

2nd May, 1960.

G.P.C.
NI/GP/60/21

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

GENERAL PURPOSES COMMITTEE

MULTIPLE CORRELATION RECORDING EQUIPMENT

Note by the Secretary

1. In many of the experiments that are planned on the proton linear accelerator (for example, experiments of the type A(p, 2p B) a great saving in accelerator time can be achieved if the results are recorded in some manner which enables them to be examined in detail later. This saving in time can be very great, up to a factor of thousands, so that without this technique many important experiments become impracticable. Similarly, this method of information storage will be of very great use for experiments on Nimrod and any other high intensity accelerators that may be developed in the future.

2. A multiple correlation recorder is under development by an industrial firm (Plessey Nucleonics Ltd.) to the designs of the AERE Electronics Division for use in experiments where the correlation in time and magnitude between signals from up to six instruments will be analysed in detail. The apparatus will convert the signals into binary code messages on parallel tracks on a magnetic tape. It will re-play the information as required in various forms and at speeds suited to whatever analysing equipment is used.

In complicated experiments the recorded information can be played back many times, a different analysis being performed each time. Two single channel analysers which are incorporated can be used to select different parts of the information on each play-back.

The equipment is novel in the great variety of applications for which it can be used. The storage of information can be varied from 2 to 38 "bits" per event so that, for example, two parameters in each event may be stored with 0.1% accuracy and two others with 0.2% accuracy. The temporary storage may be used to space out irregularly occurring signals to suit the analysing time of a "kicksorter".

3. The placing of the development contract with Plessey Nucleonics was authorised in July 1959 at an estimated cost of £16,000. The choice of firm was approved through the appropriate AEA channels after due consideration. In view of the great interest to both the AEA and the NIRNS it was agreed to share the cost equally; that is to say, the NIRNS share of the contract was estimated at £8,000. At least one model produced under the development contract will be supplied to the NIRNS.
4. The development has involved more difficulty than was expected, and the estimated cost of the contract has now risen to £27,000. On a 50:50 basis as before, the NIRNS share would therefore be £13,500 and it therefore becomes necessary to ask the approval of the G.P.C. before proceeding.

For completeness it should be added that some expense within the AERE electronics division would also be involved. The due share (estimated at £5,000) of this would be charged automatically to the NIRNS under the standing accounting arrangements.

5. Notwithstanding the increased estimate, it is submitted that the development is well worth the increased cost, and the Committee's approval is requested for the continuation of this development, involving NIRNS expenditure not exceeding £15,000 under the contract (plus £5,000 within AERE). Simultaneously, the approval of the appropriate AEA body is being requested by the AEA sponsors, for their half of the cost.
6. In NI/GP/60/22 approval is sought for a 1024 channel Pulse Amplitude Analyser which will be used in conjunction with the Multiple Correlation Recording Equipment. It is considered that these two items should be judged separately as each can be used without the other albeit with much less effectiveness.