NOAA/RESEARCH FLIGHT FACILITY'S SUPPORT OF THE NATIONAL EAST COAST WINTER STORMS (NECWS) PROGRAM DURING THE 1971-72 OPERATING SEASON

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April 1972

Abstract

The Research Flight Facility's early efforts to supply real-time operational reconnaissance data and information about the genesis, structure and time-history of east coast winter storms began in the 1966-67 winter season (Spar et al, 1969). The program, then a cooperative effort of the U.S. Weather Bureau, New York University and the Research Flight Facility, has grown into a major mission which is currently supported by the Departments of Commerce, Defense and Transportation, with adjunct cooperation of New York University.

This paper will serve as a final report to summarize the efforts of the Research Flight Facility in support of the NOAA/National Weather Service, Regional Weather Center, and the over-all program, during the 1971-72 winter operating season.

1971-72 WINTER OPERATING SEASON.

During the 1971-72 winter operating season, the Research Flight Facility (RFF) completed a total of 41 hr 20 min (four flights) in support of the operational requirements of the National Weather Service (NWS)/Regional Weather Center (RWC), located on the Bronx campus of New York University, as part of the National East Coast Winter Storms Program (NECWS).[1] In addition to satisfying RWC's requirements for real-time *in situ* meteorological (reconnaissance) information, the RFF collected high-density research-quality meteorological and associated data. This effort was in support of scientists at New York University's Department of Meteorology and Oceanography, who are presently engaged in a non-funded cooperative analysis program designed to study the genesis and life history of winter coastal storms.[2]

All flights completed during this season, with RFF's DC-6 A/B aircraft (N6540C), were categorized as "special requests" from the RWC, and, in general, were originated and terminated at Miami, Florida. One of the missions involved an incidental staging (recovery) at Langley AFB, due to a mission scheduled for NOAA/ERL-Sea Air Interaction Laboratory on the following day.

The program was conducted in accordance with the National East Coast Winter Storms Operations Plan, FCM 71-8, Washington, D.C., November 1971, and the NOAA/RFF OPS PLAN 1-72, January 1972.

1. The National East Coast Winter Storms Program is a cooperative effort involving the forces of the Departments of Commerce (NOAA/NWS, RFF), Defense (Air Force-AWS, Navy-VW-4) and Transportation (FAA and Coast Guard).
2. This effort is being directed by Dr. V. Cardone of the Department of Meteorology and Oceanography, New York University.

RFF was placed on "standby" or "alert" status early in January and was released from operational responsibilities, by mutual agreement with RWC, during the last week in March 1972. RFF completed final processing and analysis of the data on 21 April 1972.

This report will summarize the data (operational and research) collected, processed and delivered (to RWC and NYU) as RFF's contribution to the over-all effort.

The excellent cooperation that the RWC provided during the mission planning and execution stages of this program must be acknowledged at this juncture. The use of the RWC as a ground-monitor station for the RFF aircraft has made the almost immediate real-time transmission of reconnaissance reports a reality. Voice transmission of data between the aircraft and the RWC was accomplished via single-side-band (SSB) communications on frequencies assigned for this purpose. In addition, a ground-monitor station at the RFF in Miami was activated in order to establish a communications network between Miami, the aircraft, and the RWC in New York.

Tables 1 - 4 (shown in the attachments) summarize RFF's participation during the 1971-72 winter season. Approximate flight tracks and associated synoptic weather maps (taken from the Daily Weather Map Series, published by NOAA's Environmental Data Services) are also shown as attachments for supplemental documentation.

ACKNOWLEDGEMENTS.

We wish to take this opportunity to thank the many individuals involved, for their efforts in behalf of the RFF: Drs. J. Spar and

V. Cardone, Department of Meteorology and Oceanography, New York University--for guidance and encouragement during the planning and analysis phases of the program; Mr. S. Grimm, Chief, Emergency Warnings Branch, NOAA/NWS--for his help in integrating research objectives into the multi-agency program; Mr. D. Coveney, Meteorologist-in-Charge, Forecast Office/RWC, NOAA/NWS) and his very professional staff (Messers Kaplan, Maree, Kussman, Cravens, Zucker, Ace, Stone, Pullman and Fayne)--their timely analyses and flight monitoring assistance made the program viable; and, last but not least, Mr. S. Simplicio, Director, NOAA/NWS Eastern Region--whose continuing interest and "push" is largely responsible for the establishment of the entire winter storms reconnaissance program.

CAPABILITIES FOR THE 1972-73 WINTER SEASON.

The East Coast Winter Storms Program is a project that will continue to receive RFF's support during the coming year. RFF's aircraft capabilities are expected to be maintained at their current level (in terms of platforms), and at an improved level (in terms of sensors and recording systems).

NOAA's allocation of flight hours to the NWS is expected to be in accordance with the requirements established by NOAA/NWS Headquarters.

REFERENCES.

1. National East Coast Winter Storms Operations Plan, FCM 71-8, Washington, D.C., Nov. 1971.

REFERENCES (cont'd).

2. NOAA/RFF OPS PLAN 1-72, East Coast Winter Storms Project 1972, Miami, Florida, Jan. 1972.

3. Spar, J., H.A. Friedman and F. L. Zuckerberg, 1969: Aircraft reconnaissance of winter coastal cyclones in the northeastern United States. Bulletin of the American Meteorological Society, Vol. 50, No. 11, pp. 857-865.

ATTACHMENTS.

Tables 1 - 4; flight tracks; and, synoptic weather maps, as noted, taken from the Daily Weather Map Series, published by the NOAA/Environmental Data Services.

Table 1. NOAA/RFF support of NECWS (1971-72): RFF missions.

FLT IDENT	DATE	FLT TIME	ALTITUDE	PRESSURE-DATA LEVEL	TRACK
720203B	3 Feb 72	7 hr 35 min	7000 ft	850 mb	Modified Gull Delta, with RON at Langley AFB, Va.
720217B	17 Feb 72	11 hr 15 min	6000 ft	850 mb	Gull Delta to Norfolk, Va. optional return to Miami.
720219B	19 Feb 72	12 hr 05 min	1500 ft	Surface	Navy Alpha to Norfolk, Va. optional return to Miami.
720322B	22 Mar 72	10 hr 25 min	1500 ft 18000 ft	Surface 500 mb	Navy Alpha with modified high level return to Miami.
TOTALS:					
Four (4) flights		41 hr 20 min			

Table 2. NOAA/RFF support of NECWS (1971-72): RECCO data.

FLT IDENT	RECCO MESSAGES	RECCO OBS	AVERAGE TRANSMISSION TIME
720203B	8	14	7.6 min
720217B	9	16	9.7 min
720219B	11	22	14.5 min [1]
720322B	10	20	6.2 min
TOTALS:	38	72	9.5 min [2] 9.7 min [3]

1. Included delay caused by equipment replacement.
2. Simple average.
3. Weighted average.

Table 3. NOAA/RFF support of NECWS (1971-72): Original and processed data.

	ORIGINAL DATA		PROCESSED DATA		
FLT IDENT	MAG TAPE	DIG OBS	CONVT TAPE	OTL	FINAL LIST (PRINT)
720203B	YES	25,945	YES	1/10	1/10
720217B	YES	39,180	YES	1/10	1/10
720219B	YES	43,120	YES	1/10	1/10
720322B	YES	36,600	YES	1/10	1/10
TOTALS:		144,845			

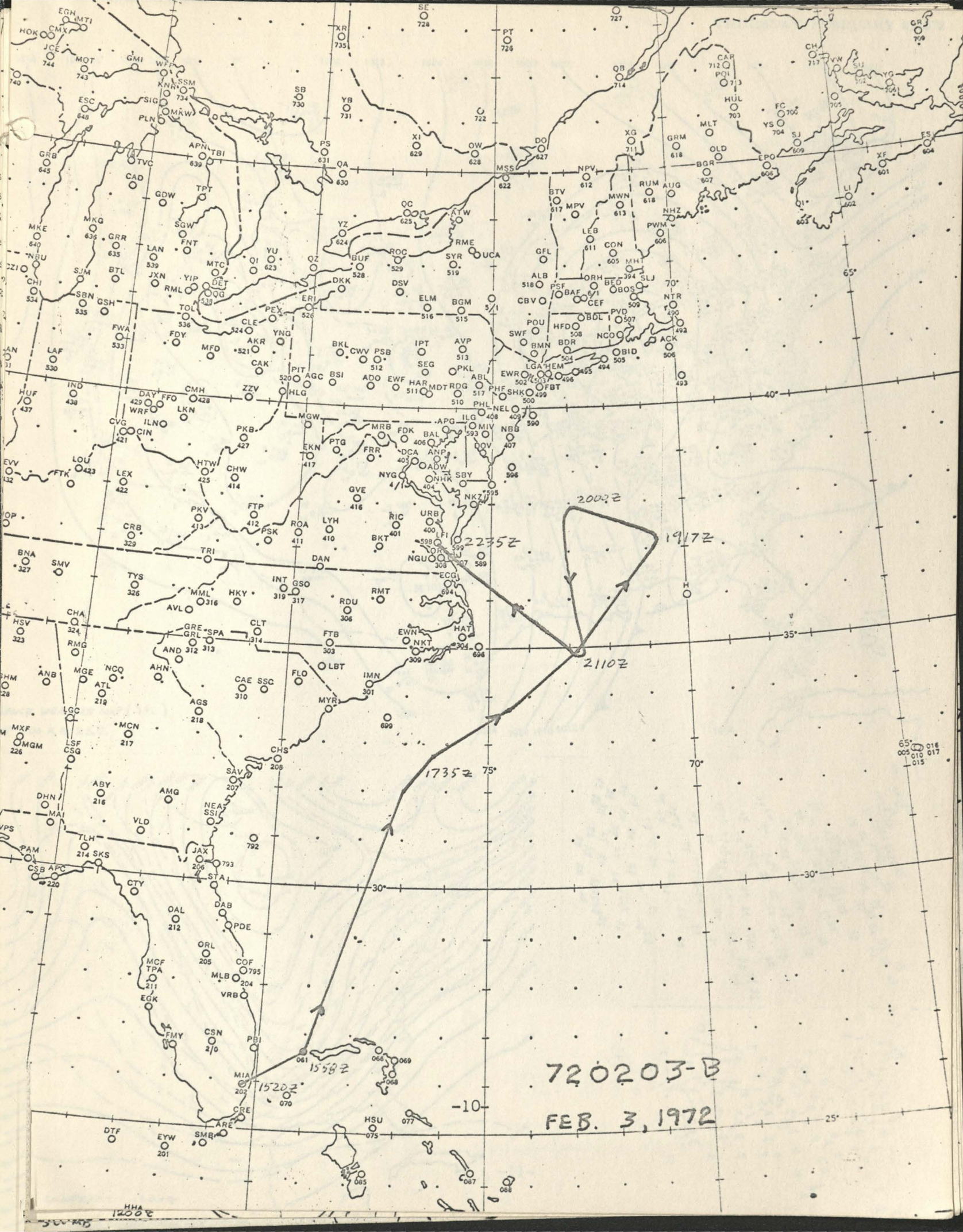
Note: Data recorded on magnetic tape in a binary-coded-decimal form.
DIG OBS = number of recorded observations on the magnetic tape.
CONVT TAPE = a processed tape; edited with MAG TAPE input data; completely FORTRAN compatible.
OTL = original tape listing (first look at the data).
FINAL LIST = reprocessed, edited and corrected data printout using the CONVT TAPE and calibration data as input.
1/10 = indicates that every 10th record was printed in the OTL and FINAL listings.

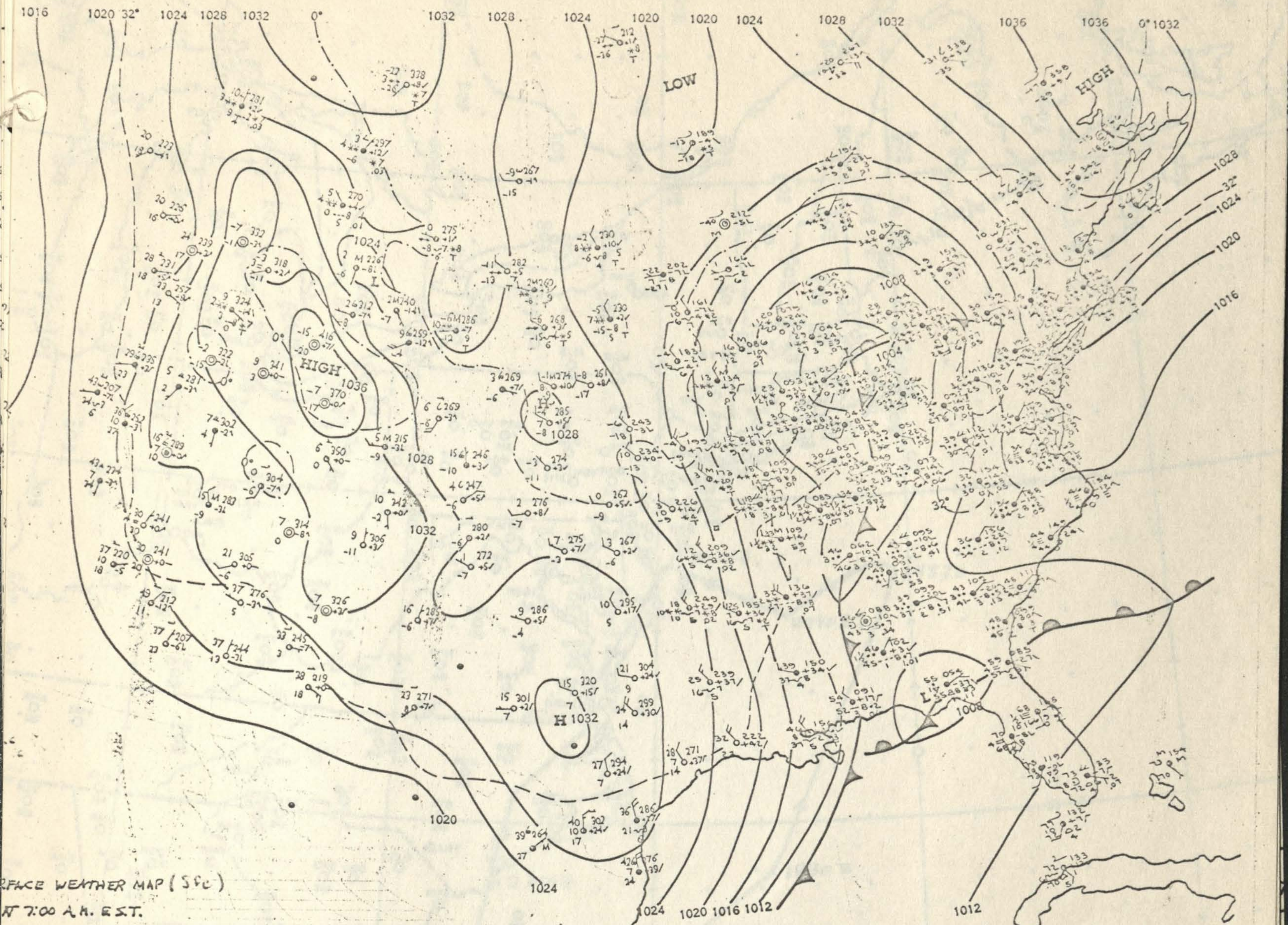
Table 4. NOAA/RFF support of NECWS (1971-72): Radar and film data.

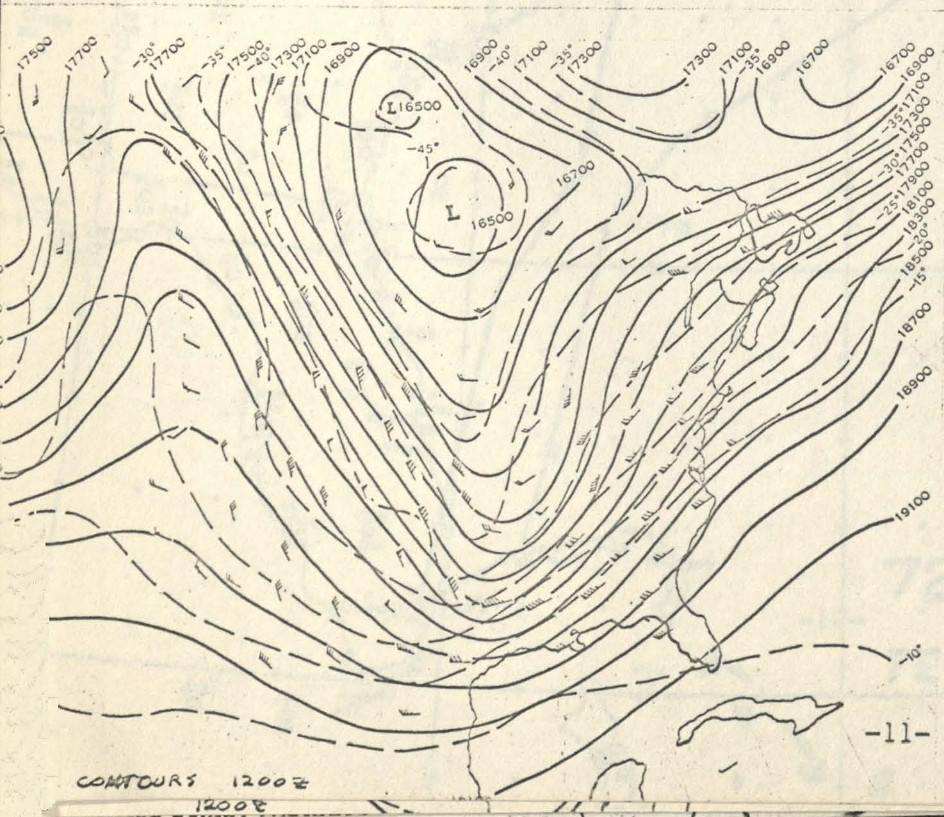
	RADAR DATA (PHOTOGRAPHS)			PHOTO PANEL AND CLOUD DATA (PHOTOGRAPHS)		
FLT IDENT	WP-101	RDR-1D/E	APS-20	PHOTO PANEL	FWD	SIDE (CAMERAS)
720203B	6120	6120	1224	5400	*	*
720217B	7200	7200	1878	7860	*	*
720219B	9855	9855	2820	8088	*	*
720322B	8520	8520	+	7320	*	*
TOTALS:	31,695	31,695	5922	28,668		

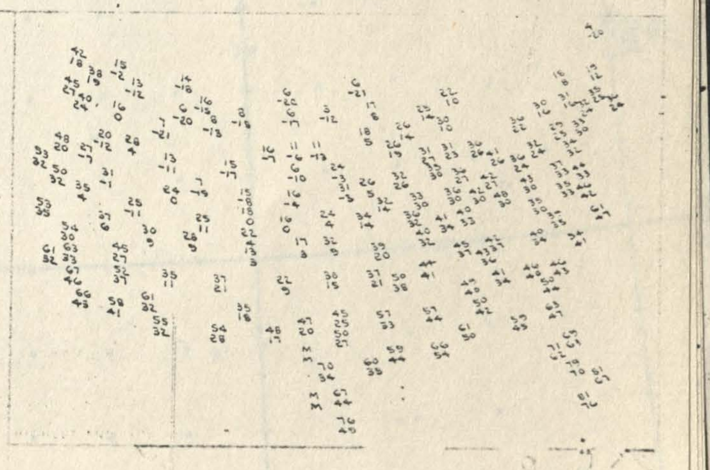
* = not required for mission.

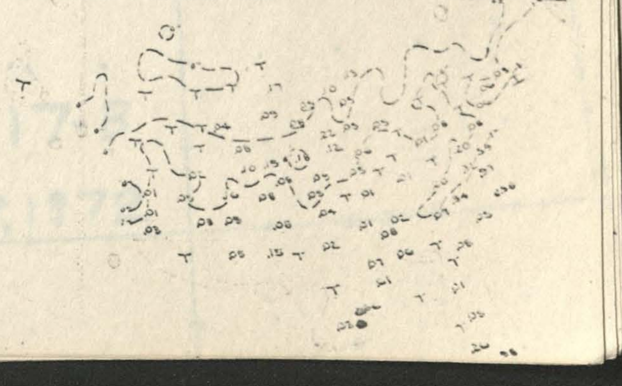
+ = system not available for this flight.

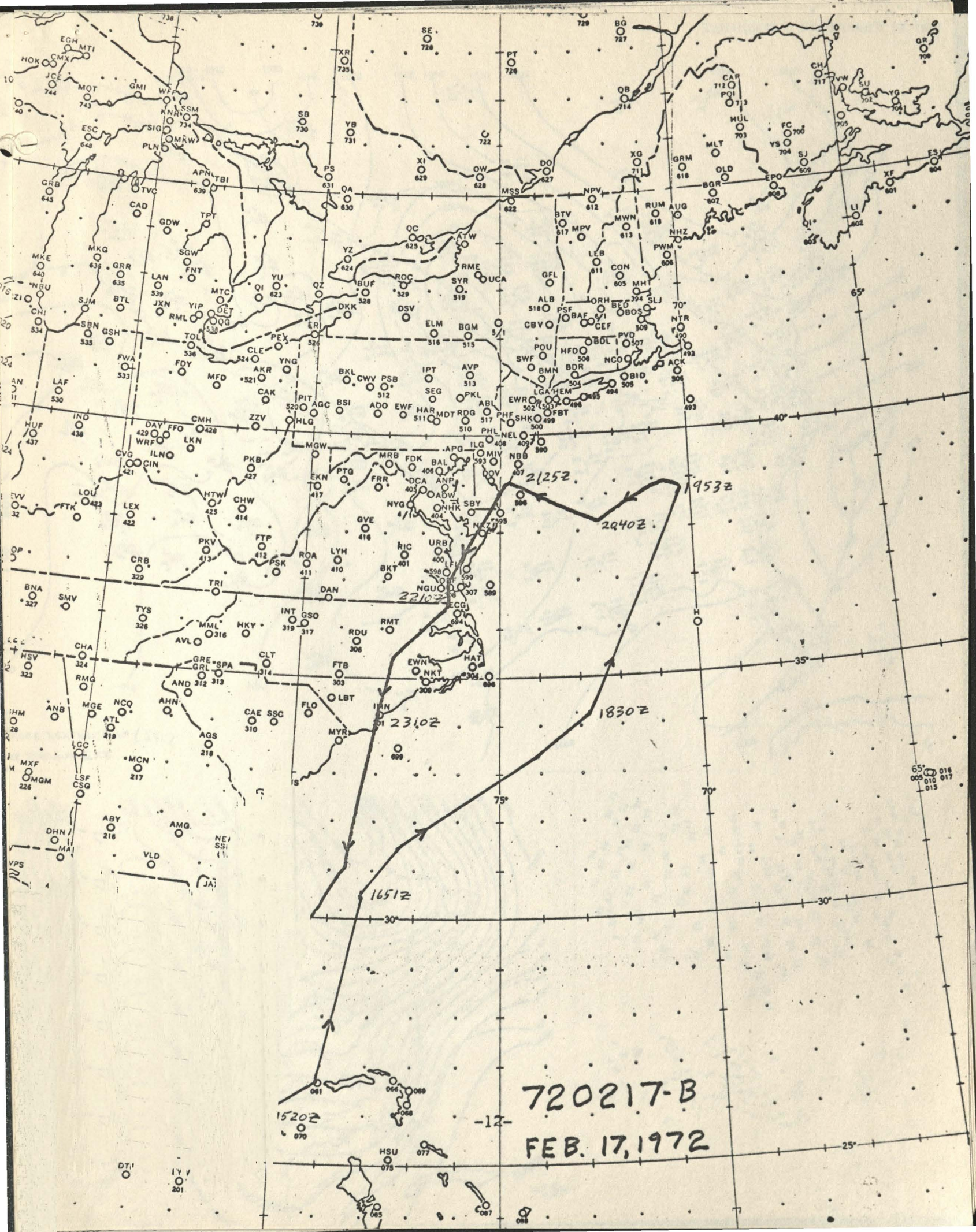

2002Z
1917Z
2235Z
2110Z
1735Z
1558Z
1520Z
720203-B
FEB. 3, 1972

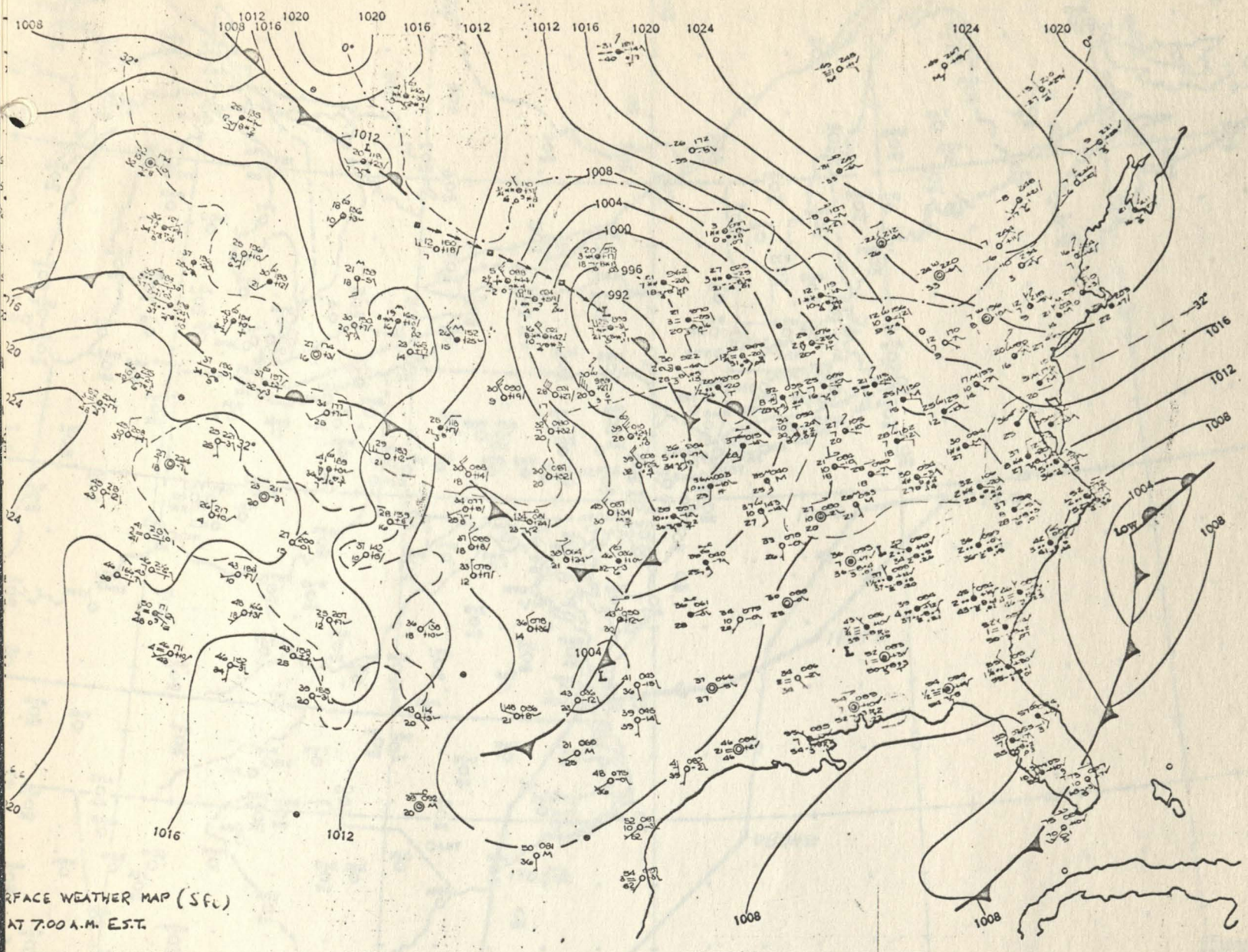

HIGH
LOW
HIGH
RFACE WEATHER MAP (Sfc)
AT 7:00 A.M. E.S.T.


L16500
L 16500
CONTOURS 1200Z

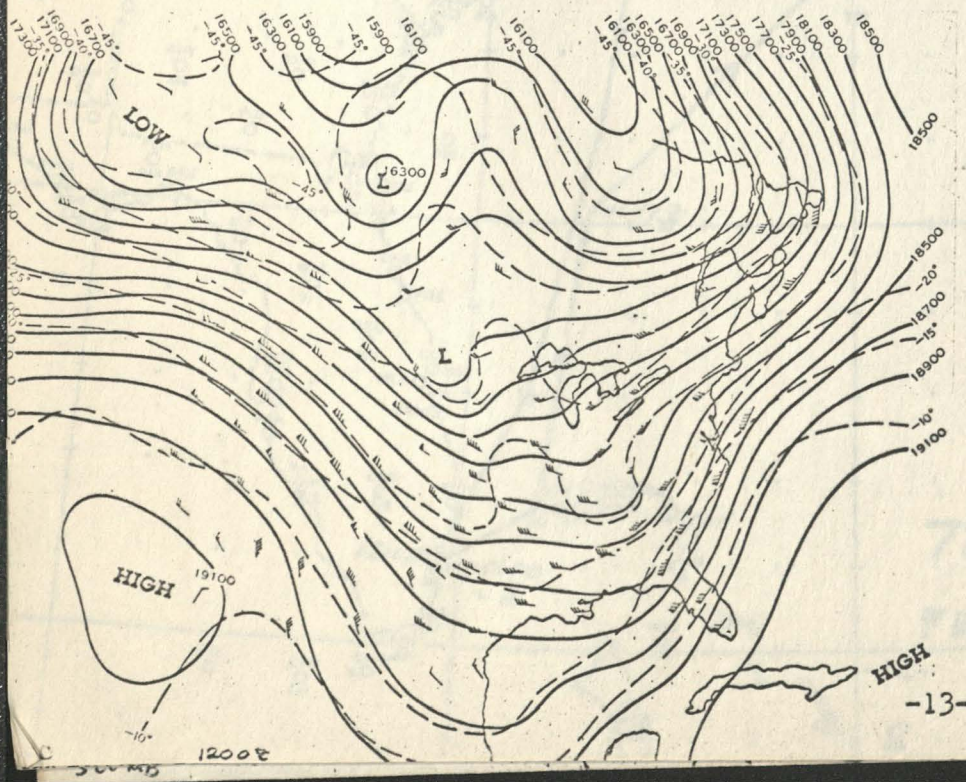


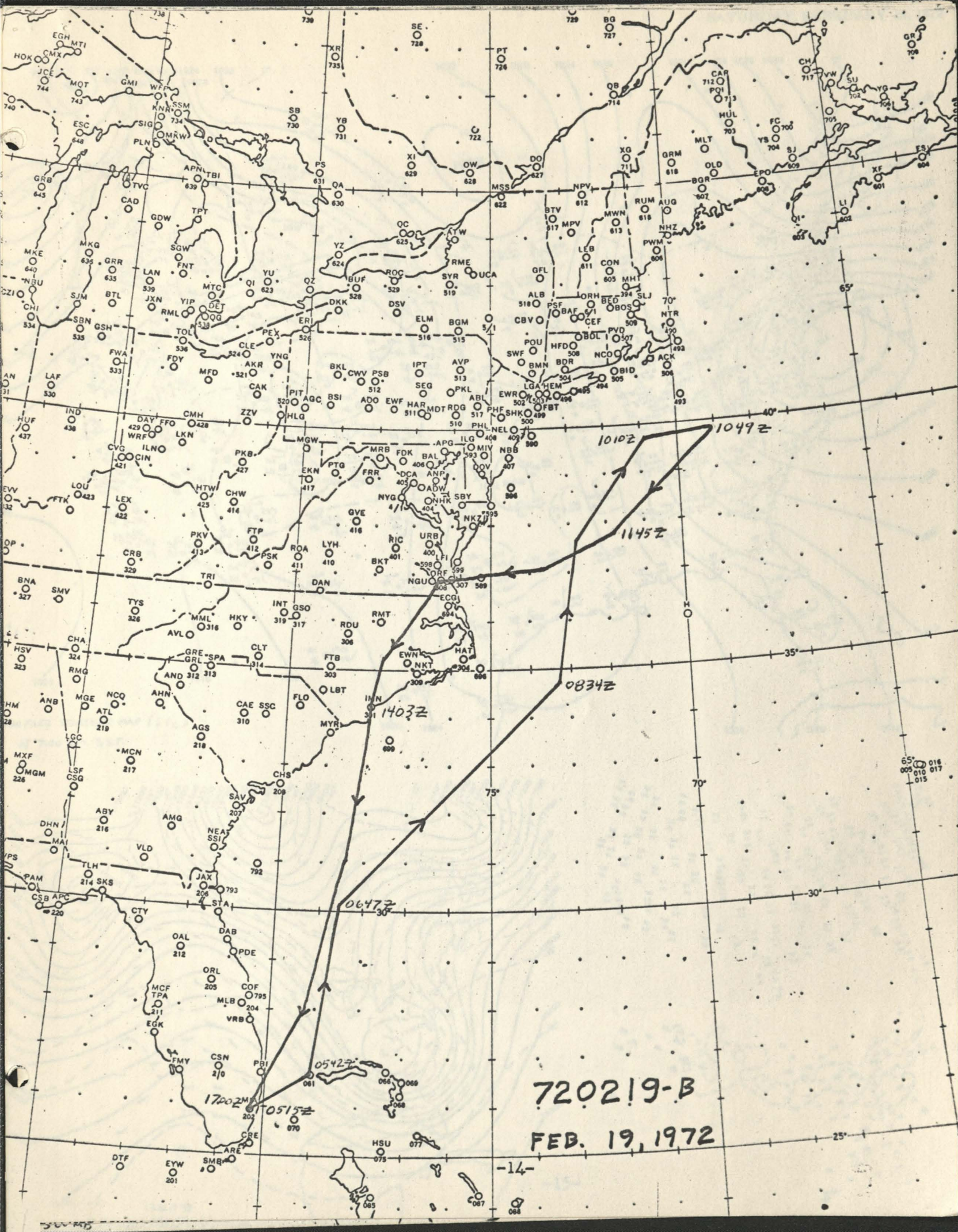



1953Z
2140Z
2125Z
2210Z
2310Z
1830Z
1651Z
1520Z
720217-B
-12-
FEB. 17, 1972



RFACE WEATHER MAP (SFC)
AT 7:00 A.M. E.S.T.




1049Z
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0834Z
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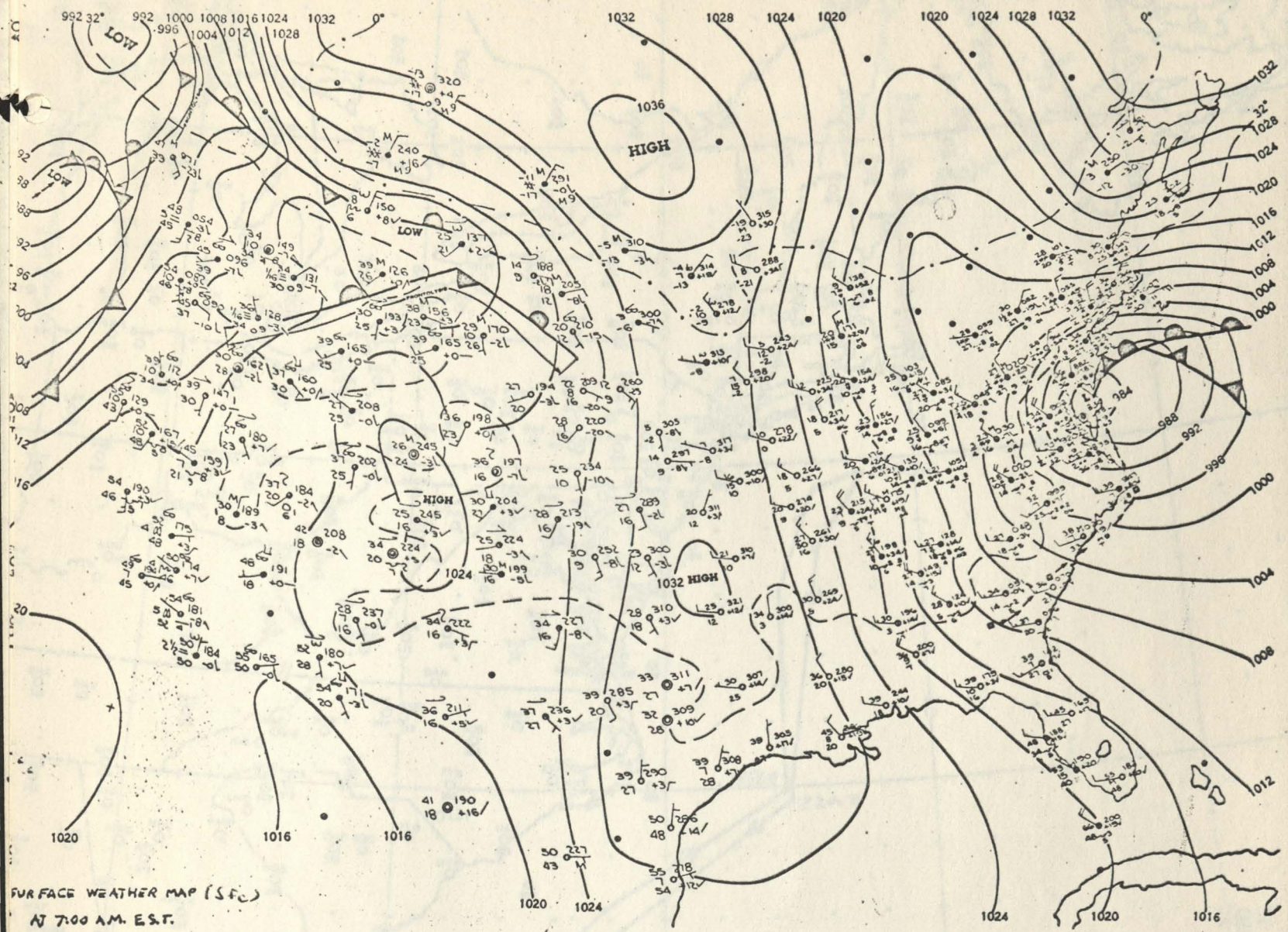
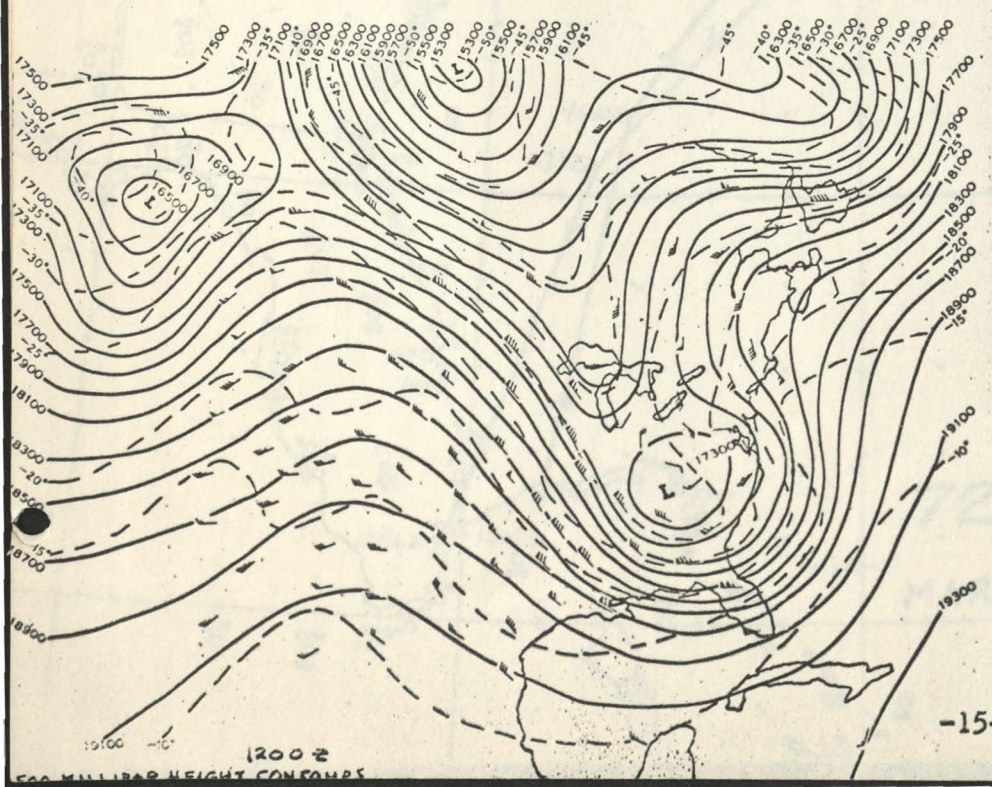
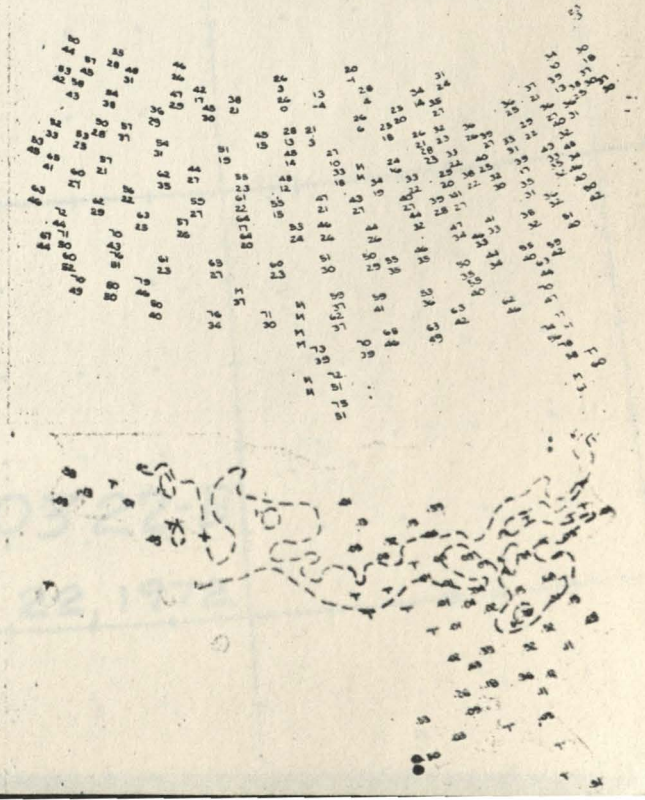
1700Z
0515Z
720219-B
FEB. 19, 1972

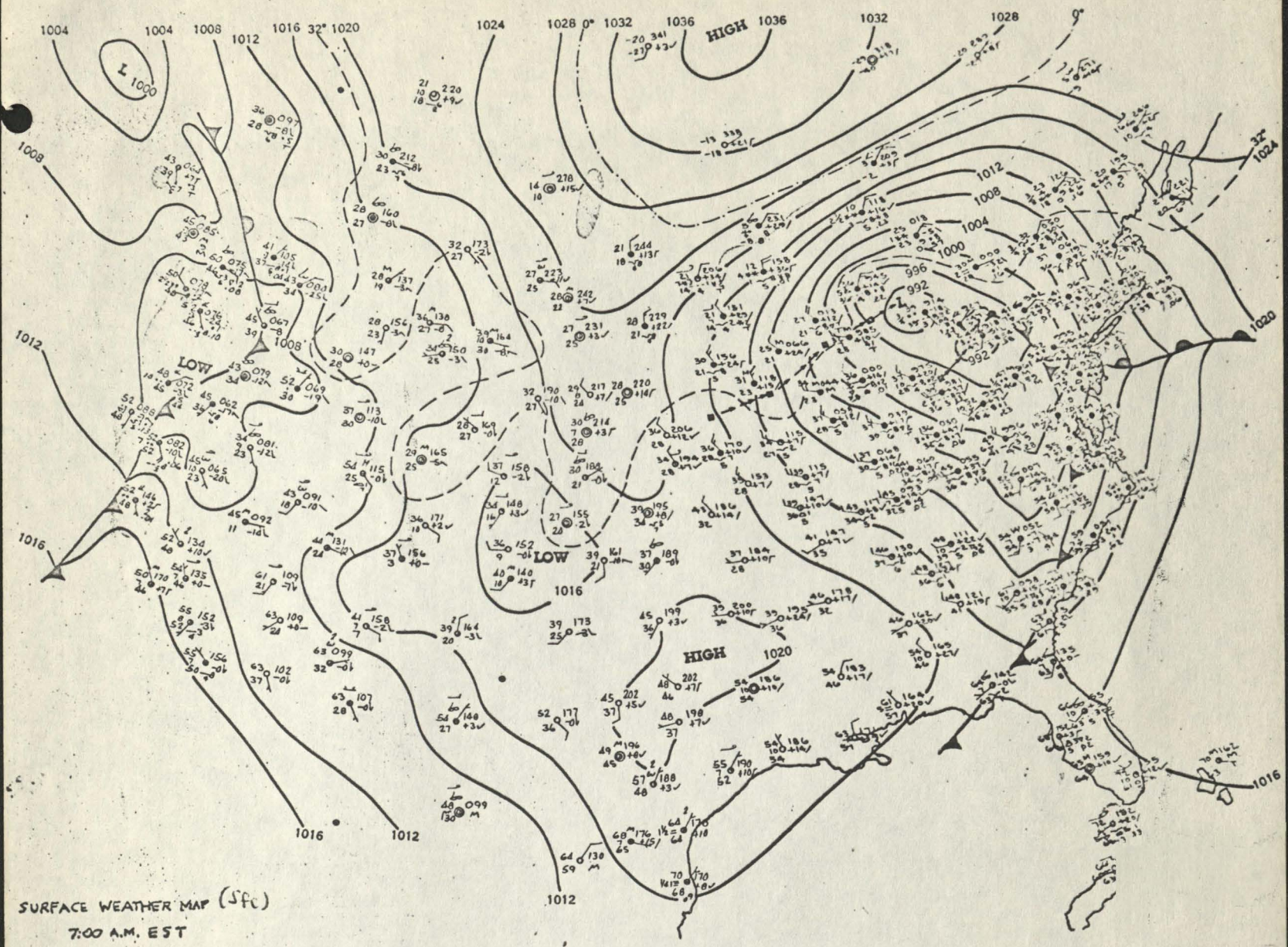


SURFACE WEATHER MAP (SFC)
AT 7:00 A.M. E.S.T.



1200Z
500 MILLIBAR HEIGHT CONTOURS





SURFACE WEATHER MAP (Sfc)

7:00 A.M. EST