ENTRY No. 55

NAME OF MACHINE MC 16 F DATE 1981-07-07
INSTITUTION KAROLINSKA HOSPITAL
ADDRESS S-104 01 STOCKHOLM (Sweden)
TEL (0)8 - 7361000 TELEX
IN CHARGE Prof. L. WIDEN REPORTED BY S. LINDBACK, SCANDITRONIX

HISTORY AND STATUS
DESIGN, date 1980 Model tests 1980
ENG DESIGN, date 1980 - 81
CONSTRUCTION, date 1980 - 81
FIRST BEAM, date (or goal) April 1981
MAJOR ALTERATIONS
COST, ACCELERATOR
COST, FACILITY, total
FUNDED BY

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

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) 84 cm, R extraction 33 cm
R injection - cm
GAP, min 6.6 cm, Field 20.7 kG
max 11.9 cm, Field 12.8 kG
at 160,000 Ampere turns
AVERAGE FIELD at R ext 17.4 kG
B max/ <B> 1.16
NUMBER OF SECTORS compact 3, separated - Spiral, max 40 deg
SECTOR ANGLE (SSC) - deg
TRIMMING COILS 2 sets of valley coils for ischronization
2 " " " " " harmonics
CONDUCTOR, material and type Cu, indirectly cooled
STORED ENERGY (cryogenic) - MJ
POWER : main coils 35 max, kW ; current stability 10^{-5}
trimming coils 5 max, kW ; current stability 10^{-4}
WEIGHT : Fe 17 tons ; coils 0.8 tons
COOLING system Demineralized water
ION ENERGY (bending limit) E/A = 17.2 q^2/a^2 MeV/amu
(focusing limit) E/A = - q /a MeV/amu

ACCELERATION SYSTEM
DEES, number 2 ; angle 76-90 deg
BEAM APERTURE 2.0 cm ; DC Bias - kV
TUNED by, coarse - fine flaps
RF 26 to 26.2 mHz, stable ± 10^{-6}
Orb F 13 to 26.2 mHz
HARMONICS, RF/Orb F, used 1,2
DEE - Gnd, max 40 kV, min gap - cm
STABILITY, (pk-pk noise)/(pk RF volt) < 10^{-3}
ENERGY GAIN, max 160 kV/turn
RF PHASE, stable to ± 0.5 deg
RF POWER input, max 30 kW
FREQUENCY MODULATION, rate - /s
modulator, type -
beam pulse, width -

VACUUM SYSTEM
OPERATING PRESSURE < 10^{-5} Torr or mbar
PUMPS, No, Type, Size 2 oil diffusion pumps Ø 250
1 mechanical fore pump

ION SOURCES
Internal, cold cathode. Horizontally mounted

INJECTION SYSTEM

EXTRACTION SYSTEM
Electrostatic deflector, magn. focusing 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	16	17.2	>500	>50
d	8	8.5	>500	>50

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	pμA of MeV ions
(π mm. mrad) rad	

OPERATING PROGRAMS, time distribution
BASIC NUCLEAR PHYSICS SOLID STATES PHYSICS
BIOMEDICAL APPLICAT. ISOTOPE PRODUCTIONS

REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS

CONTROL: Programmable microprocessor controller, compact desk-top console

OPTION: Local radiation shield around cyclotron. Targets and chemical processing system for production of ^{11}C, ^{13}N, ^{15}O, ^{18}F. Lead shielded hot cell.

INSTALLATIONS: Karolinska Hospital, Stockholm (1981)
Johns-Hopkins Hospital, Baltimore (1981)