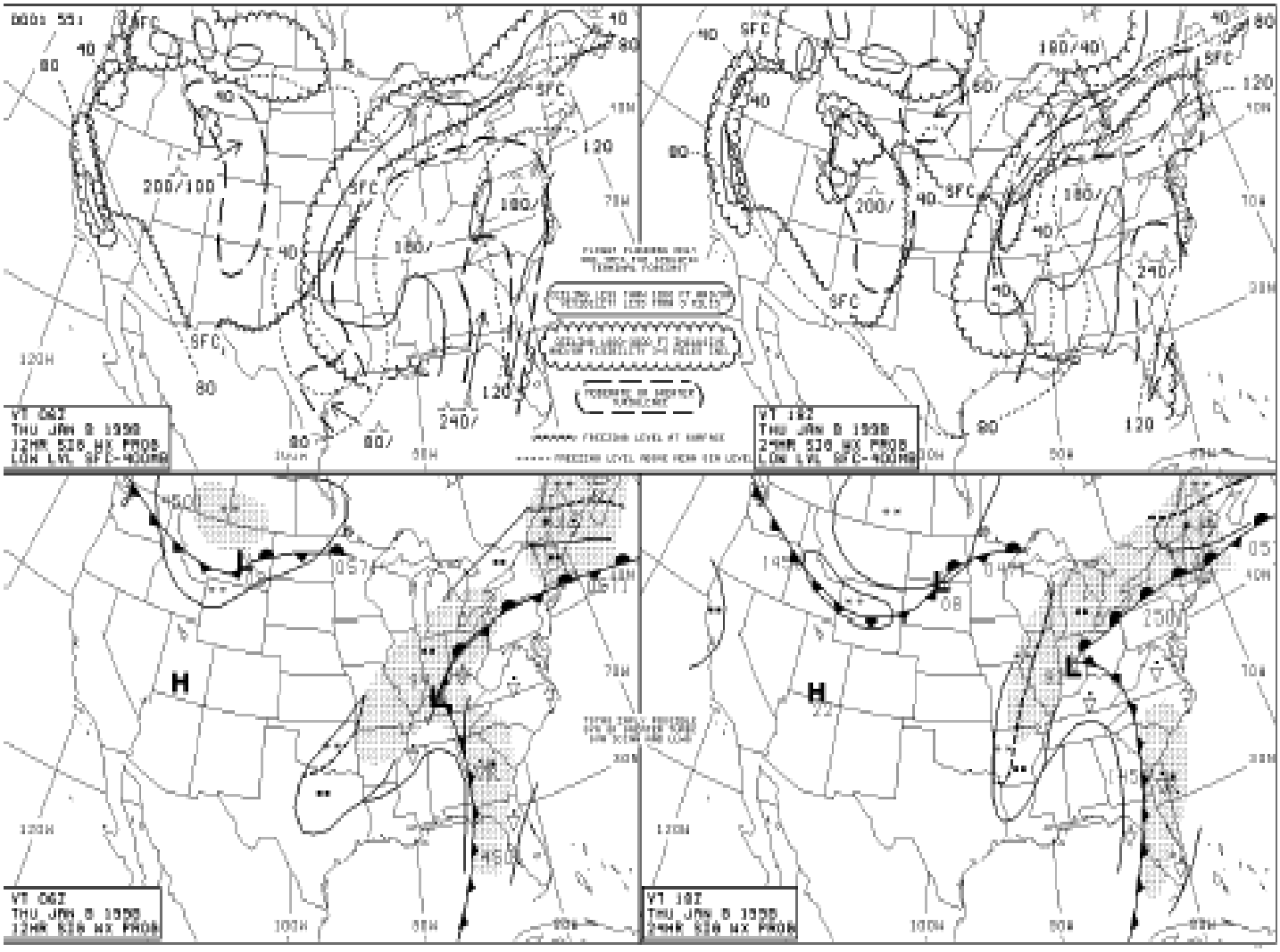
Weather Data Basics

Analysis=Current Conditions
Prognostic=Forecast Conditions

Low Level Significant Weather Prog Chart

Issued Four Times Daily: 0000, 0600, 1200, 1800 Zulu
Surface up to 18,000' MSL
Four Panel Chart
IFR Conditions - Contoured Line
Marginal VFR Conditions - Scalloped Line
Freezing Level at Surface - Series of Dots
Freezing Level at Altitude - Series of Dashes
Intermittent Precipitation - Series of Dashes & Dots
Thunderstorms - R
Rain Showers - ▽
Moderate to Severe Turbulence - Heavy Dashed Line

12 Hour VFR & IFR Turbulence Freezing Levels	24 Hour VFR & IFR Turbulence Freezing Levels
12 Hour Loc. of Press. Systems Fronts Precipitation	24 Hour Loc. of Press. Systems Fronts Precipitation



Radar Summary Charts

Issued 35 Minutes Past the Hour
Graphical Presentation of Radar Echoes and Watch Areas
Strongest Echoes Are From Thunderstorms
Shows Precipitation Intensity, Tops, Bases and Movement of Precipitation
Does Not Show Clouds Because Water Vapor Does Not Reflect Energy, Only Liquids or Solids

VIP levels Video Integrator and Processor, which contours radar reflectivity (in dBZ) into six

Categories:

Blue	1	Light	-
Cyan	2	Moderate	(None)
Green	3	Strong	+
Yellow	4	Very Strong	++
Magenta	5	Intense	X
Red	6	Extreme	XX
White		Unknown	(None)

Symbols Used on Chart

Symbol	Meaning
R	Rain
RW	Rain shower
S	Snow
SW	Snow shower
T	Thunderstorm
NA	Not available
NE	No echoes
OM	Out for maintenance

Symbol	Meaning
↗ 35	Cell movement to the northeastat 35 knots
LM	Little movement
WS999	Severe thunderstorm watch number 999
WT210	Tornado watch number 210
SLD	8/10 or greater coverage in a line
	Line of echoes

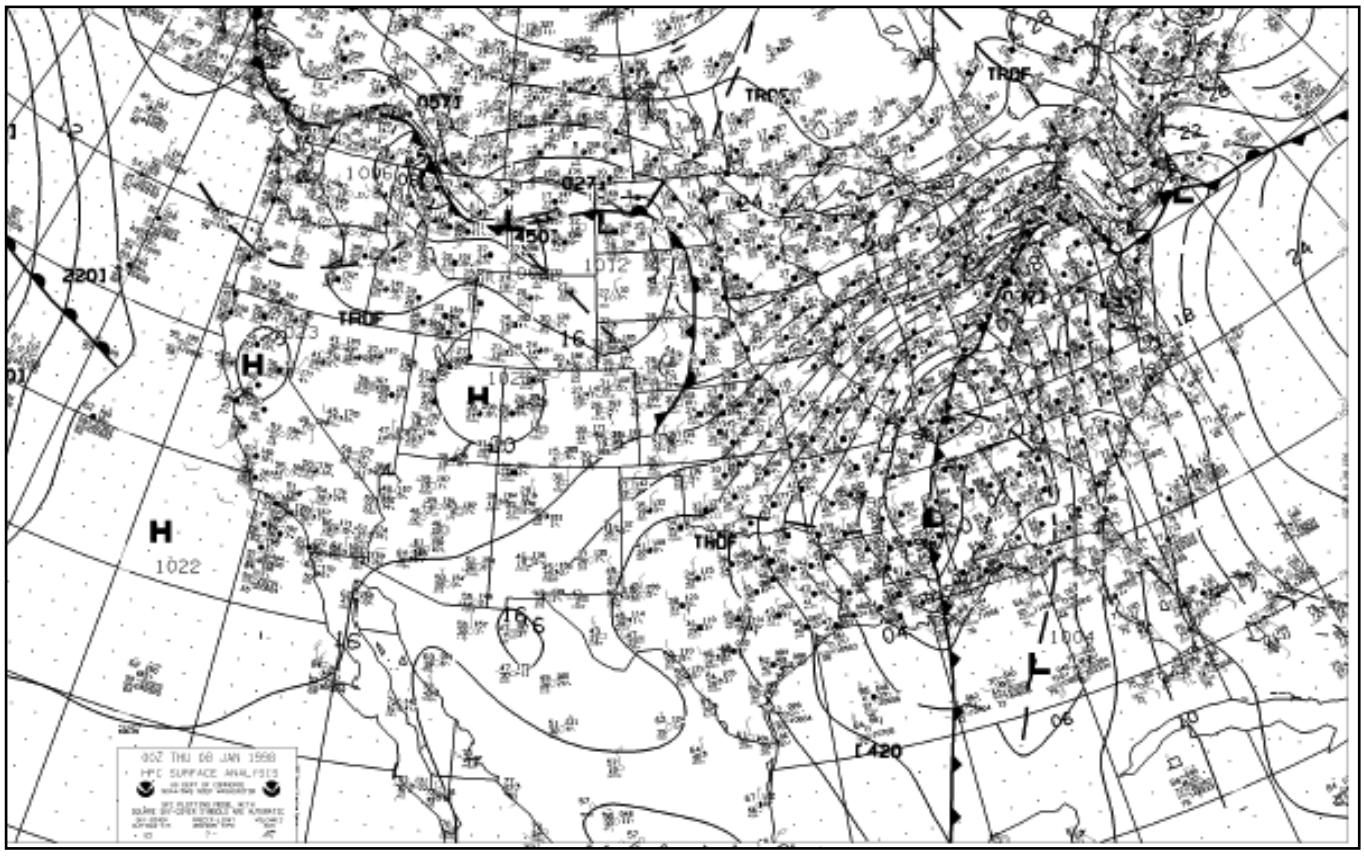
Surface Analysis Chart

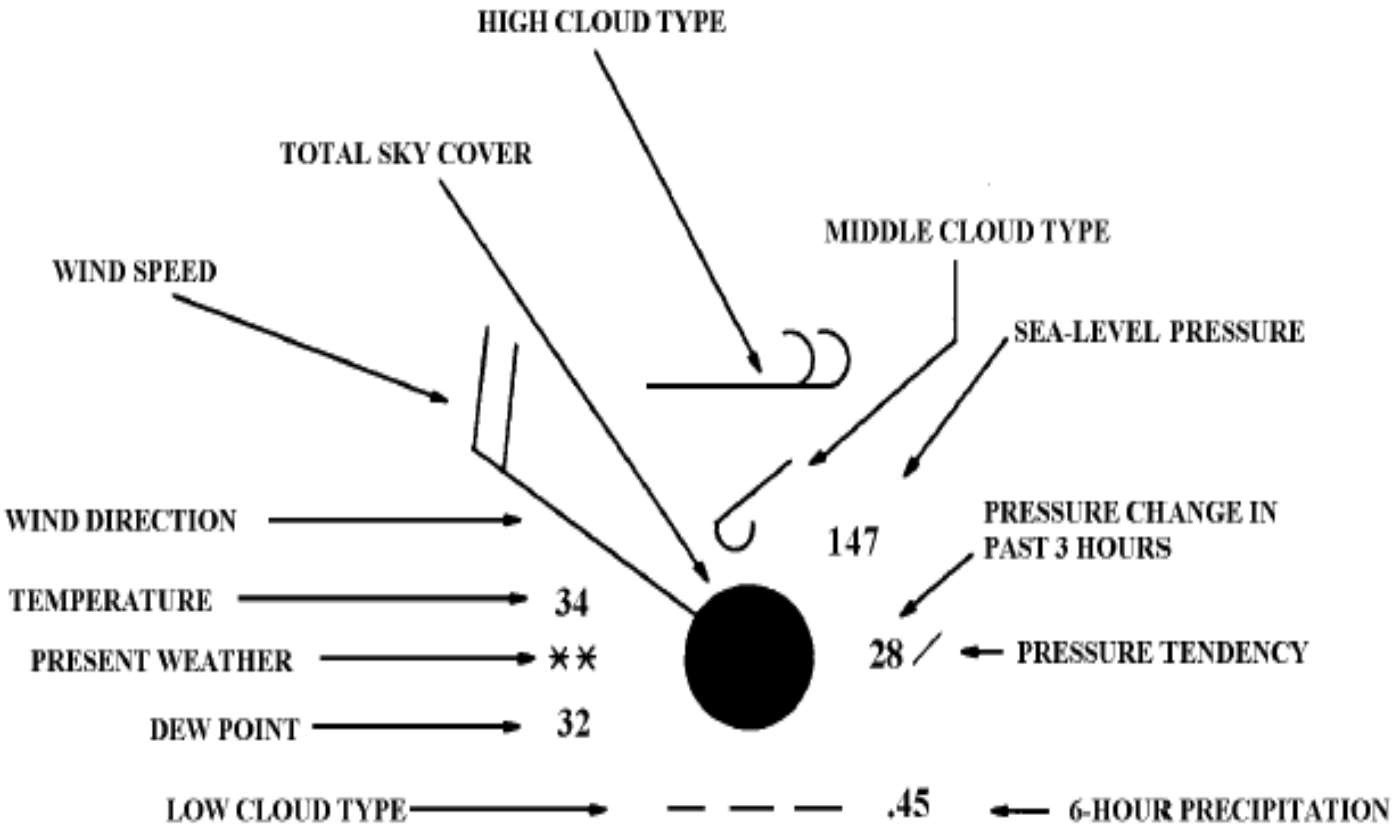
Issued Every 3 Hours

Depicts Fronts, Pressure Systems, Isobars, Troughs and Ridges

Depicts Station Observations:

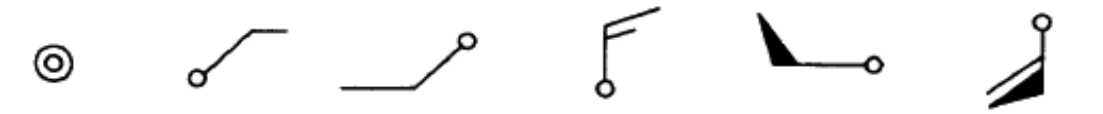
- Sky Cover
- Wind Speed & Direction
- Precipitation
- Temperature & Dew Point
- Low, Middle & High Cloud Types
- Past 6 Hour Precipitation





1. **Total sky cover: Overcast.**
2. **Temperature: 34 degrees F, Dew Point: 32 degrees F.**
3. **Wind: From the northwest at 20 knots (relative to true north).**

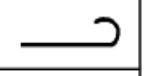
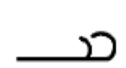
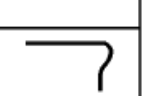
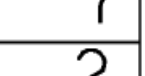
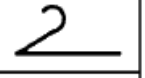
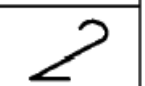
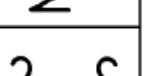
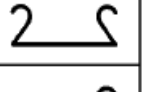
Examples of wind direction and speed



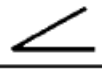
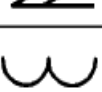
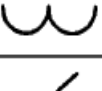
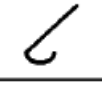
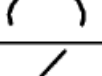
4. **Present Weather: Continuous light snow.**
5. **Predominate low, middle, high cloud reported: Strato fractus or cumulus fractus of bad weather, altocumulus in patches, and dense cirrus.**
6. **Sea-level pressure: 1,014.7 millibars (mbs).**
   NOTE: Pressure is always shown in three digits to nearest tenth of an mb. For 1,000 mbs or greater, prefix a "10" to the three digits. For less than 1,000 mbs, prefix a "9" to the three digits.
7. **Pressure change in the past 3 hours: Increased steadily or unsteadily by 2.8 mbs. The actual change is in tenths of a mb.**
8. **6 - hour precipitation in hundredths of an inch: 45 hundredths of an inch.**

Cloud Classifications

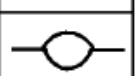
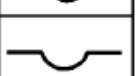
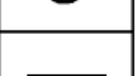
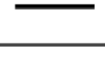
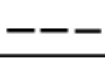
High Clouds

	C_H	DESCRIPTION (Abridged from W.M.O. Code)
1		Filaments of Ci, or "mares tails," scattered and not increasing
2		Dense Ci in patches or twisted sheaves, usually not increasing, sometimes like remains of Cb; or towers tufts
3		Dense Ci, often anvil shaped derived from or associated Cb
4		Ci, often hook shaped gradually spreading over the sky and usually thickening as a whole
5		Ci and Cs, often in converging bands or Cs alone; generally overspreading and growing denser; the continuous layer not reaching 45 altitude
6		Ci and Cs, often in converging bands or Cs alone; generally overspreading and growing denser; the continuous layer exceeding 45 altitude
7		Veil of Cs covering the entire sky
8		Cs not increasing and not covering the entire sky
9		Cc alone or Cc with some Ci or Cs but the Cc being the main cirroform cloud

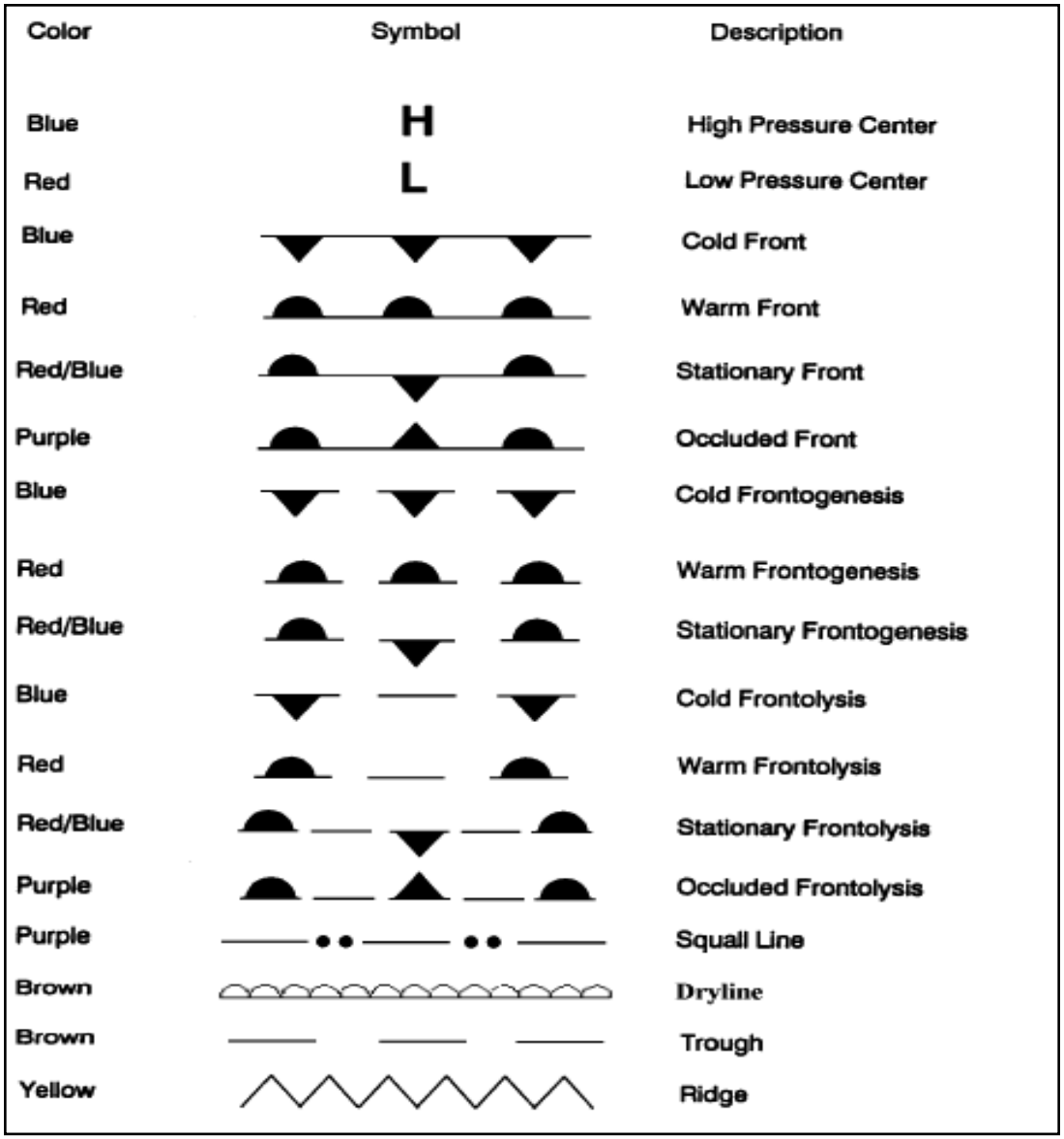
Middle Clouds

	C_M	DESCRIPTION (Abridged from W.M.O. Code)
1		Thin As (most of cloud layer is semitransparent)
2		Thick As, greater part sufficiently dense to hide sun (or moon), or Ns
3		Thin Ac, mostly semitransparent; cloud elements not changing much at a single level
4		Thin Ac in patches; cloud elements continually changing and/or occurring at more than one level
5		Thin Ac in bands or in a layer gradually spreading over sky and usually thickening as a whole
6		Ac formed by the spreading out of Cu
7		Double-layered Ac, or a thick layer of Ac, not increasing; or Ac with As and/or Ns
8		Ac in the form of Cu-shaped tufts or Ac with turrets
9		Ac of chaotic sky, usually at different levels; patches of dense Ci are usually present

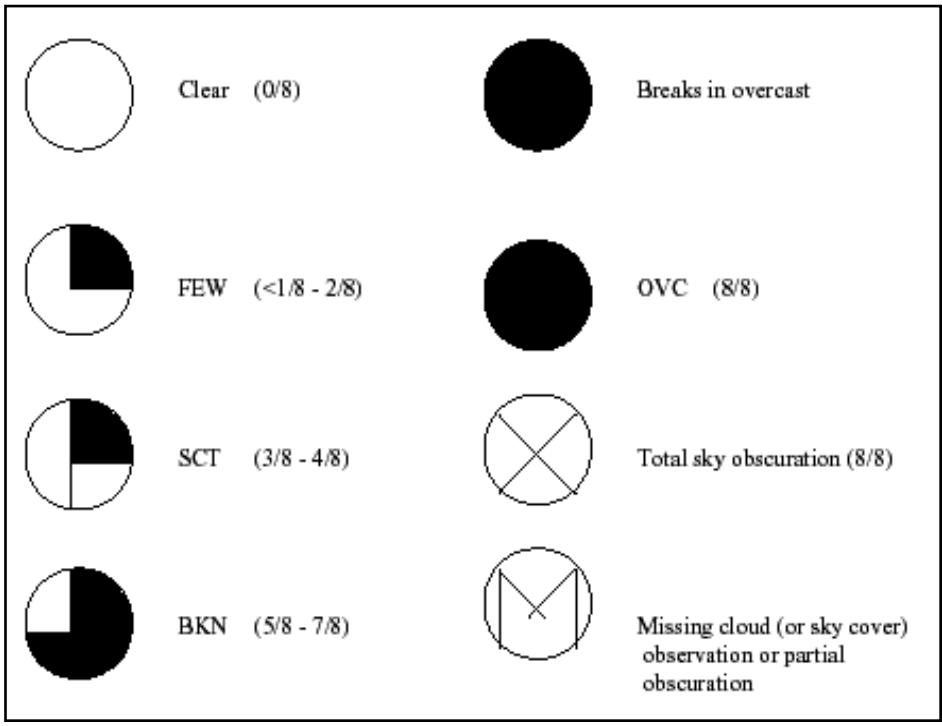
Low Clouds

CLOUD ABBREVIATION		C_L
St or Fs - Stratus or Fractostratus	1	
Ci - Cirrus	2	
Cs - Cirrostratus	3	
Cc - Cirrocumulus	4	
Ac - Altocumulus	5	
As - Altostratus	6	
Sc - Stratocumulus	7	
Ns - Nimbostratus Cu or Fc - Cumulus or Fractocumulus	8	
Cb - Cumulonimbus	9	

Frontal Depiction



Sky Cover Depiction



Metars

Aviation Routine Weather Report
Issued Hourly
Or Upon Receipt of Any Official Weather (SPECI)

Metar Contractions:

MI Shallow	PE Ice Pellets	SA Sand
PI Partial	GR Hail	HZ Haze
BC Patches	GS Small hail/Snow Pellets	PY Spray
DR Low Drifting	UP Unknown precipitation	Other phenomena:
BL Blowing		PO Well-developed Dust/Sand Whirls
SH Shower(s)	Obscuration:	SQ Squalls
TS Thunderstorm	BR Mist (visibility 5/8 statute miles or more)	FC Funnel Cloud, (+FC for Tornado, or Waterspout)
FZ Freezing	FG Fog (visibility 1/2 mile or less)	SS Sandstorm
	FU Smoke	DS Duststorm
Precipitation:	VA Volcanic Ash	
DZ Drizzle	DU Widespread Dust	
RA Rain		
SN Snow		
SG Snow Grains		
IC Ice Crystals		

Cloud group in the form NCChhh, where NNN is either FEW, SCT, BKN, or OVC to indicate cloud coverage. The term is immediately followed by the cloud height in hundreds of feet. The amount of coverage for each term in eights is listed below.

CLR	No clouds detected below 12,000 feet.
SKC or CLR	0/8
FEW	>0 - 2/8
SCT	3/8 - 4/8
BKN	5/8 -<8/8
OVC	8/8

At manual stations, CB or TCU may be appended to the cloud height if observed. Vertical Visibility (VV) is reported in hundreds of feet for an indefinite ceiling, e.g. VV002. Surface obscuration reported using amount (FEW, SCT, etc), followed by 000, e.g. SCT000.

KAVL 252154Z 19005KT 7SM -RA OVC060 21/15 A2991 RMK AO2 RAB41 SLP114 P0000 T02060150

Terminal Aerodrome Forecasts

Issued Every 4 Hours
Valid for 24 Hours
Forecast for 5nm from Airport

The following codes and coverage amounts, in eights of the sky are the same as used in METAR reports:
SKC or CLR 0/8
FEW >0 - 2/8
SCT 3/8 - 4/8
BKN 5/8 - <8/8
OVC 8/8
VV (vertical vsby) 8/8

KAVL 251732Z 251818 00000KT P6SM SCT030 BKN100
TEMPO 1922 BKN030
FM2200 VRB03KT P6SM BKN035 OVC080
TEMPO 2202 4SM TSRA OVC025CB
FM0200 34006KT P6SM BKN025 OVC120
FM0600 34005KT 3SM BR BKN015
TEMPO 0812 2SM BR OVC006
FM1300 34008KT P6SM BKN025

TAF Contractions:

MI Shallow	PE Ice Pellets	SA Sand
PI Partial	GR Hail	HZ Haze
BC Patches	GS Small hail/Snow Pellets	PY Spray
DR Low Drifting		
BL Blowing	UP Unknown precipitation	Other phenomena:
SH Shower(s)		PO Well-developed Dust/Sand Whirls
TS Thunderstorm		
FZ Freezing	Obscuration:	SQ Squalls
	BR Mist (visibility 5/8 statute miles or more)	FC Funnel Cloud, (+FC for Tornado, or Waterspout)
Precipitation:		
DZ Drizzle	FG Fog (visibility 1/2 mile or less)	SS Sandstorm
RA Rain		DS Duststorm
SN Snow	FU Smoke	
SG Snow Grains	VA Volcanic Ash	
IC Ice Crystals	DU Widespread Dust	

ASOS

Joint Effort Between the FAA and The NWS.
Up to the Minute Information

Different Types :
A01 (without Precipitation Discriminator)
A02 (with Precipitation Discriminator)

ASOS Reports Contain the Following:
Cloud height
Visibility
Precipitation
Pressure
Temperature
Dewpoint
Rainfall Accumulation
ASOS can be used to generate METAR’s.

AWOS

FAA Reporting Station
Up to the Minute Reporting

Different Types:
AWOS-A Altimeter Setting Only
AWOS-1 AWOS-A + Wind Speed/Gusts, Temp/DP
AWOS-2 AWOS-1 + Cloud & Ceiling Data (Like ASOS)

PIREPS

Two Types - Pireps (UA) and Urgent Pireps (UUA)

Pireps can be obtained through FSS or from the weather computer.

Not required, unless unforecasted weather is encountered.

Pilot weather reports (PIREP's) are essential to maintaining a real-time weather picture for both the pilot and the controller. The importance of PIREP's is stated in the Aeronautical Information Manual: The Flight Service Station uses the reports to brief other pilots, to provide inflight advisories, and weather avoidance information to en route aircraft.

Pilots are urged to pass along flight conditions to the ground facility with which communications are established:, i.e. Flight Watch (EFAS) , AFSS, ATCT, or ARTCC .
One of the primary duties of EFAS, radio call "Flight Watch," is to serve as a collection point for the exchange of PIREP's with en route aircraft.

Pilot Reports

PIREP's are classified as follows:

Urgent (UUA)

1. Tornadoes, funnel clouds, or waterspouts.
2. Severe or extreme turbulence (including clear air turbulence).
3. Severe icing.
4. Hail.
5. Low level wind shear (if reported air speed fluctuations of 10 knots or more)--defined as wind shear within 2,000 feet of the surface.
6. Volcanic ash clouds.
7. Any other weather phenomena reported which are considered as being hazardous, or potentially hazardous to flight operations.

Routine (UA)

1. All other PIREP's except as listed above are classified as routine.

Turbulence Level of Intensity:

Intensity	Aircraft Reaction
Light	Loose objects in aircraft remain at rest.
Moderate	Unsecured objects are dislodged. Occupants feel definite strains against seat belts and shoulder straps.
Severe	Occupants thrown violently against seat belts. Momentary loss of aircraft control. Unsecured objects tossed about.
Extreme	Aircraft is tossed violently about, impossible to control. May cause structural damage.

Icing Level of Intensity:

Intensity	Aircraft Reaction
Trace	Ice becomes perceptible. Rate of accumulation slightly greater than sublimation. Deicing/anti-icing equipment is not used unless encountered for an extended period of time (over 1 hour).
Light	The rate of accumulation may create a problem if flight is prolonged in this environment (over 1 hour). Occasional use of deicing/anti-icing equipment removes or prevents accumulation. It does not present a problem if this equipment is used.
Moderate	The rate of accumulation is such that even short encounters become potentially hazardous, and use of deicing/anti-icing equipment or diversion is necessary.
Severe	The rate of accumulation is such that deicing/anti-icing equipment fails to reduce or control the hazard. Immediate diversion is necessary.

Elements of a PIREP:

1. Three letter station identifier
XXX
Nearest weather reporting location to the reported phenomenon
2. Report type
UA or UUA
Routine or Urgent PIREP
3. Location
/OV
In relation to a VOR
4. Time
/TM
Coordinated Universal Time
5. Altitude
/FL
Essential for turbulence and icing
reports
6. Type Aircraft
/TP
Essential for turbulence and icing
reports
7. Sky cover
/SK
Cloud height and coverage (sky clear,
few, scattered, broken, or over-cast)
8. Weather
/WX
Flight visibility, precipitation, restrictions
to visibility, etc.
9. Temperature
/TA
Degrees Celsius
10. Wind
/WV
Direction in degrees magnetic north
and speed in knots
11. Turbulence
/TB
See AIM paragraph 7-1-21
12. Icing
/IC
See AIM paragraph 7-1-20
13. Remarks
/RM
For reporting elements not included or
to clarify previously reported items

Airmets

Airmen's Meteorological Information.
Issued for the Same Six Areas as the Area Forecast (FA).
Hazards of Particular Interest to Small Aircraft or Less Experienced Airmen.
Valid for 6 Hours.
Surface Winds of 30 knots or more.

Airmet Sierra - IFR Weather and Mountain Obscuration.
Airmet Tango - Turbulence
Airmet Zulu - Icing

Sigmet

Significant Meteorological Information.
Issued for the Same Six Areas as the Area Forecast (FA).
Hazards to All Aircraft.
Valid for 4 Hours.
Severe Icing
Severe Turbulence or CAT
Dust and Sand Storms
Volcanic Eruptions

Convective Sigmet

Associated with Convective Activity.
Issued for the Eastern, Central, and Western U.S.
Tornadoes
Lines of Thunderstorms
Embedded Thunderstorms
Hail 3/4" Diameter or Greater