

## Letters To The Editor

518·5 : 551·506·7 : 551·507·3

### AN IMPROVED METHOD OF COMPUTATION OF UPPER AIR DATA FROM F-TYPE RADIOSONDE OBSERVATIONS

The present method of computation of upper air data from the recorded observations of the F-type radiosonde (Venkiteshwaran, Thatte and Keshavamurthy 1948), consists of—(1) Counting the number of 'impulses' recorded on the tape for the different pressure and temperature values and noting the time at which the pressure and temperature signals are received, (2) Plotting these impulses against time on the radiosonde calibration sheets and (3) Reading off the values of temperatures for the standard pressure levels, from both the flight and calibration curves plotted on the same sheet.

On these sheets, one small division represents two impulses along the ordinate, and 5 millibars or half a degree centigrade along the abscissae. Though the counting of the impulses is free from personal errors, small errors of the order of half a division corresponding to  $\pm 3$  mb and  $\pm 0.3^\circ\text{C}$  can occur during the plotting of calibration and flight curves and in picking out values from these. These errors can be reduced by the use of larger charts, but even by doubling the scale, it was noticed that personal errors of the order of  $\pm 2$  mb and  $\pm 0.2^\circ\text{C}$  occur. A new method has, therefore, been attempted, dispensing with the plotting of the calibration curve and flight curve and thereby eliminating sources of personal errors.

Each radiosonde is calibrated for every 100 millibars for pressure and every 10 degrees centigrade for temperature over the whole range. If it is assumed that the variation with pressure and temperature of the number of impulses between two successive points is

TABLE 1

Pressure level (mb)	Dry bulb temp. ( $^\circ\text{C}$ )		Wet bulb temp. ( $^\circ\text{C}$ )	
	Graphical	Computed	Graphical	Computed
900	21.2	21.0	15.9	15.7
850	19.9	19.7	10.7	10.7
800	15.9	16.1	8.1	7.8
700	5.7	5.8	2.3	2.8
600	-4.1	-4.1		
500	-15.1	-15.1		
400	-26.9	-27.2		
300	-43.3	-43.7		
200	-59.8	-60.4		
100	-58.6	-59.0		

linear, it is not necessary to plot either the calibration curve or flight curve, but the pressure and temperature during flight at any point can be computed directly from the number of impulses recorded. The values can be interpolated quickly on a calculating machine.

Table 1 gives temperatures obtained for the standard levels by both methods, the current and the new, for an ascent taken at Payerne on 28 May 1956 during the international comparison of radiosondes. It will be seen that the final data by both methods agree very well. With a calculating machine the computation can be done quickly, and with suitable counting and printing equipment for the signals the computation may become more or less automatic.

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#### REFERENCE

- Venkiteshwaran, S.P., 1948 *India met. Dep. Thatte, R.P. and Keshavamurthy, A. Sci. Notes*, **9**, 113.