**ENTRY No.** CU120

NAME OF MACHINE W.U. Med School Cyclotron II DATE 5/10/89
INSTITUTION Washington University Medical School, Barnard Hospital
ADDRESS St. Louis, MO 63110 USA
TEL 314-454-3596 TELEX
IN CHARGE JT Hood, Director REPORTED BY Jobo.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 Ampere turns
AVERAGE FIELD at R ext 16.5 kG
B max/ <B>
NUMBER OF SECTORS { compact 3 / separated } 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 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 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 $m^2$ ; movable $m^2$
TARGET STATIONS 3 in 1 rooms
STATIONS served at same time, max
MAG SPECTROGRAPH, type
COMPUTER model
OTHER FACILITIES

**CHARACTERISTIC BEAMS**

| PARTICLE | ENERGY (MeV) Goal | Achieved | CURRENT (pμA) Internal | External |
|---|---|---|---|---|
| p | | 15 | | 50 |
| d | | 8 | | 75 |
| α | | 16 | | |
| $^3$He | | 20 | | 50 |
| 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 1 % | | pμ A of | MeV ... Ions |
| EMITTANCE | | | |
| (π mm. mrad) { .50 axial / .50. rad } | | pμA 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**