ENTRY NO. 36
NAME OF MACHINE MC 40 (Scanditronix)
INSTITUTION Joint Research Center (Operated by E.E.C.)
ADDRESS 20120 ISPRA (Varese) Italy
TEL 0039 332 789895 TELEX 380042:380058 EUR I
IN CHARGE G. RICCOBONO REPORTED BY M. CASTIGLIONI

HISTORY AND STATUS
DESIGN, date ..... Model tests .....
ENG DESIGN, date .....
CONSTRUCTION, date .....
FIRST BEAM, date (or goal) 1982
MAJOR ALTERATIONS .....
9×10^6 SKR
COST, ACCELERATOR .....
1.1×10^7 SKR (Excl. Bld.)
COST, FACILITY, total .....
FUNDED BY E.E.C.

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT
SCIENTISTS 2 ENGINEERS 2
TECHNICIANS 2 CRAFTS .....
GRAD STUDENTS involved during year --
OPERATED BY -- Research staff or 1 Operators
OPERATION 55 hr/wk. On target 44 hr./wk
TIME DISTR. in house 70 % Outside 30 %
BUDGET, op & dev 1.5×10^2 ECU
FUNDED BY E.E.C.

RESEARCH STAFF, not included above
USERS, in house 4 outside .....
GRAD STUDENTS involved during year 5
RESEARCH BUDGET, in house 4.8×10^5 $
FUNDED BY E.E.C.

MAGNET
POLE FACE, diameter (compact) 135 cm, R extraction 50 cm
R injection ..... cm
GAP, min 10 cm, Field 21.2 kG
min 18 cm, Field 13.3 kG at 241.000 Ampere turns
AVERAGE FIELD at R ext 17.9 kG
B max/ < B > 1.19
NUMBER OF SECTORS compact 3, separated ..... Spiral, max 4.5 deg
SECTOR ANGLE (SSC) ..... deg
TRIMMING COILS 8 circular coils
4 sets of harmonic coils
CONDUCTOR, material and type Cu
STORED ENERGY (cryogenic) ..... MJ
POWER: main coils 100 max, kW; current stability 10^{-4}
trimming coils 10 max, kW; current stability 10
WEIGHT: Fe 57 tons; coils 2.4 tons
COOLING system Demineralized water
ION ENERGY * (bending limit) E/A = 40 q^2/a^2 MEV/amu
(focusing limit) E/A = -- q/a MeV/amu

ACCELERATION SYSTEM
DEES, number 2 90° deg
BEAM APERTURE 2 cm; DC Bias 0 kV
TUNED by, coarse mov. short fine var. capacitor
RF 12.5 to 27 mHz, stable ± 10^{-6}
Orb F ..... to ..... mHz
HARMONICS, RF/Orb F, used 1 and 2
DEE—Gnd, max 44 kV, min gap ..... cm
STABILITY, (pk-pk noise)/(pk RF volt) 10^{-3}
ENERGY GAIN, max 176 kV/turn
RF PHASE, stable to ± 0.5 deg
RF POWEP input, max 60 kW
FREQUENCY MODULATION, rate ..... /s
modulator, type .....
beam pulse, width 15-20 deg.

VACUUM SYSTEM
OPERATING PRESSURE 2×10^{-6} Torr or mbar
PUMPS, No, Type, Size 2 Turbo molecular
Leybold Heraeus type 3.500

ION SOURCES
Internal cold cathode, axially mounted

INJECTION SYSTEM

EXTRACTION SYSTEM
Electrostatic Deflector, Magn. Channel

FACILITIES FOR RESEARCH
SHIELDED AREA, fixed 280 m²; movable ..... m²
TARGET STATIONS 4 (+3) in in 3 cells
STATIONS served at same time, max 1
MAG SPECTROGRAPH, type ---
COMPUTER model PDP 11-03 with HP 2240 A
OTHER FACILITIES Helium jet cooling system for targets

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
Protons		38	100	65
Deuterons		19	100	65
Alfa		38	60	30
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	pμ A of MeV
	rad	

OPERATING PROGRAMS, time distribution
BASIC NUCLEAR PHYSICS ..... SOLID STATES PHYSICS.....
BIOMEDICAL APPLICAT..... ISOTOPE PRODUCTIONS 10%
Radiation damage and α - implantation in fusion reactors materials 90%

REFERENCES/NOTES
1)
2)

PLAN VIEW OF FACILITY, COMMENTS, ETC.