ENTRY No. 8

NAME OF MACHINE ... TRIUMF ... DATE ... July 1981
INSTITUTION Universities of Alberta, British Columbia, Victoria and Simon Fraser University
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IN CHARGE ... E.W. Vogt ... REPORTED BY ... M.K. Craddock, G. Dutto, E.W. Blackmore

HISTORY AND STATUS

DESIGN, date July 1966 ... Model tests December 1966
ENG DESIGN, date ... October 1968
CONSTRUCTION, date ... January 1970
FIRST BEAM, date (or goal) ... December 1974
MAJOR ALTERATIONS
COST, ACCELERATOR ... Can$12,000,000
COST, FACILITY, total ... Can$40,000,000
FUNDED BY AECB, NRC and TRIUMF universities

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS ... 13 ... ENGINEERS ... 15
TECHNICIANS ... 50 ... CRAFTS ... 20
GRAD STUDENTS involved during year ... 0
OPERATED BY ... Research staff or ... 17 ... Operators
OPERATION ... 24 × 6 ... hr/wk, On target ... 24 × 5 ... hr/wk
TIME DISTR. in house ... 60* ... %, Outside ... 40 ... %
BUDGET, op & dev ... Can$16,800,000 (1981-2)
FUNDED BY ... National Research Council of Canada

RESEARCH STAFF, not included above

USERS, in house ... 95* ... outside ... 110
GRAD STUDENTS involved during year ... 40
RESEARCH BUDGET, in house ... Can$2,105,000*
FUNDED BY Natural Sciences & Engineering Research Council

MAGNET

POLE FACE, diameter (compact) 1717 cm, R extraction 780 cm
R injection ... 25 ... cm
GAP, min ... 52.8 cm, Field ... 5.8 ... kG
max ... ∞ ... cm, Field ... 2.0 ... kG
at 0.72×10⁶ Ampere turns
AVERAGE FIELD at R ext ... 4.6 ... kG
B max/ <B> ... 1.26
NUMBER OF SECTORS { compact ... / separated ... 6 ... } Spiral, max 70 deg
SECTOR ANGLE (SSC) ... - deg
TRIMMING COILS ... 55 circular
... 13 harmonic
CONDUCTOR, material and type ... Al
STORED ENERGY (cryogenic) ... - ... MJ
POWER : main coils 1270 max, kW ; current stability
trimming coils ... 68 max, kW ; current stability
WEIGHT : Fe ... 4000 ... tons ; coils ... 170 ... tons
COOLING system ... water
ION ENERGY (bending limit) E/A = ... q^2/a^2 MeV/amu
(focusing limit) E/A = ... q /a MeV/amu

ACCELERATION SYSTEM

DEES, number ... 2 ... ; angle ... 180 ... deg
BEAM APERTURE ... 8 ... cm ; DC Bias ... 0 ... kV
TUNED by, coarse ... panels ... fine ... panels
RF ... to ... 23.055 ... mHz, stable ± ... 1/10⁶
Orb F ... to ... 4.61 ... mHz
HARMONICS, RF/Orb F, used ... 5
DEE - Gnd, max ... 85 ... kV, min gap ... 2.5 ... cm
STABILITY, (pk-pk noise)/(pk RF volt) ... 1/10⁴
ENERGY GAIN, max ... 340 ... kV/turn
RF PHASE, stable to ± ... 0.5 ... deg
RF POWER input, max ... 1650 ... kW
FREQUENCY MODULATION, rate ... - ... /s
modulator, type ... -
beam pulse, width ... -

VACUUM SYSTEM

OPERATING PRESSURE ... 6 × 10⁻⁸ ... Torr
PUMPS, No, Type, Size
... 2 He-cooled 20 K cryopanels, 1.2 m²

ION SOURCES

1. "Ehlers" Hot Filament Arc (H^-)
2. "Lamb Shift" Polarized H^-

INJECTION SYSTEM

40 m long, electrostatic bends and quadrupoles

EXTRACTION SYSTEM

Electron stripping in carbon foil

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed ... 2350 ... m² ; movable ... m²
TARGET STATIONS ... 14 ... in ... 10 ... rooms
STATIONS served at same time, max ... 8
MAG SPECTROGRAPH, type ... QD ... R = 2.5 m
COMPUTER model ... PDP 11/34, VAX 11/780
OTHER FACILITIES Polarized fast neutron beam
Thermal neutron source
Biomedical π^- irradiation

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	ENERGY (MeV) Achieved	CURRENT (pμA) Internal	CURRENT (pμA) External
H^-	65-100	70-90		
	180-520	180-520	150	150
Polarized H^-	180-520	180-520	0.2	0.2
SECONDARY			(part/s)	
π^+	20-350	15-170	10^7/μA	
μ^+	4-90	4-90	10^5/μA	

BEAM PROPERTIES

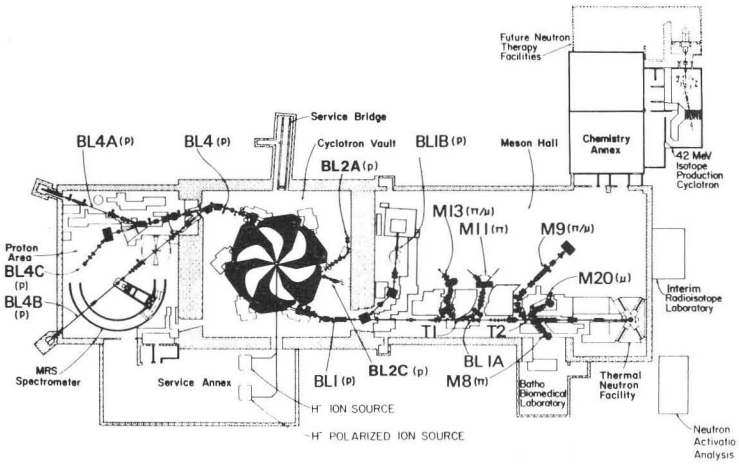
	MEASURED	CONDITIONS
PULSE WIDTH ... RF deg	100	pμ A of 500 MeV H^- ions
PHASE EXC, max 20 RF deg	100	pμ A of 500 MeV H^- ions
EXTRACT eff 99.95 %	100	pμ A of 500 MeV H^- ions
RESOL ΔE/E 0.3 %	100	pμ A of 500 MeV H^- ions
EMITTANCE 0.1	3	pμ A of 500 MeV H^- ions
(π mm. mrad) .3 axial / .3 rad	100	pμA of 500 MeV H^- ions

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS ... SOLID STATES PHYSICS ...
BIOMEDICAL APPLICAT. ... ISOTOPE PRODUCTIONS ...
Nuclear physics, condensed matter physics and applied research operate simultaneously during unpolarized operation which is ~75% time.

REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS



*includes four founding universities