ENTRY NO. 75

NAME OF MACHINE CP-42 H^- Cyclotron

INSTITUTION THE CYCLOTRON CORPORATION

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IN CHARGE G.O. Hendry REPORTED BY T.Y.T. Kuo

HISTORY AND STATUS

DESIGN, date Mid. 1977 Model tests

ENG DESIGN, date Mid. 1977

CONSTRUCTION, date Mid. 1978

FIRST BEAM, date (or goal) July, 1979

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) 120 cm, R extraction 53 cm

R injection cm

GAP, min 5 cm, Field 24 kG
min 12 cm, Field 16 kG } at 92,400 Ampere turns

AVERAGE FIELD at R ext 18.4 kG

B max/ < B > 1.3

NUMBER OF SECTORS { compact 3 / separated } Spiral, max 64 deg

SECTOR ANGLE (SSC) deg

TRIMMING COILS

CONDUCTOR, material and type Hollow Copper

STORED ENERGY (cryogenic) MJ

POWER: main coils 100 max, kW; current stability 10(-5)
trimming coils max, kW; current stability

WEIGHT: Fe 35 tons; coils 3 tons

COOLING system Recirculated Water

ION ENERGY (bending limit) E/A = 42 q^2/a^2 MEV/amu
(focusing limit) E/A = q/a MeV/amu

ACCELERATION SYSTEM

DEES, number 2 90 deg

BEAM APERTURE 1.8 cm; DC Bias 1.5 kV

TUNED by, coarse fine Capacitors, Trimmer

RF to 26.8 mHz, stable ± 0.5 kHz

Orb F to 26.8 mHz

HARMONICS, RF/Orb F, used 1

DEE—Gnd, max 35 kV, min gap 0.5 cm

STABILITY, (pk-pk noise)/(pk RF volt) 10(-4)

ENERGY GAIN, max 100 kV/turn

RF PHASE, stable to ± deg

RF POWEP input, max 100 kW

FREQUENCY MODULATION, rate /s

modulator, type

beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE $6x10^{-6}$ H_2 Torr or mbar

PUMPS, No, Type, Size

Four 10-inches Diff. Pumps

ION SOURCES

PIG

INJECTION SYSTEM

EXTRACTION SYSTEM

Charge Exchange Foil

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed m^2; movable m^2

TARGET STATIONS in

STATIONS served at same time, max

MAG SPECTROGRAPH, type

COMPUTER model

OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
H^-	11-42	11-42	200	200 p
SECONDARY		(part/s)		

BEAM PROPERTIES

	MEASURED		CONDITIONS		
PULSE WIDTH	40	RF deg	200 pμ A of	42 MeV	H^- ions
PHASE EXC. max		RF deg	pμ A of	MeV	ions
EXTRACT eff	100	%	pμ A of	MeV	ions
RESOL ΔE/E	1	%	pμ A of	MeV	ions
EMITTANCE (π mm. mrad)	10 axial 10 rad		pμ A of	MeV	

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS SOLID STATES PHYSICS

BIOMEDICAL APPLICAT ISOTOPE PRODUCTIONS (*)

NEUTRON PRODUCTION (*)

*Varied

REFERENCES/NOTES

1) G.O. Hendry et.al. Proceedings of 9th Int.Conf. on Cyc. and their Appl., 125 (1981).

PLAN VIEW OF FACILITY, COMMENTS, ETC.