

ENTRY No. CU119

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 .. JT 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 .. 2 ..  
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 .. } Spiral, max .. deg  
SECTOR ANGLE (SSC) { separated .. } 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<sup>2</sup>/a<sup>2</sup> MeV/amu  
(focusing limit) E/A = .. q<sup>2</sup>/a<sup>2</sup> 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, (pk-pk noise)/(pk 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 μ .. 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<sup>2</sup> ; movable .. m<sup>2</sup>  
TARGET STATIONS .. 1 .. In .. } .. rooms

STATIONS served at same time, max ..  
MAG SPECTROGRAPH, type ..  
COMPUTER model ..  
OTHER FACILITIES ..

CHARACTERISTIC BEAMS  
PARTICLE .. ENERGY (MeV) .. CURRENT (pμA)

Goal .. Achieved .. Internal .. External ..  
d .. 6, 8 .. 80 ..

SECONDARY .. (part/s)

BEAM PROPERTIES  
MEASURED .. CONDITIONS ..

PULSE WIDTH .. RF deg .. pμA of .. MeV .. ions  
PHASE EXC, max .. RF deg .. pμA of .. MeV .. ions  
EXTRACT eff .. % .. pμA of .. MeV .. ions

RESOL ΔE/E .. % .. pμA of .. MeV .. ions  
EMITTANCE ..

(x mm. mrad) { .. axial } .. pμA of .. MeV .. ions  
{ .. 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