

ENTRY No. 122

NAME OF MACHINE W.U. Med School Cyclotron I DATE 5/10/89
INSTITUTION Washington University Medical School, Barnard Hospital
ADDRESS St. Louis, MO 63110 USA
TEL 314-454-3596 TELEX
IN CHARGE J.T. Hood, Director REPORTED BY John T. Hood
MM Ter-Pogossian, Professor of Radiation Sciences

HISTORY AND STATUS

DESIGN, date 1962 Model tests
ENG DESIGN, date 1963
CONSTRUCTION, date 1963-64 Allis-Chalmers
FIRST BEAM, date (or goal) 1964
MAJOR ALTERATIONS

COST, ACCELERATOR \$120,000
COST, FACILITY, total \$190,000
FUNDED BY NIH

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT
SCIENTISTS 2 ENGINEERS 1
TECHNICIANS 2 CRAFTS 2

GRAD STUDENTS involved during year
OPERATED BY Research staff or X Operators
OPERATION hr/wk, On target hr/wk
TIME DISTR. in house %, Outside %
BUDGET, op & dev
FUNDED BY NIH

RESEARCH STAFF, not included above
USERS, in house 6 outside
GRAD STUDENTS involved during year 2
RESEARCH BUDGET, in house
FUNDED BY NIH

MAGNET
POLE FACE, diameter (compact) 81. cm, R extraction .33 cm
R injection cm
GAP, min cm, Field kG
max cm, Field kG at
AVERAGE FIELD at R ext 15 kG Ampere turns
B max/ < B >
NUMBER OF SECTORS compact separated Spiral, max deg
SECTOR ANGLE (SSC) deg
TRIMMING COILS

CONDUCTOR, material and type Copper, Hollow Conductor
STORED ENERGY (cryogenic) MJ
POWER: main coils 40 max, kW; current stability
trimming coils max, kW; current stability
WEIGHT: Fe tons; coils tons
COOLING system water
ION ENERGY (bending limit) E/A = q^2/a^2 MeV/amu
(focusing limit) E/A = q^2/a^2 MeV/amu

ACCELERATION SYSTEM

DEES, number 1; angle 180 deg
BEAM APERTURE 2.5 cm; DC Bias 0 kV
TUNED by, coarse fine
RF 11.4 to mHz, stable +/-
Orb F to mHz
HARMONICS, RF/Orb F, used
DEE - Gnd, max kV, min gap cm
STABILITY, (lpk-pk noise)/(lpk RF volt)
ENERGY GAIN, max kV/turn
RF PHASE, stable to +/- deg
RF POWER input, max 25 kW
FREQUENCY MODULATION, rate /s
modulator, type
beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE 20 u Torr or mbar
PUMPS, No, Type, Size 2 - oil diffusion
Seven inch

ION SOURCES

Hot filament

INJECTION SYSTEM

EXTRACTION SYSTEM

Electrostatic and Magnetic Channel

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed m^2; movable m^2
TARGET STATIONS 1 in 1 rooms
STATIONS served at same time, max
MAG SPECTROGRAPH, type
COMPUTER model
OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE ENERGY (MeV) CURRENT (pA)
Goal Achieved Internal External
d 6, 8 80

SECONDARY

(part/a)

BEAM PROPERTIES

MEASURED CONDITIONS
PULSE WIDTH RF deg pA of MeV ions
PHASE EXC, max RF deg pA of MeV ions
EXTRACT eff % pA of MeV ions
RESOL AE/E % pA of MeV ions
EMITTANCE

(pi mm. mrad) axial rad pA of MeV ions

OPERATING PROGRAMS, time distribution
BASIC NUCLEAR PHYSICS SOLID STATES PHYSICS
BIOMEDICAL APPLICAT. 100% ISOTOPE PRODUCTIONS

REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS