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# THE TARGET MONITOR SYSTEM OF THE CPS.

A system of Čerenkov counters has been built around the PS machine for a reliable indication and observation of high energy secondary particle bursts produced from target-proton-beam interactions.

## 1. Monitors.

After a burst-shape comparison between Čerenkov and scintillation counters, Čerenkov counters were chosen as the target monitor instrument. The scintillators in comparison with the Čerenkov counters showed a tail at the end of the burst shape. This tail was possibly due to low energy radiation.

Each counter consists of a RCA-6810-A tube with a voltage divider arrangement, which has been developed by the von Dardel Group. (see fig. 1)

The radiator and light guide is a lucite tube of 2 cm diameter and 20 cm long. The housing is a CERN standard one with an iron shielding and an inner tube μ-metal.

## 2. Monitor positions in the PS ring.*

The distance and the angle under which the monitor is looking to the target has an influence on the high energy burst indication.

A comparison of the burst shapes was made between counters placed behind the main concrete shielding in several high energy analysed beams and the target monitor in the ring, all observing the (integrated) burst shape from the same target.

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* Thanks are due to M.G.N. Hine for his help and advice during these studies.

The burst shapes were compared :

a at different target-monitor angles; the effect of changing the angle of the counter axis was not detectable at a distance more than $\sim$ 35 cm from the vacuum chamber; nearer the chamber the burst shape from the target monitor was not reliable.

b at different target-monitor distances; the burst shape from the target monitor showed differences in shape with the counters behind the shielding (which were identical) at distances nearer than 30 cm to the target; there was also found that the burst-output did not change with $1/r^2$.

c at different operating conditions target beam, at different beam intensities and at a reasonable distance from target and vacuum chamber (see a and b), the burst shapes were reliable, especially if the output voltage of the counter was kept to 0,1 and 0,05 V.

A convenient counter position with a reliable burst-shape indication and without detectable background radiation was finally found on the downstream side of the magnets above the target concerned (see fig.2).

Six standard counters have been placed on the magnets 1, 4, 5, 11, 60 and 100. For practical observing reasons one counter has been fixed against the inner concrete wall in the ring near magnet 2, looking at burst shapes from targets in s.s. 1 and 2.

3. M.C.R. facilities.

A counter high voltage and signal cable network has been made in the PS ring in such a way that all magnets can be reached. The highest cable concentration is in the South Target Area.

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Eight high voltage and signal cables (75Ω) are connected via a junction box in the ring with the M.C.R..

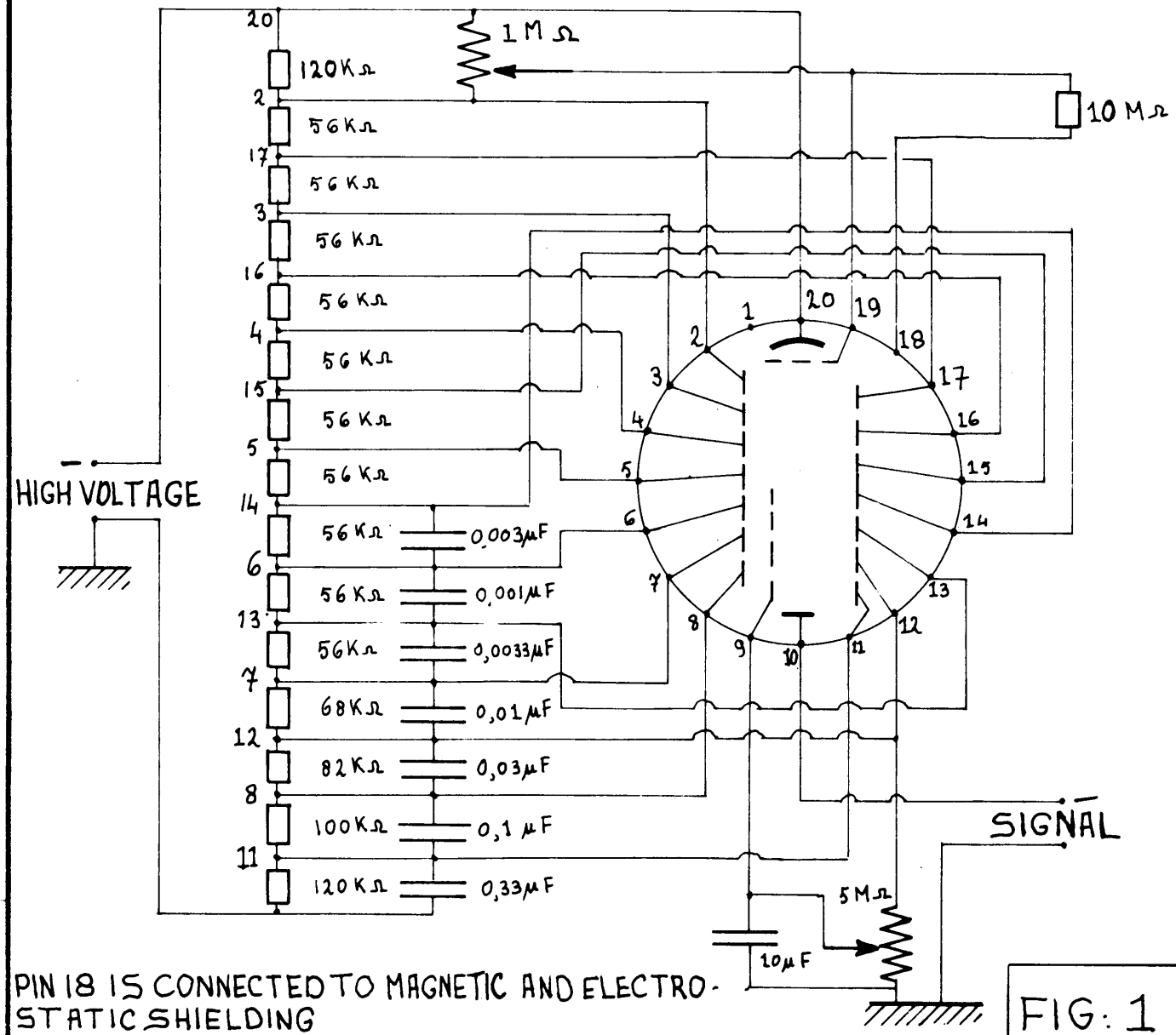
With a double 8 channel high voltage selector and two Oltronix high voltage supplies the burst shapes of two counters can be observed at the same time.

The counter signals are fed into the scope selector via a termination selector (75Ω, 2 kΩ, 10 kΩ, 0,2 μF and 2 μF), which makes it possible to observe integrated burst shapes.

M. van ROOY.
Th. SLUYTERS.

Distribution : (open)

MPS Scientific Staff
Ch. Brooks
M.G.N. Hine
J.J. Merminod




PIN 18 IS CONNECTED TO MAGNETIC AND ELECTRO-STATIC SHIELDING

FIG: 1

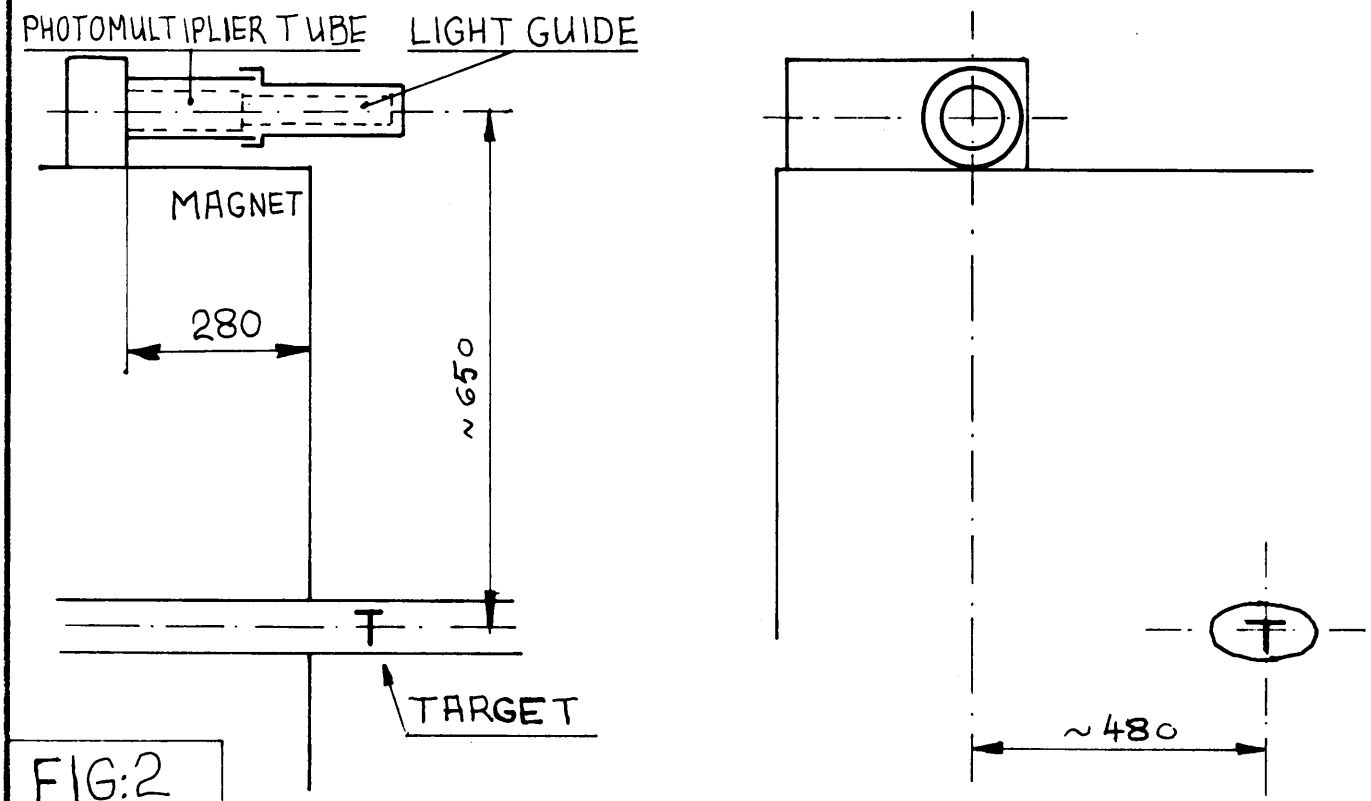



FIG:2