

ENTRY No. CUI22

NAME OF MACHINE W.U. Med School Cyclotron II DATE 5/10/89

INSTITUTION Washington University Medical School, Barnard Hospital

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TELEX

IN CHARGE J.T. Hood, Director

REPORTED BY John T. Hood

M.M. Ter-Pogossian, Professor of Radiation Sciences

HISTORY AND STATUS

DESIGN, date Model tests

ENG DESIGN, date Cyc Corp. CS-15

CONSTRUCTION, date

FIRST BEAM, date (or goal) June, 1978

MAJOR ALTERATIONS

COST, ACCELERATOR \$650,000

COST, FACILITY, total \$900,000

FUNDED BY NIH (Heart and Lung)

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 .35 cm

R injection cm

GAP, min cm, Field kG

max cm, Field kG at

AVERAGE FIELD at R ext 16.3 kG Ampere turns

B max/

NUMBER OF SECTORS {compact 3} Spiral, max deg

SECTOR ANGLE (SSC) deg

TRIMMING COILS

CONDUCTOR, material and type Aluminum ribbon

STORED ENERGY (cryogenic) MJ

POWER: main coils 60 max, kW; current stability

trimming coils max, kW; current stability

WEIGHT: Fe tons; coils

COOLING system water

ION ENERGY (bending limit) E/A = q²/a² MeV/amu

(focusing limit) E/A = q²/a² MeV/amu

ACCELERATION SYSTEM

DEES, number 2; angle 120 deg

BEAM APERTURE cm; DC Bias kV

TUNED by, coarse short fine

RF 12 to 25 MHz, stable ±

Orb F to MHz

HARMONICS, RF/Orb F, used

DEE - Gnd, max kV, min gap cm

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

ENERGY GAIN, max kV/turn

RF PHASE, stable to ± deg

RF POWER input, max kW

FREQUENCY MODULATION, rate /s

modulator, type

beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE 10 μ Torr or mbar

PUMPS, No, Type, Size 1 Oil diffusion

ten inch

ION SOURCES

Penning

INJECTION SYSTEM

EXTRACTION SYSTEM

Electrostatic and Magnetic Channel

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed m²; movable m²

TARGET STATIONS 3 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

p 15 50

d 8 75

α 16

³He 20 50

SECONDARY (part/s)

BEAM PROPERTIES

MEASURED

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) { .50 axial } μA of MeV ions

{ .50 rad }

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS SOLID STATES PHYSICS

BIOMEDICAL APPLICAT. 100% ISOTOPE PRODUCTIONS

REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS