U.S. Weather Bureau.
Circular N, 6th ed, rev. Air Weather Service Addendum 1

HEADQUARTERS
AIR WEATHER SERVICE
ANDREWS AIR FORCE BASE
Washington 25, D. C.

QC
983
.C57
no.N
6th ed.
Rev.
1951
AWS
addendum 1

AIR WEATHER SERVICE

ADDENDUM 1

to

WBAN MANUAL OF SURFACE OBSERVATIONS

LIBRARY
N.O.A.A.
U.S. Dept. of Commerce

LIBRARY
MAY 6 1952
WEATHER BUREAU

Effective 0000GCT, 1 June 1951

79824

National Oceanic and Atmospheric Administration

ERRATA NOTICE

One or more conditions of the original document may affect the quality of the image, such as:

Discolored pages
Faded or light ink
Binding intrudes into the text

This has been a co-operative project between the NOAA Central Library and the Climate Database Modernization Program, National Climate Data Center (NCDC). To view the original document, please contact the NOAA Central Library in Silver Spring, MD at (301) 713-2607 x124 or www.reference@nodc.noaa.gov.

LASON
Imaging Contractor
12200 Kiln Court
Beltsville, MD 20704-1387
March 21, 2005

HEADQUARTERS
AIR WEATHER SERVICE
ANDREWS AIR FORCE BASE
Washington 25, D. C.

15 March 1951

1. GENERAL. The WBAN Manual of Surface Observations (Sixth Revised Edition) as supplemented by this AWS Addendum is directive upon all units of the Air Weather Service. The WBAN Manual of Surface Observations and this AWS Addendum supersede the WBAN Manual of Surface Observations, January 1949, and all supplements, changes and addenda thereto. The WBAN Manual of Surface Observations, June 1951, and this AWS Addendum become effective 0000GCT, 1 June 1951.

2. SCOPE. The WBAN Manual of Surface Observations has been prepared to provide instructions covering Airways and Synoptic Observations. This AWS Addendum provides instructions common only to the Air Weather Service. Instructions contained in the WBAN Manual of Surface Observations and this AWS Addendum will take precedence over conflicting instructions contained in any publication. Interpretations or amplifications of instructions contained in the WBAN Manual and this AWS Addendum will not be made, except as noted below:

a. When specifically authorized by the WBAN Manual or this AWS Addendum.

b. When required to fulfill local needs in areas of hostilities.

c. When the supplemental information has been approved by this headquarters.

3. SUPPLEMENTS. Wing, group, and independent squadron Commanders will supply necessary instructions or amplifications as "Supplements" to this AWS Addendum. The exact format of these supplements are at the discretion of the organization preparing them. Supplemental instructions issued in accordance with paragraph 2c will be forwarded to this headquarters for approval prior to issue. Organizations issuing supplements will forward ten (10) copies of the supplement to this headquarters and will make distribution to adjacent AWS units to insure that such units are aware of the supplemental procedures.

4. SPECIAL PROJECTS. AWS units operating in conjunction with a special project are authorized to deviate from the instructions in the WBAN Manual of Surface Observations and this AWS Addendum

when so directed by the agency in charge of the project. All observations transmitted over normal weather communications circuits will be made in accordance with these instructions.

5. PROCEDURES. The WBAN Manual of Surface Observations and USWB Circular "S" will be bound in a loose-leaf, hard-backed binder. The punched holes will be protected by use of gummed reinforcements. The AWS Addendum will be entered in accordance with instructions in the FOREWORD.

6. SUPPLY OF MANUALS. Additional copies of the WBAN Manual of Surface Observations, this AWS Addendum and USWB Circular "S" will be procured from the Middletown Air Materiel Area in accordance with instructions contained in Section XXIX of AFM 67-1.

BY COMMAND OF BRIGADIER GENERAL SENTER:

J. K. ARNOLD, JR.
Colonel, USAF
Chief of Staff

OFFICIAL:

Robert B. Edwards
ROBERT B. EDWARDS
Major, USAF
Adjutant General

DISTRIBUTION:

450 - Hq, 2059th AWW
168 - Hq, 2143d AWW
120 - Hq, 2105th AWG
50 - Hq, 2107th AWG
80 - Hq, 2108th AWG
5 - Hq, 55th SRS
5 - Hq, 57th SRS
10 - CADO
2 - Air Missions
2 - USAF Instrument School
200 - Dept of Weather, Chanute AFB
800 - Stock, MAAMA

FOREWORD

This Air Weather Service Addendum to the WBAN Manual of Surface Observations was prepared by Headquarters, Air Weather Service, to prescribe certain observing procedures common to the Air Weather Service that are not covered in the basic WBAN Manual of Surface Observations.

This addendum has been prepared in such a manner as to permit the addendum pages to be inserted in the basic manual adjacent to the material to which reference is made. The pages are numbered in two places. The number in the lower margin is the addendum page number and the number in the upper margin is the page number that will be used after the page is placed in the WBAN Manual. The page will carry the same number as the basic manual page to which it refers, with the addition of a lower case letter to indicate that it is an addendum page. When more than one addendum page is used, the pages will be numbered the same as the basic page and the letter designator will increase in alphabetical order. Instructions for the entry of each page will be given in the lower margin of the page.

The basic WBAN Manual of Surface Observations will be marked to indicate that an addendum item pertains to the paragraph. Make the annotation in accordance with the following example:

(See par A1230.)
1230. INTERCONNECTION OF LAYERS. **********

Those pages of the addendum which do not refer to a specific paragraph or page of the basic WBAN Manual will be bound following the last page of the WBAN Manual.

A1110. DEFINITION OF SKY COVER. The ceilometer or ceiling light will always be used as a guide in estimating sky cover during periods of darkness. In addition, the observer will never attempt to make a night-time cloud or sky cover observation without first permitting his eyes to become adapted to the darkness. Darkness adaptation requires a minimum period of about 5 minutes after leaving a lighted room similar to that found in a weather station. During this time the observer should not look at lights or lighted areas. If this precaution is not observed, darkness adaptation will never be obtained. The actual cloud or sky cover observation should be made from a darkened area, if at all possible. Detachment commanders will attempt to secure permission to turn off, or have turned off, the lights adjacent to the observation site during the short period of time necessary to make the cloud or sky cover observation.

(Insert Facing Page 1 of WBAN Manual)

A1431. MEASURED CEILING. A ceiling may be classified as measured when determined by use of a ceilometer or ceiling light, only when the ceiling height is less than ten (10) times the length of the baseline used. For example: if the baseline were 1000 feet in length, the maximum measured ceiling which may be reported would be 9,500 feet. When the ceiling is ten (10) times or more the length of the baseline, the indications from a ceilometer or ceiling light will be used as a guide in estimating the height.

(Insert Facing Page 5 of WBAN Manual)

A1441.1 OBSERVATIONS ON REDUCED BASELINE. All observing stations will survey and mark baseline distances of 250 feet, 500 feet and 1000 feet for use with the ceiling light or ceilometer projector and clinometer. The shorter baselines will be used for heights as indicated:

250 Feet - Heights of 300 feet or less.
500 Feet - Heights of more than 300 feet up to and including 1500 feet.
1000 Feet - Heights over 1500 feet.

It is recommended that baseline distances of 1,500 feet and 2,000 feet be surveyed and marked for use with clouds above 10,000 feet. Tables giving cloud height versus elevation angle will be available for all baseline distances used. The tables will clearly state whether the tabular values of cloud height incorporate any difference in elevation between point of observation and the surface, as defined in paragraph 1412.

(Insert Facing Page 7 in WBAN Manual)

A1442. BALLOONS. Delete the present paragraphs (2) and (3) of the basic manual and substitute the following in their place:

(2) Watch the balloon continuously, determining with a stop watch, the length of time required for the balloon to enter into the base of the layer. The point of entry will be considered as the time at which the balloon first begins to fade due to the effects of the layer. If there is any doubt in the mind of the observer as to the accuracy of the balloon's indications, the height indicated will be used as a guide in estimating the height of the layer. The observer will always be alert for such things as the balloon entering the side of a cloud rather than the base, the balloon being obscured by a cloud drifting across the field of view below the balloon, or effects of precipitation on the ascent rate of the balloon.

(3) Determine the height by means of the table appropriate to the balloon used. (See Table 4 for values of height versus time). Interpolate between the given values to determine heights at the nearest 5 second period.

(Insert Facing Page 9 in WBAN Manual)

A1448. CEILOMETER OPERATION. Ceilometer Equipment, AN/GMQ-2, will be operated during periods when clouds are present or are forecast to be present. A theodolite check of the angle recording accuracy of the equipment will be made at least once each month by setting up a theodolite adjacent to the detector and sighting on the spot produced by the projector beam on the cloud base. This check should be made at as many different elevation angles as possible to insure that the equipment is operating properly. The comparison is made by comparing cloud heights as determined by the ceilometer and the theodolite. If the cloud heights indicate a random (plus and minus at adjacent values) error, the operational procedures used in the comparison should be carefully checked. If this check does not indicate a discrepancy, this fact should be reported to the squadron headquarters for action by a qualified technician. If the elevation angles or cloud heights indicate a constant error at all values, this fact will be reported to the squadron headquarters for immediate correction by a qualified technician.

A1448.1 Ceilometer Equipment, AN/GMQ-2, will be operated in accordance with instructions contained in SECTION 4, "OPERATION" of TM11-2419. Care will be taken to insure that the threshold setting is not so high as to give angle markings in excess of 4 to 6 degrees for clouds less than 5000 feet above the surface.

A1448.2 The ceilometer record will be evaluated in accordance with SECTION 4, "OPERATION" of TM11-2419, as supplemented below:

(1) The base of the cloud layer will be the point of low maximum ceilometer reaction. This point is determined by selecting the point of first maximum reaction while the detector is on its upward scan and the last point of maximum reaction while the detector is on the downward scan. The elevation angle corresponding to these points is selected by use of dividers as indicated in TM11-2419 and the one degree correction for time lag applied. This correction is expressed as follows:

Detector on upward scan	Detector on downward scan
Elevation angle minus 1 Degree	Elevation angle plus 1 Degree

(Insert Facing Page 12 in WBAN Manual)

A1448.3 Ceilometer chart rolls will be prepared in accordance with the following instructions.

(1) At the beginning and end of each roll enter the station name, date of beginning and ending of the roll (day, month and year, LST).

(2) At the beginning and end of each roll enter the length of the baseline used.

(3) Enter the date and time (LST) of starting and stopping the recorder and the method of operation used.

103440 May 51
AUTO-ON

A1448.4 Ceilometer chart rolls will be disposed of in accordance with AWS Letter 11-3. The chart rolls will be placed in the cardboard shipping box and the data blocks on the end of the box completed, if the rolls are to be forwarded from the station. Enter the following data in these blocks:

(1) Station name.

(2) Date of beginning of roll.

(3) Date of end of roll.

(Insert Facing Page 13 in WBAN Manual)

A1511. SUMMATION. Observers will use extreme caution in classifying a layer as "thin" since this classification may have a very definite effect on the operational use of the observation. The previous criteria for classifying a layer as thin "i.e., use of sun or moon" can not be used for this purpose. The transparency of a layer must be determined by the observer being able to plainly see the sky or higher clouds through the layer.

(Insert Facing Page 14 in WBAN Manual)

A2101. The provisions of paragraph A1110 pertaining to darkness adaptation are applicable to visibility observations.

A2011. Observations of visibility from the control tower will normally be made by tower operators. Detachment commanders will make necessary arrangements with the local AACS commander to insure that control tower visibility observations are made when requested by the local weather station. The detachment commander will also be responsible for providing necessary charts of visibility check points (see paragraph A2110.1) and training of tower operators in accordance with AWS Letter 50-1.

A2110. CHART OF VISIBILITY MARKERS. Charts of visibility markers will be prepared in accordance with the following specifications. Stations presently having charts that do not differ materially in scale or format from these specifications need not prepare a new set of charts.

(1) The chart for visibility markers within $1\frac{1}{2}$ miles of the point of observation will be drawn on the scale of 1 inch equals $\frac{1}{4}$ mile. Concentric circles will be drawn for each $\frac{1}{4}$ mile distance from the point of observation.

(2) The chart for all visibility markers will be drawn on a minimum scale of 1 inch equals 2 miles. Concentric circles will be drawn for each 1 mile distance from the point of observation.

(3) Day and night visibility markers may be shown on one chart, or separate charts may be prepared for day and night markers, the letter "N" will be entered below the night visibility markers.

(4) Vibisility markers will be selected in accordance with paragraphs 2120, 2130 and 2140 of the basic manual.

(5) The distance to the marker, height of the marker above the ground and identification of the marker will be placed below a simple drawing of the marker on the chart, as shown below:

Water Tower
D-$3\frac{1}{2}$ H-75

A2110.1 A set of visibility charts prepared in accordance with paragraph A2110 will be prepared for use in the control tower. This set of charts will be prepared with the tower as the point of observation.

(Insert Facing Page 21 in WBAN Manual)

2. Delete example 2 of the basic manual and substitute the following:

"R-reported in 1228 obs; S- began at 1235 and both continued through 1330. Enter remark in 1328 obs: "SB35". NOTE: If the R- had stopped at 1235 the entry in remarks would have been "RE35 SB35".

3. Delete example 3 of the basic manual and substitute the following:

"No precipitation reported in the 1228 obs; SW began at 1240 and was reported by a special (See par. A9132.6(4); SW stopped at 1255, began again at 1305 and stopped at 1315. Enter remark in 1328 obs: "SE15".

(Insert Facing Page 38 of WBAN Manual)

A5213. CHARTS. Thermograph Chart, ML-234, will be used with Thermograph, ML-277(), in cold climates. Thermograph Chart, ML-235, will be used with Thermograph, ML-77(). These charts will be obtained through normal supply channels and completed charts will be disposed of in accordance with AWS Letter 11-3.

(Insert Facing Page 55 in WBAN Manual)

A6010.1 Enter Table 9 with dew point with respect to ice in degrees and tenths and read the dew point with respect to water to the nearest whole degree. Enter Tables 10A and 10B with dry bulb temperature in whole degrees and relative humidity with respect to ice in whole percent. Interpolate between the given 10% columnar headings when necessary. Read the relative humidity with respect to water to the nearest whole percent. Do not use these tables when Psychrometric Calculator, ML-429/AM is used.

(Insert Facing Page 61 in WBAN Manual)

A6430. TWENTY-FOUR HOUR MAXIMUM RELATIVE HUMIDITY. Enter

24HR.
MAX
RH

in the space at the top of Column 78.

A6440. TWENTY-FOUR HOUR MINIMUM RELATIVE HUMIDITY. Enter

24HR
MIN
RH

in the space at the top of Column 79.

(Insert Facing Page 68 in WBAN Manual)

A7230. Paragraph 7220 of the basic manual is not applicable to units of the Air Weather Service. Station elevation and removal corrections are defined in paragraphs 1310 through 2330 and paragraphs 3500 through 3542 of AWSM 105-15.

A7230.1 Paragraph 7230 of the basic manual is not applicable to units of the Air Weather Service. Barometer corrections and their application are set forth in paragraphs 3100 through 3413 of AWSM 105-15.

A7231. Paragraph 7231 of the basic manual is not applicable to units of the Air Weather Service. Barometer corrections are determined and applied as set forth in paragraphs 3100 through 3413 of AWSM 105-15.

(Insert Facing Page 71 in WBAN Manual)

A7242. Units of the Air Weather Service will use a mercurial barometer of the type, ML-2( ), for the 6-hourly comparison of the barograph, except that mobile units may use a precision aneriod for this purpose when a mercurial barometer is not available. The barograph correction will be posted adjacent to the barograph. An adjustable type correction indicator may be used for this purpose. This indicator can be made locally from cardboard (or plastic if available).

(Insert facing page 72 of WBAN Manual)

A7245. CHARTS. Units of the Air Weather Service will use Microbarograph Chart, ML-236 with Microbarograph ML-3( ). Table 10C is not applicable to the Air Weather Service. These charts will be obtained through normal supply channels and will be disposed of in accordance with AWS Letter 11-3.

(Insert facing page 73 of WBAN Manual)

A7320. Paragraphs 7320 through 7324 of the basic manual are not applicable to the Air Weather Service. Station pressure will be reduced to sea level pressure in accordance with SECTION 5000 of AWSM 105-15.

(Insert facing page 78 in WBAN Manual)

A7410. DESCRIPTION OF DIAGRAMS. Forms 1154C through 1154H and the table "Correction for Lapse Rate and Humidity" (see paragraph 7430(6) will be obtained by letter request, through channels, to Chief, Air Weather Service, ATTN: AWS DM/Supply Division.

(Insert facing page 80 in WBAN Manual)

A7520. Paragraphs 7520 and 7521 of the basic manual are not applicable to the Air Weather Service. Altimeter settings will be determined as set forth in SECTION 4000 of AWSM 105-15.

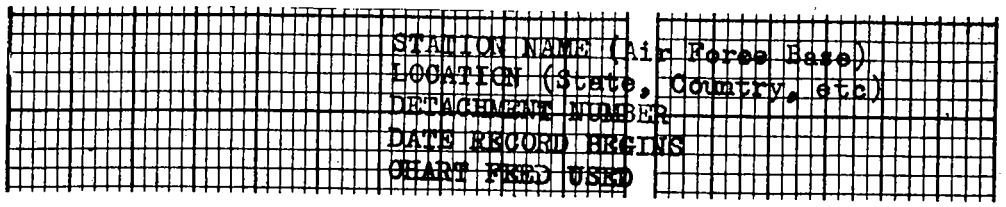
(Insert facing page 83 of WBAN Manual)

A8312. Wind Recorder, ML-144, is considered a gust recording instrument. All references to gust recording equipment are applicable to Wind Recorder, ML-144.

(Insert facing page 94 of WBAN Manual)

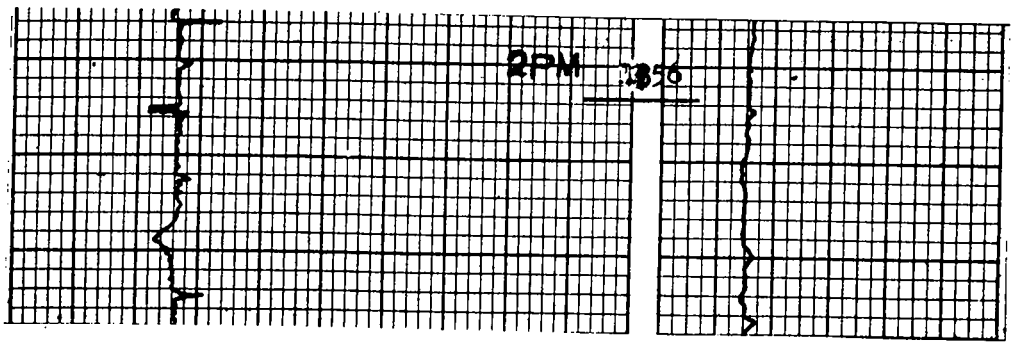
8500. ENTRIES ON WIND RECORDER RECORD

A8510. ENTRIES PRIOR TO PLACING CHART ON RECORDER. Make the following entries on Chart Roll, ML-172, prior to placing it on the recorder.

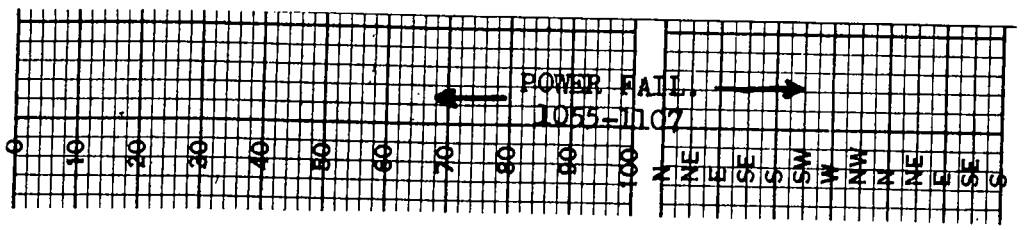


A8520. ENTRIES WHILE ON RECORDER. Make the following entries on Chart Roll, ML-172, while it is on the recorder.

(1) Time check lines will be made at the time of each 6-hourly observation. Make the time check line by drawing a black pencil line across the space between 100 mph and North on the chart, and entering the local time.

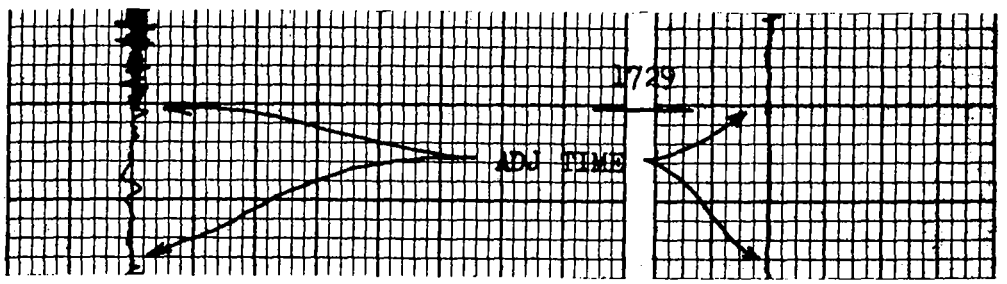


(2) Indicate power failures by means of an arrow and the time of power failure.

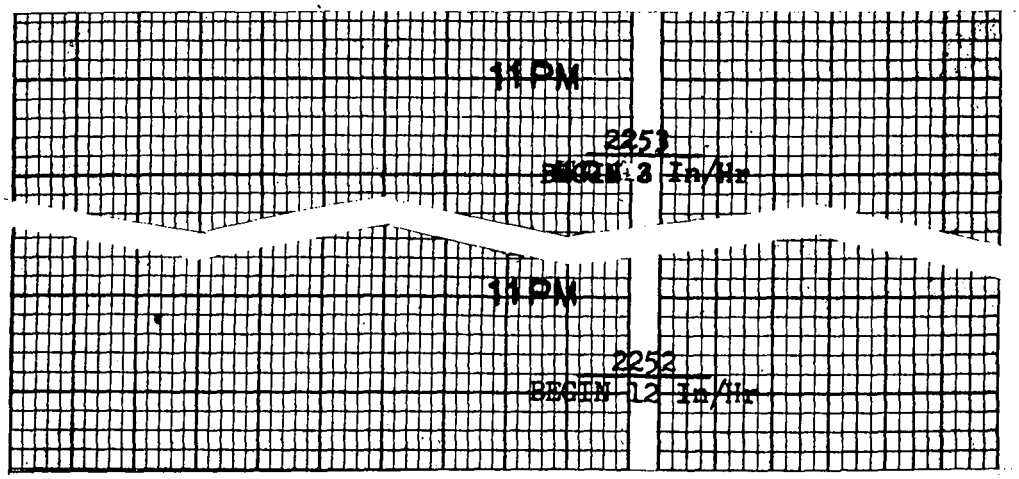


(Insert facing page 96 of WBAN Manual)

(3) When the recorder becomes more than 10 minutes in error, the chart feed rate will be increased or stopped, as necessary, to bring the recorder into correct time adjustment. Indicate this by means of an arrow and time of adjustment.



(4) When the chart feed rate is changed, indicate this by means of black pencil mark similar to that used for a time check and the note "BEGIN 12 IN/HR" or "BEGIN 3 IN/HR". When a new chart feed is used, it will be continued for 24 hours, or some multiple of 24 hours (i.e. 24, 48, etc.), or until a new chart roll is installed, which ever occurs first.



A8530. ENTRIES AFTER CHART REMOVAL FROM RECORDER. Make entries for name of station, detachment number, date of removal from recorder and chart feed rate used in the manner prescribed in paragraph A8510.

A8540. DISPOSITION OF CHART ROLLS. Completed Chart Rolls, ML-172 will be diposed of in accordance with AWS Letter 11-3. Chart Roll, ML-172, may be cut into 24 hour sections (midnight to midnight, LST) for summary of the day purpose. If this is done, the sections will be reassembled and rolled into a roll prior to forwarding. Use scotch tape to join the sections together to form a continuous chart. Chart Roll, ML-172, will be replaced in its cardboard shipping box (if available), and the data entered in the spaces on the end of the box, prior to forwarding.

A8550. CHANGING CHARTS. Chart Roll, ML-172, will be changed at 0001 LST on the first day of each month and at intermediate times as required to maintain and supply of roll for record.

A8560. CHART REEDS. A chart feed rate of 3 inches per hour will be used for normal operation. Increased chart feed rates may be used when it is desired to obtain detailed records of wind during tropical cyclones (See par. 8312), thunderstorms or frontal passages.

(Insert facing page 96b)

A9132.1 CEILING. Add the following criteria for special observations due to changes in ceiling to those listed in paragraph 9132.1 of the basic manual.

(7) The ceiling changes from unlimited to any value.
(8) The ceiling decreases to less than 2000 feet, or increases to 2000 feet or more.
(9) The ceiling decreases to become less than the GCA minimum for the airport..
(10) The ceiling increases to become equal to or more than the GCA minimum for the airport.

(Insert facing page 98 of WBAN Manual)

A9132.3 VISIBILITY. Add the following criteria for special observations due to a change in visibility to those listed in paragraph 8132.3 of the basic manual.

(1) During the period between local sunset and local sunrise (darkness) the visibility decreases to less than 2 miles or increases to 2 miles or more.

(2) The visibility decreases to become less than the highest instrument minimum for the airport, or increases to become equal to or more than the highest instrument minimum for the airport.

(3) The visibility decreases to become less than the GCA minimums for the airport, or increases to become equal to or more than the GCA minimums for the airport.

(Insert facing page 99 of WBAN Manual)

A9132.6 PRECIPITATION. Add the following criteria for special observations due to precipitation to those listed in paragraph 9132.6 of the basic manual.

(4) Any form of precipitation (liquid, freezing or frozen), except very light, begins, and the preceding record or special observation did not indicate that precipitation was occurring at the station.

A9132.9 TERMINAL FORECAST GROUPS. Wing, group and independent squadron commanders will prescribe the criteria for special observations required by changes in the TFAWS groups. When it is not desired that changes in TFAWS groups be considered as criteria for special observations, no supplemental instructions need be issued.

A9141. Weather stations will make local extra observations whenever:

(1) The ceiling becomes 2000 feet or less.
(2) The visibility becomes 3 miles or less.
(3) Any form of precipitation is occuring.
(4) Any obstruction to vision other than haze or smoke in present.
(5) Any other criteria specified by wing, group or independent squadron commanders are met.

(Insert facing page 100 of WBAN Manual)

Delete so much of the second line on page 101 of the basic manual as reads "or when there are no impending aircraft operations".

A9143. The remark "ACFT ACCIDENT" will never be transmitted or disseminated in any manner.

A9150. CHECK OBSERVATIONS. Weather stations supplying observations to a communications agency for broadcast to aircraft will make check observations to insure that the elements broadcast have been observed within 20 minutes of the time of broadcast. Detachment commanders are responsible for coordination with the local AACS commander to determine the time of broadcast, filing times and code form required for these observations.

(Insert facing page 101 of WBAN Manual)

A9161. HOURLY REPORTS. Air Weather Service units will arrange additive data in the following order:

(1) Remarks pertaining to those portions of the observation from station identification through altimeter setting.
(2) 3 and 6 - hourly additive data
(3) Radar storm detection reports
(4) RAIGG, RAFRZ and 700 mb data
(5) PILOT reports (When specified by wing, group or squadron commanders).
(6) Terminal forecast groups
(7) Notices to air men in Q Code or Plain Language.
(8) Significant cloud group (if specified by paragraph 1103.2).

(Insert facing page 102 of WBAN Manual)

A9180. DISSEMINATION. Wing, Group and Independent Squadron Commanders will specify the applicable manual of operations or instructions governing transmission of observations.

(Insert facing page 103 of WBAN Manual)

A9200 SYNOPTIC OBSERVATIONS

Delete the note "(Not applicable at Air Force Stations)".

(Insert facing page 104 of WBAN Manual)

A11001. WBAN 10A and B will be prepared in duplicate by AWS surface observation sections. WBAN 10D will not be prepared. Disposition of completed forms will be made in accordance with AWS Letter 11-3. WBAN 10A and 10B will be obtained through supply channels. This form is listed under Air Force Stock No. 2600-617-443-815.

A11003. A 3H pencil will be used providing the impression is sufficiently dark for good microfilm reproduction. When the impression is not dark enough for good microfilm reproduction, a well sharpened, 2H pencil will be used. Test the impression by holding the completed form at arms length in normal light. If all entries are easily read and completely legible, the impression is satisfactory. Numbers, symbols and letters will be of such a size as to fill 2/3 to 3/4 of the vertical space between lines.

(Insert Facing Page 111 in WBAN Manual)

A11103.1 Additive data groups will be used by all AWS units which transmit observations in the Airways Code and do not transmit a 3 or 6 hourly observation in the 1949 Synoptic Code. Those portions of TABLE 18 in conflict with this procedure will be ignored. The symbolic form for additive data groups are given in paragraph 11103.11 of the basic manual. The following are encoding instructions for individual elements:

(1) Group "appRR"

a - Characteristic of barograph trace during the past three hours. "a" is coded in accordance with the instructions given in paragraph 7620 of the basic manual. If the station is not equipped with a barograph or the characteristic can not be determined a slant "/" will be reported.

pp - Amount of barometric tendency (net change) during the three-hour period ending at the actual time of observation, reported in "units" and "tenths" of millibars. "pp" is coded from TABLE AI.

TABLE AI

SYMBOL pp - Amount of Barometric Change

Code Figure	Inches of Mercury	Millibars		Code Figure	Inches of Mercury	Millibars
00	0.000	0.0		19	0.055	1.9
02	0.005	0.2		20	0.060	2.0
03	0.010	0.3		22	0.065	2.2
05	0.015	0.5		24	0.070	2.4
07	0.020	0.7		25	0.075	2.5
08	0.025	0.8		27	0.080	2.7
10	0.030	1.0		29	0.085	2.9
12	0.035	1.2		30	0.090	3.0
14	0.040	1.4		32	0.095	3.2
15	0.045	1.5		34	0.100	3.4
17	0.050	1.7		36	0.105	3.6

(Insert Facing Page 112 in WBAN Manual)

TABLE AI CONTD.

SYMBOL pp - Amount of Barometric Change

Code Figure	Inches of Mercury	Millibars
37	0.110	3.7
39	0.115	3.9
41	0.120	4.1
42	0.125	4.2
44	0.130	4.4
46	0.135	4.6
47	0.140	4.7
49	0.145	4.9
51	0.150	5.1
52	0.155	5.2
54	0.160	5.4
56	0.165	5.6
58	0.170	5.8
59	0.175	5.9
61	0.180	6.1
63	0.185	6.3
64	0.190	6.4
66	0.195	6.6
68	0.200	6.8

Code Figure	Inches of Mercury	Millibars
69	0.205	6.9
71	0.210	7.1
73	0.215	7.3
75	0.220	7.5
76	0.225	7.5
78	0.230	7.8
80	0.235	8.0
81	0.240	8.1
83	0.245	8.3
85	0.250	8.5
86	0.255	8.6
88	0.260	8.8
90	0.265	9.0
91	0.270	9.1
93	0.275	9.3
95	0.280	9.5
97	0.285	9.7
98	0.290	9.8
99	See Coding Instructions	
//	Missing	

When the value for "pp" equals or exceeds 9.9 mbs. the "99ppp" group is inserted in message immediately following the "appRR" or the "app" group, as appropriate. When the group "99ppp" is used "pp" is always encoded as "99" and the charge encoded in tenths of millibars for "ppp".

RR - Amount of precipitation for the six-hour period preceding the actual time of observation, in "hundredths" of an inch. "RR" is coded in accordance with the instructions given in paragraph 4310 of the basic manual, and Table AII.

TABLE AII

SYMBOL RR - Amount of Precipitation
(In 6-hour period oreceding observation).

Code Figure	Amount	Code Figure	Amount	Code Figure	Amount
00	TRACE.*	07	.07 inch.	97	.97 inch.
01	.01 inch.	08	.08 inch.	98	.98 inch.
02	.02 inch.	09	.09 inch.		
03	.03 inch.	10	.10 inch.	99	.09 inch.
04	.04 inch.	11	.11 inch.	00	1.00 inch.
05	.05 inch.	etc.	etc.	01	1.01 inch.
06	.06 inch.	96	.96 inch.	02	1.02 inch.

* A "trace" of precipitation is an amount generally considered too small to measure; actually it is less than 0.005 inch.

When precipitation has not occurred during the preceding 6-hour period, "RR" is omitted from the group and only three code figures will be reported for this group (i.e.: app).

When a TRACE of precipitation has occurred, code figure "00" will be reported.

When the amount of precipitation is 1.00 inch or more, the number of whole inches is reported as a plain language word inserted in the message following the "appRR" group. If both the "99ppp" group and "a plain language precipitation word" are reported, the order in message will be "appRR 99ppp Language".

EXAMPLES:

When a = 6, pp = 02, and RR = zero, the group is coded "602".
When a = 6, pp = 02, and RR = TRACE, the group is coded "60200".
When a = 6, pp = 9.9, and RR = zero, the groups are coded "699 99099".
When a = 6, pp = 10.2, and RR = 1.00, the groups are coded "69900 99102 ONE".
When a = 6, pp = 3.4 and RR = 1.03 the groups are coded "63403 ONE".
When a = missing, pp = missing, and RR = zero, the group is coded "///".
When a = missing, pp = missing, and RR = .03, the group is coded "///03".

(Insert Facing Page 113b)

(2) Group $C_LC_MC_HD_C$

C_L = Clouds of genera (types) Sc, St, Cu, and Cb. "C_L" is encoded in accordance with Circular "S", pages 12-24.

C_M = Clouds of genera (types) Ac, As, and Ns. "C_M" is encoded in accordance with Circular "S", pages 25-33.

C_H = Clouds of genera (types) Ci, Cs, Cc. "C_H" is encoded in accordance with Circular "S", pages 34-43.

D_C = True direction from which clouds are moving, reported to 8 points of the compass. "D_C" is encoded from Table AIII.

TABLE AIII

SYMBOL D_C - Direction From Which Clouds are Moving

Code Figures	True Direction	Code Figures	True Direction
0	No clouds or Calm	5	Southwest
1	Northeast	6	West
2	East	7	Northwest
3	Southeast	8	North
4	South	9	Unknown

When NO clouds are present, the $C_LC_MC_HD_C$ group is omitted from the message.

When the sky or upper clouds are completely hidden by obscuring phenomena on the surface or in a layer aloft, the group "$C_LC_MC_HD_C$ " will be coded as "////". When upper clouds or the sky are visible through surface based obscuration or an obscuring layer aloft, the group "$C_LC_MC_HD_C$" will be encoded in the normal manner. Obscuring phenomena on the surface or aloft will not be shown in the cloud group.

(3) Group "$9S_pS_ps_ps_p$"

9 - Indicator figure for the Special Phenomena Group ($9S_pS_ps_ps_p$).

S_pS_p - Special Phenomena, general description.

At the present time "depth of snow on ground" is the only element reported as additive data by the "9$S_pS_ps_ps_p$" group. Hence, code figure 85 (Depth of Snow on Ground, in whole inches) from Code Table No. 20 of the Synoptic Code, 1949 Edition, will be encoded for "S_pS_p" so that the first three digits of the group will always be "985").

s_ps_p - Special Phenomena, detailed description.

The code figure reported for "s_ps_p" is the actual depth of snow on ground in whole inches. One inch of snow on ground is the smallest amount reported in the Special Phenomena Group (i.e., 98501); hence the group will never be coded "98500". (See notes regarding snow on the ground on page 113f).

The "depth of snow on ground" is reported as follows:

(1) At 1230 GCT: When there is more than a TRACE of snow on the ground, the depth will be reported by the Special Phenomena group regardless of whether or not precipitation has occurred during the preceding 6 hours.

(2) At 1830, 0030, and 0630 GCT: When precipitation has occurred during the preceding 6 hours and there is more than a TRACE of snow on ground, the depth will be reported in the Special Phenomena Group. For example: 2 inches of snow cover would be coded as 98502, 13 inches as 98513, etc.

(4) Group "$T_n/_xT_n/_x$"

T_nT_n - Minimum temperature of the air in whole degrees Fahrenheit.

At 1230 GCT the minimum temperature, which occurred during the 12-hour period preceding the time of observation, will be reported.

At 1830 GCT the minimum temperature, which occurred during the 24-hour period preceding the time of observation, will be reported.

(Insert Facing Page 113d)

T_xT_x - Maximum temperature of the air in whole degrees Fahrenheit.

At 0030 GCT the maximum temperature, which occurred during the 12-hour period preceding the time of observation, will be reported.

At 0630 GCT the maximum temperature , which occurred during the 24-hour period preceding the time of observation, will be reported.

When the maximum or minimum temperature is missing, slants (//) will be reported.

Stations not equipped to regularly determine maximum and minimum temperatures will omit the $T_n/_xT_n/_x$ group from the meaasge.

NOTE: See paragraphs 1804.221 and 1804.222 of the Synoptic Code, 1949 Edition, regarding procedures for reporting temperatures of 0^oF or lower, and 100^oF or higher.

(5) Group $2h_{85}h_{85}h_{85}a_3$

2 - Indicator figure for the 850 mb. pressure group ($2h_{85}h_{85}h_{85}a_3$).

$h_{85}h_{85}h_{85}$ - Height in "tens" of geopotential feet above mean sea level of the 850 mb. pressure surface (i.e., in thousands, hundreds, and tens of "gp feet").

a_3 - Characteristic of barograph trace during the three-hour period ending 3 hours prior to the actual time of observation. "a_3" is the "a" from the observation three-hours previous.

INTERPRETATIONS OF "DEPTH OF SNOW ON GROUND"

The following interpretations of coding "depth of snow on ground" are offered for general guidance to all observers in coding this element. Traces of snow are not included in the additive data groups; however, they are included in "group 7" of the 6-hourly synoptic reports, (7RRRts).

"A trace of snow on the ground" means that there is some snow on the ground in exposed places, but the depth is too small to measure for practical purposes (this depth is set at "0.4 inch or less").

The accurate and uniform determination of a "trace of snow on ground" is a difficult procedure. In general, the observer should be guided by the average conditions throughout the area surrounding the station. If a "trace of snow on the ground" is observed in fairly exposed places and this appears to be the general condition of the surrounding country, a "trace" will be reported even though there is no snow remaining in exposed places immediately adjacent to the station. In general, a trace will not be reported when it is quite evident that the remaining snow is due to localized conditions such as snow whose presence has been prolonged by artificial conditions arising from its sheltered position, such as under trees, north side of buildings and ridges, or in drifts (natural or man made) whose surfaces have melted and frozen, resulting in a hard ice-crusted mound that may linger for weeks.

The term "depth of snow on ground" as written above includes new snow, old snow, ice, and any ice-like formation which may be present on the ground.

Coding instructions require that depth of snow be reported to the nearest whole inch, and when the depth is exactly halfway between two whole inch measurements the 5 tenths is dropped or added in accordance with standard rule for the disposal of decimals. For example: up to 0.4 inch, inclusive, is coded a "TRACE"; 0.5 to 1.4 inches, inclusive, is coded 1 inch; 1.5 to 2.4 inches, inclusive, is coded as 2 inches, etc.

It is generally preferred that the term "snow cover" be used instead of "snow" in referring to the total depth of accumulated snow and ice present on the ground. It is also desirable to avoid terms like "10 inches of snow", "snow 4 inches", etc., when referring to the accumulated depth of both the new and old snow. The terms "snow cover 10 inches", or "4 inches of snow cover" or "7 inch snow cover" are more explicit, and may serve to avoid giving the impression that the depth of snow which feel during the past 6 hours was 10, 4 or 7 inches, respectively.

(Insert Facing Page 113f)

A11103.2 The rules for selecting the significant cloud layer or layers and coding the group $8N_sCh_sh_s$ are given in paragraphs 1311 through 1314.3 of AWS Manual 105-24. Those stations currently including the group $8N_sCh_sh_s$ will continue to do so. Additions or deletions to the list of stations adding this group will be made by means of unnumbered letters.

(Insert Facing Page 115 in WBAN Manual)

A11211. VERIFICATION. The right hand margin of the WBAN 10A and 10B form will be divided into two columns. No column headings need be entered. The first column will be used for the entry of the initials of the senior forecaster on duty at the time the weather observation was made. The forecaster will initial this column after he has inspected the observation and found all elements correct to the best of his knowledge. This inspection will consist of verification of data on the WBAN 10A and 10B form and the transmitted observation. When a forecaster is not on duty, the senior weather observer on duty shall perform this verification. The second column will be used for the intials of the observer transmitting the observation and will be a certification that the observation has been transmitted correctly over communications circuits and over local distribution channels. (When the station does not actually make the transmission, the observer will verify the observation from the teletype).

(Insert Facing Page 119 in WBAN Manual)

HEADQUARTERS
AIR WEATHER SERVICE
ANDREWS AIR FORCE BASE
Washington 25, D. C.

AIR WEATHER SERVICE ADDENDUM I

to

WBAN MANUAL OF SURFACE OBSERVATIONS

AWS AMENDMENT)
NO. 1)

10 July 1951

1. Air Weather Service Addendum I to WBAN Manual of Surface Observations, 1 June 1951, will be amended by replacing pages 104a and 115a with the inclosed revised pages 104a and 115a. This amendment is effective upon receipt.

2. The amendment will be promptly entered in the addendum and recorded in the "Record of Changes".

3. This amendment has been distributed in accordance with the distribution formula listed below. Additional copies will be procured from the 831st Air Force Specialized Depot, Shelby, Ohio, in accordance with Section XXIX, AFM 67-1.

BY COMMAND OF BRIGADIER GENERAL SENTER:

OFFICIAL:

ROY W. NELSON, JR.
Lt Colonel, USAF
Acting Chief of Staff

Robert B. Edwards
ROBERT B. EDWARDS
Major, USAF
Adjutant General

2 Inclosures:
1. Revised page 104a
2. Revised page 115a

DISTRIBUTION:

450 - Hq, 2059th AWW
168 - 2143d AWW
120 - 2105th AWG
50 - 2107th AWG
40 - 6th Wea Sq
40 - 8th Wea Sq
5 - 55th SRS
5 - 57th SRS
15 - Data Control Unit
10 - CADO
2 - Air Missions
2 - USAF Instrument School
200 - Dept. of Weather, Chanute
800 - Stock, Shelby, Ohio

A9200. SYNOPTIC OBSERVATIONS

Delete the note "(Not applicable at Air Force Stations)".

A9400. RUNWAY AND GCA OBSERVATIONS

A9310. Runway and GCA observations, when made, will be recorded on locally devised form. Such observation will not be used as the official observation for entry on WBAN 10A and 10B or transmission over weather communications channels. Runway and GCA observations will be disseminated locally as may be required.

(Insert facing page 104 of WBAN Manual)

A11103.2 The rules for selecting the significant cloud layer or layers and coding the group $8N_sCh_sh_s$ are given in paragraphs 1311 through 1314.3 of AWS Manual 105-24. The following stations will include this group:

Long Beach, California
Hamilton AFB, California
March AFB, California
Travis AFB, California
McClellan AFB, California

(Insert facing page 115 in WBAN Manual)

HEADQUARTERS
AIR WEATHER SERVICE
ANDREWS AIR FORCE BASE
Washington 25, D. C.

AIR WEATHER SERVICE ADDENDUM I

to

WBAN MANUAL OF SURFACE OBSERVATIONS

AWS AMENDMENT)
NO. 2) 10 August 1951

1. Air Weather Service Addendum I to WBAN Manual of Surface Observations, 1 June 1951, will be amended by entering the pen and ink corrections indicated on the inclosed sheet.

2. The attached pen and ink corrections include the errata corrections for the basic WBAN manual as well as corrections in the addendum.

3. This amendment has been distributed in accordance with the distribution formula listed below. Additional copies will be obtained from the 81st AF Specialized Depot, Shelby, Ohio, in accordance with Section XXIX, AFM 67-1.

BY COMMAND OF BRIGADIER GENERAL SENTER:

OFFICIAL:

ROY W. NELSON, JR.
Lt. Colonel, USAF
Acting Chief of Staff

Robert B. Edwards
ROBERT B. EDWARDS
Major, USAF
Adjutant General

1 Inclosure:
Pen and Ink Changes

DISTRIBUTION:

300 - Hq, 2059th AWW	10 - CADO
168 - 2143d AWW	2 - Air Missions
120 - 2105th AWG	2 - USAF Instrument School
50 - 2107th AWG	200 - Dept. of Weather, Chanute AFB
40 - 6th Wea Sq	800 - Stock, Shelby,Ohio
40 - 8th Wea Sq	15 - DCU
5 - 53d SRS	100 - 2101st AWG
5 - 55th SRS	100 - 2102nd AWG
5 - 57th SRS	100 - 2103d AWG

AWS ADDENDUM I

to

WBAN MANUAL OF SURFACE OBSERVATIONS
(1 June 1951)

AWS AMENDMENT)
NO. 2) 10 August 1951

1. Make the following pen and ink corrections in the WBAN Manual of Surface Observations and AWS Addendum I:

a. Page 13a, following paragraph A144B.4, add the following paragraph:

A1510. When the space allotted in columns 3 - 4 (column 3 on revised forms) is not large enough to permit entry of ceiling and sky condition data, place additional entries on the next line. Leave the other spaces in the lower line blank unless remarks require more space than is provided for in column 14 (column 13 on revised forms).

b. Page 17, Table 4a: Add "(any form and intensity including EW)", opposite "Sleet".

c. Page 96c, Paragraph A8560: Change "CHART REEDS" to "CHART FEED".

d. Page 99, Paragraph 9132.3(1): Enter a bracket inclosing subparagraphs (c), (d), and (e) and showing that the asterisk applies to these three subparagraphs. The bracket will be similar to the one in paragraph 9132.3(2).

e. Page 100, Footnote: Change the last word of the footnote to read "operations".

f. Page 113c, Table AII: Under the "Amount" column, change the figures opposite code figure 99 from ".09" to ".99".

g. Page 119c, Paragraph 11211: In the first line add the words "or left" between the second and third words. The sentence will then read "The right or left hand margin - - - - - ".

h. Page 120, Figure 6, Column 66: Substitute "57" for "57.0".

i. Page 120, Figure 6, Column 67: Substitute "28" for "27.7".

j. Page 120, Figure 6, Column 70: Substitute "0" for "T".

(This page may be destroyed when changes are made)

2. A revised edition of WBAN Form 10A and 10B has been printed. The existing stocks of current WBAN 10A and 10B forms will be used until exhausted. The revised form has new numbers on columns 4 to 14 and 36 to 38. When the station receives the new form (SC Form 444, dtd 1 June 1951), all references to column numbers given in the following paragraphs should be changed to agree with the revised form:

1510	3910	7710	8410	10310
1520	3911	7720	8420	11103
1544	3920	7730	8430	Figure 1a
2410	5510	7750	8440	Figure 5
2420	6410	7760	8450	Figure 6

(This page may be destroyed when changes are made)

HEADQUARTERS
AIR WEATHER SERVICE
ANDREWS AIR FORCE BASE
Washington 25, D.C.

AIR WEATHER SERVICE ADDENDUM I

to

WBAN MANUAL OF SURFACE OBSERVATIONS

AWS AMENDMENT)
NO. 3) 8 October 1951

1. Air Weather Service Addendum I to WBAN Manual of Surface Observations, 1 June 1951, will be amended by entering the revised pages 102a, 103a, and 115a.

2. This amendment is effective upon receipt.

3. This amendment has been distributed in accordance with the distribution formula listed below. Additional copies will be obtained from the Wilkins AF Specialized Depot, Shelby, Ohio, in accordance with Section XXIX, AFM 67-1.

BY COMMAND OF BRIGADIER GENERAL SENTER:

ROY W. NELSON, JR.
Colonel, USAF
Chief of Staff

OFFICIAL:

Kenneth M. Fulcher
KENNETH M. FULCHER
Major, USAF
Actg. Adjutant General

1 Incl:
Revised Page 102a, 103a, 115a

DISTRIBUTION:

5 - Hq, AWS
175 - Hq, 2059th AWW
150 - Hq, 2143d AWW
40 - Hq, 2101st AWG
30 - Hq, 2102nd AWG
45 - Hq, 2103d AWG
100 - Hq, 2105th AWG
45 - Hq, 2107th AWG
30 - Hq, 6th Wea Sq
50 - Hq, 8th Wea Sq
5 - Hq, 53d SRS
5 - Hq, 55th SRS
5 - Hq, 57th SRS
10 - Hq, CADO-E
1 - Navy Rsch Section
Library of Congress
5 - Hq, Air University
5 - Hq, ARDC
ATTN: Lt Col Kodis
10 - Cambridge AF Rsch
Center ATTN: CRHS
5 - Chanute AFB Dept of Wea
5 - Dir of Fly Safety Rsch Norton AFB
1 - Dir of R&D ATTN: Brig Gen D.N.Yates
5 - CH, USWB
1 - USAF Mission to Argentina
1 - USAF Mission to Turkey
3 - R&D Board Comm on Geophysics
50 - AWS DO/Stnds
200 - Stock Specialized Depot
18 - National Guard Bureau ATTN: NG-AFM
15 - DCU
5 - Aerology Section CNO, USN

A9161. HOURLY REPORTS. Air Weather Service Units will arrange additive data in the following order:

(1) Remarks pertaining to these portions of the observations from station identification through altimeter setting.
(2) 3 and 6 - hourly additive data.
(3) Radar storm detection reports.
(4) RAIN, RAFRZ and 700 mb data.
(5) PILOT reports (when specified by wing, group or squadron commanders).
(6) Terminal forecast groups.
(7) Notices to airmen in Q Code or Plain Language.
(8) Significant cloud group (if specified by paragraph 1103.2).

A9162. OTHER REPORTS. The communications agency controlling the circuit will prescribe the exact format for SPL messages. See the appropriate AACS or CAA manuals.

A9163. CORRECTED REPORTS. See the appropriate AACS manual or CAA manual for composition of COR messages.

(Insert Facing page 102 of WBAN Manual)

A9163.1 See the Appropriate AACS manual or CAA manual for examples of COR messages.

A9174. DELAYED MESSAGES. Composition of PDW messages will be specified by the agency controlling the circuit. See the appropriate AACS manual or CAA manual for composition and examples of PDW messages.

A9180. DISSEMINATION. Wing, group and independent squadron Commanders will specify the applicable manual of operations or instructions governing transmission of observations.

(Insert facing page 103 of Manual)

A1103.2 The rules for selecting the significant cloud layer or layers and coding the group $8N_sC_hh_sh_s$ are given in paragraphs 1131 through 1314.3 of AWS Manual 105-24. The following stations will include this group:

Long Beach, California
Hamilton AFB, California
March AFB, California
Travis AFB. California
McClellan AFB, California

A1203. STATE OF GROUND. Air Force stations will make observations of state of ground in accordance with the basic manual.

(Insert facing page 115 of Manual)

79824