



RADAR WEATHER OBSERVATIONS

OBSERVATIONS FORMS

Radar Forms (MF 7-60, formerly WBAN-60 and WBAN 610-3) are used for recording radar weather observations at approximately 110 National Weather Service radar stations located throughout the United States. A condensed explanation of the RAREP (Radar Report) code, together with an example copy of the report form MF 7-60, are shown on pages 2 and 3. The National Weather Service radar observational network as of April 1983 is shown on page 4.

Records are available in this general form beginning in the late 1950's. Form MF 7-60 provides for the entry of detailed information about the character, type and intensity of precipitation, direction and distance of the echoes from the station, movement of the echoes, maximum height of tops of cells, and pertinent remarks. An upward pointing arrow indicates the beginning of the digital section of the observation which gives additional information on echo locations and intensities. Observations are taken about 35 minutes past the hour throughout the day and night and more frequently during severe weather. Additional special observations are taken in case of aircraft accidents.

RADAR PHOTOGRAPHY

There are 59 National Weather Service radar observing stations with camera-equipped Weather Surveillance Radar (WSR-57 or WSR-74S), as of August 1984, that provide photographs of the Plan Position Indicator (PPI) scope on 16-mm film. When echoes are visible, pictures are taken at least every 5 minutes and sometimes as often as every 40 seconds.

A junction lamp display is shown to the right of the PPI scope on 16-mm photos. This display provides the viewer with pertinent information about the radar function settings, range, etc. at the time of the photo. On 35-mm photos, this information is available by means of a coded lamp system which is around the outside perimeter of the PPI scope. A plaque displayed just below the lamp display on 16-mm film and just below the clock on 35-mm film gives the international call sign, year, and film roll number. On all 35-mm photos, and some 16-mm photos, the Julian date is indicated in the center of the clock. All photos have a film frame number shown on a counter below the plaque. See the attached legends for detailed explanation of these displays.

CONDENSED EXPLANATION OF THE RADAR REPORTING CODE

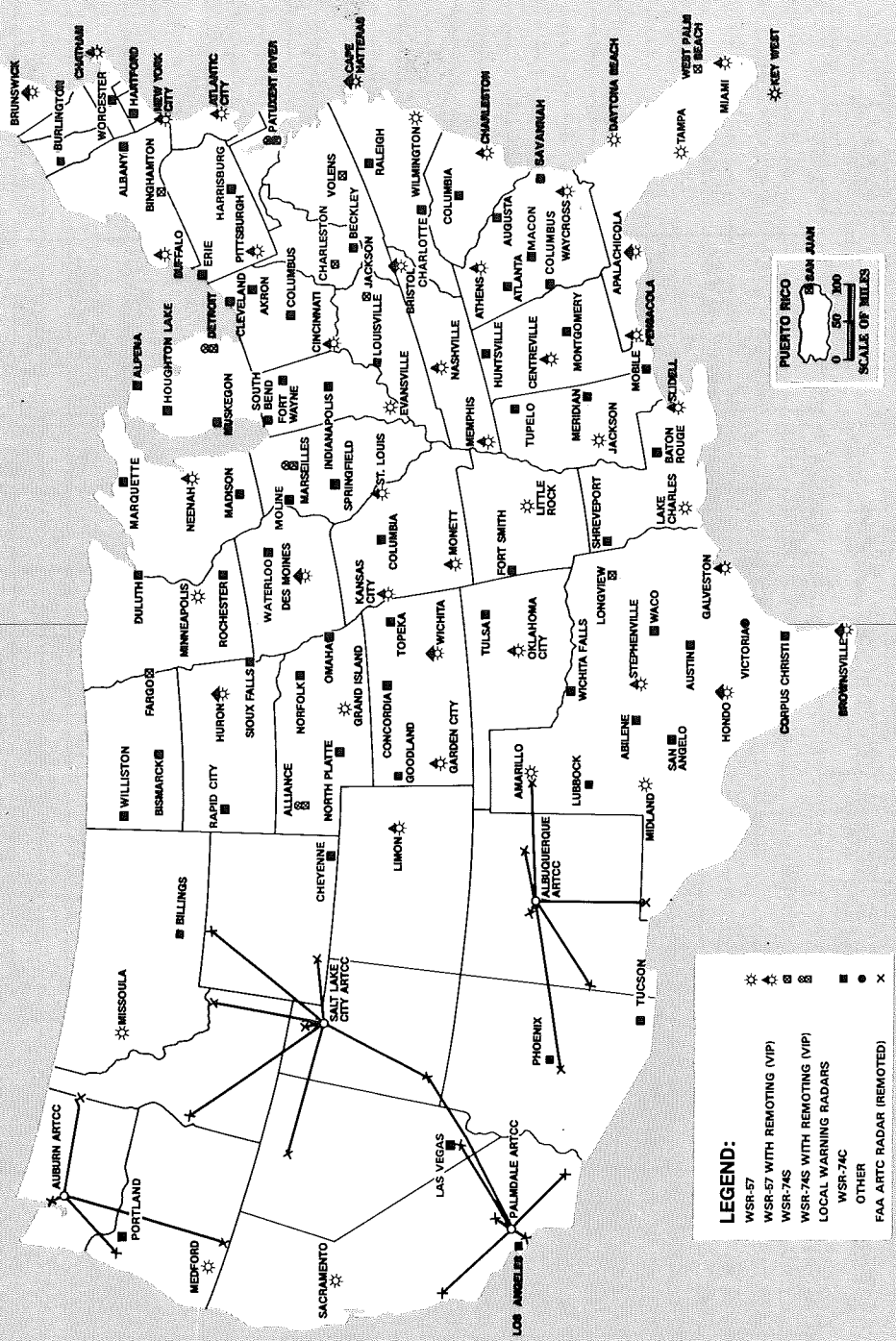
EFFECTIVE JAN. 1, 1979

LOCATION IDENTIFIER EEW	TIME 1735	ECHO CONFIGURATION AREA	AREAL COVERAGE 5	PRECIPITATION TYPE TRW	INTENSITY +	INTENSITY TREND /+	ECHO LOCATION 8/80 182/80 90W	ECHO MOVEMENT C2325	ECHO TOP MT 300 AT 191/55																											
<p>DIGITAL LOCATIONS AND INTENSITIES</p>																																				
<p>DECODED REPORT</p> <p>At 1735 GMT, the Neenah Wisconsin radar shows an area five tenths covered by thunderstorms. These thunderstorms are intensifying and some of them have reached heavy intensity. The area extends from 80 n.mi. at 8° to 80 n.mi. at 182°. The area is 90 n.mi. wide. Individual thunderstorms are moving through the area at 25 knots. The highest echo top is 30,000 feet. It is located 95 n.mi. from Neenah at 191°. The digital section of the observation shows the maximum intensity of the echoes observed in the grid boxes in rows 1 through P.</p>																																				
<p>TIME OF OBSERVATION</p> <p>The time of observation is reported in Greenwich Mean Time (GMT). Regular observations are taken at 35 minutes past the hour. Special observations may be taken at any time.</p>																																				
<p>AREAL COVERAGE</p> <p>The areal coverage in tenths is reported with a one or two digit number.</p>																																				
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<p>PRECIPITATION TYPE SYMBOLS</p> <p>R Rain RW Rain Shower L Drizzle S Snow IP Snow Shower A Ice Pellet Hail</p> <p>ZR Freezing Rain ZRW Freezing Rain Shower ZL Freezing Drizzle SW Snow Shower IPW Ice Pellet Shower</p> <p>The letter "T" is put before any precipitation type when thunder is believed to be occurring with the precipitation.</p>																																				
<p>ECHO INTENSITY SYMBOLS</p> <p>- no symbol + Weak ++ Moderate Strong Very Strong</p> <p>Intensity symbols aren't used with drizzle, snow, ice pellets, or hail.</p>																																				
<p>OPERATIONAL STATUS CONTRACTIONS</p> <p>Operational status contractions are encoded with the remarks. The following contractions are used.</p> <table border="1"> <thead> <tr> <th>CONTRACTION</th> <th>MEANING</th> </tr> </thead> <tbody> <tr> <td>PPINE</td> <td>No echoes detected</td> </tr> <tr> <td>PIOM</td> <td>Radar out of service for maintenance</td> </tr> <tr> <td>PPINA</td> <td>Radar observation not available</td> </tr> <tr> <td>ROBOPS</td> <td>Radar operating below performance standards</td> </tr> <tr> <td>RHINO</td> <td>RHI Scope inoperative. Height not available</td> </tr> <tr> <td>ARNO</td> <td>A/R scope inoperative.</td> </tr> </tbody> </table>										CONTRACTION	MEANING	PPINE	No echoes detected	PIOM	Radar out of service for maintenance	PPINA	Radar observation not available	ROBOPS	Radar operating below performance standards	RHINO	RHI Scope inoperative. Height not available	ARNO	A/R scope inoperative.													
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<p>DIGITAL LOCATIONS AND INTENSITIES</p> <p>The digital section of the observation is based on a grid with boxes that are about 22 n.mi. on a side. Each grid box is identified by two letters. The first identifies the row containing the box and the second the column. Rows are lettered from North to South, columns from West to East.</p> <p>The digital section of the observation is made up of one or more groups. The first two characters in each group are grid box identifiers. The next character is a number which represents the maximum observed echo intensity in that box. Any following numbers represent intensities in the following grid boxes in the row. The rows are encoded from North to South and the columns from West to East. The intensities are encoded using the following numbers.</p> <table border="1"> <thead> <tr> <th>CODE NUMBER</th> <th>INTENSITY</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>no echoes</td> </tr> <tr> <td>1</td> <td>weak</td> </tr> <tr> <td>2</td> <td>moderate</td> </tr> <tr> <td>3</td> <td>strong</td> </tr> <tr> <td>4</td> <td>very strong</td> </tr> <tr> <td>5</td> <td>intense</td> </tr> <tr> <td>6</td> <td>extreme</td> </tr> <tr> <td>8</td> <td>unknown (believed severe)</td> </tr> <tr> <td>9</td> <td>unknown</td> </tr> </tbody> </table>										CODE NUMBER	INTENSITY	0	no echoes	1	weak	2	moderate	3	strong	4	very strong	5	intense	6	extreme	8	unknown (believed severe)	9	unknown							
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<p>REMARKS</p> <p>Any appropriate remarks are encoded following the echo tops. Such things as radar indications of severe weather and comment which clarify the observations are included as remarks.</p> <div style="text-align: center;"> <p>U.S. DEPARTMENT OF COMMERCE National Oceanic and Atmospheric Administration NATIONAL WEATHER SERVICE SILVER SPRING, MD. 20910</p> </div>																																				

STATION	DATE	TIME	3 CONFIGURATION	4 COVERAGE INTENSITY	5 TREND	6 LOCATION		7 WIDTH DIAMETER	8 MOVEMENT		9 TOPS	10 REMARKS	11 INT.
						RADAR AND DVP CALIBRATION	SATELLITE DATE-TIME		FILM ROLL DATE-TIME	COUNTERS DATE-TIME			
WLSO, GALVESTON, TX (WLSO)	04	0625	AREA 3TRW+ / NEW			200/90	170/160	25W			300 AT	10 (LCH TROP 441)	LC
	04	0726	AREA 2TRW+ / NC			226/45	183/105	30W			390 AT	(CAMELA 1/5 0620)	LC
	04	0827	AREA 3TRW+ / T			235/45	185/90	20W			400 AT		LC
	04	0925	AREA 1Rw+ / -			67/70	202/60	20W			400 AT		LC
	04	1026	AREA 1TRW+ / NC			15/50	179/20	100W			260 AT		LC
	04	1125	AREA 2TRW+ / NC			193/40	136/185				280 AT		LC
	04	1227	AREA 1TRW+ / NEW			146/25	176/120	D10			410 AT	(LCH TROP 465)	LC
	04	1325	AREA 2TRW+ / NC			75/60	187/175	100W			360 AT		LC
	04	1426	AREA 2TRW+ / -			132/40	178/105	D8			280 AT	(GREENS ARE)	LC
	04	1525	AREA 1RW / -			63/140	146/85				180 AT		LC
	04	1626	AREA 2TRW+ / T			53/145	69/140				310 AT		LC
	04	1725	AREA 2TRW+ / NC			21/110	68/235				360 AT		LC
	04	1825	AREA 2TRW+ / T			27/185	74/190				550 AT	(LCH TROP 465)	LC
	04	1925	AREA 2TRW+ / NC			33/200	72/190				530 AT	(LCH TROP 469)	LC
	04	2026	AREA 3TRW+ / NC			47/190	35/70	65W			570 AT	(LCH TROP 469)	LC
	04	2125	AREA 1TRW+ / T			312/55	142/110	55W			400 AT		LC
	04	2225	AREA 1TRW+ / T			303/2	42/2				570 AT		LC

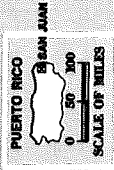
NOAA NATIONAL WEATHER SERVICE RADAR NETWORK

APRIL 1983



LEGEND:

- ☼ WSR-57
- ☼ WSR-57 WITH REMOTING (VIP)
- ☼ WSR-74S
- ☼ WSR-74S WITH REMOTING (VIP)
- ☼ LOCAL WARNING RADARS
- ☼ WSR-74C
- OTHER
- ✕ FAA ARTC RADAR (REMOVED)



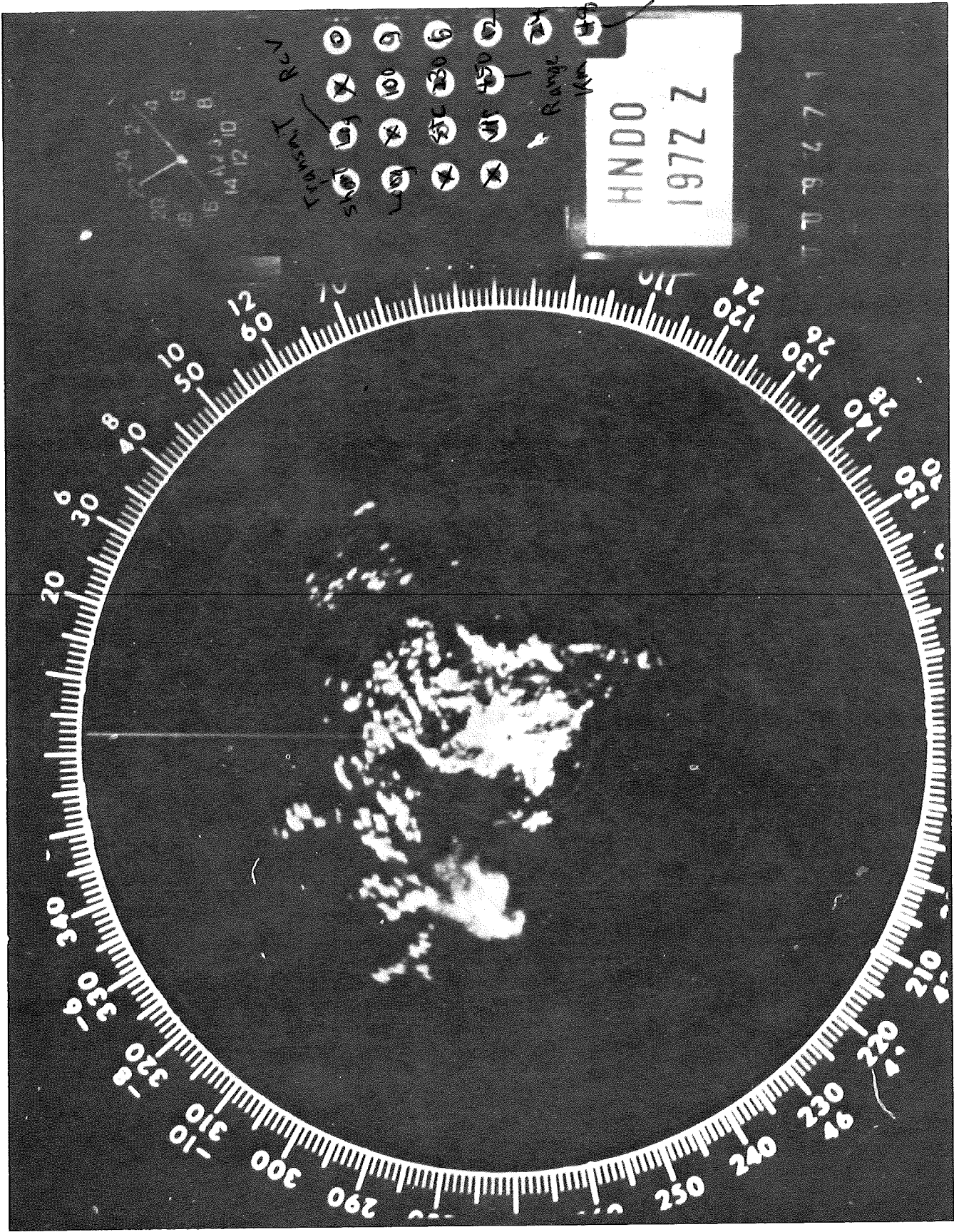
RADAR PRODUCTS AVAILABLE AT THE NATIONAL CLIMATIC DATA CENTER

Paper copies of Form MF 7-60 can be furnished in actual size (11 by 17 inches) or 8 1/2 by 13 inches. These forms are also available on microfiche beginning with January 1982. Copies of the radar film can be supplied in either 16-mm or 35-mm size. Glossy prints (8 by 10 inch size) of individual film frames can also be furnished (see example attached). Cost estimates for providing any of these records will be furnished upon request. Inquiries should be addressed to the National Climatic Data Center, NOAA, Federal Building, Asheville, NC 28801-2696, or you may wish to consult with the NCDC before ordering these products. A meteorologist is available for assistance from 8 a.m. to 4:30 p.m. Eastern Time by telephoning 704-259-0682.

OVERLAYS AND GRID MAPS

For users of radar data who wish to plot the observations, radar overlays and/or grid maps will be useful. A radar overlay shows the geographic features and political boundaries of the radar station. Radar grid maps mark the grid boxes around the station and are necessary to plot the digital section of the observation. Both these overlays and grid maps are available in either 125 or 250 nautical mile ranges for most stations. These may be obtained for individual radar stations from the National Climatic Data Center or from the following address:

National Weather Service
Sounding Systems, W/OTS22x2
8060 13th St.
Silver Spring, MD 20910



HNDO
197Z Z

Sig
ATTN
DB

STANBY Rev
Range
1000

Legend for 35-mm Radarscope Photographs

<u>Light Position</u>	<u>Indication</u>
35°	250-mile range
45°	125-mile range
55°	50-mile range
65°	25-mile range
95°	66-db attenuation
105°	33-db attenuation
115°	24-db attenuation
125°	12-db attenuation
135°	6-db attenuation
145°	3-db attenuation
215°	Spare - unassigned
225°	Linear receive
235°	Logarithmic receiver
305°	STC
315°	Long pulse
325°	Short pulse

Legend for Function Lamp Display
WSR-57 & WSR-74

* Signal Attenuation: Indicates strength of signal attenuated out in order to measure echo intensity.

* Radar Range: Indicates the maximum range of echo detection.

Receive Function: STC-Range normalization. Used in LIN mode if available. Prevents overestimation of echo strength of targets close to the receiver. VIP - Displays echo intensity at another location on the console. Used in Log mode.

Transmit Function: S - short pulse operation
L - long pulse operation

any X denotes spare lamps.

* Signal attenuation incremented differently between radar sets.

* Radar Range: KM for WSR-74 NM for WSR-57

USCOMM-NOAA-ASHEVILLE, N.C.-2/85/2000