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Symbol: TM-69

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Group Ref: TMG-M33

This document consists of 7 pages
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July 21, 1952

MINUTES OF THE THIRTY-THIRD MEETING OF THE THEORETICAL MEGATON GROUP

18 July 1952

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1. The thirty-third meeting of the TMG convened at 9:00 AM on Friday, 18 July 1952, in the W-Division Conference Room. Those present were:

H. A. Bethe, Chairman	J. C. Mark
W. Bouricius	L. W. Nordheim
A. A. Broyles	W. E. Ogle
K. M. Case	A. Peaslee
E. Cashwell	J. C. Potts
J. J. Devaney	F. Reines
C. Evans	J. R. Reitz
F. Evans	R. D. Richtmyer
D. K. Froman	A. Rosenbluth
G. M. Grover	M. Rosenbluth
M. G. Holloway	R. W. Spence
F. C. Hoyt	P. R. Stein
R. Landshoff	J. L. Tuck
E. Long	S. M. Ulam
C. L. Longmire	G. M. Wing

E. Zadina

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Topics

2. Further Analysis of Matterhorn Burning Calculations
3. Radiation Flow Calculations
4. Mean Free Path Calculations
- 5.
6. Alarm Clock Implosion Calculations
7. Report on Alarm Clock Design
8. Calculations Required for Alarm Clock Design
9. Experimental Program for Upshot

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W.D. Family

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2. Further Analysis of Matterhorn Burning Calculations

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3. Radiation Flow Calculations

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5.

Marshall Rosenbluth reported on the results of the four complete implosion calculations so far carried out on the MANIAC.

[redacted] Some of the results of most significance are summarized in Table II.

Table II

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6. Alarm Clock Implosion Calculations

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7. Report on Alarm Clock Design

Nordheim reported on a preliminary design study of an alarm clock now being carried out by ACF. This tentative design of a deliverable bomb will come within the present Air Force limitations of

weight < 50,000 lbs.
outside diameter < 62.5"
length < 20"

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8. Calculations Required for Alarm Clock Design

The theoretical problems and calculations for final alarm clock design were outlined and discussed by Bethe.

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A problem which has been investigated by Bethe is that of growth of small amplitude waves for variable density (as behind the radiation front). Long waves are unaffected; for short waves k in the expression

$$e^{\sqrt{gk} \cdot t}$$

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becomes $(d \log P/dx)_{\max}$ in place of $1/\lambda$. A complete solution depends on a Schrödinger type eigenvalue problem.

It is highly important that the theory of this be carefully investigated and also that an implosion be carried out with release of the pressure at an appropriate point in time.

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8.4 Problems of Case Design. Minimization of the weight of the case is one of the most important practical problems in the alarm clock program.

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Tests on the behavior of cases are proposed for Upshot.

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9. Experimental Program for Upshot.

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Bethe stated his opinion that such
schemes did not appear at all hopeful.

Frank C. Hoyt

Frank C. Hoyt

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2A - G. Bell
3A - H. A. Bethe
4A - W. Bouricius
5A - N. E. Bradbury
6A - S. W. Burris
7A - B. G. Carlson
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