ENTRY No. FM1 McGill Synchrocyclotron April 19, 1989
NAME OF MACHINE ..... DATE .....
INSTITUTION McGill University
ADDRESS 3610 University Street, Montréal, Québec H3A 2B2 CANADA
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IN CHARGE Prof. Jean Barrette REPORTED BY Mr. Leo Nikkinen

HISTORY AND STATUS
DESIGN, date 1945 Model tests -
ENG DESIGN, date -
CONSTRUCTION, date 1945 - 1946
FIRST BEAM, date (or goal) June 1949
MAJOR ALTERATIONS External Beam Hall added in 1963
External Beam Area Relocated in 1983
COST, ACCELERATOR $200K
COST, FACILITY, total $2 Million
FUNDED BY -

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT
SCIENTISTS 1 ENGINEERS 1
TECHNICIANS - CRAFTS -
GRAD STUDENTS involved during year -
OPERATED BY X Research staff or Operators
OPERATION - hr/wk, On target - hr/wk
TIME DISTR. In house - %, Outside - %
BUDGET, op & dev -
FUNDED BY -

RESEARCH STAFF, not included above
USERS, In house - outside -
GRAD STUDENTS involved during year -
RESEARCH BUDGET, In house $200,000
FUNDED BY -

MAGNET
POLE FACE, diameter (compact) 90 cm, R extraction 90 cm
R injection 0 cm
GAP, min 15 cm, Field 16.1 kG
max 19 cm, Field 15.1 kG at 5.3×10^5 Ampere turns
AVERAGE FIELD at R ext 15.9 kG
B max/ <B> 1.01
NUMBER OF SECTORS compact -, separated - Spiral, max - deg
SECTOR ANGLE (SSC) - deg
TRIMMING COILS -

CONDUCTOR, material and type Aluminum, 6x1 cm
STORED ENERGY (cryogenic) - MJ
POWER: main coils 150 max, kW ; current stability 10^{-5}
trimming coils - max, kW ; current stability -
WEIGHT: Fe 273 tons ; coils 11 tons
COOLING system De-ionized Water
ION ENERGY (bending limit) E/A = 100 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 1 cm ; DC Bias 0-3 kV
TUNED by, coarse - fine -
RF 30 to 6 mHz, stable ± -
Orb F 26 to 22.3 mHz (protons)
HARMONICS, RF/Orb F, used -
DEE - Gnd, max 10 kV, min gap 5 cm
STABILITY, (pk-pk noise)/(pk RF volt) -
ENERGY GAIN, max 20 kV/turn
RF PHASE, stable to ± - deg
RF POWER input, max 40 (avg.), 200 (pk) kW
FREQUENCY MODULATION, rate 4000 /s
modulator, type Swept Oscillator
beam pulse, width 20 μsec

VACUUM SYSTEM
OPERATING PRESSURE 10^{-5} Torr or mbar
PUMPS, No, Type, Size 2x16" Oil Diffusion Pump
10,000 l/sec each

ION SOURCES
Cold Cathode PIG

INJECTION SYSTEM
Radial Extraction Ion-Source

EXTRACTION SYSTEM
Regeneration Deflection

FACILITIES FOR RESEARCH
SHIELDED AREA, fixed 125 m^2 ; movable - m^2
TARGET STATIONS 1 in 1 rooms
STATIONS served at same time, max 1
MAG SPECTROGRAPH, type -
COMPUTER model
OTHER FACILITIES Internal Bombardment Probes

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (μA) Internal	External
p	100	100	2	0.3
d	50	50	2	0.3
He-3	133	133	1	0.1
He-4	100	100	0.8	0.08
SECONDARY				(part/s)

BEAM PROPERTIES

MEASURED		CONDITIONS
PULSE WIDTH	RF deg	μA of MeV ions
PHASE EXC, max	RF deg	μA of MeV ions
EXTRACT eff	10-15 %	μA of MeV ions
RESOL ΔE/E	%	μA of MeV ions
EMITTANCE		
(π mm. mrad)	15 axial, 20 rad	μA of MeV ions

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

REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS