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Renewed Diagram Paper (Aerogram) for Aerological Sounding Work

by

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According to proposition of the Aerological Commission in Toronto (1947) the IMO decided that a new unit for geopotential ought to be adapted for use in international synoptic work [1, p. 86]. This unit, the geopotential metre, gpm, was defined as being exactly 98 per cent of the dynamic metre which is $= 10\ m^2\ s^{-2}$. In this way, the numeric value of the geopotential will closely agree with the corresponding geometric height in metres. This practical view has been the motive for introducing the new unit. Anyhow, in respect to scientific studies, it can not be an amendment, since we now have one unit more which does not belong to any absolute unit system.

When introducing the gpm in our aerogram paper [2] we also slightly changed the scales of the diagram. The ground network consists of a logarithmic pressure scale as ordinate and a linear temperature scale as abscissa. The height (geopotential) scale is also on the abscissa and the distance of 1° C corresponds to 10 gpm. The proportion of the ordinate and abscissa units is chosen in such a manner that the height-pressure curve for an isothermal atmosphere with 0° C temperature has a sloping of 45°. Then, the absolute scale of temperature is determined so that 1 cm^2 area on the aerogram corresponds to a work of 100 Joules. In this way we have on the aerogram:

$$1°\ C = 1.91\ mm$$
$$\log 10 = 344\ »$$

Further, there are height scales (in gpm) for the following pressure layers of dry air:

1000 — 850	300 — 250
850 — 700	250 — 200
700 — 600	200 — 150
600 — 500	150 — 100
500 — 400	100 — 50
400 — 300	

as well as the corresponding scales to correct these heights for the humidity of the air column.

The other scales are the same as former, only changed to gpm:

1. The distance of 1000 mb level from the barometer level, with the mean virtual temperature of the air column of 0° C.
2. The distance of any two pressure levels with 0° C mean virtual temperature of the air column.
3. A scale for correcting the distances with 0° C virt. temperature to the right mean virt. temperature.
4. Dry adiabats, computed with the exponent 0.2845, and pseudo-adiabats.
5. Virtual temperature corrections in degrees C at 1000 and 500 mb for saturated air.

This aerogram sheet (as appendix in this issue) is mainly intended for radiosounding practice. Therefore the thermodynamic curves therein are very few. — The width of the sheet is the standard A 3, 297 × 420 mm².

On the back side of the sheet is a co-ordinate system for plotting the pressure against the ascending time of the radiosonde [3].

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REFERENCES.

1. OMI, 1948. Conference of Directors, 1947, List of Resolutions. Lausanne.
2. WEICKMANN, L., 1938. Über aerologische Diagrammpapiere, Berlin.
3. RAUNIO, NIILO, Amendments to the Computation of the Radiation Error of the Finnish (Väisälä) Radiosonde. (Geophysica, this issue).