

ENTRY No. **C75**

NAME OF MACHINE **W.U. Sector Focused Cyclotron** DATE **7/15/81**
INSTITUTION **Washington University**
ADDRESS **Box 1134, St. Louis, Missouri 63130, U.S.A.**
TEL **314-889-6579** TELEX
IN CHARGE **John T. Hood** REPORTED BY **John T. Hood**

HISTORY AND STATUS

DESIGN, date **1960** Model tests **1961-62**
ENG DESIGN, date **1961-63**
CONSTRUCTION, date **1962-65**
FIRST BEAM, date (or goal) **1965**
MAJOR ALTERATIONS

COST, ACCELERATOR

COST, FACILITY, total
FUNDED BY **AFOSR, NSF**

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS **ENGINEERS 1**
TECHNICIANS **CRAFTS 1**

GRAD STUDENTS involved during year

OPERATED BY **Research staff or x Operators**

OPERATION **12** hr/wk, On target **10** hr/wk

TIME DISTR. in house **%**, Outside **%**

BUDGET, op & dev

FUNDED BY **Washington University**

RESEARCH STAFF, not included above

USERS, in house **4** outside **1**

GRAD STUDENTS involved during year **6**

RESEARCH BUDGET, in house

FUNDED BY

MAGNET

POLE FACE, diameter (compact) **137** cm, R extraction **54.5** cm

R injection **cm**

GAP, min **14.8** cm, Field **17.8** kG

max **33.8** cm, Field **10.3** kG } at **46 x 10⁶**

AVERAGE FIELD at R ext **14** kG } Ampere turns

B max/ < B >

NUMBER OF SECTORS { compact **3** } Spiral, max **deg**

SECTOR ANGLE (SSC) **deg**

TRIMMING COILS **5** pairs radial

4 pairs/sector first harmonic

CONDUCTOR, material and type **copper strap**

STORED ENERGY (cryogenic) **MJ**

POWER: main coils **120** max, kW; current stability

trimming coils **60** max, kW; current stability

WEIGHT: Fe **82** tons; coils **12** tons

COOLING system **oil**

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

(focusing limit) E/A = **q²/a² MeV/amu**

ACCELERATION SYSTEM

DEES, number **1**; angle **180** deg

BEAM APERTURE **3.2** cm; DC Bias **0** kV

TUNED by, coarse **MS** fine **Vc, Auto**

RF **7** to **16** MHz, stable \pm

Orb F **7** to **16** MHz

HARMONICS, RF/Orb F, used **1**

DEE - Gnd, max **60** kV, min gap **cm**

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

ENERGY GAIN, max **kV/turn**

RF PHASE, stable to \pm **deg**

RF POWER input, max **100** 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**

Twenty and seven inch

ION SOURCES

Penning, Hot Filament

INJECTION SYSTEM

EXTRACTION SYSTEM

Electrostatic and Magnetic Channel

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed **100** m²; movable **m²**

TARGET STATIONS **6** in **2** rooms

STATIONS served at same time, max **1**

MAG SPECTROGRAPH, type

COMPUTER model

OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV)		CURRENT (μ A)	
	Goal	Achieved	Internal	External
α		12-30		10
³ He		9-37		20
p		12		20
d		15		20

SECONDARY (part/s)

BEAM PROPERTIES

MEASURED CONDITIONS

PULSE WIDTH **RF deg** μ A of **MeV** ions

PHASE EXC, max **RF deg** μ A of **MeV** ions

EXTRACT eff **%** μ A of **MeV** ions

RESOL $\Delta E/E$ **%** μ A of **MeV** ions

EMITTANCE

(π mm, mrad) { **axial** } μ A of **MeV** ions

{ **rad** }

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS **60%** SOLID STATES PHYSICS **%**

BIOMEDICAL APPLICAT. **20%** ISOTOPE PRODUCTIONS **20%**

REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS