

MARK IV REDESIGN COMMITTEE
MINUTES OF MEETING NO. 11
January 21, 1960

In attendance: F. Adams, B. Bunker, A. Crabtree, P. Edwards, D. Goerz,
G. Loew, O. Krause, R. B. Neal, V. Prosper, P. Zinder.

The minutes for Meeting No. 10 were distributed and accepted as written. It was noted we are approximately 5 days ahead of schedule, since we are presently testing the new $2\pi/3$ mode accelerator in position, thanks to the cooperation of all people concerned.

Discussion

Among the items discussed at the meeting were:

1. The feasibility of retaining the center cavity when the accelerator section is modified in the near future. It was proposed to modify the present $2\pi/3$ section for hard solder in order to be compatible with the new vacuum system and not consider using the new modulator in the scheduled April change-over. The new solder was used in this accelerator section consisting of 95% tin and 5% silver. It appears that the shear strength is low, therefore more testing will be required before it will be acceptable.
2. The merits of using a 20 litre per second ionic pump for each of the window sections and upper klystron waveguide sections.
3. The feasibility of incorporating a leak detection system in the conversion of Mark IV. Various possibilities were discussed with the representatives from CEC. The following criteria were used in a choice of this system:
 - a. The time constant should not exceed 1-2 seconds for most effective leak testing.
 - b. The system chosen should be capable of adaptation to a poor man's mass spectrometer at a future date.
 - c. Electronic packaging should be portable to provide leak detection at several locations.

Proposal

To provide a package of electronics which can be used with one or more mass spectrometers. The mass spectrometers should be integral to the accelerator during operation. However, this unit may be moved. A problem involved in moving the unit is the additional collection of dirt on the Diatron

which may cause burn-out of the filament. The preamplifier will be connected by a long cable to the amplifier, such that the preamplifier, which includes the electrometer tube, is in close proximity with the Diatron.

Recommendation

It is recommended that a leak detection section be purchased and necessary arrangements be made in construction to permit use without disturbing the high vacuum in the system. The following items will be required for this:

Leak Detection

<u>Amount</u>	<u>Item</u>	<u>Number</u>	<u>Cost</u>
1 each	Diatron 4 (mass 4-He)	38762	\$425.00
1 each	Diatron envelope	39345	132.00
1 each	Magnet, 2,250 gauss	39049	48.00
1 each	Amplifier	60095	195.00
1 each	Adapter flange		25.00
1 each	Repackaged electronics unit	24-210AMA	<u>2,600.00</u>
TOTAL -			\$3,425.00
(Special, not required, a Phillips gauge electronics unit -			\$ 225.00)

Scanning Unit (Poor man's mass spectrometer)

<u>Amount</u>	<u>Item</u>	<u>Number</u>	<u>Cost</u>
1 each	Diatron 20 (up to mass 80 variable)	18678	\$ 960.00
1 each	Diatron envelope	39345	132.00
1 each	3900 gauss-magnet	45844	144.00
1 each	Amplifier	60095	195.00
1 each	Adapter flange		25.00
1 each	Adapter plug		10.00
1 each	Repackaged electronics unit, with scanning provision	24-210AMA	<u>3,100.00</u>
TOTAL -			\$4,466.00

This system will be connected in any one of four possible places located on the waveguide pump-out. The system can be roughed by the low vacuum system. However, it can be completely removed without affecting the high vacuum system. The location is as close as practical to possible leaks. Ultimate sensitivity is 1×10^{-11} millimeters of mercury helium partial pressure. The vacuum gauge to provide protection is located at the other end of a short waveguide pump-out.

Decisions

1. To continue with the present plans and schedules with a target date of 1 April for Mark IV shutdown for the changeover with no major changes in the present plans as outlined to date. The system, insofar as possible, will be compatible with future modifications.
2. That we proceed with tests on the experimental waveguide valve.
3. That we use a manifold system for the klystrons in the upstairs section.