

ENTRY NO. 101

March 23, 1984

NAME OF MACHINE .60 inch cyclotron
INSTITUTION University of Washington
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IN CHARGE William G. Weitkamp REPORTED BY William G. Weitkamp

HISTORY AND STATUS

DESIGN, date 1947 Model tests
ENG DESIGN, date 1948
CONSTRUCTION, date 1948
FIRST BEAM, date (or goal) July 1951
MAJOR ALTERATIONS None

COST, ACCELERATOR \$500,000 (1950)
COST, FACILITY, total \$900,000 (1950)
FUNDED BY State of Washington, ONR, U.S. A.E.C.

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS 1 ENGINEERS
TECHNICIANS 1 CRAFTS
GRAD STUDENTS involved during year 0
OPERATED BY Research staff or 1 Operators
OPERATION 40 hr/wk On target 20 hr/wk
TIME DISTR. in house 2 % Outside 98 %
BUDGET, op & dev \$50,000
FUNDED BY Income from user charges

RESEARCH STAFF, not included above

USERS, in house 2 outside 20
GRAD STUDENTS involved during year 1
RESEARCH BUDGET, in house variable
FUNDED BY U.S. D.O.E., National Instit. of Health

MAGNET

POLE FACE, diameter (compact) 1.52 cm, R extraction 63 cm
R injection 1 cm
GAP, min .25 cm, Field kG
min cm, Field kG at 3.6 x 10^5
AVERAGE FIELD at R ext 15 kG Ampere turns
B max/ < B >
NUMBER OF SECTORS { compact - } Spiral, max deg
{ separated - }
SECTOR ANGLE (SSC) - deg
TRIMMING COILS -

CONDUCTOR, material and type copper bar
STORED ENERGY (cryogenic) MJ
POWER: main coils 160 max, kW; current stability 1:10^5
trimming coils max, kW; current stability
WEIGHT: Fe 200 tons; coils 18 tons
COOLING system oil/water
ION ENERGY (bending limit) E/A = q^2/a^2 MEV/amu
(focusing limit) E/A = q/a MEV/amu

ACCELERATION SYSTEM

DEES, number 2 angle 180 deg
BEAM APERTURE 3-10 cm; DC Bias - kV
TUNED by, coarse shorting stubs fine var. capacitor
RF to 11.5 MHz, stable +/-
Orb F to 11.5 MHz
HARMONICS, RF/Orb F, used -
DEE-Gnd, max 110 kV, min gap variable cm
STABILITY, (pk-pk noise)/(pk RF volt) -
ENERGY GAIN, max 250 kV/turn
RF PHASE, stable to +/- deg
RF POWER input, max 125 kW
FREQUENCY MODULATION, rate /s
modulator, type
beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE .5 x 10^5 Torr or mbar
PUMPS, No. Type, Size 1 DPI, MC=7000 20 in.,
MCF 1400, MCF 700

ION SOURCES

Internal PIG Source

INJECTION SYSTEM

conventional

EXTRACTION SYSTEM

Electrostatic deflector-RF combination

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 300 m^2; movable m^2
TARGET STATIONS 3 in 2 rooms
STATIONS served at same time, max
MAG SPECTROGRAPH, type -
COMPUTER model -
OTHER FACILITIES Fast neutron production target and collimator

CHARACTERISTIC BEAMS

Table with columns: PARTICLE, ENERGY (MeV) Goal, Achieved, CURRENT (pμA) Internal, External. Rows for p, d, α.

SECONDARY (part/s)

BEAM PROPERTIES

MEASURED CONDITIONS
PULSE WIDTH RF deg μA of MeV ions
PHASE EXC. max RF deg μA of MeV ions
EXTRACT eff % μA of MeV ions
RESOL ΔE/E % μA of MeV ions
EMITTANCE (π mm. mrad) { axial } μA of MeV
{ rad }

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 2 SOLID STATES PHYSICS
BIOMEDICAL APPLICAT. 98 ISOTOPE PRODUCTIONS

REFERENCES/NOTES

- 1) F.H. Schmidt, G.W. Farwell, J.E. Henderson, T.J. Morgan
2) and J.F. Streib, Rev. Sci. Instrum. 25, 499 (1954)

PLAN VIEW OF FACILITY, COMMENTS, ETC.