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INDIA METEOROLOGICAL DEPARTMENT.

METEOROLOGICAL ORGANISATION
FOR
AIRMEN.

(M. O. A. Pamphlet.)

1937.



PUBLISHED BY THE MANAGER OF PUBLICATIONS, DELHI

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INDIA METEOROLOGICAL DEPARTMENT.

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Name (in block capitals) :

Address :

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Signature.

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Meteorological Organisation for Airmen.

I.—Area of responsibility and nature of Organisation.

1. The India Meteorological Department provides a weather service for airmen over the eastern half of the Persian Gulf, the whole of Baluchistan, India and Burma. The existing organisation for the supply of weather reports and forecasts admittedly falls short of the standards recommended by the International Convention for Air Navigation, particularly in South India, but every attempt is made to maintain it as efficiently as existing facilities allow. The service includes supply of weather forecasts, upper wind and low cloud data and surface observations. The officers of the India Meteorological Department, though authorised to supply weather information, are not expected to give advice regarding the suitability or otherwise of the weather for flying, of the condition of the aerodrome or the seaplane base for landing, or of alternative routes between stations. Details of the service provided are described in this pamphlet; they apply generally to civil aviation over the whole country as well as to Royal Air Force aeroplanes over regions served by the civil forecasting centres, but do not apply strictly to Royal Air Force flights over Baluchistan, Sind, the North-West Frontier Province and the Punjab.

2. The following classes of offices and observatories aid in the provision of

Classification of meteorological stations.
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 weather reports for airmen :—

(i) *Forecasting centres* under the charge of meteorologists, where weather observations are collected by telegrams from a number of observing stations and ships at sea to form the basis of weather reports and forecasts. For civil aircraft there are three such centres, located at Karachi, Calcutta and Poona, while for military aircraft there are two forecasting centres at Quetta* and Peshawar. For details regarding areas of responsibility, etc., of Karachi, Calcutta and Poona forecasting centres, reference may be made to *Table I* (page 12) and the *Map* facing this page. The areas of responsibility of Peshawar and Quetta* forecasting centres have been indicated in *Table I*.

(ii) *Surface observatories*, numbering about 330 and classified into various classes, according to their instrumental equipment and to the frequency of observations taken. Most of them report to one or more of the forecasting centres by telegram.

(iii) *Pilot balloon observatories*, numbering 38, which supply information regarding upper winds and low clouds. For details see *Table II* (page 16).

(iv) *Current weather observatories* which can supply information about local weather and ground winds at short notice or at times when weather is adverse to flying. For details see *Table III* (page 24).

3. The meteorological messages supplied to and by airmen are classified

Classification of weather messages.

 as follows :—

(i) *NEWSMET messages*.—Weather reports and forecasts in plain language issued regularly for airmen at routine hours are designated **NEWSMET** messages and begin with the code word **NEWSMET**. The names of the end

* The forecasting centre at Quetta has been temporarily transferred to Karachi.

stations of the section of the route to which the NEWSMET applies and the date and time of issue (in G. M. T.) follow this code word, *e.g.*, a typical message relating to the Karachi-Jodhpur section of the route begins "NEWSMET Karachi-Jodhpur 20 August 1530 G. M. T.....". The forecasting centres at Karachi and Calcutta prepare two synoptic charts a day based on observations taken at 8 hours L. T. and 17 hours I. S. T.* and hence issue two NEWSMETs a day. The forecasting centre at Poona prepares one chart daily based on 8 hours L. T. observations and therefore can issue only one NEWSMET daily for routes in Southern India. Detailed specifications of NEWSMET messages are given in *Appendix I*. As the organisation in respect of the Bushire/Bahrein-Gwadur and Rangoon-Victoria Point sections of the air route is unavoidably inadequate, only very general inferences are issued for these regions.

(ii) *STORMET messages*.—Occasionally, at times of threatening or stormy weather in the Bay of Bengal and the Arabian Sea, additional weather charts are prepared at the forecasting centres. Whenever considered desirable after study of these charts, special brief weather reports may be issued, *en clair* as cautionary messages by W/T for the benefit of airmen. These messages are designated STORMET messages and begin with the code word STORMET followed by the names of the end stations of the section of the route to which the message refers and the date and time of issue (G. M. T.), *e.g.*, "STORMET Calcutta-Akyab 20 September 0430 G. M. T.....".

(iii) *PILOT messages*.—These contain information regarding direction and velocity of upper winds up to a height of 4,000 metres above sea level and are coded in the usual international form (see *Appendix II*). The pilot balloon stations, as a rule, release balloons twice daily once in the morning and once in the afternoon with the exception of a few stations in northern India which take three flights a day, and a few stations in south India which let off one balloon daily in the morning (see *Table II*, page 16).

(iv) In response to special requests for height of low cloud if made by aircraft in flight in the "Q Code" the information will be supplied by pilot balloon stations (see "QBB" in *Appendix VII*, page 59).

(v) *MET reports* are brief coded messages, containing local weather observations taken at Current Weather Observatories at fixed routine hours, which, on the trans-India air route, generally coincide with the routine periods of watch of aeronautical W/T stations. (For code and specifications see *Appendix II*. The list of current weather observatories on the trans-India air route is given in *Table III*, page 24.)

(vi) *SPEMET reports* contain, in the same code as MET reports, local weather observations made at current weather observatories at any non-routine time on special request by aircraft in flight.

(vii) *DANMET reports* are coded cautionary messages, containing information regarding weather phenomena dangerous or adverse to aviation and are sent voluntarily by current weather observers. (For code, etc., see *Appendix II*; for stations whence these reports are issued see *Table III*, page 24).

(viii) *IMPMET reports* are coded messages sent voluntarily by current weather observers about improvements in adverse weather conditions previously reported by DANMET reports. Each DANMET message is

*The routine times of observation in Mekran, Iran and the Persian Gulf are 0400 and 1200 G. M. T.

generally followed by an IMPMET message as soon as the weather improves appreciably. (For code see *Appendix II*).

(ix) RECTIF reports (beginning with indications like RECTIF NEWS-MET, RECTIF PILOT, etc.) are issued occasionally either to correct errors in, or supplement, any of the above-mentioned reports. When issued by wireless they go out as CQ messages. The distribution and disposal of RECTIF reports are always identical with those of the messages to which they are corrections or supplements.

(x) AERMET reports are meteorological reports from aircraft in flight to the nearest controlled aerodrome when weather conditions are difficult for flying (for code etc. see *Appendix VIII*).

II.—Procedure for obtaining weather reports and forecasts.

(a) *On the trans-India air route between Karachi and Victoria Point.*

4. On this route the issue of different kinds of meteorological messages by W/T to all main aerodromes has been placed on a routine basis and airmen are able to refer to the latest reports on the Weather Notice Boards at aerodromes or to get reports by W/T in the air. There is in general no need to enter into any special arrangements with forecasting centres. The routine arrangements are detailed in *Tables IV to IX and XII*, while for fuller information on any point paragraphs 11 to 44 below as well as the *Appendices* may be referred to. Meteorological Officers at forecasting centres will always be glad to explain the latest available weather charts and discuss the weather situation with pilots at the Meteorological Office during office hours, should the pilots so desire.

(b) *On other routes.*

5. On other routes airmen should apply to a Meteorological Office for such forecasts and weather reports as may be required. Application should be made to the Meteorologist at Karachi, Calcutta or Poona according to region of flight (see *Table I*, page 12, and *Map* facing page 1); it should preferably be sent at least 18 hours* before the forecast is required and it should state clearly :—

- (a) The date, time, place of commencement and destination of intended flight ;
- (b) Route by which the airman intends to fly, with information regarding landing at intermediate places if any, along the route ;
- (c) The address to which the forecast should be sent and the time by which it should reach the airman ;
- (d) The mode of supply, i.e., whether by telegram, W/T or telephone, etc.

A typical requisition telegram for a forecast is given below :—

Example.—"Request forecast for flight Bellary-Bombay commencing 7 hours fourteenth April morning stop Wire Rao care Postmaster Bellary to reach by 22 hours thirteenth".

In order to ensure timely delivery of these telegrams pilots are advised to warn those concerned at the receiving end that such messages are to be expected and how they are to be delivered.

If the station of starting has a forecasting centre, it is advisable for the airman to obtain the forecast in person during office hours from the Meteorological Office, where he will also have facilities for consulting the weather charts and discussing the weather situation.

* See paragraph 7 below.

6. It may sometimes happen that the route expected to be covered on a flying day lies over the *areas of responsibility of two or more forecasting centres*. A requisition giving the details enumerated in clauses (a), (b), (c) and (d) of paragraph 5 above should then be sent to *each* forecasting centre for the different portions of the route served by each of the centres. For a *non-stop flight* over a route lying within the jurisdictions of different forecasting centres, if the aviator makes a special request to the nearest forecasting centre, that centre may arrange the issue of a consolidated forecast for the whole route, after obtaining, if necessary, forecasts for portions of the route outside its area of responsibility from other forecasting centres.

7. The 18 hours' notice stipulated above does not signify that urgent requests for forecasts remain unattended for 18 hours; all urgent requests received within office hours at forecasting centres are attended to immediately. It is however to the airman's own advantage to give at least 18 hours' notice whenever he can, because the forecaster is thus enabled to study the weather situation with reference to the particular needs of the airman and call for special observations, whenever the weather conditions demand them.

8. When a weather report or forecast is required very urgently at night during the closed hours of the meteorological office concerned, it is advisable to make the request by telephone trunk call, and not by telegram.

The telephones to be called are as follows :—

Area for which weather report is required.	Telephone to be called up.	
	Station.	Telephone No.
Southern and Central India	Poona	690
Northwest India and United Provinces . .	Karachi	5125 (extension).
Northeast India and Burma	Calcutta	Alipore 203

9. Pilot balloon observatories (see *Table II*) are authorised to supply on request the latest information available about local upper winds and cloud heights to local enquirers. Excepting forecasts, which are in plain language, other messages are generally supplied in coded form.

10. For regular air services, schedules of supply of weather reports are prepared by the Meteorological Offices to suit the time-tables and needs of the services; in the event of delays or changes in the schedule of operation of the services, the Meteorologist concerned should be informed so as to enable him to change the time or date of issue of forecasts.

III.—Arrangements on the trans-India air route between Karachi and Victoria Point.

(a) Routine forecasts : NEWSMET messages.

11. NEWSMET messages are defined in para. 3(i) above. They are prepared by the Meteorologists at Karachi and Calcutta twice daily and are ready for issue by 1300 and 2100 I. S. T. (0730 and 1530 G. M. T.). The evening NEWSMET that is issued at night covers a period of 16 hours, i.e., from 22:

I. S. T. to 14 I. S. T. of the next day, and the noon NEWSMET covers a period of 8 hours, i.e., from 14 I. S. T. to 22 I. S. T. These messages contain information about past and present weather as well as the weather expected during the next 16 hours and 8 hours respectively. Detailed specifications of NEWSMET messages are given in *Appendix I*.

12. The meteorological offices at Karachi and Calcutta transmit the NEWSMET messages to the respective wireless stations as soon as these are ready. Further distribution and disposal of these messages as also of RECTIF NEWSMET messages are as indicated in *Tables IV* and *V*.

13. Aircraft in flight wishing forecasts should listen in at the time of the exchange of the daily routine reports (see times given in *Table IV*). Airmen on the ground should refer to the Weather Notice Boards referred to in *Tables IV* and *V* for the requisite forecasts.

NOTE.—(i) Eastbound aircraft making a flight to Jodhpur with a very short stop at Karachi may ask the Karachi aeronautical W/T station for a copy of NEWSMET message with any RECTIF message that might have been issued in respect of Karachi-Jodhpur route. Similarly west-bound aircraft in flight towards Rangoon may ask the Rangoon aeronautical W/T station for forecast covering Rangoon-Victoria Point section.

(ii) Cases may arise where for special reasons an aircraft has failed to pick up the NEWSMET message in the air and has also not landed at an aerodrome where the NEWSMET message is exhibited on the Notice Board. On such occasions, which are expected to be rare, the aircraft in flight may ask for a copy of the forecast from the nearest wireless station or the forecasting centre.

14. The wireless stations at Chittagong, Sandoway, Bassein, Tavoy and Victoria Point if asked by local enquirers for NEWSMET messages, obtain them from the nearest wireless station at which these are available (*vide Tables IV* and *V*). The W/T stations obtain them, if necessary, from the local meteorological office or aerodrome.

15. The aeronautical W/T station at Rangoon transmits daily between 1630 and 1645 G. M. T., the forecasts issued from Calcutta (between 1545 and 1615 G. M. T.) in respect of the sections Calcutta-Akyab, Akyab-Rangoon and Rangoon-Victoria Point and such other reports as may be required, to the Siamese radio station at Laksi for the benefit of airmen leaving Bangkok for Rangoon in the early morning.

(b) *Special forecasts : STORMET messages.*

16. These messages, defined in paragraph 3(ii), are communicated as soon as ready by forecasting centres to local W/T stations. Their further distribution and disposal are exactly in accordance with those for NEWSMET messages, i.e., as in *Tables IV* and *V*.

(c) *Upper Winds : PILOT messages.*

17. The pilot balloon stations along the Karachi-Calcutta route mentioned in *Table VI(a)* send up balloons 3 times daily, early morning, forenoon and afternoon, while those on the Calcutta-Victoria Point route (with the exception of Calcutta) mentioned in *Table VI(b)* send up balloons twice daily, morning and afternoon. The times at which the routine messages are ready, are indicated in column 3 of *Table VI (a)* and columns 3 and 4 of *Table VI (b)*.

18. All messages or parts of messages containing current upper wind information in code begin with the indication PILOT. The form of the message

is **PILOT IIGG* H₁ddv₁v₁ H₁ddv₁v₁** etc., where symbols have the usual international significance. (For specifications of Code see *Appendix II*.) They are communicated by the pilot balloon observatories shown in column 1 of *Table VI (a & b)* (pages 30 and 32), to the wireless stations mentioned in column 5 of *Table VI (a)* and column 6 of *Table VI (b)* at or before the time noted in column 3 of *Table VI (a)* and columns 3 and 4 of *Table VI (b)*; these in turn signal the messages to destination mentioned in column 6 of *Table VI (a)* and 7 of *Table VI (b)* during the daily routine watch periods shown in column 7 of *Table VI (a)* and 8 of *Table VI (b)*. Further disposal of the **PILOT** messages is shown in *Tables VII* and *VIII*.

19. When no pilot balloon ascent is possible owing to rain, fog or other reason, the fact is communicated at the usual routine times in the form **PILOT IIGG balloon failed fog (or rain or burst, etc.)**. As soon as an ascent is possible and data are ready, these are communicated to the wireless station.

20. If the balloon ascent at the usual routine time does not furnish information up to 4000 metres, but up to a lower height, a **PILOT** message containing the available information and the reason for shortness of ascent is communicated at the usual time. If, later, an ascent reaching higher than the first one is made another **PILOT** message is communicated.

21. On rare occasions and for special reasons meteorological authorities may arrange for additional pilot balloon ascents at non-routine hours. These data are communicated in the form of **PILOT** messages to wireless stations for disposal like the routine messages.

22. Airmen on ground at Karachi, Jodhpur, Delhi, Allahabad, Calcutta, Akyab and Rangoon should refer to Weather Notice Boards for the data. Aircraft in flight requiring pilot balloon data should listen in during routine wireless watch periods [*vide* column 7 of *Table VI (a)* and column 8, *Table VI (b)*]. Wireless stations however are also prepared to supply the latest **PILOT** messages available on request to aircraft in flight outside these routine times. The wireless station at Chittagong keeps the **PILOT** reports for Chittagong and Dacca readily available for issue to local enquirers. The wireless stations, at Chittagong, Sandoway, Bassein and Tavoy if asked by local enquirers for **PILOT** messages relating to other stations obtain the data from the nearest wireless station at which they are available (*vide Table VI*). The W/T stations, if necessary, obtain them from the local meteorological office or aerodrome as the case may require.

(d) Height of low cloud.

23. Information regarding height of low cloud or 'h' is supplied as a routine in MET, SPEMET, DANMET and IMPMET messages from Current Weather Stations on trans-India route (see *Table III-a*) and other routes where W/T is established. It will be based generally on eye-estimates made by the observers at the time of preparing the messages. These eye-estimates are occasionally liable to considerable error. In making eye-estimates the observers will be guided by their knowledge of the height at which a pilot or a ceiling balloon might have been lost in the cloud, or a hill-top covered by cloud, or height obtained by searchlights where they have been installed.

*GG = Mean of "time of release of balloon" and "time of completion of ascent," correct to the nearest hour, e.g., if a balloon is released at 0625 G. M. T. and followed up to 0715 G. M. T. the time of observation is given as 0700.

(e) *Special requests for cloud heights.*

24. Current Weather Stations on the Karachi-Victoria Point air route (for list, see *Table III-a*) at which there are also W/T stations furnish information by W/T regarding low cloud height in response to special requests received by W/T according to the International "Q Code" (see *Appendix VII*, page 59).

(f) *Local weather reports, including voluntary reports of adverse weather conditions and their improvement: MET, SPEMET, DANMET and IMPMET reports.*

25. These messages have been defined in paragraph 3(v)—(viii). Their form is given below:—

MET
SPEMET Station GGgg wwVhN_h DDFWN.

DANMET
IMPMET Station w₂GGgg wwVhN_h DDFWN.

For details regarding specifications, reference may be made to *Appendix II*.

26. It will be seen that the two codes given above are identical except that the time of observations in DANMET and IMPMET reports, is prefixed by the extra figure w₂ giving the special element of warning. The specification of weather phenomena under w₂ which determine the issue of DANMET/IMPMET messages are given in *Appendix III*.

27. The messages have neither address nor signature. The distribution is given in *Tables IX(a)* and *IX(b)*.

28. (a) These messages are compiled by the local representatives of the Meteorological Department and refer to the weather conditions at the meteorological observing station.

(b) At places where there is an aerodrome officer and where the distance between the meteorological observing station and the aerodrome is considerable, the aerodrome officer sends, in plain language, a message about weather conditions at the aerodrome, if he considers that the conditions described, in any coded message (with reference to the meteorological station) differ from those at the aerodrome. The message is in the following form:—

Weather.—(Heavy rain, rain, showers, drizzle, no precipitation).

Visibility.—(Metres).

Cloud height.—(Metres).

The message is signed "Aerodrome" and distributed like the preceding coded message.

When an aircraft is expected shortly to arrive at an aerodrome, and the weather conditions at the aerodrome justify cautionary announcements, such as visibility has fallen below 1,000 metres on account of fog or dust or blinding rain, or thunder is heard from a neighbouring thunderstorm, or a thunderstorm is believed to be approaching the aerodrome, and when the Aerodrome Officer has reason to think that no intimation of these has been communicated to the aircraft from the Observatory, he will send a plain

language message signed "Aerodrome," by W/T to the aircraft in the following form :—

Weather (Thunderstorm approaching aerodrome, or over aerodrome, Fog over aerodrome, Dust-storm approaching aerodrome, or over aerodrome, Heavy or blinding rain over aerodrome).

Visibility (.....metres).

Cloud height (.....metres).

29. Meteorological observing stations mentioned in *Table III(a)* and *Table IX* take their routine observations for MET reports just prior to the commencement of the times given against MET reports in column 4 of *Table XII* and transmit them to the local W/T stations for despatch by wireless at the times of watch which follow soon after.

30. SPEMET, DANMET and IMPMET reports are prepared and issued only during periods when the local W/T station is keeping watch for communication with aircraft in the section concerned. Meteorological observers or their understudies are on watch during these period so as to be able to respond to requests for observations from aircraft or to report immediately the occurrence and improvement of phenomena adverse to flying. They are prepared to supply a coded local weather (SPEMET) report ordinarily within ten minutes of receipt of a request ; further transmission of the message to the requisitioner may take anything from 5 to 30 minutes.

The periods of watch of W/T personnel and weather observers vary according to changes in the scheduled programmes of regular air services and special flights and notified deviations from these programmes. The local W/T stations keep the representative of the Meteorological Department informed of the hours of watch for any aircraft and about their movements. The local aerodrome officer sends similar information regarding the scheduled flights and changes in programmes to the meteorological representative.

31. All coded messages are communicated, immediately on preparation, to the local aerodrome authority and to the local W/T station for transmission in accordance with *Table IX(a)*. A full list of aerodrome authorities and representatives of the meteorological department is given in *Tables X* and *XI*.

32. IMPMET reports are communicated to all to whom the DANMET message was sent. If a DANMET or IMPMET message has to be sent within 10 minutes prior to the time fixed for a routine MET message, only the DANMET or IMPMET message is issued. The particular routine MET observation is, however, taken as usual and recorded in the Aviation Current Weather Register.

33. A wireless station receiving a report from the local meteorological station transmits it as follows :—

- (a) In the case of routine (MET) reports, at the next routine period, to the wireless stations and aircraft in flight indicated in *Table IX*.
- (b) In the case of special (SPEMET) reports, immediately to the wireless station or aircraft from which the request was received.
- (c) In the case of DANMET and IMPMET reports, immediately to aircraft in flight and W/T stations indicated in *Table IX*.

34. Wireless stations receiving coded messages by W/T communicate them to the local aerodrome and meteorological authority and in the case of a SPEMET to the aircraft from which the request for the report was received.

35. At aerodromes or observatories where Weather Notice Boards are maintained for exhibition of meteorological information, local MET, SPEMET, DANMET and IMPMET reports, as well as those received from other stations, are exhibited.

36. Aircraft in flight, wishing local weather reports about the time of the exchange of the daily routine (MET) reports (*vide* column 4, Table XII), should listen in for these. For local weather reports at other times, the aircraft sends a request to a wireless station.

37. On receiving a request for a SPEMET report, a wireless station obtains it from the representative of the meteorological department at that place if a local report is required; if, however, the request is for a report in respect of any other station, it passes on the request to the wireless station concerned.

38. An airman on the ground requiring information about current weather conditions at another station on the air-route should apply to the nearest forecasting centre or aerodrome officer; at stations (*e.g.*, Sandoway) where neither of these exists but where a wireless station is established, the airman should apply to the wireless station. The officer receiving the request obtains the information by wireless if necessary (provided the request is made at a time when the local wireless station is on watch) and is responsible for the supply of a reply to the request.

39. The wireless stations at Chittagong, Sandoway, Bassein, Tavoy and Victoria Point keep, readily available (in the form of Appendix IV), the latest MET, SPEMET, DANMET or IMPMET reports received from other centres and local meteorological offices, for issue in reply to requisitions from aircraft in flight and from local enquirers. Local meteorological offices supply on request the latest available local data to airmen on the ground.

40. If, after the issue of a DANMET message for any phenomenon, an occasion arises for another DANMET for a second phenomenon *before improvement* of the first, a second DANMET message is issued.

41. If, after the issue of a DANMET message, an occasion arises for a second DANMET, *simultaneously or after the improvement of the first but before the relevant IMPMET is issued*, only a second DANMET message is issued in respect of the second dangerous phenomena but no IMPMET is issued for the improvement of the first phenomena.

For example, if a DANMET message has been issued in respect of bad visibility and visibility later improved to more than 2,000 metres but low cloud appeared so as to constitute a fresh danger, a IMPMET message in respect of the improvement of visibility is not issued but a fresh DANMET message is issued in respect of low cloud.

42. If, after the issue of two or more DANMET messages improvement takes place in one or more of the phenomena but not in all the phenomena no IMPMET message is issued; the IMPMET message is issued only when all the phenomenon for which DANMETS were issued have improved. In this IMPMET w_2 would refer to the phenomena in respect of which the last DANMET was issued.

For example, if DANMET message has been issued in respect of 'wind' and, later, another DANMET message in respect of 'Sand or duststorm,' and if, after some time, wind force drops to 5 or less but visibility continues to remain less than 1,000 metres, a IMPMET message is not issued in respect

of either 'sand or duststorm' or 'wind' but merely a fresh DANMET message in respect of 'visibility'; an IMPMET message for visibility is issued finally when the visibility improves to greater than 2,000 metres.

So long as conditions at a station are dangerous in one form or another, only DANMET messages are issued from there and no IMPMET messages.

(g) Weather Notice Boards.

43. "Weather Notice Boards" for exhibition of all available weather information at aerodromes are supplied by the Meteorological Department to be fixed in a prominent position, readily accessible to airmen, preferably where they invariably pass on their way to or from their machines. These are erected on the aerodromes at Drigh Road (Karachi), Jodhpur, New Delhi, Bamrauli (Allahabad), Dum Dum (Calcutta), Akyab and Mingaladon (Rangoon). Excepting at Drigh Road and Jodhpur where the entire responsibility will rest with the meteorological staff, aerodrome staff will be responsible at all the other places mentioned above for arrangements for the timely reception and prompt exhibition of information on these notice boards. Similar notice boards are also maintained by the meteorological staff at the meteorological offices at Karachi and Alipore (Calcutta) and at the observatory at Chatham Lines, Allahabad.

44. The reports contained in MET, SPEMET, DANMET and IMPMET as well as QBB messages are entered on the form of *Appendix V* and posted on the notice boards. PILOT reports (and RECTIF PILOT if any), are also entered on the form of *Appendix V*. The NEWSMET and STORMET messages (and corresponding RECTIFS if any), are placed as received, or copied, on the form of *Appendix VI*.

45. A summary of the times of wireless distribution of the various kinds of messages on the main trans-India route is given in *Table XII* (page 41).

C. W. B. NORMAND,
Director-General of Observatories.

TABLES AND APPENDICES

TABLE
Forecasting

Forecasting Centre. 1	Karachi. 2	Calcutta. 3
Area of responsibility (See Map).	East Persian Gulf and Mekran coasts, Sind, Rajputana, the Punjab, west United Provinces and north Gujarat.	East United Provinces, Bihar and Orissa, Bengal, Assam, Burma and Bay Islands.
Existing air-routes for which service is regularly afforded.	(1) Bushire-Jask-Karachi. (2) Bahrein-Sharjah-Gwadar-Karachi. (3) Karachi-Jodhpur-Delhi-Allahabad. (4) Karachi-Jodhpur. Jhansi-Allahabad. (5) Karachi-Lahore. (6) Karachi-Ahmedabad.	(1) Allahabad-Calcutta. (2) Calcutta-Rangoon-Victoria Point.† (3) Calcutta-Dacca.
Officer-in-charge of forecasting.	Meteorologist, Karachi.	Meteorologist, Calcutta.
Postal address	Meteorological Office, 8/3, Civil Lines, Victoria Road, Karachi.	Meteorological Office, Alipore, Calcutta.
Telegraphic address	Weather, Karachi.	Weather, Calcutta.
Telephones	5124 5125, with extension.	Office : Regent 410. Residence : Alipore 203.
Office hours, <i>i.e.</i> , hours (I. S. T.) during which information for aviation can be obtained.	Week days—0830-1700 and 1930-2100. Sundays and Holidays—1000-1300 and 1930-2100.	Monday to Friday—0900-1600 and 1800-2000. Saturday—0900-1300 and 1800-2000. Sundays and Holidays—0900-1200 and 1800-2000.
Synoptic charts prepared.	Two synoptic charts ready at 1130 and 2030 I.S.T. respectively. [See paragraph 3 (i)].	Two synoptic charts ready at 1130 and 1930 I.S.T. respectively. [See paragraph 3 (i)]. Special charts during disturbed or suspicious weather in the Bay of Bengal for storm-warning to ships. [See paragraph 3 (ii)].

*As a result of the serious earthquake damage in 1935, the Quetta office has been uncertain. The details given in column 3 refer to the office temporarily

† A very general inference regarding weather conditions over Rangoon-Bangkok.