

ENTRY NO. 66

NAME OF MACHINE AMERSHAM INTERNATIONAL FIRST CYCLOTRON
INSTITUTION AMERSHAM INTERNATIONAL
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HISTORY AND STATUS

DESIGN, date 1962 Model tests -
ENG DESIGN, date -
CONSTRUCTION, date 1963-65
FIRST BEAM, date (or goal) 1965
MAJOR ALTERATIONS Computer Control 1975
Full automation (without operator) 1977
COST, ACCELERATOR £.35m (1965 price)
COST, FACILITY, total £.50m (1965 price)
FUNDED BY United Kingdom Atomic Energy Authority

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS 3 ENGINEERS 5
TECHNICIANS 6 CRAFTS
GRAD STUDENTS involved during year -
OPERATED BY Research staff or Operators
OPERATION 165 hr/wk. On target 155 hr/wk
TIME DISTR. in house % Outside %
BUDGET, op & dev -

FUNDED BY Amersham International Medical Products Division

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 7 cm
R injection 7 cm
GAP, min 16 cm, Field 18 kG
min 30 cm, Field 12 kG at 50 x 10^6
AVERAGE FIELD at R ext 15 kG Ampere turns
B max / < B > 1.5
NUMBER OF SECTORS compact 3 separated - Spiral, max 48 deg
SECTOR ANGLE (SSC) deg

TRIMMING COILS -
CONDUCTOR, material and type Aluminium
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 Closed loop demineralised water
ION ENERGY (bending limit) E/A = 30 q^2/a^2 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 75 kV
TUNED by, coarse MS fine MP
RF 10 to 21 MHz, stable ± 50 x 10^-5
Orb F to MHz
HARMONICS, RF/Orb F, used 1
DEE-Gnd, max 50 kV, min gap 3 cm
STABILITY, (pk-pk noise)/(pk RF volt) 10
ENERGY GAIN, max 100 kV/turn
RF PHASE, stable to ± deg
RF POWER input, max 100 kW
FREQUENCY MODULATION, rate 6000 /s
modulator, type Thyatron Crowbar
beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE 5-10 x 10^-6 Torr or mbar
PUMPS, No, Type, Size 1 oil diff pump 5000 l/sec

ION SOURCES

PIG, Filament

INJECTION SYSTEM

EXTRACTION SYSTEM

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed m^2; movable m^2
TARGET STATIONS in
STATIONS served at same time, max
MAG SPECTROGRAPH, type
COMPUTER model D.G.NOVA 2
OTHER FACILITIES

CHARACTERISTIC BEAMS

Table with columns: PARTICLE, ENERGY (MeV) Goal, Achieved, CURRENT (pA) Internal, External. Rows for p and d particles.

SECONDARY (part/s)

BEAM PROPERTIES

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

OPERATING PROGRAMS, time distribution

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

REFERENCES/NOTES

- 1)
2)

PLAN VIEW OF FACILITY, COMMENTS, ETC.

ISOTOPE PRODUCTION MACHINE

- Remote controlled targetry
- Mini computer control since 1974 with no operator attendance for 100 hr plus per week
- Automatic Target charge with no operator attendance since 1977.