

POWER SPECTRA OF TRACK ROUGHNESS OBTAINED FROM THE 'APT SURVEY'

In order to design a suspension system for a railway vehicle a pre-requisite is to know something of the type of roughness that the vehicle will encounter. A survey was planned to cover lines over which the Advanced Passenger Train (APT) might run, by use of the TMM1 machine. Twenty-five main-line sites were randomly chosen. Since the number of sites was so limited the results cannot be expected to show extremes of roughness, but should represent average values for main-line conditions.

Power spectra have been calculated for 22 sites. These spectra showed no large discrepancies, and a 'maximum' spectrum was obtained for each of the four co-ordinates of measurement, composed of the maximum values measured at each frequency band in any of the 22 spectra. Analytic expressions have been fitted to the maximum spectra, and can be used instead of the individual data points.

The measured spectra are accurate to within 30% over the range $0.01 < f < 0.325$. Further work is needed on extending the spectra to both lower and higher frequencies, the range of immediate interest being $0.001 < f < 1$ cycle/ft.