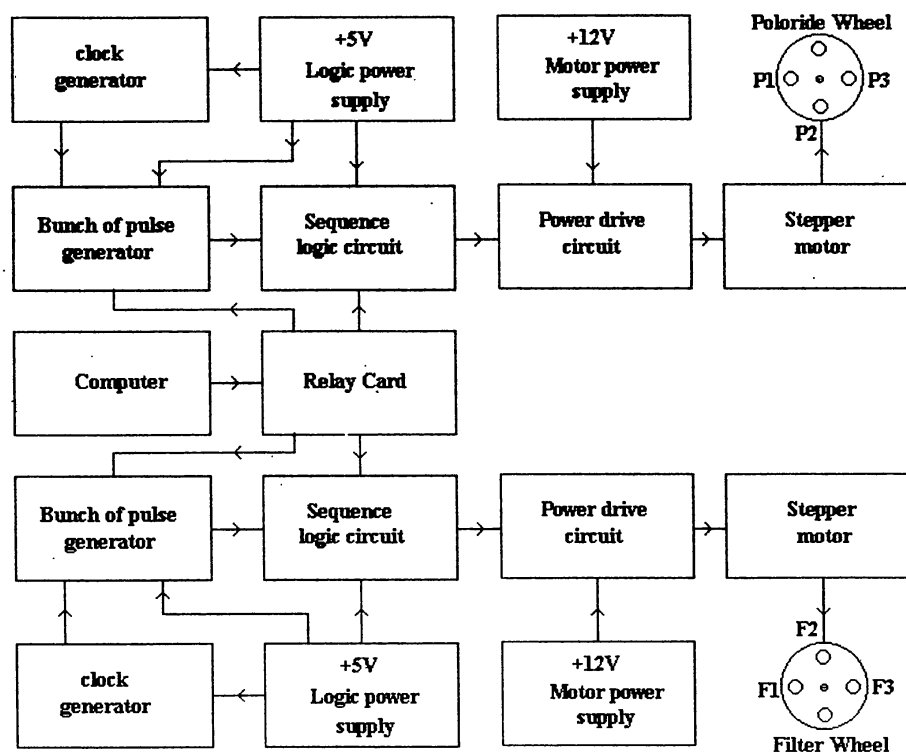


Total solar eclipse polarimeter controller

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For the detection of circum-solar dust ring during total solar eclipse of October 24, 1995 it was planned to obtain the coronal solar image through three filters in different wavelengths. The polarization measurement was aimed at obtaining three images, through three different orientations of polarizing filters, thus making seven combinations of filter and polaroids in front of the objective lens. In order to achieve this objective, we proposed designing filter and polaroid wheel controller which could rotate and position the two wheels holding the filters and polaroids at certain angle. Since the total duration during eclipse at Kalpi (UP) was estimated to be approximately one minute, we needed a controller to achieve fast change over of filters



Block diagram of polarimeter controller

and polaroids. Therefore, we designed a computer controlled system that can rotate the polaroid and filter wheels sequentially according to the requirement. We selected stepper motors due to their precise movement, holding torque and instant directional reverse capability through a computer. Accordingly, we developed a stepper motor controller circuit using locally available components. This controller uses a relay card which gives the signal to pulse bunch circuit. The bunch circuit produces desired number of pulses which are then fed to the sequential logic and drive circuit to rotate the stepper motor in desired angles.

The instrument was successfully operated during the total solar eclipse of 24th October 1995 at Kalpi (UP). During the totality period of approximately 1 minute, all the seven required sequence of polaroid and filter wheel movements were performed. Further use of this instrument e.g. scanning in x-y plane is also possible with minor modifications.