GLINT NO. 391
November 6, 1970

NOTE ON MOTOR EFFICIENCY

K.M. Price

In the past there has been speculation on drive motor efficiencies with usual estimates of 80% made. Overlooked, however, was the simple method of using the data on the motor nameplate and a power meter reading to obtain efficiency at rated power. This is computed and tabulated below.

Declination Slew Motor

7.5 hp 1085 rpm 208 volt 22 amp — 89% efficiency at rated power

Power meter reading - 22.0 amp,

6.3 kw, $\therefore$ PF = .80

Hour Angle Slew Motor

5 hp 1800 rpm 208 v 19.6 amp — 78% " "

Power meter reading 18.5 amp,

4.5 kw, $\therefore$ PF = 0.68

Hour Angle Correct Motor

1/3 hp 3450 rpm 200v 1.54 amp

Power meter reading - not taken

Hour Angle Track Motor

1/3 hp 1800 rpm 200v 2.4 amp — 62% " "

Power meter reading 2.2 amp,

0.4 kw, $\therefore$ PF = 0.51

Formulas used:

$$\text{Power factor} = \frac{\text{kw}}{\text{kva}} = \frac{\text{watts recorded by power meter}}{(3)(120)(\text{amps recorded by power meter})}$$

$$\text{Efficiency} = \frac{(\text{rated hp})(746)}{(3)(120)(\text{rated amps})(\text{power factor})}$$