

THE DECCA HYDROGRAPHIC SURVEY CHAIN IN SWEDEN

NOTE BY THE DIRECTING COMMITTEE: *The following remarks regarding the article "Investigations of the Accuracy obtained with the Decca System for Survey in the Southern Baltic" by Hugo Larsson, Swedish Hydrographic Office, Stockholm, which appeared in the International Hydrographic Review, Vol. XXVI, No. 2, November, 1949, have been received from the Decca Navigator Company, London, and are published at their request.*

In the article "Investigation of the Accuracy obtained with the Decca System for Survey in the Southern Baltic" (November 1949 issue of the Review), figure 3 on page 35 bears the caption: "Curve showing Deccometer readings during a rapid change of weather conditions" and on page 26 it is stated: "The interrelation between the phase variations and rain was particularly noticeable when sudden weather changes took place".

A representative of the Decca Navigator Company was present at the Red slave station of the Chain in question when the large pattern-shift co-incident with rain at the slave was first observed, in August 1948, and made several records of monitor readings such as that shown in the curve referred to above. The cause of the shifts observed in 1948 is still not definitely established but the effect is an isolated phenomenon, being apparently confined to the Red slave station of the Swedish Chain. No comparable effect has been observed elsewhere; on the English Chain, for example, the automatic phase correction circuits maintain an extremely high stability of locking in all weathers and no monitoring is carried out beyond routine inspection of the patterns at a Government receiving station and at the Chain headquarters. On the Survey Chain recently deployed in the Persian Gulf, a Standard Deviation of about .005 Lanes was recorded over several complete working days.

In the Spring of this year, Decca engineers carried out an examination in Sweden of the equipment suspected as the source of the rain instability and certain modifications were made by way of insurance against a recurrence of the effect, but no wet weather was forthcoming during their stay and proof could not be established that a cure had been made. The rain effect would not be of practical importance in the Survey work in question owing to the effectiveness of the monitoring service instituted by the Royal Swedish Hydrographic Office, but we must emphasise that any suggestion implicit in the article that pattern-shifts with weather changes are an inherent feature of the Decca System can, in the light of the great volume of observational data available, be positively refuted.

In the same article it is stated (page 32) that "in high-precision air mapping of unknown territories the Decca System seems inefficient with regard to territories of high attenuation as is very often the case in non-cultivated areas, because in these areas it is impossible to control the propagation speed by previously triangulated points...". Where there are sharp changes and discontinuities between soils of low and widely-differing conductivities, or between water and very low-conductivity ground as in Sweden, a relatively high density of ground control would be desirable if the mapping scale were large. A much higher density of control would, of course, be required in a purely visual survey and the advantages of the all-height coverage for fixing and tracking that Decca provides are very great irrespective of the nature of the terrain. It should be noted, however, that high attenuation is not of itself productive of large errors in Decca fixation; in relatively uniform areas such as desert, present knowledge of the phase-velocity/soil conductivity relationship enables corrections of considerable precision to be made in computing the Decca lattices.

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