ENTRY NO. 83

NAME OF MACHINE Injector Cyclotron

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IN CHARGE Ivan D. Proctor REPORTED BY Ivan D. Proctor

HISTORY AND STATUS

DESIGN, date * Model tests

ENG DESIGN, date

CONSTRUCTION, date 1968

FIRST BEAM, date (or goal) 1969

MAJOR ALTERATIONS None

COST, ACCELERATOR 430K$

COST, FACILITY, total 580K$

FUNDED BY U.S.D.O.E.

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS 1 ENGINEERS

TECHNICIANS 2 CRAFTS

GRAD STUDENTS involved during year

OPERATED BY Research staff or X Operators

OPERATION 10 hr/wk. On target 10 hr./wk

TIME DISTR. in house 90 % Outside 10 %

BUDGET, op & dev

FUNDED BY U.S.D.O.E.

RESEARCH STAFF, not included above

USERS, in house 10 outside 2

GRAD STUDENTS involved during year

RESEARCH BUDGET, in house

FUNDED BY U.S.D.O.E.

MAGNET

POLE FACE, diameter (compact) 82 cm, R extraction 35 cm

R injection cm

GAP, min 5 cm, Field 20 kG
max. ~~min~~ 10 cm, Field 12 kG } at 0.16 x 10^6 Ampere turns

AVERAGE FIELD at R ext 16 kG

B max/ < B > 1.016

NUMBER OF SECTORS { compact 3 / separated } Spiral, max 30 deg

SECTOR ANGLE (SSC) deg

TRIMMING COILS Bump Only

CONDUCTOR, material and type Al (edge cooled)

STORED ENERGY (cryogenic) MJ

POWER: main coils 58 max, kW; current stability 4/10^5

trimming coils max, kW; current stability

WEIGHT: Fe 14 tons; coils 1 tons

COOLING system LCW

ION ENERGY (bending limit) E/A = 15 q^2/a^2 MEV/amu

(focusing limit) E/A = 15 q/a MeV/amu

ACCELERATION SYSTEM

DEES, number 2 - 120 deg

BEAM APERTURE 1.9 cm; DC Bias 1 kV

TUNED by, coarse Strap fine Capicitor

RF 12.5 to 25 mHz, stable ±

Orb F 12.5 to 25 mHz

HARMONICS, RF/Orb F, used 1

DEE—Gnd, max 30 kV, min gap 1 cm

STABILITY, (pk-pk noise)/(pk RF volt) 0.1%

ENERGY GAIN, max 100 kV/turn

RF PHASE, stable to ± deg

RF POWEP input, max 36 kW

FREQUENCY MODULATION, rate /s

modulator, type

beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE 1.5 x 10^{-6} Torr or mbar

PUMPS, No, Type, Size

1500 L/S Turbo

4000 L/S Cryo

ION SOURCES

PIG External

INJECTION SYSTEM

Axial Mirror

EXTRACTION SYSTEM

Electrostatic Channel

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed m²; movable m²

TARGET STATIONS 6 in 2 vaults

STATIONS served at same time, max 1

MAG SPECTROGRAPH, type Enge Split Pole

COMPUTER model Nuclear Data

OTHER FACILITIES Neutron T.O.F. Array, Quadrupole Spectrometer

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
H^-	15	15	75	50
D^-	8	8	25	15
SECONDARY		(part/s)		

BEAM PROPERTIES

	MEASURED		CONDITIONS		
PULSE WIDTH	9 RF deg	8	pμ A of 15 MeV	H^-	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 75 SOLID STATES PHYSICS

BIOMEDICAL APPLICAT ISOTOPE PRODUCTIONS

Applied 25

REFERENCES/NOTES

1) * Cyclotron Corp. Model CNI-15

2)

PLAN VIEW OF FACILITY, COMMENTS, ETC.