

WEATHER REPORTS BY UKWMO MONITORING POSTSMETARINTRODUCTION

1. In order to supplement or, in the case of large scale disruption of communications, to replace the meteorological service provided for Sector Controls and Strike Command by the Meteorological Office, all posts and controls will report weather observations using the METAR code. Certain posts have been equipped with instruments which enable them to produce detailed observations, known as METAR ALPHA, the remaining posts and controls reporting basic observations known as METAR BRAVO.

INSTRUMENTATION

2. METAR ALPHA posts have the following instruments:
- a. Aneroid Barometer (mounted on the wall of the Post Monitoring Room) which measures atmospheric pressure in millibars (Fig K.1).
 - b. A hand held Anemometer, which measures wind speed in knots (Fig K.2.)
 - c. A Whirling Frame Psychrometer, which measures air temperature in degrees Celsius (Fig K.3)
3. METAR BRAVO posts whilst not holding these instruments use visual estimates to assess the wind speed and direction.

OBSERVATIONS REQUIRED

4. The following criteria are included in the observation
- | | |
|-----------------------------------|-------------------------|
| a. Atmospheric pressure | METAR ALPHA Posts only. |
| b. Outside temperature | METAR ALPHA Posts only. |
| c. Wind direction | All Posts and Controls. |
| d. Wind speed | All Posts and Controls. |
| e. Visibility | All Posts and Controls. |
| f. Observation of present weather | All Posts and Controls |
| g. Amount of cloud cover | All Posts and Controls |
| h. Predominant cloud type | All Posts and Controls |
| j. Estimate of cloud height | All Posts and Controls |

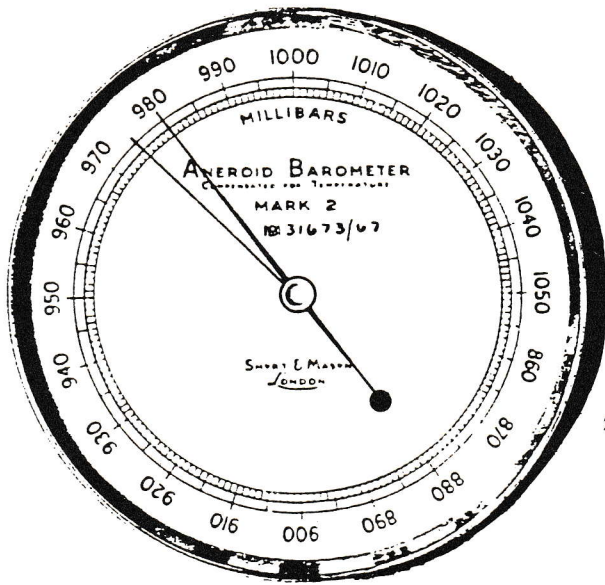


Fig K1 Aneroid Barometer

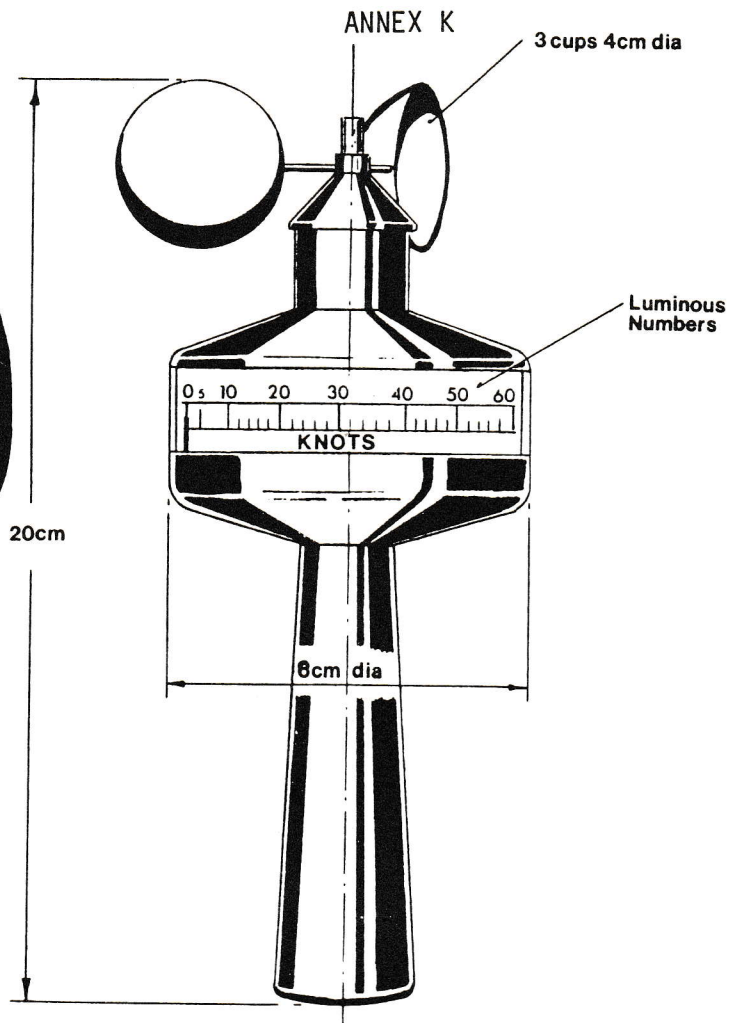


Fig K2 Anemometer

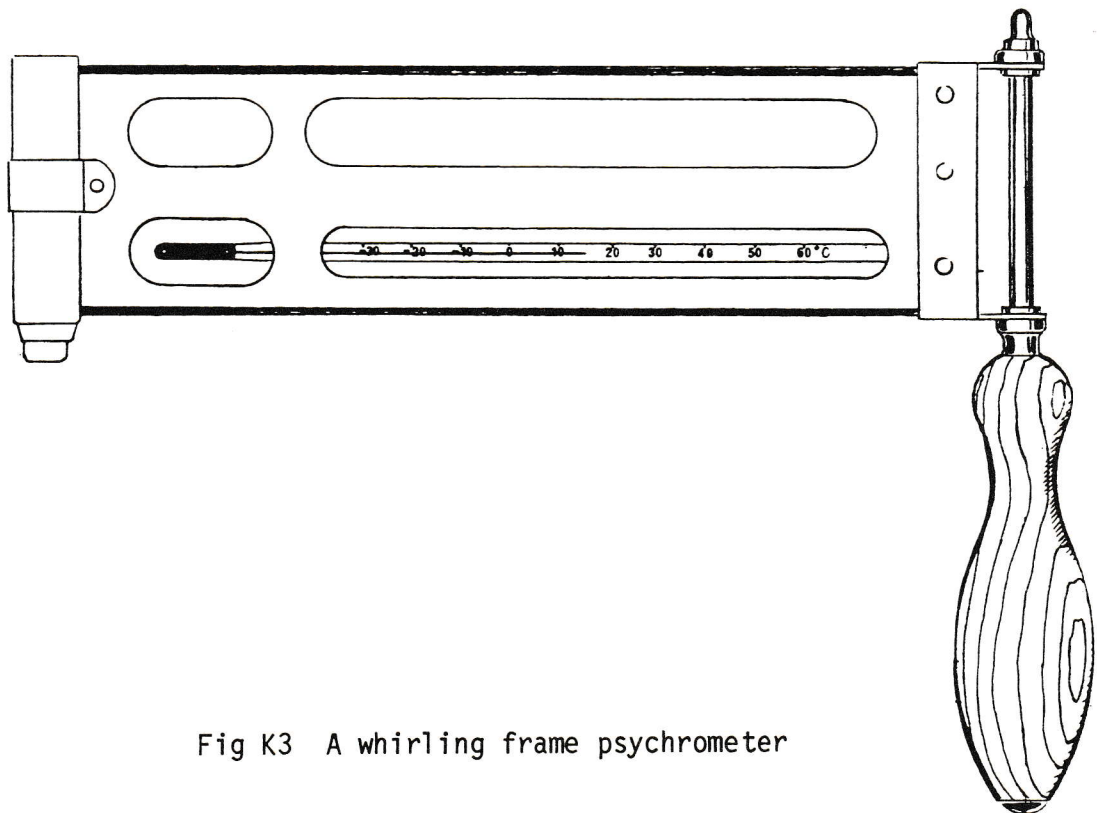


Fig K3 A whirling frame psychrometer

METHOD

5. Normally the observation should be made starting at H+50 ie ten minutes before the hour reported, every hour (see Para 8). Once an Attack Warning RED has been issued, do not make further outside observations until instructed by the Duty Officer through the Post Display Plotter, or at the Control through the Group Information Supervisor. Make all outside observations from a point which is clear of obstructions with a good field of view where possible.

a. Atmospheric Pressure. Read atmospheric pressure from the barometer in whole millibars, ie read 1024 millibars as "1024". When reading the barometer special care is required as follows:

- (1) View the barometer at eye level from directly in front to reduce parallax error.
- (2) Position the movable index fully anti-clockwise to avoid confusion with the barometer needle.
- (3) Tap the barometer gently to take up instrument "lag" prior to taking a reading.
- (4) Ensure that corrections resulting from exercise analysis are applied properly, eg, not applied twice.

b. Temperature. Determine the outside temperature by spinning the whirling frame psychrometer at least 10 times and then reading the scale of the thermometer. Always report to the nearest whole degree with half degrees being always thrown to the odd number. eg 3x5°C is reported as 03°C, 6x5°C as 07°C. Minus temperatures are preceded by the letter M, eg M02 is minus 2°C.

c. Wind Direction. Determine the direction from which the wind is blowing, in tens of degrees from true North, based on 10-degree marks made on the ventilator on which the GZI is mounted.

d. Wind Speed. Read wind speed in Knots, from the anemometer, held up in a position exposed to the wind flow. Posts and Controls without anemometer are to assess the wind speed using the Wind Speed Scale (Fig. K.4).

e. Visibility. Using predetermined visual points report lowest visibility present. (It is quite possible for visibility to vary in different directions and care is therefore needed.) The predetermined visibility points must therefore be selected in more than one direction. At night, if possible, time should be taken to allow the eyes to adjust to the conditions. Where visibility cannot be assessed then "/"'s are inserted in the message content. Visibility estimates will be facilitated if a diagram is prepared giving distances of landmarks from 20 metres to above 10 km. Report visibility in metres from 0001 to 9998, use code 9999 if visibility is 10 km or more. Always report four figures or "////".

f. Present Weather. Visual observation of the weather is made using the Present Weather Codes (Fig K.5). The highest code figure is always reported if more than one type of weather is currently observed.

- g. Cloud Amount. This is the total amount of the sky covered by cloud of any type reported in oktas ($1/8$). This can range from 0 for a completely clear sky to 8 for complete cloud cover. If the sky is not discernible due to fog then 9 is reported, (see Fig K6).
- h. Cloud Type. The type of cloud reported is the predominant type of cloud in the sky. There are ten basic types (see Fig K.6) and the only exception to the predominant rule is that, if present, CB Cumulonimbus is always reported.
- j. Cloud Height. The height in feet of the base of the predominant cloud type, reported in hundreds of feet.

6. Enter the observations on the METAR Report Form (Fig K.13) it is suggested that items are ringed where possible and that figures are only entered on those elements which require them eg visibility, wind direction, cloud height etc. When the observer has returned to the Monitoring Room or Control the various aide memoire may be consulted prior to completion of the METAR form. To complete form, those sections ringed may then be readily entered in the appropriate box at the bottom of the form by cross referencing the weather elements eg VVVV for visibility, CC for cloud type etc to those printed on the section headings on the main part of the form. Notes of guidance on the completion of the report are printed on the reverse of the Form.

7. During periods following the Attack Warning RED when no outside observations are being made, reports giving the atmospheric pressures only are to continue at METAR ALPHA posts.

REPORTING PROCEDURES

8. Report METAR ALPHA observations as soon as completed, if possible before the hour. If not, they are to be passed to the Post Display Plotter as soon as the five minute readings have been collected. METAR BRAVO observations will be passed to the Post Display Plotter when all of the METAR ALPHA observations have been passed, ie H+5 mins and if necessary at H+15 mins. The Post Display Plotter will record METAR ALPHA reports on individual MRA Forms (Fig K.10) and METAR BRAVO reports on MRB Forms (Fig K.11). A maximum of 10 METAR BRAVO reports for the same time are to be included on a MRB form (Fig K.11). Group Control METAR BRAVO are to be passed to the Group Information Orderly.

9. Telling and recording procedures for:

a. METAR ALPHA report:

(1) Say METAR ALPHA followed by the Group identity followed by the Post number and the words POST OVER.

(2) Release transmit button of the Loudspeaker Telephone and pause to allow the PDP to repeat the Group identity and Post number and the words POST OVER. (PDP selects correct form.)

(3) Report the entries on the METAR Report Form, saying the figures and letters in each group individually and phonetically, except for the time which is spoken by reference to the 24 hour clock, followed by the words METAR ALPHA COMPLETE, OVER.

(4) Release the transmit button of the LST to allow the plotter to acknowledge by saying THANK YOU OUT.

NOTE: Where the weather observation (WW) is made up of only 4 characters (eg 19FC) the report will include the words "BLANK BLANK" after the WW element has been told.

METAR ALPHA 0215 0950 24012KT 4000 50DZ 5SC025 M01 1002.

EXAMPLE: METAR ALPHA HORSHAM FIFTEEN POST OVER - (Plotter replies HORSHAM FIFTEEN POST OVER) - ZERO TWO ONE FIVE - OH NINE FIFTY - TWO FOUR ZERO ONE TWO - FOUR ZERO ZERO ZERO - FIVE ZERO DELTA ZULU BLANK BLANK - FIVE SIERRA CHARLIE ZERO TWO FIVE - MIKE ZERO ONE - ONE ZERO ZERO TWO - METAR ALPHA COMPLETE, OVER - (Plotter says THANK YOU OUT).

b. METAR ALPHA restricted report used during the attack period:

(1) Use the same procedure as in para 10.a, modified as follows:

METAR ALPHA 0215 0950 //KKT // // // // // // 1003

EXAMPLE: METAR ALPHA HORSHAM FIFTEEN POST, RESTRICTED REPORT, OVER - (Plotter replies HORSHAM FIFTEEN POST, RESTRICTED REPORT, OVER) - ZERO TWO ONE FIVE - OH NINE FIFTY - ONE ZERO ZERO THREE - METAR ALPHA RESTRICTED COMPLETE, OVER - (Plotter says THANK YOU OUT).

(2) Note "/" (SLASH) is shown on the post report form for all elements other than post number, time and pressure. The Post Display Plotter also enters "/" (SLASH) in all sections of MRA Control Form other than ident, time and pressure before releasing the form to the Group Information Orderly.

c. METAR BRAVO report

(1) Use the same procedure as in para 10.a, replacing the word METAR ALPHA with METAR BRAVO and omitting the temperature and pressure groups.

METAR BRAVO 0312 0950 00000KT 0200 44FG 0///// (NOTE SKY CLEAR)

EXAMPLE: METAR BRAVO OXFORD TWELVE POST OVER - (Plotter replies OXFORD TWELVE POST OVER) - ZERO THREE ONE TWO - OH NINE FIFTY - ZERO ZERO ZERO ZERO ZERO - ZERO TWO ZERO ZERO - FOUR FOUR FOXTROT GOLF BLANK BLANK - ZERO SLASH SLASH SLASH SLASH SLASH, - METAR BRAVO COMPLETE, OVER - (Plotter says THANK YOU OUT).

NOTE: When the METAR Report is being made short pauses should be inserted between items of information to allow the plotter to complete Form METAR ALPHA or METAR BRAVO.

d. At the Control: The Post Display Plotter completes Form MRA or MRB (Fig K.10 and K.11). The Group Information Orderly collects the completed forms and takes them to the Group Information Supervisor who checks the contents of the forms. The GIS ensures that the time is corrected when necessary ie during British Summer Time to ZULU time before passing to the Group Information VDU Operator. The METAR BRAVO reports are only transmitted when instructed by the Duty Officer.

e. At the Control: The Group Information VDU Operator calls QQQ MRAOXF as an example and will be presented with the correct format for the sending of the METAR ALPHA reports. (See Fig K.12). All details on the format will be completed using "/" where indicated on the form. Any queries should be called to the attention of the GIS. If and when instructed by GIS the VDU operator will call QQQ MRBOXF to obtain a format (Fig K.13) for transmitting all the remaining METAR BRAVO reports. Note the individual Group three letter ident code is used.

10. The word METAR is used only to warn the Post Display Plotter of the type of report that is to be given and not to obtain priority over any other reports.

11. Thunderstorms. If thunderstorms have been reported within a METAR report they must also be reported, separately, to the Post Supervisor immediately after passing the METAR observations:

a. Say the words POST SUPERVISOR PLEASE, OVER (Plotter will ring the Post Supervisor, who will come on circuit and say POST SUPERVISOR, OVER).

b. Pass the following message:

HORSHAM TEN POST - THUNDERSTORM REPORT - FIFTEEN HUNDRED (Time of METAR Report) OVER - (Post Supervisor will repeat the message as an acknowledgement, replacing the word OVER with the word OUT).

NOTE: Thunderstorms are reported to the Post Supervisor as they occur, between METAR observations in accordance with Standard Operating Procedures.

Thunderstorm reports are required by the Chief Warning Officer to assess the credibility of AWDREY responses.

MAINTENANCE OF INSTRUMENTS

12. No local maintenance of METAR instruments is permitted and unserviceabilities are to be immediately reported to Group Headquarters.

13. Aneroid barometers, once installed at Posts are calibrated in accordance with the mean sea level pressure equivalent at the Post site. Barometers are not to be removed from Posts, except on specific instructions, as removal will upset the calibration.

14. If, as a result of persistent incorrect pressures, as revealed during the collation of METAR reports by the Meteorological Officers at Sector or the Meteorological Office, the calibration of a barometer may be authorised, but is only attempted following advice from the Senior Meteorological Officer. When instructed, METAR ALPHA Post Observers can make the necessary adjustment using the procedures outline in para 15. There are two styles of Barometer now on issue to the Organisation and it should be noted that both styles are labelled Mark III, however the mechanism has been updated on the newer issues. The difference is that the new instrument does not have a hole drilled in the back for adjustment.

15. The Procedures for adjusting the instruments are as follows:

a. Barometer with a hole in the rear face

(1) With the barometer on the wall, tap the face gently but firmly with a finger tip as if you are preparing to read it for a report. This will vibrate the mechanism and allow the springs to overcome any friction in the various pivots and axles.

(2) Lift the barometer from its hook and place it gently on a table or work surface so that it is vertical. Chock each side of the case so that it cannot roll off the table.

(3) Locate a screwdriver, with a blade about 3 mm in width, in the adjustment screw, through the hole in the rear of the case. AVOID HORIZONTAL (INWARD) PRESSURE ON THE SCREW - this will strain the mechanism.

(4) Rotate the screw $\frac{1}{8}$ of a turn and observe if the pointer on the dial has moved towards or away from the recalibration pressure. Turn the screw in small steps so that the pointer approaches the recalibration valve, tapping the face between turns to settle the mechanism.

(5) When the pointer is indicating the recalibration pressure, withdraw the screwdriver, tap the face and check the reading. Replace the instrument on the wall and check the reading again. Repeat the procedure as necessary until the setting cannot be improved.

(6) If the movement of the screw does not change the setting the instrument is unserviceable. Advise the Post Supervisor and report to the Group Headquarters in writing.

NOTE: Remember the following:

- Do not attempt recalibration without instructions from the Sector Meteorological Officers.
- Always use a clean screwdriver with square faces.
- Do not subject the instrument to sharp knocks or bangs.
- Always chock the instrument to prevent it from rolling.
- Never apply horizontal pressure to the screwdriver.
- Always move the adjustment screw in small $\frac{1}{8}$ of a turn steps and tap between each.
- Check the reading is correct once the instrument has been returned to the wall.

b. Barometer without a hole in the rear of the Case.

(1) With the barometer on the wall, tap the face gently but firmly with a finger tip as if you are preparing to read it for a message. This will vibrate the mechanism and allow the springs to overcome any friction in the various pivots and axles.

(2) Lift the barometer from its hook and carefully remove the three small brass screws from the side of the face rim with a small electrical screwdriver and lift off the back casing.

(3) Holding the barometer upright carefully turn the knob in the centre of the back plate until the pointer indicates the recalibration reading, tapping the instrument to settle the mechanism. Repeat the procedure as necessary until you are satisfied the setting cannot be improved.

(4) Carefully replace the rear casing and the three screws before rehanging the instrument on the wall.

(5) If turning the knob does not move the pointer the instrument is unserviceable and this should be reported to the Post Supervisor and Group Headquarters.

NOTE: Remember the following:

- Do not attempt recalibration without instructions from the Sector Meteorological Officer.
- Always use a small electrical screwdriver.
- Take care of the instrument and do not subject it to sharp bangs and knocks.
- Check that the reading is still correct after the barometer has been returned to the wall.

Fig K4

W I N D S P E E D S C A L E

MEAN KNOTS	GENERAL DESCRIPTION	SPECIFICATION FOR USE ON LAND
0	Calm	Smoke rises vertically
2	Light Air	Wind direction shown by smoke drift, but not by weathervanes
5	Light Breeze	Wind felt on face, leaves rustle gently, weathervanes move
9	Gentle Breeze	Leaves and small twigs in constant motion; a light flag will be extended
13	Moderate Breeze	Raises dust and loose paper; small branches are moved
19	Fresh Breeze	Small trees in leaf begin to sway
24	Strong Breeze	Large branches in motion; telegraph wires whistle
30	High Wind	Whole trees move
37	Gale	Twigs snap off; walking difficult
44	Strong Gale	Slight structural damage; chimney pots removed etc
52	Storm	Trees uprooted; considerable structural damage
60	Violent Storm	Widespread damage (very rarely experienced in Britain)

Fig K5

THE PRESENT WEATHER CODES
(WW----)

Code	Name	Notes	Connection with other groups
04FU	Smoke haze	A suspension of small particles produced by combustion.	
05HZ	Dust haze	A suspension of dust or small sand particles, not being raised by strong winds at the time.	
07SA	Dust storm	Particles of dust (or sand) lifted to great heights by a strong and turbulent wind.	
10BR	Mist	A suspension of microscopic water droplets, reducing the visibility.	Visibility more than 1000m
11MIFG	Shallow fog	Fog lying on the ground or the sea, below eye level with visibility over 1000m above the fog.	
17TS	Thunder heard	A sharp or rumbling sound which accompanies lightning (which may not be seen).	
18SQ	Wind Squall	A strong wind that rises suddenly, lasts for at least a minute, and then dies away quickly.	
19FC	Tornado	A violent whirlwind, with a funnel cloud (10-50m wide) protruding down from the base of a Cumulonimbus.	Cloud type is 'CB'
21RERA	Recent Rain	Not raining at the time of the observation, but ground wet from rain which can be assumed to have fallen within the past hour.	
22RESN	Recent Snow	Not snowing at the time of the observation, but ground white from snowfall which can be assumed to have fallen within the past hour.	
27REGR	Recent Hail	Not hailing at the time of the observation, but hail lying on the ground which can be assumed to have fallen within the past hour.	

Code	Name	Notes	Connection with other groups
38BLSN	Blowing Snow	Not snowing at the time of the observation, but old loose snow particles being raised by the wind to at least several feet above the ground.	
FG	Fog	A suspension of very small water droplets. The air feels raw, clammy or wet.	Visibility less than 1000m.
40BCFG	Fog in patches	-	
44FG	Fog sky visible	Blue sky or stars can be seen when looking vertically up through the fog.	
45FG	Fog sky obscured	Nothing visible when looking vertically up through the fog.	
48FZFG	Fog freezing	-	Temperature 0°C or below.
DZ	Drizzle	Fairly uniform precipitation, exclusively of very fine drops of water. When they drop onto a water surface the effect is imperceptible.	Cloud type is 'ST'
50DZ	Drizzle slight	Can be detected on the face. Produces little or no runoff from roads or roofs.	
53DZ	Drizzle moderate or heavy	Causes windows and roads to stream with moisture.	
56FZDZ	Drizzle freezing	Liquid drizzle drops which freeze on impact with the ground or objects near the ground.	Temperature below 0°C.
RA	Rain	Precipitation of water drops.	
60RA	Rain slight	Low intensity; either scattered large drops or numerous small drops. Puddles form slowly, if at all.	
63RA	Rain moderate	Puddles form rapidly. Downpipes flow freely. Some spray when rain falls on hard surfaces.	
64XXRA	Rain heavy	Roaring noise on roofs. Extensive splashing on roads.	

Code	Name	Notes	Connection with other groups
66FZRA	Rain freezing	Liquid rain drops which freeze on impact with the ground or objects near the ground.	Temperature below 0°C.
68RASN	Rain and snow	A mix of rain and snow. Sleet.	
SN	Snow	Precipitation of ice crystals.	
70SN	Snow slight	Sparse small flakes. Snow depth does not accumulate faster than 1/2cm per hour.	
73SN	Snow moderate	Large flakes falling thickly enough to impair visibility substantially. Snow depth accumulates at up to 4cm per hour.	
74XXSN	Snow heavy	Visibility reduced to a low value. Snow depth increases by over 4cm per hour.	
SH	Showers	Precipitation of any kind falling from cumuliform clouds. A shower is usually of fairly brief duration, with the intensity of precipitation varying quite rapidly as the shower passes overhead. They are often followed, and preceded, by a clearance of cloud. Rainbows may occur.	Cloud type is either 'CU', 'CB', or 'SC'.
80RASH	Showers of rain	May form puddles, but not rapidly.	
81XXSH	Showers of heavy rain	Puddles form rapidly. Visibility reduced.	
85SNSH	Showers of snow	Flurries of sparse, small flakes.	
86XXSH	Showers of heavy snow	Periods of snowfall with large flakes, falling thickly enough to impair visibility substantially.	
89GR	Showers of hail	Sparse hailstones, small in size, which may be mixed with rain.	Cloud type is 'CB'
90XXGR	Showers of heavy hail	A fall of hail sufficient to cover the ground with white. In extreme cases there may be damage done to glass-houses etc.	Cloud type is 'CB'

ANNEX K

Code	Name	Notes	Connection with other groups
TS	Thunderstorm	One or more electrical discharges producing lightning and thunder.	Cloud type is 'CB'
95TS	Thunderstorm with rain or snow	If no precipitation is falling, report 17TS.	
96TSGR	Thunderstorm with hail	-	

If none of the preceding 'weather' phenomena are occurring (ie the conditions are dry and the visibility is good) then the WEATHER group is reported as "////".

When two types of precipitation occur at the same time (such as rain and drizzle, rain and snow, snow and hail) the intensity of each type is not given separately. It is the intensity of the mixture that is reported. Apart from the combination of 'rain and snow' which can be reported by the Code number 68RASN, other cases of mixed precipitation should be reported by a single description using the following order of precedence: (1) hail, (2) snow, (3) rain, (4) drizzle.

Fig K6

CLOUD AMOUNT TYPES AND HEIGHT

1. CLOUD AMOUNT (N)

In place of the 3 categories 'No Cloud', 'Partly Cloudy' and 'Overcast' in the ROCMET/SUPMET Weather Code, the total amount of the sky covered by cloud is reported in 'oktas' (eighths) in the METAR Code.

Meaning	METAR N Code	Meaning
No Cloud	0	0/8
Partly Cloudy	4	4/8
Overcast	8	8/8
Sky Obscured	9	

Any amount from 0/8, 1/8 ... to 8/8 can be reported by the figure for N. If for any reason the amount of cloud cannot be estimated, N is coded as / (slash, or solidus). A 9 is used if thick fog is obscuring cloud amount and type. At night the clouds are often very difficult to assess, but whenever possible the value of N should be estimated from the area of sky in which stars are not clearly visible.

2. CLOUD TYPE (CC)

Two letters are available to describe the main type of cloud that is present. Normally it will only be possible to attempt an estimate of the cloud type during daylight hours. If no estimate can be made, the cloud type is coded // (double slash).

The broadest sub-division of cloud types is into the following categories:

1. Lumpy, detached clouds (Cumuli-form) called Cumulus (CU) or Cumulonimbus (CB).

These clouds grow vertically upwards in the atmosphere. Usually they are small, shallow and well separated in the early morning, but become deeper, more massive and clustered in the afternoon before dying away in the evening. Rain (or snow) falling from these clouds is in the form of SHOWERS (see WW Weather Code - Nos 80, 81, 85 and 86). The biggest clouds of this type are the Cumulonimbus clouds, which may generate THUNDERSTORMS and HEAVY SHOWERS. If a Thunderstorm is occurring, or hail is falling, weather code WW = 89, 90, 95 or 96 is reported and the Cloud Type must be CB (Cumulonimbus).

2. Layered clouds (Strati-form) which may be of two types:

- a. Single, thin cloud sheets (through which the sky can be seen) called Stratus (ST), Stratocumulus (SC), Alto cumulus (AC) or Cirrocumulus (CC) according to the height of the cloud sheet.
- b. Multiple, thick cloud layers (generally associated with steady rain or snow, either at the time or in the near future). These are called Altostratus (AS) or Nimbostratus (NS).

c. Wispy clouds (Cirri-form) high in the sky called Cirrus (CI) or Cirrostratus (CS).

Often more than one of these cloud types will be observed at the same time.

The coded report should then indicate the predominant type, with priority always being given to CB which must be reported if it is observed.

3. CLOUD HEIGHT (Height of cloud base) (hhh) always reported in hundreds of feet.

This is a very difficult feature to estimate except under special conditions, or with special instrumentation. At certain sites, cloud covering the tops of hills or high masts can be useful for obtaining the height of very low cloud. Aeroplanes flying in and out of a cloud layer may supply a clue on other occasions. But there will be many times when no helpful indications exist, and no estimate should be attempted (hhh is coded ///).

Examples: 001 is 100 ft, 012 is 1200 ft, 100 is 10,000 ft and 250 is 25,000 ft.

The normal ranges of height appropriate to each cloud type is:

	Types	Height range in UK
High clouds:	CI, CS, CC	18,000 ft or above
Medium clouds:	AC, AS	8000 ft - 18,000 ft
Low clouds:	CU, CB, SC	2000 ft - 8000 ft
Very low clouds:	ST, NS	below 2000 ft

These are the normal height bands, which trained meteorologists will use to interpret your cloud observations on the basis of the cloud types you report. Unless you have firm evidence for an estimate of the cloud height it is better not to report anything.

Cloud	Appearance of sun, moon	Optical phenomena	Precipitation, thunder	Range of cloud base over British Isles
Ci	Only dense patches may veil or hide the sun	Halo phenomena may occur, but the halo circle is almost never complete	None from Ci	Usually 20,000-14,000 ft
Cc	Usually transparent enough to show the position of the sun or moon	Corona sometimes, but no halo phenomena. Occasionally irisation on the edges of the cloud, generally within 300 of the sun	None from Cc	If at a non-aviation station the height cannot reasonably be estimated, the British practice is to use a nominal height of 25,000 ft, and 35,000 ft for any higher cloud
Cs	Never thick enough to prevent shadows when the sun is above 300. The sun's outline will be visible, unless the sun is close to the horizon	Halo phenomena generally produced which may sometimes provide the only indication of thin cirrostratus. Corona sometimes, but no irisation	None from Cs	Cs may thicken to become As
Ac	May be thin enough to show position of sun or moon, or these may be seen through spaces in the clouds. Sometimes thick enough to hide the sun or moon.	Corona or irisation often seen. Ac castellanus and floccus may sometimes show mock suns or a luminous pillar	Although usually none from Ac, very occasionally rain or snow may reach the earth's surface (usually from altocumulus castellanus)	Usually 6500-20,000 ft. If at a non-aviation station the height cannot reasonably be estimated, the British practice is to use a nominal height of 10,000 ft and 15,000 ft for any Ac or As above.
As	Thinner parts reveal the sun or moon as though through ground glass. Denser parts completely hide sun or moon. No shadows are cast	Corona sometimes, but no halo phenomena	When precipitation reaches the ground it is generally continuous rain, snow or ice pellets; the drops are of moderate size. Precipitation seldom reaches the ground if the cloud base is higher than about 10,000 ft	Altostratus may thicken with progressive lowering of the base to become Ns
Ns	Sun or moon always blotted out. In daylight the cloud appears as if illuminated from within	None	Usually rain, snow or ice pellets, sometimes moderate or heavy	Usually between the surface and 10,000 ft
Sc	Sun, moon, higher clouds or blue sky may be seen through gaps. Thin patches may show position of sun or moon. When dense, sun or moon completely hidden	In extremely cold weather a halo may sometimes occur in virga beneath Sc. When the cloud is not very thick a corona or irisation is sometimes observed	Rain, snow, or snow pellets; intensity. Drizzle may occur occasionally when the base of the Sc is low	Usually between 1000 ft* and 4500 ft but may often be observed to 6500 ft
St	Usually so thick that sun or moon completely hidden. When thin, outline of sun or moon clearly visible without ground-glass effect	Corona may be produced when the cloud is very thin	Only weak falls of drizzle, rain, snow or snow grains, but along coasts and in mountainous areas amounts may be considerable. Precipitation may fall from a higher cloud hidden by St, then dark uniform St closely resembles Ns and may easily be confused with it	Usually between the surface and 2000 ft but may sometimes be observed to 4000 ft
Cu		Rainbow sometimes from precipitating Cu	Cu with strongly sprouting cauliflower tops may, rarely, give showers. In the tropics they may give abundant rainfall	Usually between 1000 ft* and 5000 ft, but may sometimes be observed to 6500 ft. After initial formation, a rise in temperature often leads to a rise in cloud base
Cb		Rainbow sometimes. Lightning	Usually showers or thunderstorms, often with squalls, sometimes with hail. By convention the cloud is called Cb if accompanied by lightning, thunder or hail	Usually between 2000 ft* and 5000 ft, but may sometimes lower to near surface, or be as high as 6500ft

* At stations substantially over 500 ft above sea level the base will often be less

Fig K.7

METAR REPORT FORM

GROUP/POST DESIG

TIME (GGgg)

CLOUD COVER (N)										
Amount	0	1/8	2/8	3/8	4/8	5/8	6/8	7/8	8/8	?
code	0	1	2	3	4	5	6	7	8	/

SURFACE WIND (DDff)		SPEED		BIT	
DIRECTION	code	code	force	No	0
000	calm	00	calm		0
360	N	02	smoke drifts		1
050	NE	05	wind felt on face		2
090	E	09	leaves move		3
130	SE	13	small branches move		4
180	S	19	small trees move		5
230	SW	24	wires whistle		6
270	W	30	bec hard to walk		7
310	NW	37	walking difficult		8
vrb	Variable	44	some damage		9
		52	trees uprooted		10
to nearest 10 degrees		actual		Kts	

VISIBILITY (VVVV)		Exact visibility (if known)	
code	description	m	Km
0000	Less than 50m		
0100	50-150 m		
0200	150-350 m		
0500	350-750m		
0900	750-1050 m		
2000	1050m-3.5Km		
6000	3.5Km-9.5Km		
9999	10Km or more		

WEATHER (WW)		OBSERVATION	
code	description	code	description
04FU	smoke haze	/////	dry with no weather to report
05HZ	dust haze		
10BR	mist		
11MIFG	shallow fog		
17TS	thunder heard		
18SQ	wind squall		
19FC	tornado		
21RERA	ground wet recent rain		
22RESN	ground wet recent snow		
27REGR	hail stones		
38BLSN	blowing snow		
40BCFG	patchy fog		
44FG	fog sky visible		
45FG	fog sky obscured		
48FZFG	freezing fog		

DRY AT TIME OF OBSERVATION

WEATHER (WW)		OBSERVATION	
code	description	code	description
50DZ	drizzle slight		
53DZ	drizzle mod to heavy		
56FZDZ	drizzle freezing		
60RA	rain slight		
63RA	rain moderate		
64XXRA	rain heavy		
66FZRA	rain freezing		
68RASN	rain and snow		
70SN	snow slight		
73SN	snow moderate		
74XXSN	snow heavy		
80RASH	shower rain		
81XXSH	shower heavy rain		
85SNSH	shower snow		
86XXSH	shower heavy snow		
89GR	shower hail		
90XXGR	shower heavy hail		
95TS	thunderstorm /rain/snow		
96TSGR	thunderstorm /hail		

WET AT TIME OF OBSERVATION

CLOUD TYPE (CC)		HEIGHT	
code	description	code	description
CI	white wisps		
CC	finely mottled		
CS	thin white veil		
AS	thick grey veil		
AC	mottled layer		
SC	lumpy layer		
CU	upward building detached blobs		
CB	very deep and heavy with wispy tops		
NS	formless heavy overcast		
ST	very low ragged layer		

CLOUD HEIGHT (hh)

TEMPERATURE (TT) degs C

PRESSURE (PPPP) MBS

METAR - REPORT

IDENT	GGgg	DDff	KT	VVVV	WW	----	NCC	hh	M/P	TT	PPPP
			KT								

Fig K.8

NOTES ON USE OF METAR REPORT FORM

- 1. Allow time for eyes to adjust to outside environment, if possible**
- 2. Ring the weather elements on the front of the form. The following is the suggested order:-**
 - a. Weather (WW)
 - b. Start to assess the wind speed and direction (DDDff)
 - c. Start to assess the visibility by looking in all directions and by reference to known visibility points report the visibility (VVVV) in metres. Remember the criteria for fog is less than 1000m.
 - d. Record the total coverage of the sky by cloud (N)
 - e. Decide the predominate cloud type (CC) and height (hhh)
 - f. Record the present weather (WW) always report the highest code figure
 - g. Complete the wind speed and direction
 - h. METARA record temperature (TT) use P or M to indicate plus or minus
 - i. METARA record pressure (PPPP) in whole millibars
 - j. Enter the time of observation (GGgg)
- 3. Complete the report after returning to the Post or Control after reference to SOP and Cloud guides if required**
- 4. Report observation to Post Display Plotter (see annex K)**



CONTROL FORM - METARA OBSERVATIONS

PROSIGN		AD/CODE	
RR		MR	
SAUK00		EGRR	
IDENT		TIME	DDD f f
V V V V		K T	
W W		N C C h h h	
M / P T T		P P P P	

1. The originator is to complete all boxes for which information is given by entering :

- a. After MR - the 3 letter Group Identity
 - b. After EGRR - the date and time of the observation to the nearest hour
 - c. Under IDENT - the Group 2 digit numerical code followed by the post number
 - d. Under TIME - the actual time of observation
 - e. Under DDDff - the wind direction and speed
 - f. Under VVVV - the visibility in meters always reported using four figures
 - g. Under WW - the numerical code and letters reported for the present weather code (Always 4 sometimes 6 characters)
 - h. Under NCChhh - the total cloud cover, predominant cloud type and its base height
 - j. Under ^M/_PTT - record temperature (TT) use P or M to indicate plus or minus
 - k. Under PPPP - the pressure in whole millibars (3 or 4 figures)
2. A slash "/" should be included to indicate elements not reported
3. On completion pass the form to the G.I.S.

Fig K.10



CONTROL FORM - METARB OBSERVATIONS

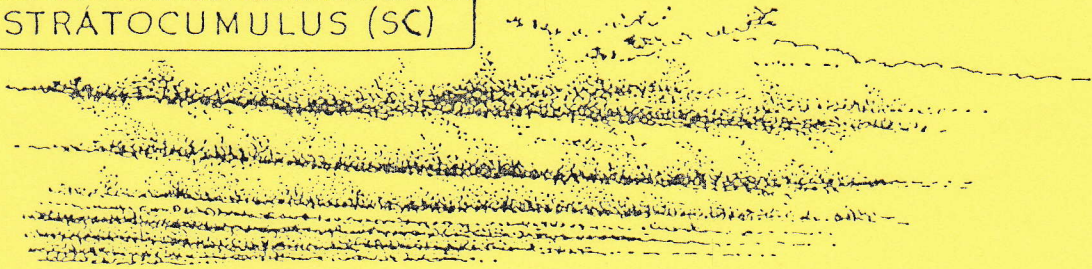
PROSIGN		AD/CODE			
RR		MR	<input type="text"/>	<input type="text"/>	<input type="text"/>
SAUK00		EGRR	<input type="text"/>	<input type="text"/>	<input type="text"/>
IDENT	TIME	DDD f f	VVVV	WW	NCC h h h
<input type="text"/>	<input type="text"/>	<input type="text"/> KT	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/> KT	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/> KT	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/> KT	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/> KT	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/> KT	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/> KT	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/> KT	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/> KT	<input type="text"/>	<input type="text"/>	<input type="text"/>

1. The originator is to complete all boxes for which information is given by entering :
 - a. After MR - the 3 letter Group Identity
 - b. After EGRR - the date and time of the observation to the nearest hour
 - c. Under IDENT - the Group 2 digit numerical code followed by the post number
 - d. Under TIME - the actual time of observation
 - e. Under DDDff - the wind direction and speed
 - f. Under VVVV - the visibility in meters always reported using four figures
 - g. Under WW - the numerical code and letters reported for the present weather code
(Normally 4 characters sometimes 6 characters)
 - h. Under NCChhh - the total cloud cover, predominant cloud type and its base height
2. A slash "/" should be included to indicate elements not reported
3. On completion pass the form to the G.I.S.

Fig K.11

CLOUD TYPE (CC)

STRATOCUMULUS (SC)



Large lumpy masses or rolls of dull grey cloud, often covering the whole of the sky, generally not very thick and the blue of the sky often appears in the gaps.

CUMULUS (CU)



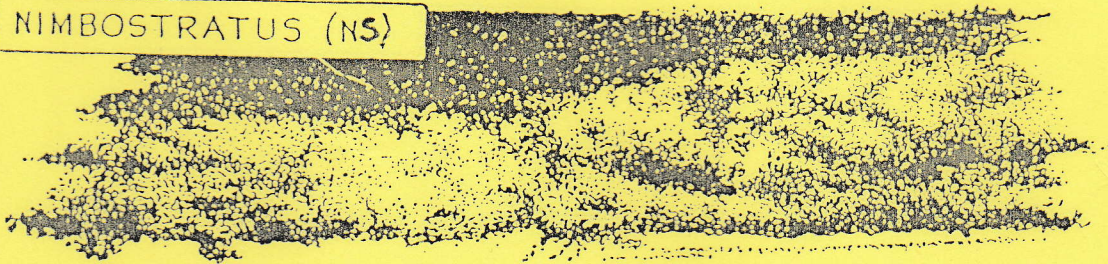
Thick clouds with vertical development - the summit is dome-shaped and the clouds are isolated with clear spaces between - varied in size.

CUMULONIMBUS (CB)



Great masses of clouds rising in the form of towers of which the upper parts often spread out in the form of an anvil - gives showers of rain or snow.

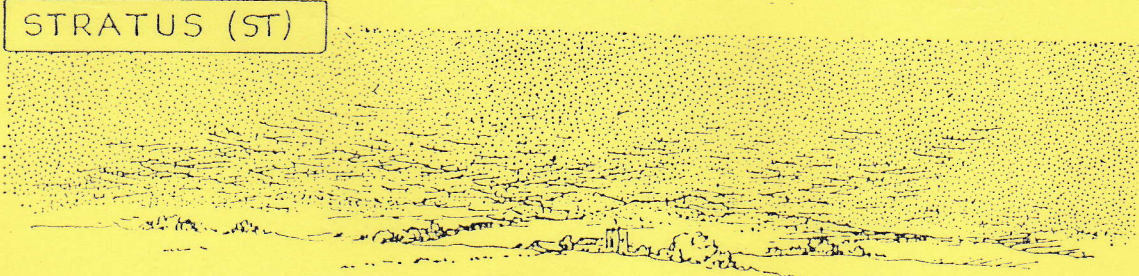
NIMBOSTRATUS (NS)



LOW CLOUDS - Below 7,000 feet.

A low layer of structureless and rainy-looking cloud usually dark grey in colour. When rain or snow falls from this type of cloud it is of a continuous nature.

STRATUS (ST)



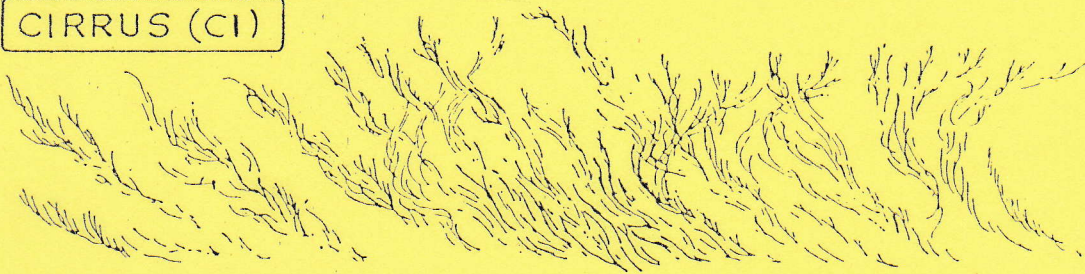
A uniform layer of cloud like fog in appearance but not lying on the ground, usually light sky.

LOW

VERY
LOW

CLOUD TYPE (CC)

CIRRUS (CI)



CLOUD TYPES:—The names given to the various types of clouds are derived from Latin words.

CIRRUS—A tuft, feather-like plumes.

CUMULUS—A lump or heap.

STRATUS—A layer-clouds spread out flat.

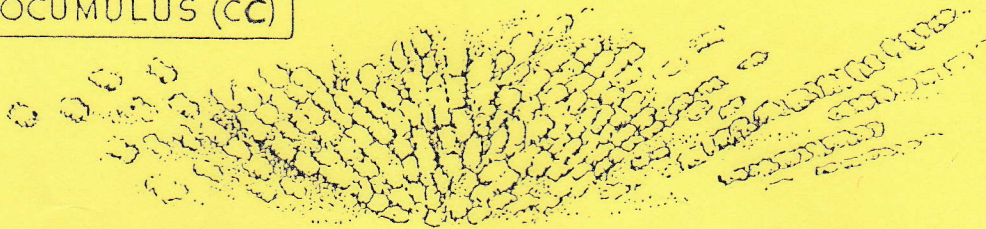
NIMBUS—A dark gloomy rain cloud.

ALTO—Meaning "high".

HIGH CLOUDS—About 30,000 feet.

Threads and groups of Cirrus with gentle wind after stormy weather foretell settled weather—more often they are signs of bad weather—sometimes called "Mares' Tails".

CIRROCUMULUS (CC)



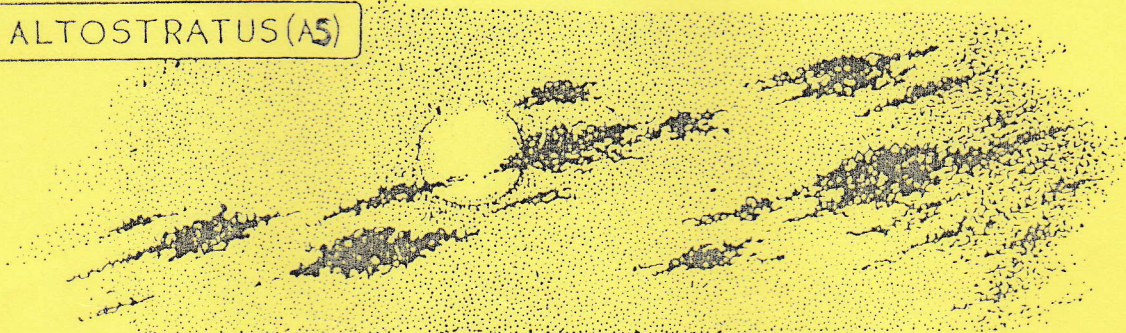
Small rounded masses or white flakes without shadows, in groups or lines or sometimes in the form of ripples, like those formed on sand on the sea shore.

CIRROSTRATUS (CS)



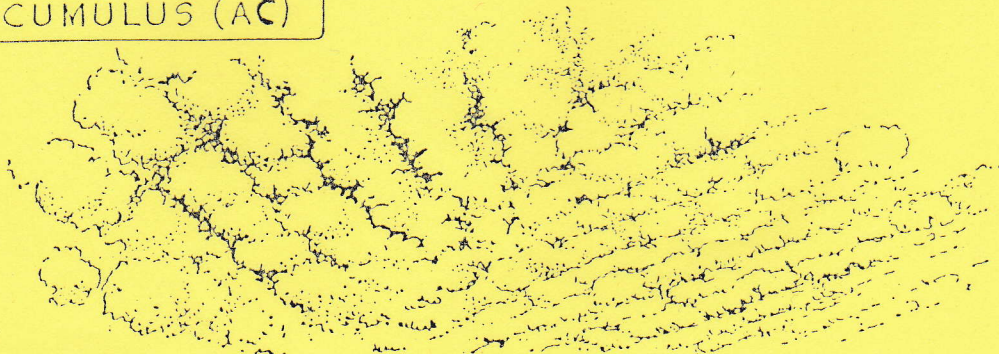
Thin veil of whitish clouds, sometimes covering the whole sky and giving it a milky appearance—the veil often produces a halo round the sun or moon.

ALTOSTRATUS (AS)



A veil, more or less grey in colour—varies in thickness from quite light, through which the sun or moon can be seen dimly, although blurred, to a thick dark layer.

ALTOCUMULUS (AC)



Rounded masses or discs, more or less large, arranged in groups or lines or in rows. Following one or two directions—sometimes crowded together.

HIGH

MED