ENTRY NO. 61

NAME OF MACHINE Brookhaven Cyclotron DATE 8/15/78
INSTITUTION Brookhaven National Laboratory
ADDRESS Upton, New York 11973

IN CHARGE W. B. Jones REPORTED by W. B. Jones

HISTORY AND STATUS

DESIGN, date 1963 MODEL tests 1963
ENG. DESIGN, date 1964
CONSTRUCTION, date 1965-1967
FIRST BEAM date (or goal) 1968
MAJOR ALTERATIONS none

OPERATION, 50 hr/wk; On Target varies hr/wk
TIME DIST., in house 90 %, outside 10 %
USERS' SCHEDULING CYCLE 1 weeks
COST, ACCELERATOR 400,000 (conversion)
COST, FACILITY, total
FUNDED BY US-DOE

ACCELERATOR STAFF, OPERATION and DEVELOPMENT

SCIENTISTS 1 ENGINEERS 0
TECHNICIANS 3 CRAFTS 0
GRAD STUDENTS involved during year 0
OPERATED BY Res staff or x Operators
BUDGET, op & dev 103,000
FUNDED BY US-DOE

RESEARCH STAFF, not included above

USERS, in house 4 outside 1
GRAD STUDENTS involved during year varies
RES. BUDGET, in house
FUNDED BY

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 100 m^2
movable m^2
TARGET STATIONS 3 in 2 rooms
STATIONS served at same time, max 1
MAG SPECTROGRAPH, type
COMPUTER, model
OTHER FACILITIES

REFERENCES/NOTES

MS Movable Short
MP Movable Panels

MAGNET

POLE FACE diameter 152 cm; R extraction 65 cm
GAP, min 19 cm; Field 18 kG
max 34.5 cm; Field 12 kG
AVERAGE FIELD at R ext 15.4 kG
} at X 10^6 ampere turns
CURRENT STABILITY parts/10^6; $B_{max}/\langle B \rangle$
NUMBER OF SECTORS 3 ; SPIRAL, max 50 deg
POLE FACE COIL PAIRS: AVF /sec;
Harmonic correction 5
Rad grad /sec or Circ coils 8
WEIGHT: Fe tons; Coils tons
CONDUCTOR, Material and type
STORED ENERGY MJ
COOLING SYSTEM
POWER: Main coils 200 max, kW
Trimming coils max, kW
YOKE/POLE AREA %
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 1 angle 180 deg
BEAM APERTURE 3.5 cm; DC BIAS 0 kV
TUNED by, coarse MS fine panels
RF 9 to 21 mHz, stable ± /10^6
Orb F 3 to 22 mHz; GAIN, max 120 kV/turn
HARMONICS, RF/Orb F, used 3
DEE-Gnd, max 70 kV, min gap 7 cm
STABILITY, (pk-pk noise)/(pk RF volt)
RF PHASE stable to ± deg
RF POWER input, max 100 kW
RF PROTECT circuit, speed μsec
Type Constant current supply
FREQUENCY MODULATION, rate /sec
MODULATOR, type
BEAM PULSE, width

VACUUM SYSTEM

PUMPS, No., Type, Size
OPERATING PRESSURE 2 μTorr,
PUMPDOWN TIME hrs

ION SOURCES/INJECTION SYSTEM

Hooded hot filament

EXTRACTION SYSTEM

electrostatic deflector

CONTROL SYSTEM

ENTRY NO. 61 (cont.)

CHARACTERISTIC BEAMS

	Particle	Goal (MeV)	Achieved (MeV)
ENERGY	P_4	40	36
	He3	40	48
	He	53	66.5
CURRENT		(μA)	(μA)
Internal	over	200	
External	10	to 50	
	MAX.	POWER	1 KW
		(part/s)	(part/s)
Secondary			

BEAM PROPERTIES

	Measured		Conditions			
Pulse Width	5	RF deg	____	μA of ____	MeV	____
Phase Exc, max	____	RF deg	____	μA of ____	MeV	____
Extract Eff	20	%	____	μA of ____	MeV	____
Res, ΔE/E	.6	%	____	μA of ____	MeV	____

Emittance

(mm-mrad) { ____ axial / ____ radial } ____ μA of ____ MeV ____

OPERATING PROGRAMS, time dist

Basic Nuclear Physics	variable	%
Solid State Physics	"	%
Bio-Medical Applications	"	%
Isotope Production	"	%
Development		%
		%
		%

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