

AD No. 24 504

ASTIA FILE COPY

MEDICAL ACCELERATOR PROJECT  
Navy Contract Nonr-225(06)  
NR 022 166

STATUS REPORT  
1 September - 30 November 1953

M.L. Report No. 224  
December, 1953



***Microwave Laboratory***  
**STANFORD UNIVERSITY**  
**STANFORD, CALIFORNIA**

**MEDICAL ACCELERATOR PROJECT  
Navy Contract Nonr-225(06)  
NR 022 166**

**STATUS REPORT  
1 September - 30 November 1953**

**M.L. Report No. 224  
December, 1953**

**Prepared by:**

**The Staff of the Microwave Laboratory**

**Approved by:**

**Edward L. Ginzton  
Director  
Microwave Laboratory**

**STAFF**

**Contract Nonr-225(06)**

**1 September 1953 - 30 November 1953**

**Faculty**

**E. L. Ginzton**

**Shops, etc.**

**None**

**Administrative**

**Research Associates**

**Barber, W. C.  
Eldredge, A. L.**

**None**

**Research Assistants**

**x Steele, R. E.**

**x - Partial compensation from this contract for work during the period.**

DEVELOPMENT OF 6 MEV LINEAR ACCELERATOR  
FOR MEDICAL AND RADIOGRAPHICAL APPLICATIONS

Status Report

1 September - 30 November 1953

I. INTRODUCTION

During the three months ending 30 November 1953, the development work on a small, compact accelerator, suitable for medical and industrial applications, has continued, with emphasis on the construction of a complete, small accelerator which will check the operation of the gun and buncher, as well as the feasibility of producing a sealed-off accelerator. The last status report described the injection gun and buncher which will be used with this experimental accelerator. In the following sections of this report the coupler and target of the unit will be described briefly.

It should be reported also that the electroforming techniques which were developed with the aid of this contract have been successfully applied to produce a 5 1/2 foot accelerator section which includes the buncher and uniform section in a single unit. This 5 1/2 foot section will be used in the construction of the "medical accelerator" which is the therapeutic x-ray machine being built for Stanford University Hospital.

II. COUPLER

A coupler, which matches the buncher to conventional rectangular waveguide, has been designed and constructed. The

basic design of the unit is similar to that of the couplers used on the Mark III accelerator. The mechanical construction of the coupler is such that the gun can be fastened on one side and the buncher on the other side by gold diffusion seals. A photograph of the coupler is shown on the left in Fig. 3.

### III. TARGET FOR X-RAY PRODUCTION

A gold target for converting the kinetic energy of the accelerated electron into x-radiation has been designed. The design provides that the primary electrons strike a gold foil which serves as a vacuum seal at the end of the accelerator. The gold foil, which is purposely made thinner than the range of the primary electrons, is backed by an insulated aluminum electrode where the electrons are stopped and their current is measured.



**Fig. 3. Experimental medical accelerator  
coupler body (left);  
Electroformed test section of  
accelerator wave guide (right).**

## STAFF LIST

### W.W. HANSEN LABORATORIES OF PHYSICS

Consisting of

High Energy Physics Laboratory - Microwave Laboratory

1 September - 30 November, 1953

#### FACULTY

Chodorow, Marvin  
Ginzton, E.L., Director  
Microwave Laboratory  
Hofstadter, Robert  
Jaynes, E. T.  
Mozley, R. F.  
Panofsky, W. K. H.  
Director, High Energy  
Physics Laboratory  
Sonkin, Simon

#### RESEARCH ASSOCIATES AND PROJECT ENGINEERS

Auld, B. A.  
Barber, W. C.  
Brown, Karl L.  
Chang, N. C.  
Chang, Street  
Crowe, K. M.  
Debs, R. J.  
Eldredge, A. L.  
Franklin, L. H.  
Hahn, Beat  
Holman, F. S.  
Hsieh, C. L.  
Jasberg, J. H.  
Jones, C. B.  
Knudsen, A. W.  
Kyhl, R. L.  
Mallory, K. B.  
McIntyre, J. A.  
Motz, Hans  
Nalos, E. J.  
Neal, R. B.  
Neilsen, I. R.  
Olson, C. W.  
Shaw, H. J.  
Smars, E. A.  
Susskind, Charles  
Varian, R. H.  
Varian, S. F.  
Williams, W. S. C.

#### RESEARCH ASSISTANTS

Berman, A. I.  
Carlile, R. N.  
Fechter, H. R.

#### RESEARCH ASSISTANTS (Continued)

Fregeau, R. M.  
Friedman, R. M.  
George, Wayland  
Gilbert, Gordon  
Golde, H. P. O.  
Hagerman, D. C.  
Hanson, P. B.  
Heims, S. P.  
Helm, R. H.  
Helmer, J. C.  
Hudson, A. M.  
Janney, D. H.  
Kantz, A. D.  
Loh, Eugene  
Masek, G. E.  
McAllister, R. W.  
Narud, J. A.  
Newton, C. M.  
Otsuka, S. P.  
Reagan, D. D.  
Rustgi, M. L.  
Rogers, E. L.  
SooHoo, R. F.  
Steele, R. E.  
Tautfest, G. W.  
Thon, William  
Van Sciver, W. J.  
Vartanian, P. H.  
Whitehurst, R. N.  
Wilson, K. L.  
Winkler, R. H.

#### ACCELERATOR TECHNICIANS

Bartlett, A. J.  
Combs, L. L.  
Vorkoeper, W. M.

#### ELECTRICIANS AND ELECTRONIC TECHNICIANS

Absker, J. S.  
Buchalter, Harry  
Freise, W. H.  
Honore, P. M.  
James, R. W.  
Jew, A. Y.

#### ELECTRICIANS AND ELECTRONIC TECHNICIANS

Johnston, T. W.  
Johnston, J. J.  
Leeman, R. A.  
Peterson, J. E.  
Roe, E. D.  
Selby, A. H.  
Sherwin, K. H.  
Smith, V. F.  
Steele, D. R.  
Summers, T. O.  
Swank, D. A.  
Volpe, W. J.  
Watts, W. H.  
Wilcoxson, R. H.  
Yingst, L. E.

#### MECHANICIANS

Abreu, P. A.  
Adams, V. I.  
Bauer, William  
Bowman, B. B.  
Boyer, L. D.  
Brennan, J. A.  
Broeder, Robert  
Chambers, B. R.  
Cheney, G. E.  
Coate, W. E.  
Creech, R. A.  
Cummings, R. M.  
Evans, M. E.  
Herzog, W. E.  
Janay, R. C.  
Johnson, C. I.  
Koula, A. F.  
Leitner, R. E.  
Lloyd, D. D.  
Maher, A. T.  
Mansfield, R. S.  
Mayer, H. L.  
Morrill, L. R.  
Picatti, Charles  
Pope, J. A.  
Prosper, V. A.  
Richmond, W. C.  
Rust, J. C.  
Siegner, G. L.

STAFF LIST - Continued

MECHANICIANS (cont.)

Stebbins, Malcolm  
Sundberg, O. E.  
Wayte, J. M.  
Wood, F. R.  
Wood, Joseph  
Wright, E. A.

TUBE TECHNICIANS

Bennett, B. D.  
Ewings, W. C.  
Marshall, E. J.  
McIntosh, V. G.  
Meloni, J. P.  
Messimer, R. C.  
Soderstrom, H. W.  
Stocker, Olga  
Varian, L. D.

DRAFTING

Bunker, F. W.  
Keith, R. F.  
Lee, S. W.  
Marcum, A. I.  
Markrell, R. J.  
Renga, F. L.  
Sinclair, F. E.

LABORATORY ASSISTANTS

Chang, C. K.  
Dodge, W. R.  
Dowdle, H. L.  
Hopson, A. W.  
Johnson, K. W.  
Shah, S. A.  
Smithson, H. W.  
Smithson, H. Wayne  
Thorson, R. D.  
Tocher, Richard D.  
Tocher, W. J.

ADMINISTRATIVE AND GENERAL

Becker, Laurose  
Huettmann, A. D.  
Johnson, D. M.  
Kerr, K. R.  
Markrell, E. M.  
Moore, S. L.  
O'Neill, M. D.  
Pindar, F. V. L.  
Associate Director  
Hansen Laboratories  
Raper, H. J.  
Sandstrom, Elsa  
Spaeth, J. L.  
Taylor, P. J.