- FLEWEAFAC Jacksonville.

(b) As the Net Control Station, FLEWEAFAC Jacksonville shall maintain flight guard ground monitoring responsibility for all VW-4 aircraft on reconnaissance missions and for those operating on this Circuit.

(c) The FLEWEAFAC Suitland shall also monitor all transmissions on this Circuit and provide assistance and backup capability to insure continuous monitoring of aircraft.

(d) Except in the case of an emergency, aircraft shall notify the NET CONTROL Station before leaving the Circuit.

(e) To facilitate High Frequency Direction Finding (HFDF) identification, the aircraft will give its call sign at the beginning of each transmission. Each radio check shall contain one full count if no other traffic is passed.

(f) If, after a frequency shift, no contact is made within 15 minutes, the aircraft and ground monitoring station shall return to the last frequency on which contact was made.

(g) To determine if another Circuit (frequency) will provide better communications, the NET CONTROL Station or ground monitoring station will request a "Test Transmission" on another frequency. For example, upon the command "TEST CIRCUIT ALPHA" from the ground monitoring station, the aircraft shall shift to Circuit ALPHA, give three long counts, and return to the Circuit upon which the command was given.

(h) In flight position reports, request for clearances and other communications with the ARTCC can be relayed on Circuit E1001 only if normal means of communicating with the ARTCC have failed.

(2) Radio Checks.

(a) Periodic radio checks between Roosevelt Roads, FLEWEAFAC Suitland, and FLEWEAFAC Jacksonville will be initiated by FLEWEAFAC Suitland. The periodicity of these checks shall not exceed 1 hour.

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(b) Radio checks will be initiated by the aircraft before takeoff and at hourly intervals while airborne. Check times will be on the hour.

(c) If contact on a given frequency cannot be established within 15 minutes of the designated time, an attempt will be made on the next lower frequency. If a 15-minute attempt on the lower frequency is not successful, another attempt will be made on the next higher frequency. If, at this point, contact is not made, the aircraft shall return to the primary frequency.

(3) Frequency Assignments.

(a) The FLEWEAFACs Suitland and Jacksonville and Naval Station Roosevelt Roads will guard Circuits as follows:

1 Primary: Circuit CHARLIE (13221 kHz).

2 Secondary: Circuit DELTA (15081 kHz).

(b) Circuits ALPHA (4700 kHz), BRAVO (9010 kHz), and ECHO (23287 kHz) may be utilized if required.

(4) Transmission Mode.

(a) Voice. Most A/G transmissions will be using voice procedures on HF/SSB E1001 frequencies.

(b) RTTY. Radioteletypewriter communications between the aircraft and the ground monitoring station is both authorized and encouraged. The FLEWEAFACs Suitland and Jacksonville are equipped to receive A/G RTTY.

(c) CW. Radio-telegraph communications shall be used only when other communications modes fail to effect satisfactory contact.

(d) DALS. The FLEWEAFACs Suitland and Jacksonville are equipped to receive and process information sent from aircraft equipped with the Automatic Data Acquisition and Logging System. Its use is encouraged.

(5) Relay of Traffic.

(a) The FLEWEAFAC Suitland will relay reports through:

1 AUTODIN -- to addressees indicated in the aircraft message.

2 GT22117 -- to CARCAH for further relay by NHC on Circuit GT 7072.

3 Manual -- physical delivery to WSFO and NMC collocated in FOB #4, Suitland.

4 Naval Environmental Data Network (NEDN) -- DALS transmissions to FLEWEACEN Norfolk.

5 COMET System -- The FLEWEAFAC Suitland does not have access to the COMET system, but FLEWEAFAC Jacksonville will relay on COMET II network all reconnaissance reports received from FLEWEAFAC Suitland.

(b) The FLEWEAFAC Jacksonville will relay reports through:

1 AUTODIN -- to addressees indicated in the aircraft message.

2 NHC (CARCAH) on Circuit GT 2352 for further relay on Circuit GT 7072 to NMC Suitland and other WSOs.

3 COMET System -- relay to Carswell ADWS on COMET II-A system for subsequent distribution on AWN.

4 NEDN -- DALS transmissions to FLEWEACEN Norfolk.

(c) Roosevelt Roads will relay reports through:

1 AUTODIN -- to addressees indicated in the aircraft message.

2 Ramey AFB -- for further relay into the COMET network.

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c. Secondary Guard.

(1) Air-Ground Voice Air Force (HF/SSB) Circuit.

(a) If communications cannot be established by the aircraft and maintained on the Primary Circuit, the Air-Ground Voice Air Force Circuit outlined in the U.S. Air Force East Coast Winter Storms Reconnaissance Communications Support Plan, Appendix 6-A, will be used.

(b) Reports placed with the Air Force A/G stations can be further relayed (delivered) by:

1 AUTODIN.

2 GT22117.

(c) The FLEWEAFAC Suitland, upon receipt of messages on GT22117, shall effect manual delivery to WCC and NMC at Suitland.

d. Backup Guard.

(1) Navy Universal Air-Ground (CW) Circuit.

(a) If communications cannot be established and maintained on Circuits outlined above, the Navy Universal Air-Ground Circuit will be utilized.

(b) When communications cannot be established through any of the above Circuits, Navy reconnaissance aircraft may contact any Navy A/G station.

(c) When alternate ground stations must be contacted, weather messages must be addressed with proper "Tango" instructions to insure that ground stations will be responsible for immediate relay of such messages to FLEWEAFAC Suitland.

e. Message Addressing Instructions.

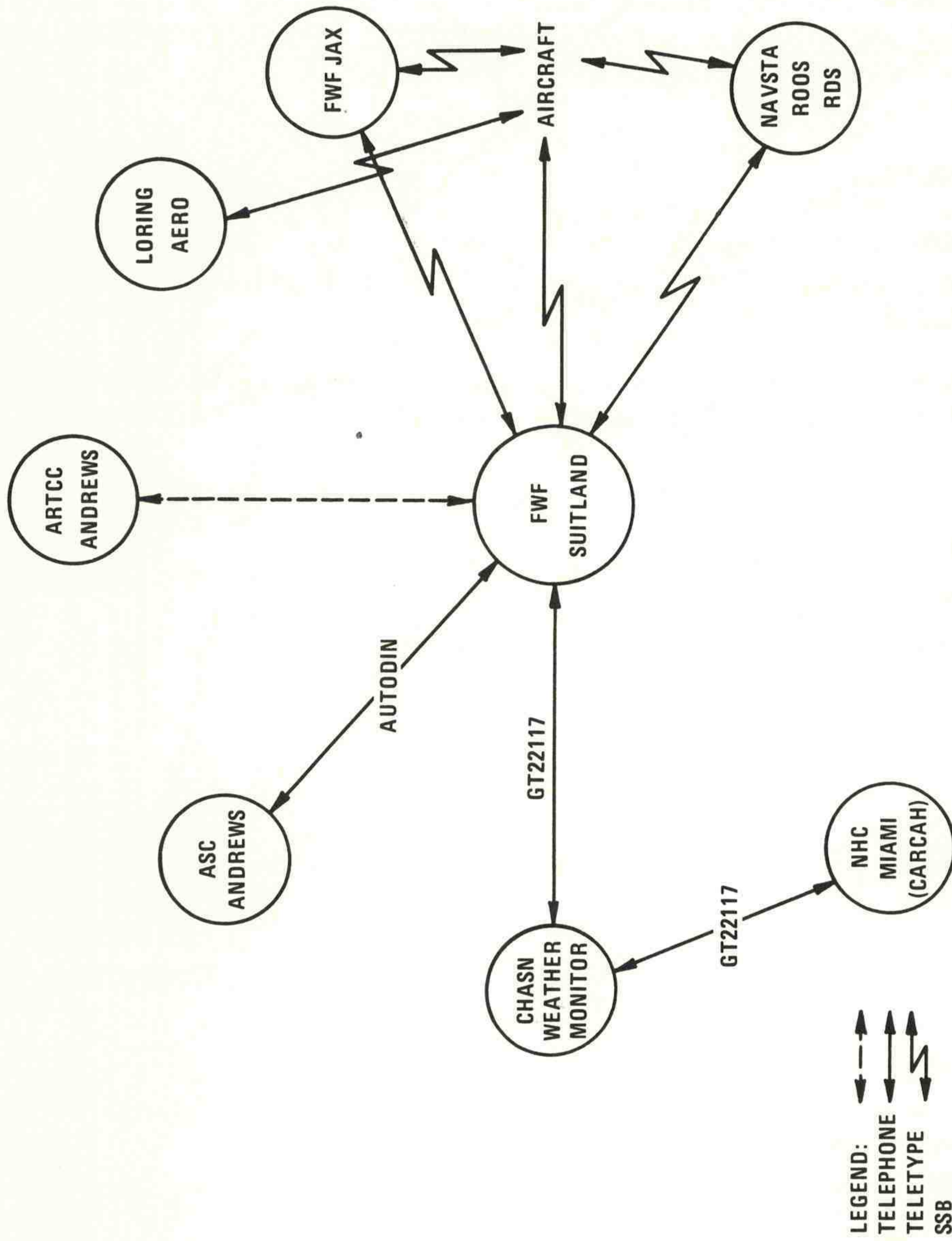
(1) Example of an east coast storm message:

P (0)181902Z

FM NAVY WEATHER 896
TO FWF SUITLAND, FWC NORFOLK, FWF QUONSET,
WBC WASH D.C., FWF JACKSONVILLE, NHC
INFO WEARECONRON FOUR
GR30
BT
UNCLAS

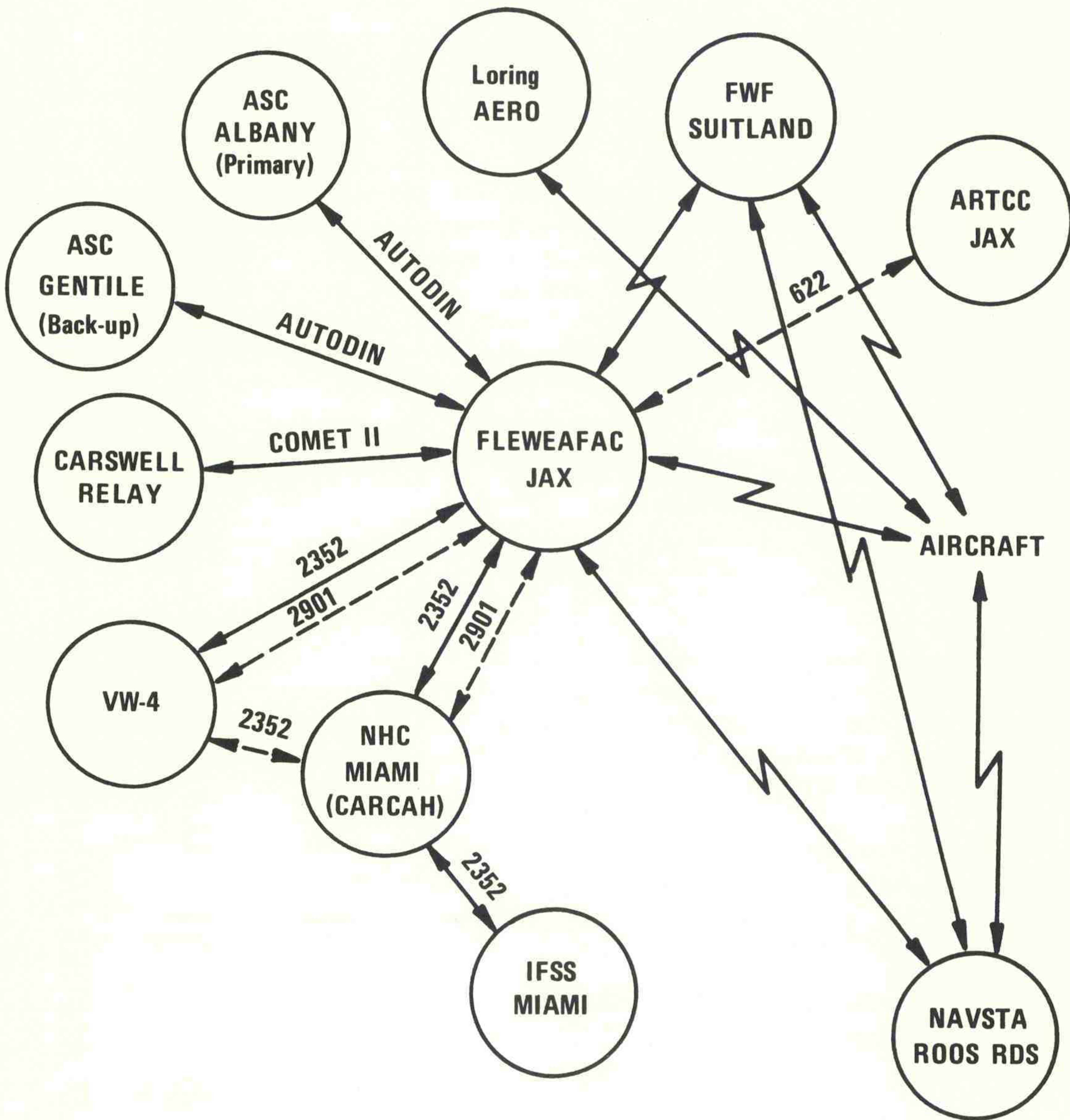
UR NAVY WEATHER TRACK A TWO 97770 . . . etc.
(Second message from Navy aircraft on a standard
track.)

(2) Figures 6B-1 and 6B-2 illustrate the normal communications channels used by FLEWEAFACs Suitland and Jacksonville.



NOTE: AUTOVON available between all activities.

FIGURE 6B-1. FLEET WEATHER FACILITY SUITLAND COMMUNICATIONS



LEGEND:
 TELEPHONE ←---→
 TELETYPE ←——→
 SSB ←⚡→

NOTE: AUTOVON available between all activities except IFSS MIAMI

FIGURE 6B-2. FLEET WEATHER FACILITY JACKSONVILLE COMMUNICATIONS DIAGRAM

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APPENDIX C

RFF EAST COAST WINTER STORMS RECONNAISSANCE COMMUNICATIONS SUPPORT PLAN

1. General. The RFF will maintain direct communications (A/G) over SSB for control and transmission of real-time RECCO observations.

2. A/G Communications.

a. The RFF aircraft will as soon as practicable after departure, establish contact with "RWC Control" the experimental Regional Weather Center (RWC) New York. This Center will communicate with RFF aircraft on frequencies* in the upper side band mode (utilizing the most appropriate frequency and taking into consideration propagation conditions, time of day, and distance from station), thereby providing direct project coordination and real-time transmission of RECCO data (Appendix 4-D). These frequencies are:

4669.5 kHz
6527.5 kHz
10094.5 kHz
13357.5 kHz
17942.5 kHz

These above listed frequencies* have been allocated for exclusive RFF use for a temporary period ending November 1970. Extension of this period is anticipated to include the 1970/71 east coast winter storms operations season, thereby providing for more effective, direct A/G communications capability.

b. In the event of a primary communication failure, project aircraft may communicate with RWC Control by the following means:

- | | |
|--|---------------------------|
| (1) MacDill and Loring AFBs | Telephone or phone patch. |
| (2) International Flight Service Stations (IFSS), N.Y. | Telephone relay. |
| (3) ARINC, N.Y. | Telephone or phone patch. |
| (4) American Telephone and Telegraph Co. (ATT) | Radio telephone patch. |

3. Point-to-Point Teletypewriter Communications. The RFF is configured with a send/receive terminal on Circuit 30GT2352 and will receive the POD from CARCAH by this means. All RFF Reconnaissance Reports and significant operational traffic received at RWC Control will be relayed over circuit 7072 to the NHC in Miami which will be responsible for entering these reports on Circuit 30GT2352 as soon as they are received. The RFF also desires that DOD RECCO Messages received at the NHC be placed on this Circuit.

*NOTE: The Suppressed Carrier SSB voice frequency is located 1.5 kHz below the indicated frequency.

4. Air Traffic Control Communications.

a. Communications between ARTCC controllers and pilots of Instrument Flight Rule (IFR) aircraft will be conducted over direct controller-to-pilot communications channels using the appropriate ARTCC sector discrete frequency. Aircraft will be advised of the frequency to be used and when a frequency change is required. When beyond VHF/UHF communication capability, the New York ARTCC desires direct controller-to-pilot communications to be conducted through:

(1) The Air Force Aeronautical Stations at MacDill or Loring AFBs by requesting "Patch" New York Center, or

(2) As an alternate, the New York ARINC on the following frequencies:

2952 kHz
5484 kHz
8959 kHz
11367 kHz
13320 kHz.

b. The Air Force's Aeronautical HF Radio Station at Loring AFB can be utilized as an alternate means of providing direct controller-to-pilot communications through an AUTOVON phone patch on any Air Force published frequency.

5. Emergency and Distress Communications.

The following frequencies have been assigned for emergency and distress:

<u>Frequency</u>	<u>Emission</u>	<u>Use</u>
500.0 kHz	CW	International distress and calling
2182.0 kHz	V	International distress and calling
5680.0 kHz	V	International SAR control (Coast Guard)
5695.5 kHz	V/CW	SAR control (Navy)
8364.0 kHz	CW	International lifeboat, life raft, and survival craft frequency
121.5 MHz	V	Emergency and distress for aircraft and ship SAR and VHF/DF primary
243.0 MHz	V	Military common emergency frequency, UHF.

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6. American Telephone and Telegraph (ATT) High Seas Radio Telephone.

The RFF aircraft have the capability of ship-to-shore telephone service provided by ATT high seas radio telephone stations, WOO/WOY, at New York. This facility can be brought into use when required, whenever other phone patch means are not available. This ATT service is conducted at a nominal charge and on a duplex basis through use of paired transmitting frequencies as follows:

<u>Shore Station WOO/WOY</u>	<u>Aircraft</u>
Transmitting Frequency	Transmitting Frequency
4390.2 kHz	4091.6 kHz
8757.6 kHz	8223.6 kHz
13175.5 kHz	12396.5 kHz
17321.5 kHz	16526.5 kHz

The SSB frequencies are available in accordance with the ATT brochure.

RWC COMMUNICATIONS PROCEDURES WITH DOD AIRCRAFT

1. General. The purpose is to supply a rapid means of communication between the forecaster and the airborne meteorologist so as to obtain meteorological information or to request flight diversion to secure more useful data. This will not be a continuous requirement, but would be on a request basis.

2. Ground Communications. The RWC will make telephone contact with the Charleston Weather Monitor (commercial 803-747-4111, Ext. 3458 or 3459) for Air Force aircraft and with FLEWEACEN Norfolk (commercial 703-444-7750 or 2436) for Navy aircraft. These military ground stations will be advised that DOD aircraft should contact the RWC on one of the following SSB frequencies:

2776 kHz	6977.5 kHz
3363 kHz	9947.5 kHz
5925 kHz	14792 kHz

3. A/G Communications. Aircraft will contact the RWC as soon as practicable after receiving the message from their ground station. Aircraft will advise RWC if unable to accept the requested diversion because of flight safety, traffic clearance, or operational consideration. The CARCAH will be advised by RWC of the diversion effected.

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APPENDIX E

COMMON COMMUNICATIONS CAPABILITIES

<u>STATIONS</u>	<u>AUTODIN</u>	<u>GT22117</u>	<u>7072</u>	<u>COMET</u>	<u>30GT2352</u>	<u>AUTOVON</u>
FLEWEAFAC Suitland	RUEBEGA	X				X
FLEWEAFAC Jacksonville	RHCJAAA			X	X	X
FLEWEACEN Norfolk	RUEBJNA					X
FLEWEAFAC Quonset Point	RUEDDDA			X		X
VW-4 Jacksonville	RUCLBKA				X	X
NAVSTA Roosevelt Roads	RULGANA					X
CARCAH Miami	RUCLEFA	X		X(SO)		X
NHC Miami	RUCLEFA		X	X(RO)	X	X
RFF Miami	RUEVEKH				X	
Alternate CARCAH Andrews	RUEBBAA	X				X
NMC Suitland	RUEOLMA		X	X(RO)		
WBC Washington	RUEOLMA		X			
RWC New York (Bronx)			X			
Charleston Weather Monitor	RUEBALA	X		X		X
MacDill Aeronautical Station	RUCJBBB	X				X
Loring Aeronautical Station	RUEDLDA					X
53rd WRS Ramey	RUCLIMA	X				X
IFSS Miami	RUCLFPA				X	
ARTCC Washington	RUEBBAA					X
ARTCC Jacksonville	RUWTALA					X
ARTCC Miami	RUCLFPA					X
ARTCC New York	RUEDJKA					X
ARTCC Boston	RUEDALA					X

Refer to Paragraph 2.b.(1), Appendix 6-B.

U.S. NAVY BACKUP/TRANSFER PROCEDURES

1. In the event of impending or actual operational failure of FLEWEAFAC Suitland, its responsibilities under this Plan will be transferred to FLEWEAFAC Jacksonville. When FLEWEAFAC Suitland can resume its responsibilities, FLEWEAFAC Jacksonville will be so notified. Procedures for transfer of responsibilities will be as follows:

a. FLEWEAFAC Suitland shall request FLEWEAFAC Jacksonville, by appropriate available communications, to assume designated responsibilities at a specified time if foreseeable.

b. FLEWEAFAC Suitland will notify Chief of Naval Operations (CNO), CINCLANTFLT, WEARECONRON FOUR, FLEWEAFAC QUONSET POINT, COMNAVWEASERV, FLEWEACEN NORFOLK, NHC MIAMI, WBC SUITLAND, CARCAH MIAMI, and ALT CARCAH ANDREWS that control will be shifted as described in a. above.

c. In the event of an operational failure occurring before the above action being taken, it is requested that the FLEWEAFAC Jacksonville assume the responsibilities as soon as cognizant of the failure.

d. When possible, actions of a. and b. shall be transmitted by one message. Format of the request for transfer follows:

FM FLEWEAFAC SUITLAND

TO FLEWEAFAC JACKSONVILLE
WEARECONRON FOUR

INFO CNO
NAVCOMSTA WASHINGTON
CINCLANTFLT
COMNAVWEASERV
COMNAV AIRLANT
COMFAIRJAX
NHC MIAMI
CARCAH MIAMI
ALT CARCAH ANDREWS AFB, MARYLAND
FLEWEACEN NORFOLK
FLEWEAFAC QUONSET POINT
WBC SUITLAND

UNCLAS STANDARD SUBJECT IDENTIFICATION CODE (SSIC).

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SUBJ: EMERGENCY TRANSFER OF RESPONSIBILITY

1. FLEWEAFAC SUITLAND CASUALTY IMMINENT.
2. REQUEST FLEWEAFAC JACKSONVILLE ASSUME NAVY EAST COAST WINTER STORM RECONNAISSANCE REPORTING.
3. RECON FLIGHT SCHEDULE IAW POD _____ Z.
4. WEARECONRON FOUR USE FLEWEAFAC JACKSONVILLE AS PRIMARY AIR-TO-GROUND COMMUNICATIONS GUARD.

2. After assumption of responsibilities, the FLEWEAFAC Jacksonville will coordinate the POD with the CARCAH at Miami or with the Alternate CARCAH at Andrews by using the Air Force TTY Circuit GT22117, by AUTOVON 889-1650 patch to 666-4612, or by commercial telephone.

PUBLICITY

News media releases that concern the cooperative efforts in severe winter storms activities of the Department of Defense, National Weather Service, Federal Aviation Administration, and U.S. Coast Guard should reflect the joint nature of these efforts by giving due credit to participating agencies. Copies of these releases should be forwarded to:

The Joint Chiefs of Staff,
Deputy Director for Operations (Environmental Services)
Washington, D.C. 20301

Department of the Army,
Office of the Assistant Chief of Staff for Intelligence
Attention: ACSI-TE
Washington, D. C. 20301

Headquarters, Naval Weather Service Command
Building 200,
Washington Navy Yard
Washington, D.C. 20390

Military Airlift Command (MAFOI)
Scott Air Force Base, Ill. 62225

Headquarters, Air Weather Service (AWFOI)
Scott Air Force Base, Ill. 62225

National Oceanic and Atmospheric Administration
Public Information Office
6010 Executive Boulevard
Rockville, Md. 20852

Federal Aviation Administration
800 Independence Avenue SW.
Washington, D.C. 20590

Commandant (API)
U.S. Coast Guard
400 Seventh Street SW.
Washington, D.C. 20591