ENTRY NO. 58

NAME OF MACHINE The Edinburgh Cyclotron DATE 7th July, 1978.
INSTITUTION Medical Research Council,
ADDRESS Cyclotron Unit, Western General Hospital, Edinburgh.

IN CHARGE T.E. Saxton REPORTED by T.E. Saxton

HISTORY AND STATUS Commercial Design - The Cyclotron Corporation model CS30 to standard specification

DESIGN, date ______ MODEL tests ______
ENG. DESIGN, date ______
CONSTRUCTION, date ______
FIRST BEAM date (or goal) Middle 1976
MAJOR ALTERATIONS ______

OPERATION, 40 hr/wk; On Target 15 hr/wk
TIME DIST., in house 100 %, outside ______ %
USERS' SCHEDULING CYCLE ______ weeks
COST, ACCELERATOR $ 850,000
COST, FACILITY, total $ 2,400,000
FUNDED BY Medical Research Council
Cancer Research Council
Scottish Home and Health Department

ACCELERATOR STAFF, OPERATION and DEVELOPMENT

SCIENTISTS 2 ENGINEERS 2
TECHNICIANS 3 CRAFTS 2
GRAD STUDENTS involved during year ______
OPERATED BY ______ Res staff or ______ Operators
BUDGET, op & dev ______
FUNDED BY Medical Research Council

RESEARCH STAFF, not included above

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

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 80 m^2
movable ______ m^2
TARGET STATIONS 2 in 2 rooms
STATIONS served at same time, max ______
MAG SPECTROGRAPH, type ______
COMPUTER, model ______
OTHER FACILITIES Short-lived gas isotope production proposed.

2 Neutron Therapy Rooms

REFERENCES/NOTES

MAGNET

POLE FACE diameter ______ cm; R extraction ______ cm
GAP, min ______ cm; Field ______ kG, max ______ cm; Field ______ kG
AVERAGE FIELD at R ext ______ kG } at ______ $\times 10^6$ ampere turns
CURRENT STABILITY ______ parts/10^6; $B_{max}/\langle B \rangle$ ______
NUMBER OF SECTORS ______ ; SPIRAL, max ______ deg
POLE FACE COIL PAIRS: AVF ______ /sec;
Harmonic correction ______
Rad grad ______ /sec or Circ coils ______
WEIGHT: Fe ______ tons; Coils ______ tons
CONDUCTOR, Material and type ______
STORED ENERGY ______ MJ
COOLING SYSTEM ______
POWER: Main coils ______ 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 ______ angle ______ deg
BEAM APERTURE ______ cm; DC BIAS ______ kV
TUNED by, coarse ______ fine ______
RF ______ to ______ mHz, stable ± ______ $/10^6$
Orb F ______ to ______ mHz; GAIN, max ______ kV/turn
HARMONICS, RF/Orb F, used ______
DEE-Gnd, max ______ kV, min gap ______ cm
STABILITY, (pk-pk noise)/(pk RF volt) ______
RF PHASE stable to ± ______ deg
RF POWER input, max ______ kW
RF PROTECT circuit, speed ______ μsec
Type ______
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

CONTROL SYSTEM

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CHARACTERISTIC BEAMS

	Particle	Goal (MeV)	Achieved (MeV)
ENERGY	d		15
CURRENT		(μA)	(μA)
Internal			
External	d	100	100
		routine 70	
		(part/s)	(part/s)
Secondary		6.3 MeV	

BEAM PROPERTIES

	Measured	Conditions
Pulse Width	____ RF deg	____ μA of ____ MeV ____
Phase Exc, max	____ RF deg	____ μA of ____ MeV ____
Extract Eff	____ %	____ μA of ____ MeV ____
Res, ΔE/E	____ %	____ μA of ____ MeV ____
Emittance (mm-mrad)	____ axial / ____ radial	____ μA of ____ MeV ____

OPERATING PROGRAMS, time dist

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

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

Used for Fast Neutron Therapy

Two beams into separate treatment rooms

One beam fixed horizontal, with fixed beryllium target

One beam Isocentric, with beryllium target in rotating gantry

Target - Patient distance 125cm.

Patient dose rate 25 rads/min.