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Memorandum
to Messrs ~~German~~ P. German Home & Stanley
from G.L.H.

Subject: REMARKS ON THE LETTER OF INTENT : P.H.I./G.M. 43/68
SUPERCONDUCTING RF SEPARATOR

The difficulties arise from the proposal for a "test beam" with single cavity separation. The likely time scale for a two-cavity beam would seem on the surface to coincide with the ^{and} extensive use of the West Hall & a more complex beam for the Omega project.

The following remarks apply only to the problems arising in the experimental ^{area} and to the provision of beam transport. It is assumed that the time required to build up the installation or test it would be of the order of 6 months (Schoppin private discussion)

- 1) ~~As~~ It is noted in the letter of intent, that the South Hall is excluded and that it is almost essential to use an ejected proton beam. Installation of the test cavity in a beam is planned for the end 1970 to summer 1971; hence the West Hall must be excluded. Only the East Hall is available for consideration.
- 2) There seems no a priori reason why a beam including a RF cavity should not be installed from a target from a slow ejected beam of type e_3 or e_5 .
- 3) At this stage there is no detailed RF beam design available nor can one make any guess on the beam requirements of the experiments to take place during the end of 1970 and during 1971. Tentatively one must assume that the RF beam plus the space necessary for the refrigerator unit, which can only be some metres away from the cavity, will require ^{the} a sacrifice of at least one of the existing ^(or future) beams and the associated experiment

of the space used by

5

It is not obvious that one should spend money on beam transport elements which are of mostly ^{little} use for slow or very low momentum ~~beam~~ beam.

4) Availability of beam transport

In the budget estimations and revisions that have been made recently it has been assumed that ^{to a first approximation} no additional (to a first approximation) beam transport will be ordered for the present experimental halls.

The B.F. beam as it is ^{tentatively} now conceived would need three magnets (one metre) and 4 lenses (standard 30 cm or 50 cm length).

The lenses at present are concentrated ^{mainly} in the k beams:
k11 for the HBC, by 1971; ^{elements may be used for} this beam is to be converted to G₂/k₁₃ for Gargamelle. (No firm decision yet.)

k10 for the 80 cm HBC; the future after mid 1971 for the chamber is unknown.

k8 for the 2 m HBC which is one of the three beams for the chamber. A long term future is likely.

Power supplies in the east area have been ~~These beams are all controlled by the TCS.~~

set up with high energy beams in mind & the use of a combination of small lenses could be seen

We see here either a problem of programming or of budget. One can see

beam such as suggested in the ^{letter} ~~proposals~~ may well use the available supplies and ^{more easily}

G.L. Munday

All these points, although they cannot be precisely evaluated at this stage, look rather difficult

→ 5)

As a result of the above considerations of the above points & it seemed worth while asking to what extent one might ~~minimise~~ minimise the effects on the P.S. Physics programme.

The beam as tentatively conceived in the drawing & outlined under the heading of in table 2 would appear to be ^{good enough} ~~concluded~~ for a physics experiment. At this stage I would ~~abandon~~ ^{followed by} the idea of a test ~~flow~~ a physics experiment. In what was unfortunately only a brief discussion with Yüngst & C. German this idea did not seem unacceptable although there seemed to be a misconception that a "quiet corner" might be found for a genuine test beam.

In order to get further opinion on the need for ^{the} test of the R.F. cavity ~~the extent of these tests~~ I have had a number of informal talks with B. Lumbaque, B. P. Wilson, H. Lengeler & P. Bernard (who in turn discussed the matter with P. Laperas) & J. Seibel. ^{result} ~~these~~ ~~remarks~~

these talks I will try to summarise below. There was a strong feeling ~~that~~ from the side of those expert in R.F. separators that considerable confidence in the cavity as a separator could be obtained from

laboratory tests but that finally one ⁽⁴⁾ would want to make tests under full operational conditions ~~say~~ in a beam. Both Lazepas & Ziebel ^{concluded} independently that ~~in~~ a beam might give satisfactory test results with two magnets & seven lenses & that ^{proposed} acceptance could be reduced. It was also ^{thought} conceivable that one ^{might} make such lenses as might be made ~~early available~~ ^{somewhat more easily} available with a minimum disorganisation to the physics programme rather than the ones that I ^{might be thought} have suggested as the optimum.

A further point ~~has~~ which I have not been able to follow ^{up} yet but may be worth looking into is ~~the~~ the following:

The time ^{taken to} of assembly of the cavity plus its R.F. system & "Cold Box" should not be taken from experimental of the physics programme. Hence, can one imagine that ^{combination of parts made as} this ~~could be done in~~ a unit construction ~~or so~~ be lifted in to the beam by some ready for ~~simply~~ ~~lifted in with a crane~~ ~~comparing up to the compressors etc.~~ This would imply that the whole device had been assembled & tested in an assembly hall. This ~~would~~ ^{obviously} cause delay in ~~testing~~ ^{beam test} although this might delay be a sensible procedure if CERN is to provide the refrigerator.

These are only a few
preliminary points, but until
some policy decisions are made
(eg. CERN providing the refrigerator)
the questions of detail are best
left for further study!

~~copy~~ Prof. Schopp