

Mr M. Snower

Precision C.R.T. device for Track Analysis

The state of development of this apparatus was described in the introduction of the proposal by J. Burren and J. MacEwan (10.2.65). For its adaptation to measure spark chamber film a 35μ diameter spot would be used to scan in the γ -direction. Hydraulic drive for the present stage would be digitised using a grating with a 2.5μ pitch to give the X-coordinates. The preferred film format would have all the spark chamber plates lying along the γ direction. A 35mm perforated film gate and transport system giving frame by frame advance would be used. The output digitisings would be handled by specially developed circuits to allow direct connection to the DDP224 without the use of a buffer core. An additional 8000 word store for the DDP224 would however be required to deal with the computation needed during on-line operation.

1. Output

Assuming 35mm perforated film and a frame length of 37.5mm then a complete scan can be made in 1.5 secs. Allowing for film wind-on time and labelling data a total frame to frame time of 4 secs. should be possible. This gives a rate of 900 events/hour, which is similar to rates already in operation at C.E.R.N. on HPD and Luciole.

2. Costs

The approximate costs of the extra components needed for completion of this apparatus to meet the above requirements are listed below.

Mechanical

Coil Mounts	..	..	..	..	..	£500
Film Gate	..	..	..	..	..	£500
Film Transport	..	..	..	..	..	£1,000
Stage Motion	..	..	..	..	..	£250
						£2,250

Electronics

Film Transport Electronics	..	..	..	..	..	£500
Fast Counter	..	..	..	..	..	£500
Register etc.	..	..	..	..	..	£250
Control of Data	..	..	..	..	..	£250
D.D.P. interrupts	..	..	..	..	..	£1,500
Track Centre Circuits	..	..	..	..	..	£300
H.T. Set	..	..	..	..	..	£500
Power Supply	..	..	..	..	..	£300
Filter Circuits etc.	..	..	..	..	..	£500
Coils	..	..	..	..	..	£600
						£5,200
Total						£7,450

In addition to Rutherford Laboratory effort contract staff would be used for most of the electronics. The hire cost would be approximately

£750

To these sums should be added the cost of the existing apparatus which would have to be replaced if development work is to continue.

This amounts to:

Mechanical

Drawing and manufacture £3,075

Optics

Lenses and gratings £730

Electronics

Power supplies, amplifiers, transistor switches, etc. £1,575

CRT

Tube and coils £350

Contract Effort

Wireman £640

£6,370

Total £14,570

3. Effort

The time scale for making the additional parts and bringing the machine into operation depends on the effort made available. The Track Analysis Section is involved in the following programme at present:

1. Completion and commissioning of HPD.
2. Completion and commissioning of the Rough Digitiser Table, initially with the R.H.E.L. Digitiser and subsequently with the Dobbie McInnes Digitiser.
3. Completion of Modifications to National and Duff Measuring Machines and Scanning Machines.
4. Commissioning of the DDP224 and its testing for ON LINE experiments.
5. Development of new precision measuring devices.

Only one full-time E.O. has been engaged on 5. with part-time help mainly from Dip. Tech. Sandwich Course students.

A reasonable team to put on this project would consist of three scientific and two design staff. At present we can use one scientific full time and one part time and have the part-time effort of one design

staff. On this scale the work will take at least 12 months to complete. With the additional staff and ancillary assistance it would be reasonable to expect the system to be working by the end of this year.

M. Snowden

Bubble Chamber Group,
Rutherford Laboratory

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Distribution: Mr. J. Burren
Mr. D. Lord
Mr. J. MacEwan
Mr. R. Lewes
Mr. J. Down
Mr. J. Forbes