ENTRY NO. 8

NAME OF MACHINE TRIUMF DATE 8/28/78

INSTITUTION Universities of Alberta, British Columbia, Victoria, and Simon Fraser University

ADDRESS UBC, Vancouver, B.C., Canada V6T 1W5

IN CHARGE J.T. Sample REPORTED by M.K. Craddock, G. Dutto

HISTORY AND STATUS

DESIGN, date July 1966 MODEL tests Dec. 1966

ENG. DESIGN, date October 1968

CONSTRUCTION, date January 1970

FIRST BEAM date (or goal) December 1974

MAJOR ALTERATIONS

OPERATION, 144 hr/wk; On Target 100 hr/wk

TIME DIST., in house %, outside %

USERS' SCHEDULING CYCLE ~12 weeks

COST, ACCELERATOR Can$12,000,000

COST, FACILITY, total Can$36,000,000

FUNDED BY Atomic Energy Control Board and TRIUMF universities

ACCELERATOR STAFF, OPERATION and DEVELOPMENT

SCIENTISTS 13 ENGINEERS 15

TECHNICIANS 70 CRAFTS 50

GRAD STUDENTS involved during year 0

OPERATED BY Res staff or X Operators

BUDGET, op & dev Can$8,700,000

FUNDED BY National Research Council

RESEARCH STAFF, not included above

USERS, in house 70* outside 60

GRAD STUDENTS involved during year 25*

RES. BUDGET, in house Can$1,800,000

FUNDED BY National Research Council

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 2350 m^2

~~movable~~ (incl shielding within area) m^2

TARGET STATIONS 10 in 2 rooms

STATIONS served at same time, max 9

MAG SPECTROGRAPH, type MRS spectrometer

COMPUTER, model

OTHER FACILITIES

Polarized fast neutron beam

Thermal neutron source

Biomedical irradiation

REFERENCES/NOTES

*includes users from the four founding universities

MAGNET

POLE FACE diameter 1717.0 cm; R extraction 780 cm

GAP, min 52.8 cm; Field 5.8 kG
max cm; Field 2.0 kG
AVERAGE FIELD at R ext 4.6 kG
} at 0.72 X 10^6 ampere turns

CURRENT STABILITY ±5 parts/10^6; $B_{max}/\langle B \rangle$ 1.25

NUMBER OF SECTORS 6 ; SPIRAL, max 70 deg

POLE FACE COIL PAIRS: AVF /sec;

Harmonic correction 13/sec

Rad grad /sec or Circ coils 55

WEIGHT: Fe 4000 tons; Coils 170 tons

CONDUCTOR, Material and type Al

STORED ENERGY MJ

COOLING SYSTEM water

POWER: Main coils 1270 normal, 3160 max, kW

Trimming coils 68 max, kW

YOKE/POLE AREA 18 %

SECTOR ANGLE (Sep Sec) - deg

ION ENERGY (Bending limit) E/A = q^2/A^2 MeV

(Focusing limit) E/A = q/A MeV

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 /10^6

Orb F to 4.61 mHz; GAIN, max 340 kV/turn

HARMONICS, RF/Orb F, used fifth

DEE-Gnd, max 85 kV, min gap 2.5 cm

STABILITY, (pk-pk noise)/(pk RF volt) $1/10^4$

RF PHASE stable to ± 0.5 deg

RF POWER input, max 1650 kW

RF PROTECT circuit, speed 20 μsec

Type Screen input. In emergency, crowbar

FREQUENCY MODULATION, rate - /sec

MODULATOR, type -

BEAM PULSE, width -

VACUUM SYSTEM

PUMPS, No., Type, Size

2 He-cooled 20 K cryopanels, 1.2 m^2

OPERATING PRESSURE 0.06 μTorr,

PUMPDOWN TIME 24 hrs

ION SOURCES/INJECTION SYSTEM

1. "Ehlers" Hot Filament Arc (H^-)

2. "Lamb Shift" Polarized H^-

EXTRACTION SYSTEM

Electron stripping in Al or C foil

CONTROL SYSTEM

3 minicomputers with CAMAC

ENTRY NO. 8 (cont.)

CHARACTERISTIC BEAMS

	Particle	Goal (MeV)	Achieved (MeV)
ENERGY	p	165-500	180-520
	p	65-100	
CURRENT		(μA)	(μA)
Internal	H^-	100 (500MeV)	120
		150 (450MeV)	
External	p	100 (500MeV)	120
		400 (450MeV)	
		MeV ~~(part/s)~~	(part/s)
Secondary	π^+	20-120	$>10^8$
	μ^+	20-75	$\sim 10^7$
polarized n		75% @ 200 40% @ 500	$\sim 6\times10^7$

BEAM PROPERTIES

	Measured		Conditions		
Pulse Width	45	RF deg	100 μA of	500 MeV	p
Phase Exc, max	20	RF deg	100 μA of	500 MeV	
Extract Eff	99.95%		100 μA of	500 MeV	
Res, ΔE/E	0.3 %		100 μA of	500 MeV	
Emittance					
(mm-mrad) 3π axial			100 μA of	500 MeV	
(mm-mrad) 3π radial					

OPERATING PROGRAMS, time dist

Basic Nuclear Physics	Simultaneous 90 %
Solid State Physics	at various %
Bio-Medical Applications	target %
Isotope Production	stations %
Development	10 %
	%
	%

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, OPERATION SUMMARY, ADDITIONAL REFERENCES

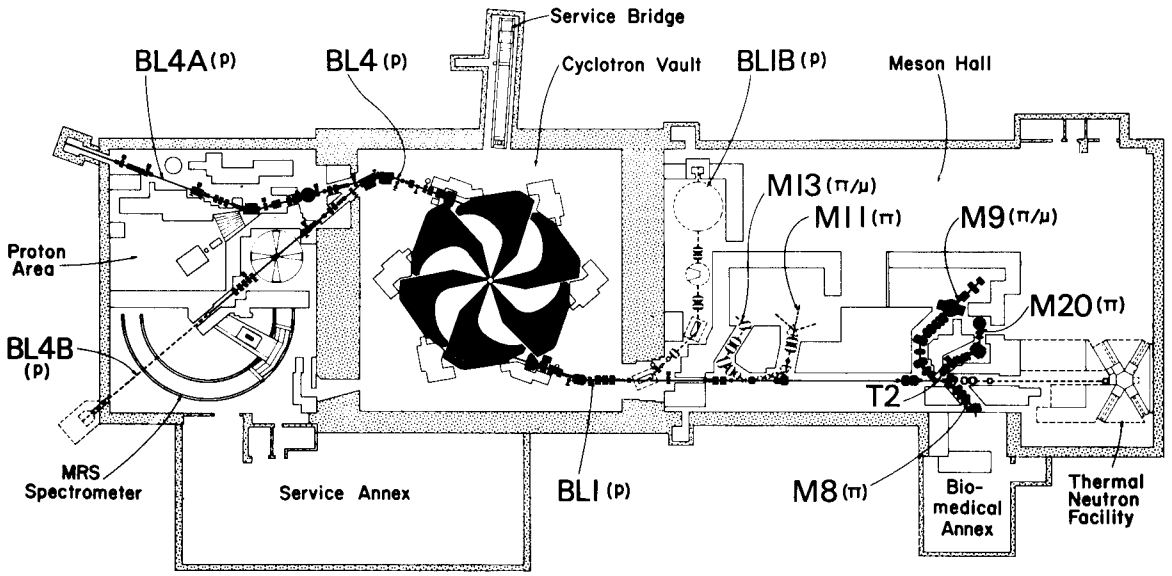

Fig. 1 Layout of the facility. Existing beam lines are indicated by solid lines, beam lines planned for future installation by dashed lines (see text).

REFERENCES

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