network (PFN). Inside the control room the desired sweep starting times, sweep lengths, and fiducial times are set on all the oscilloscopes. The sweep starts are delayed to allow for explosive burn time and the shock wave time through the inert materials of the experimental apparatus. A typical sweep length is about 6 μsec with the two fiducial pulses placed about 3 μsec apart. The pin pulses will occur between the two fiducials if the shot is correctly timed. Next, glass photographic plates are loaded into the cameras attached to the oscilloscopes and numbered. The calibration trace, which consists of timing markers on the sweep trace, is recorded on the film for each oscilloscope. Then the explosive charge is detonated and as the plane shock wave traverses the assembly, the pins are shorted producing pulses which are recorded on a different portion of the photographic plates. The two fiducial signals also appear with the pin pulses on the trace. In addition, eight raster type oscilloscopes record the firing pulse sent to the detonator as well as the two fiducials; 1/2 μsec timing markers are also recorded on the 100 μsec long raster sweeps. An enlargement of a typical pin signal record and a raster record are presented in Fig. 12.

The next step is to measure the signal times after the film records are developed. Utilizing the known time between timing markers (1/2 μsec) on each record, the time of each pin pulse is measured relative to the fiducials on a precision comparator while the fiducial times are measured from the raster records. These pin times represent the arrival time of the shock wave except for a small closure time assumed to be the same for each pin. This assumption is accurate to 7 nsec. The times are paired with the proper