Initial H.E.P. Programme for Nimrod - Notes for Experiments Committee from Standpoint of Machine Operations

1. When Nimrod is fully operational the Experiments Committee will be given detailed comments on the proposals submitted to them, comments which will show, for example, to what extent the experimental requirements can be met by the Nimrod facility, and if any machine development is needed, and which will also include an outline of one or more possible operating schedules. For this first meeting however, when Nimrod is still in a very early commissioning phase, it is not really possible to make a sophisticated analysis although some important general observations can be made.

2. An outline of the current commissioning programme and a statement on the recommended scheduling policy to about the end of 1964 is attached as Appendix I.

3. The first serious attempts at H.E.P. data taking will be possible when the simplest targetting techniques are established with flat-top times up to some 100 msec. and a beam intensity around 10^{11} p.p.p. The necessary commissioning work is planned for completion by December, 1963 on what must be recognised as a very tight schedule. At this stage the running of more than one experiment during the same beam run is most likely to be by consecutive pulse working. There is no true parasiting in this kind of operation but a particular user may well be defined as the main one whose needs control the run.

4. Extension of flat-top time, development of more versatile targetting techniques such as flat-top sharing, commissioning of the external proton beam and the raising of circulating beam intensity towards 10^{12} p.p.p. are all expected by about mid-1964.

5. All the H.E.P. experiments proposed as at the end of August, 1963, can run under the conditions described at 3 with the reservation that the two proposals calling for a beam intensity exceeding 10^{11} p.p.p. may be in difficulty. (The AERE/Southampton/UCL proposal (P3) needs 200 hrs. at 4.10^{11} and full repetition rate and AERE/Birmingham/Bristol proposal (N1) needs 300 hrs. (100 hrs./energy) at 2.10^{11} p.p.p. and 1 pulse/5 secs.)

6. Scheduling problems do not discriminate against any proposal. Several alternative schedules are possible which by appropriate grouping and pulse sharing would allow all the experiments to be accommodated. Moreover it is almost certain that this first phase of H.E.P. use will be a shakedown period dominated by frequent changes arising from machine and user needs, thus making rigorous scheduling somewhat unrealistic.

7. With the exception of the bubble chamber proposal (K1 beam) there are sufficient beams components for all the proposals provided some power supply re-connection is accepted - power supplies for 80% of the proposed beam lines should be available by February, 1964.

8. The K1 beam cannot possibly be set up before the end of March, 1964 due to unavailability of some of the necessary quadrupoles and steel shielding.

9. If for any reason it is not possible to get all the beams components and experimental equipment installed by December, 1963 it is clearly advisable to give priority to some small number so as to define worthwhile objectives and to create as soon as possible a definite demand on the machine.

10. To economise in effort, the targetting commissioning experiments mentioned at 3 have been planned to utilise the targets, target monitors and possibly some other components of two of the proposed beams. The particular beams selected are the AERE/QMC, (P2), and the RHEL, (N1), and were chosen

because (i) they will allow the comparison of spill structure in a high momentum channel (P2) with that in a low momentum one (π1), so providing a valuable check on the reliability of the observations and (ii) each group has members who are based on the Rutherford Laboratory and who will be collaborating in the targetting studies, thus ensuring that these important experiments will be completed as soon as possible. While these points have no bearing on the scientific merits of the experiments associated with these beams, they may possibly assist the committee in its selection.

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10th September, 1963.

Appendix I

Outline of Nimrod Commissioning and Recommended Scheduling Policy to December, 1964

A programme outlining the main commissioning work is attached. It must be emphasised that the schedule is extremely tight, particularly up to the end of 1963.

Machine scheduling can be divided naturally into 3 phases; phase A lasts until about the end of 1963; phase B from then until about mid-1964, followed by phase C. We must be prepared for the possibility that these dates will slip.

Phase A. Scheduling is determined by the needs of machine commissioning with as much running for H.E.P. as is compatible with this. There is a full awareness that not only is it important to do some H.E.P. as soon as possible for its own sake and that of the physicists concerned, but also that this is essential for proper training and orientation of the machine groups.

Phase B. Scheduling on a longer term basis than in phase A with comparable emphasis on H.E.P. and machine needs, and special attention to the extracted proton beam. Over the whole period we may anticipate splitting available beam time about equally between machine and H.E.P. A flexible attitude will be needed during what will be an important shakedown period for most users with frequent need for changes in plan at short notice. It is hoped that both users and machine groups will be able to give and take according to the state of their equipment so as to make full use of available beam time.

Phase C. Defined as beginning when it becomes possible to schedule all beam time with good assurance of the schedule being followed. It is likely that during the initial part of Phase C about 25% of the available beam time will be required for machine studies; this time would not necessarily be best taken in equal periods each week - longer continuous runs might be preferable. It is expected that the needs of machine studies will be met in the long term by about 10% of available beam time.

It has been estimated previously that the beam time available for H.E.P. during 1964 will be roughly as follows:

January - March, 1964	30 hours/week
April - June, 1964	60 hours/week
June onwards	100 hours/week

These running hours should be regarded as averages; some longer periods of continuous running will be possible.

Present experience suggests that these estimates are reasonable as far as machine potential is concerned, but to actually achieve more than about 70 hours/week total beam time (giving roughly 35 hrs. H.E.P. beam time during phase B) immediate action is needed to increase the Operations group effort available. Consideration has also to be given to the considerable increase in electricity maximum demand charge which arises from running during peak demand periods in the four winter months.

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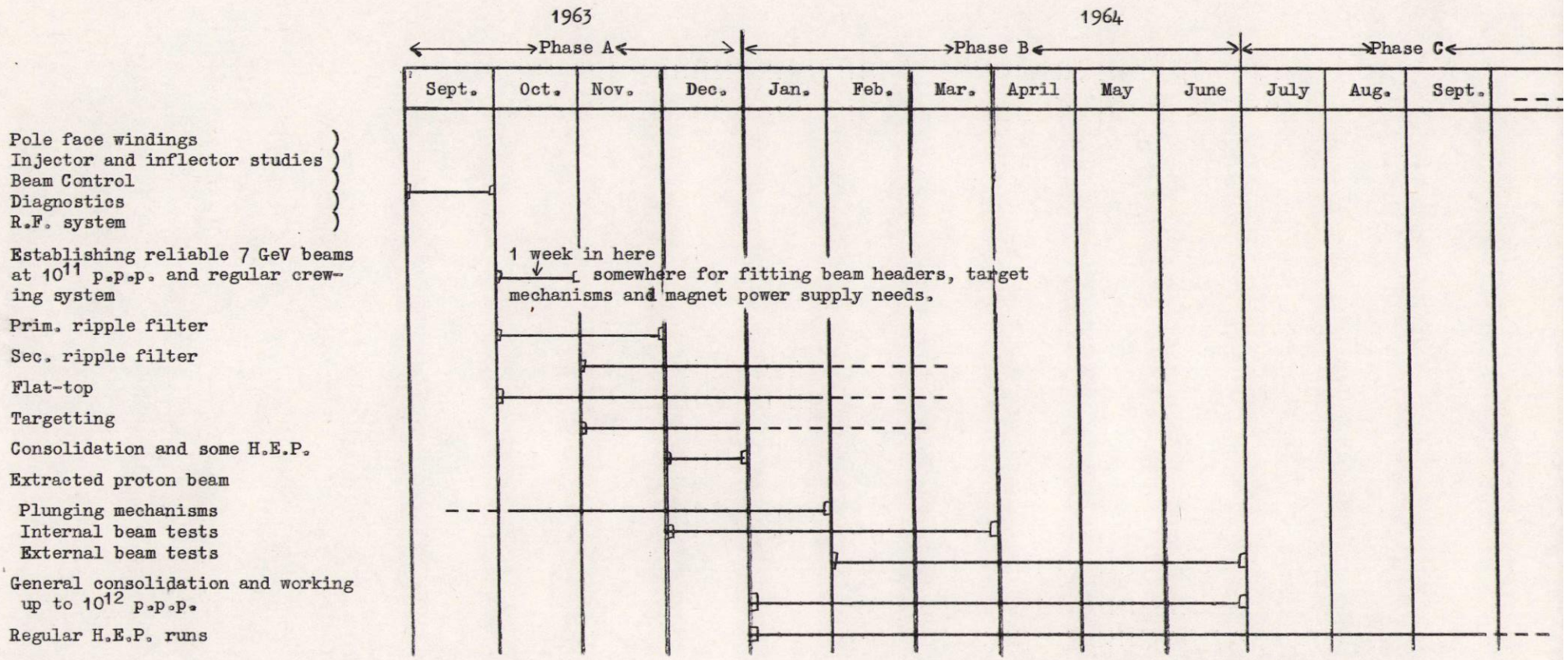

Main items of work only are listed above and terminal dates are approximate. Preparation will begin before commencement times and development is likely to proceed beyond end points shown.