

M-145

MINUTES OF PROJECT M MEETING NO. 28

Date: December 5, 1958.

Place: Room 27, Microwave Laboratory.

Present: Barber, Chu, Conner, Dedrick, De Staebler, Friedman, Ginzton, Goern, Helm, Jones, Lebacqz, Mallory, Meloni, Mozley, Neal, Olson, Panofsky, Pindar, Richter, Turner, Wadensweiler, Walling.

Next Meeting: December 19, 1958, at 4:10, same place.

Kirk being inexcusably ailing, the undersigned substituted as the inaccurate rapporteur.

I. Report of Project Status

Nothing new. Hope continues abundantly.

II. Reports from the Subcommittees

Ginzton called for general remarks on what the subcommittees are doing. He indicated that, while the staff hasn't much time to give to M matters, it's a good idea to have committees to focus on the various M topics and to provide as good answers as are possible concerning them. Some committees, such as that on Klystrons, represent development work actually going on, whereas there is a question how much time others, like Power and Instrumentation, should spend on details now.

Klystron. Lebacqz chid the audience for not having commented on the tentative M klystron specifications his committee sent out, dated November 6 and 10. They want comments on questions of gain, permanent magnets, etc. Panofsky assured him that the Specifications Committee is worrying about many of these matters now, but is not ready to publish. At the moment, there appear to be advantages to using constant voltage and adjusting by cutting out tubes. Neal says the Specs Committee thinks guns (maybe six) along the machine are desirable; hence, constant voltage would be possible. Mozley pointed out that cutting tubes out discounts accelerator length. Lebacqz opined we could get ~ 20 percent power variation with efficient klystron operation with fixed voltage. Mozley said that, no matter how they run the Mark III klystrons up and down, 75-90 kv is about the only change on the magnets in practice. Ginzton is willing to wager that it is better in terms of life and economy to run the tubes up and down than to fix voltage and cut them out. Mozley, however, claims that maintenance of the focusing coil systems is troublesome (water, interlocks, etc.). Panofsky stated that half of the machine demand will be for the highest energy possible at any time, but continued that, since it will be difficult to determine economics and demand now, the question of the magnetics should be looked at chiefly from the operating point of view.

End Station. Mozley reports the committee is looking into the kinematics of several experiments. They are talking of target areas 300' x 100'

and 500' x 100'. Friedman thinks electron-proton scattering at certain angles is possible without excessive shielding. The committee favors beam splitting for some work. He reported other ideas from the committee, which I did not comprehend and hence deem not important. Mozley warns that if machine use were enhanced by such means as beam splitting, we would employ more physicists (cum all that goes with them) than we were reconciled to -- shades of Brobeck. Jones unsuccessfully tried to pin Mozley down on experimenters' restrictions on live voltage changes. Ginzton requested a written statement from this committee on the energy variation question.

Shielding. Dedrick's committee is reviewing the tunnel radiation calculations, in the hope of discovering that there need be less distance between the tunnels and less dirt on top. He reported also that a new committee will meet at Oak Ridge December 18 to provide big machine operators and dreamers with free help in assessing complicated radiation problems, such as nucleon cascades. Pief and he hope to go to this meeting.

Beam Dynamics. Neal: no meeting yet.

Drive System and Phasing. Neal says this committee is considering such matters as the effect of radiation on the drive line, particularly if the latter is in the accelerator tunnel which seems desirable for temperature control. The committee will make critical reports on each topic in its title at the next Project M meeting. Also, the committee will publish a list of scholarly references on these subjects for interested parties.

Specifications. Ginzton states that the committee has met but has nothing substantial to report. The committee does strongly urge that chairmen of other committees make it s.o.p. to keep written record of what their committees consider and of their decisions pro and con.

Modulators. Turner: nothing to report.

Power. Jones equalled Turner in informativeness.

Instrumentation. Olson says the committee is comparing the Brobeck and Stanford estimates. This is made non-simple by the vacuum system being in our estimate but not in B's. However, the diligent committee overcame this trouble, and otherwise finds B. to be within 15 percent of us. The committee is considering what controls and instruments must report to the Control Room, and is pondering the use of telemetering and streamlining of instruments thereto. Mallory pointed out that Brobeck's vacuum system was \$2.5 million higher than ours, but Ginzton thinks it useless to worry about this before real engineering is applied to this system.

Site (B., G. and T.). Pindar reports the addition of R.H. Moulton to this committee. A search for pre-M-site space for staff is going on in such unlikely spots as Stores and the Old Steam Plant. There is no present need for a committee meeting.