ENTRY NO. 101

NAME OF MACHINE 60 inch cyclotron — March 23, 1984

INSTITUTION University of Washington

ADDRESS Seattle, WA 98195 (USA)

TEL (206)543-4080 TELEX

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 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) 152 cm, R extraction 63 cm

R injection 1 cm

GAP, min 25 cm, Field kG
min 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 POWEP 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 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

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	pμ A of	MeV	ions
PHASE EXC. max	RF deg	pμ A of	MeV	ions
EXTRACT eff	%	pμ A of	MeV	ions
RESOL ΔE/E	%	pμ A of	MeV	ions
EMITTANCE (π mm. mrad)	axial / rad	pμ A of	MeV	

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.