

ENTRY No. 61

NAME OF MACHINE FIRST AMERSHAM CYCLOTRON DATE 1981 AUGUST 15
 INSTITUTION AMERSHAM INTERNATIONAL
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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
 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 .. 2 ENGINEERS
 TECHNICIANS .. 3 CRAFTS
 GRAD STUDENTS involved during year
 OPERATED BY .. Research staff or Operators
 OPERATION .. hr/wk, On target .. >150 hr/wk
 TIME DISTR. in house .. 100 %, Outside %
 BUDGET, op & dev
 FUNDED BY ..

RESEARCH STAFF, not included above
 USERS, in house outside
 GRAD STUDENTS involved during year
 RESEARCH BUDGET, in house
 FUNDED BY ..

MAGNET

POLE FACE, diameter (compact) .140 cm, R extraction .. cm
 R injection cm
 GAP, min .. 16 cm, Field 18 kg }
 max .. 30 cm, Field 12 kg } at
 AVERAGE FIELD at R ext 15 kg } Ampere turns
 B max/ 1.5

NUMBER OF SECTORS { compact .. 3 } Spiral, max 48 deg
 separated }
 SECTOR ANGLE (SSC) deg
 TRIMMING COILS ..

CONDUCTOR, material and type .. ALUMINUM
 STORED ENERGY (cryogenic) MJ
 POWER: main coils .. 140 max, kW ; current stability
 trimming coils .. max, kW ; current stability
 WEIGHT : Fe .. 73.6 tons ; coils 6.4 tons
 COOLING system .. WATER
 ION ENERGY (bending limit) E/A = q²/a² MeV/amu
 (focusing limit) E/A = q /a MeV/amu

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
 Orb F to .. 21 mHz 100
 HARMONICS, RF/Orb F, used
 DEE - Gnd, max .. 50 kV, min gap cm
 STABILITY, (pk-pk noise)/(pk RF volt) 0.01
 ENERGY GAIN, max kV/turn
 RF PHASE, stable to ± deg
 RF POWER input, max 100 kW
 FREQUENCY MODULATION, rate .. 6000 /s
 modulator, type .. THYRATRON CROWBAR
 beam pulse, width ..

VACUUM SYSTEM

OPERATING PRESSURE Torr or mbar
 PUMPS, No, Type, Size ..

ION SOURCES

INJECTION SYSTEM

EXTRACTION SYSTEM

NONE

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 SEPARA

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV)		CURRENT (pμA)	
	Goal	Achieved	Internal	External
p	27	27	1000	
d	16	15	1000	

SECONDARY

(part/s)

BEAM PROPERTIES

MEASURED CONDITIONS
 PULSE WIDTH .. RF deg pμ A of MeV ... ions
 PHASE EXC, max .. RF deg pμ A of MeV ... ions
 EXTRACT eff % pμ A of MeV ... ions
 RESOL ΔE/E % pμ A of MeV ... ions
 EMITTANCE
 (π mm. mrad) { axial } pμ A of MeV ... ions
 { rad }

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS .. SOLID STATES PHYSICS
 BIOMEDICAL APPLICAT. ISOTOPE PRODUCTIONS 100%

REFERENCES/NOTES

SELECTED REFERENCES NOTATIONS M.S. - movable start
 CERN - Report 63-19, (1963) 286 - moveable panel

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS

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.