ENTRY No. 64

NAME OF MACHINE . 1m RADIAL RIDGE CYC. ..... DATE ..... JULY 1981
INSTITUTION ..... UNIVERSITY OF BIRMINGHAM
ADDRESS ..... BIRMINGHAM B15 2TT ENGLAND
TEL ...021-472-1301 ..... TELEX
IN CHARGE ...G.C. MORRISON ..... REPORTED BY ...W.C. HARDY

HISTORY AND STATUS

DESIGN, date ..1957 ..... Model tests ...NONE .....
ENG DESIGN, date ..1957-1963 .....
CONSTRUCTION, date ..1958-1963 .....
FIRST BEAM, date (or goal) . INT. 1961 EXT. 1963 .....
MAJOR ALTERATIONS .....
.....
COST, ACCELERATOR ....£30,000 .....
COST, FACILITY, total .....
FUNDED BY ..... O.S.I.R. (NOW S.R.C.) .....

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS ..... 0 ..... ENGINEERS ... 1 .....
TECHNICIANS ..... 6 ..... CRAFTS ..... 0 .....
GRAD STUDENTS involved during year ..... 0 .....
OPERATED BY ..... 0 ... Research staff or ..... 4 ... Operators
OPERATION ..... 100 .. hr/wk, On target ..... hr/wk
TIME DISTR. in house .... 100 .... %, Outside ... - ..... %
BUDGET, op & dev ..... £20,000 .....
FUNDED BY .. UNIV. OF BHAM AND S.R.C. .....

RESEARCH STAFF, not included above

USERS, in house .... 16 ..... outside ....0 .....
GRAD STUDENTS involved during year ..... 8 .....
RESEARCH BUDGET, in house ..... £50,000 .....
FUNDED BY .. UNIV. OF BHAM AND S.R.C. .....

MAGNET

POLE FACE, diameter (compact) 102. cm, R extraction .. 46 cm
R injection ..... cm
GAP, min .....7... cm, Field ...19..... kG
max ..14.5.. cm, Field ...13..... kG } at .....
AVERAGE FIELD at R ext .....16..... kG } Ampere turns
B max/ <B> .....1.2.....
NUMBER OF SECTORS { compact ....3. } Spiral, max .. deg
{ separated ..... }
SECTOR ANGLE (SSC) ..... deg
TRIMMING COILS . HARMONIC 2 .....
..... CIRCULAR . 8 .....
CONDUCTOR, material and type ..... CU STRIP .....
STORED ENERGY (cryogenic) ..... - ..... MJ
POWER : main coils ..40.. max, kW ; current stability .....
trimming coils ..... max, kW ; current stability .....
WEIGHT : Fe .....50..... tons ; coils .....8..... tons
COOLING system ..... WATER .....
ION ENERGY (bending limit) E/A = ... q^2/a^2 MeV/amu
(focusing limit) E/A = ... q /a MeV/amu

ACCELERATION SYSTEM

DEES, number .....1..... ; angle .....180..... deg
BEAM APERTURE ..2-3..... cm ; DC Bias .... - ..... kV
TUNED by, coarse ..M.S..... fine .....M.S.....
RF .....12..... to ....16.... mHz, stable ± ..2/10^6.....
Orb F ..... to ..... mHz
HARMONICS, RF/Orb F, used .....1.....
DEE - Gnd, max . 27... kV, min gap ....0.3..... cm
STABILITY, (pk-pk noise)/(pk RF volt) ..0-001.....
ENERGY GAIN, max .....54..... kV/turn
RF PHASE, stable to ± .....3..... deg
RF POWER input, max .....45..... kW
FREQUENCY MODULATION, rate ..... /s
modulator, type .....
beam pulse, width .....

VACUUM SYSTEM

OPERATING PRESSURE .....3×10^{-6}..... Torr or mbar
PUMPS, No, Type, Size .....1 x 40 cm.....
.....2 x 22 cm.....
.....

ION SOURCES

INTERNAL HOT CATHODE
EXTERNAL POLD$^+$ AND POL ^{3}He

INJECTION SYSTEM

..... AXIAL .....

EXTRACTION SYSTEM

..MAG./ELECT. REGENERATOR AND ELECT. DEF. .....

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed ... 90 ..... m² ; movable ..0..... m²
TARGET STATIONS .... 6 ... in .... 1 .... rooms
STATIONS served at same time, max ..1 .....
MAG SPECTROGRAPH, type ..... NONE .....
COMPUTER model . GEC 4080 + 4065 .....
OTHER FACILITIES .....
...10 MASS INDENTIFICATION SYSTEM USING .....
... COUNTER TELESCOPES .....

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
^{4}He		25		200
^{3}He		34		50
POL. d		12.5		0.2
POL. ^{3}He		34		0.005
SECONDARY				(part/s)

BEAM PROPERTIES

MEASURED CONDITIONS

PULSE WIDTH .3.0. RF deg ..10... pμ A of .34. MeV ^{3}He ions
PHASE EXC, max .15 RF deg ..".... pμ A of ".... MeV ".. ions
EXTRACT eff ...60.. % ..".... pμ A of ".... MeV ".. ions
RESOL ΔE/E .0.4.. % ..".... pμ A of ".... MeV ".. ions
EMITTANCE " " "
(π mm. mrad) { .40 axial } ..... pμA of ..... MeV ... ions
{ .... rad }

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 80% SOLID STATES PHYSICS ....
BIOMEDICAL APPLICAT. .... ISOTOPE PRODUCTIONS ....
.....
.....DEV 20% .....

REFERENCES/NOTES

NUC. INST. METH. 18/19, 25, 1962
NUC. INST. METH. 32, 325, 1965
MAJOR MODIFICATIONS DESCRIBED IN ANNUAL REVIEWS

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS

A separate ion source room houses the polarized d source and the polarized ^{3}He primary source and incorporates a beam switching facility. The polarized ^{3}He primary source operates in the magnetic field of a superconducting solenoid.