ENTRY NO. 119

NAME OF MACHINE 60 inch cyclotron

INSTITUTION University of Washington - Nuclear Physics Laboratory GL-10

ADDRESS Seattle, WA 98195

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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

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 20 hr/wk. On target 5 hr/wk

TIME DISTR. in house 2 %, outside 98 %

BUDGET, op & dev 20,000

FUNDED BY income from user charges

RESEARCH STAFF, not included above

USERS, in house 1 outside

GRAD STUDENTS involved during year 1

RESEARCH BUDGET, in house variable

FUNDED BY U.S. D.O.E., National Inst. of Health

MAGNET

POLE FACE, diameter (compact) 152 cm, R-extraction 63 cm

R injection 1 cm

GAP, min 25 cm, Field kG
max cm, Field kG } at 3.6×10^5 Ampere turns

AVERAGE FIELD at R ext 15 kG

B max/<B>

NUMBER OF SECTORS compact - / separated - Spiral, max deg

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 5×10^5 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 m²; movable m²

TARGET STATIONS 3 in 2 rooms

STATIONS served at same time, max 1

MAG SPECTROGRAPH, type -

COMPUTER model -

OTHER FACILITIES Fast neutron production target and collimator

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
p		11.5	100	1
d		21	150	1
α		42	30	1
SECONDARY			(part/s)	

BEAM PROPERTIES

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

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 2 SOLID STATES PHYSICS

BIOMEDICAL APPLICAT 98 ISOTOPE PRODUCTIONS

REFERENCES/NOTES

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

PLAN VIEW OF FACILITY, COMMENTS, ETC.