

ENTRY NO. 56

NAME OF MACHINE The Amersham Cyclotron DATE 20th July 1978
 INSTITUTION The Radiochemical Centre Ltd
 ADDRESS Amersham, Bucks, England.

IN CHARGE M.F. Finlan REPORTED by M.F. Finlan

HISTORY AND STATUS

DESIGN, date 1962 MODEL tests _____
 ENG. DESIGN, date _____
 CONSTRUCTION, date 1963-1965
 FIRST BEAM date (or goal) 1965
 MAJOR ALTERATIONS Computer control 1975

OPERATION, _____ hr/wk; On Target >150 hr/wk
 TIME DIST., in house 100 %, outside _____ %
 USERS' SCHEDULING CYCLE _____ weeks
 COST, ACCELERATOR approx. £3.5 x 10⁵
 COST, FACILITY, total approx. £5 x 10⁵
 FUNDED BY United Kingdom Atomic Energy Authority

ACCELERATOR STAFF, OPERATION and DEVELOPMENT

SCIENTISTS 3 ENGINEERS _____
 TECHNICIANS 4 CRAFTS _____
 GRAD STUDENTS involved during year _____
 OPERATED BY _____ Res staff or _____ Operators
 BUDGET, op & dev _____
 FUNDED BY _____

RESEARCH STAFF, not included above

USERS, in house _____ outside _____
 GRAD STUDENTS involved during year _____
 RES. BUDGET, in house _____
 FUNDED BY _____

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed _____ m²
 movable _____ m²
 TARGET STATIONS _____ in _____ rooms
 STATIONS served at same time, max _____
 MAG SPECTROGRAPH, type _____
 COMPUTER, model _____

OTHER FACILITIES

Isotope production - Quick change water
Irradiation, Solid State - Yes cooled target
Biological _____
Time-of-Flight Study _____
On-Line Mass Separation _____

REFERENCES/NOTES

NOTATIONS M.S.- movable start
 M.P.- movable panel

MAGNET

POLE FACE diameter: 140 cm; R extraction _____ cm
 GAP, min 16 cm; Field 18 kG } at _____ X 10⁶
 max 30 cm; Field 12 kG } ampere turns
 AVERAGE FIELD at R ext 15 kG
 CURRENT STABILITY 50 parts/10⁶; B_{max}/(B) 1.5
 NUMBER OF SECTORS 3; SPIRAL, max 48 deg
 POLE FACE COIL PAIRS: AVF None /sec;
 Harmonic correction _____
 Rad grad _____ /sec or Circ coils _____
 WEIGHT: Fe 73.6 tons; Coils 6.4 tons
 CONDUCTOR, Material and type Aluminium
 STORED ENERGY _____ MJ
 COOLING SYSTEM Water
 POWER: Main coils 140 max, kW
 Trimming coils _____ max, kW
 YOKE/POLE AREA 106 %
 SECTOR ANGLE (Sep Sec) _____ deg
 ION ENERGY (Bending limit) E/A = _____ q²/A² MeV
 (Focusing limit) E/A = _____ q/A MeV

ACCELERATION SYSTEM

DEES, number 1 angle 180 deg
 BEAM APERTURE 3.5 cm; DC BIAS 0.5 kV
 TUNED by, coarse M.S. fine M.P.
 RF 10 to 21 MHz, stable ± 10 /10⁶
 Orb F 21 MHz; GAIN, max 100 kV/turn
 HARMONICS, RF/Orb F, used _____
 DEE-Gnd, max 50 kV, min gap _____ cm
 STABILITY, (pk-pk noise)/(pk RF volt) 0.01
 RF PHASE stable to ± _____ deg
 RF POWER input, max 100 kW
 RF PROTECT circuit, speed 6000 μsec
 Type Thyratron crowbar
 FREQUENCY MODULATION, rate _____ /sec
 MODULATOR, type _____
 BEAM PULSE, width _____

VACUUM SYSTEM

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

ION SOURCES/INJECTION SYSTEM

EXTRACTION SYSTEM None

CONTROL SYSTEM

SELECTED REFERENCES
 CERN - Report 63-19, (1963) 286

ENTRY NO. 56 (cont.)

CHARACTERISTIC BEAMS

	Particle	Goal (MeV)	Achieved (MeV)
ENERGY	p	27	27
	d	16	15
CURRENT		(μ A)	(μ A)
	Internal	1000	> 500
	d	1000	> 400
External			
		(part/s)	(part/s)
Secondary			

BEAM PROPERTIES

	Measured	Conditions
Pulse Width	RF deg	μ A of MeV
Phase Exc, max	RF deg	μ A of MeV
Extract Eff	%	μ A of MeV
Res, $\Delta E/E$	%	μ A of MeV
Emittance		
(mm-mrad)	{ axial } { radial }	μ A of MeV

OPERATING PROGRAMS, time dist

Basic Nuclear Physics	%
Solid State Physics	%
Bio-Medical Applications	%
Isotope Production	100 %
Development	%
	%
	%

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

Isotope production machine, mini-computer controlled since 1974 to operate for periods of up to 100 hours with no operator in attendance. Mini-computer controlled automatic target change with no operator in attendance since 1977.