ENTRY No. 63

NAME OF MACHINE Clatterbridge Cyclotron ..... DATE .....
INSTITUTION ..... Clatterbridge Hospital .....
ADDRESS ..... Clatterbridge Road, Bebington, Wirral, Merseyside L63 4JY. (England) .....
TEL ..... TELEX .....
IN CHARGE ..... REPORTED BY ... T.E. Saxton .....

HISTORY AND STATUS

DESIGN, date ... 1981/82 ..... Model tests .....
ENG DESIGN, date ..... 1981/82 .....
CONSTRUCTION, date ... 1982 .....
FIRST BEAM, date (or goal) ... 1982/83 .....
MAJOR ALTERATIONS .....
.....
COST, ACCELERATOR .....
COST, FACILITY, total ... Approx. £4.5m .....
FUNDED BY ..... Charitable Organizations .....

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS ..... ENGINEERS .....
TECHNICIANS ..... CRAFTS .....
GRAD STUDENTS involved during year .....
OPERATED BY ..... Research staff or ..... Operators
OPERATION ..... hr/wk, On target ..... hr/wk
TIME DISTR. in house ..... %, Outside ..... %
BUDGET, op & dev .....
FUNDED BY ..... Medical Research Council .....

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) 160 cm, R extraction 64 cm
R injection ..... cm
GAP, min 12.3 cm, Field 20.7 kG
max 22.1 cm, Field 13.0 kG } at 280,000
AVERAGE FIELD at Rext ..... 17.7 kG } Ampere turns
B max/ <B> 1.19
NUMBER OF SECTORS { compact 3 / separated ..... } Spiral, max 55 deg
SECTOR ANGLE (SSC) ..... deg
TRIMMING COILS .... 4 sets valley coils harmonic
3 sets valley coils gradient
.....
CONDUCTOR, material and type ... hollow core copper conductor
STORED ENERGY (cryogenic) ..... MJ
POWER : main coils .110. max, kW ; current stability 1 x 10^{-5}
trimming coils ... 5 . max, kW ; current stability 1 x 10^{-4}
WEIGHT : Fe .....120..... tons ; coils .....4.4..... tons
COOLING system ..... Water/Chiller .....
ION ENERGY (bending limit) E/A = ..62... q^2/a^2 MeV/amu
(focusing limit) E/A = ...-... q /a MeV/amu

ACCELERATION SYSTEM

DEES, number ..... 2 ..... ; angle ..... 80 ..... deg
BEAM APERTURE ... 2.5 .... cm ; DC Bias ..... kV
TUNED by, coarse ... - ..... fine ... motor driven capacitor
RF ..... 25.1 to ... - ..... mHz, stable ± ... 1 x 10^{-6} .....
Orb F ..... 25.1 to ... - ..... mHz
HARMONICS, RF/Orb F, used ..... 1 .....
DEE - Gnd, max ..40.. kV, min gap ..... - ..... cm
STABILITY, (pk-pk noise)/(pk RF volt) ..... < 10^{-3} .....
ENERGY GAIN, max ..... 100 ..... kV/turn
RF PHASE, stable to ± ..... 0.5 ..... deg
RF POWER input, max ..... 60 ..... kW
FREQUENCY MODULATION, rate ... - ..... /s
modulator, type .....
beam pulse, width .....

VACUUM SYSTEM

OPERATING PRESSURE ..... < 10^{-5} ..... Torr or mbar
PUMPS, No, Type, Size .....
2 x 4000 l/sec oil diffusion pump
.....
100 x 20m³/h backing mechanical .....

ION SOURCES

.....

INJECTION SYSTEM

.....

EXTRACTION SYSTEM

..... Electrostatic + Electromagnetic + foc channel .....

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 .....
.....
.....

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
p	60		>100	50
SECONDARY			(part/s)	
			50 rad/min at 150cm from	
n			target after filtering	

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 / .... rad }	.....	pμA of ..... MeV ... ions

OPERATING PROGRAMS, time distribution

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

REFERENCES/NOTES

Scanditronix Model MC60PF

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS

Accelerator Part of Scanditem High Energy Isocentric Neutron Therapy Unit.

Computer controlled.