ENTRY NO. 31

NAME OF MACHINE Karlsruhe Compact Cyclotron

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IN CHARGE H. Schweickert REPORTED BY H. Schweickert

HISTORY AND STATUS

DESIGN, date ..... Model tests .....

ENG DESIGN, date CP42H⁻ Cyclotron Corporation

CONSTRUCTION, date 1979-1982

FIRST BEAM, date (or goal) 1983

MAJOR ALTERATIONS .....

COST, ACCELERATOR 2 Mio $

COST, FACILITY, total 7,0 Mio $

FUNDED BY Federal Government, TT-Project

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS - ENGINEERS 2

TECHNICIANS 2 CRAFTS 2

GRAD STUDENTS involved during year -

OPERATED BY - Research staff or - Operators

OPERATION 100 hr/wk. On target 90 hr./wk

TIME DISTR. in house 100 % % Outside - %

BUDGET, op & dev 200 T$

FUNDED BY Beam Recharges

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 angle 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 6×10^{-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 6 in 3 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
H^-	11-42	11-42	200	200
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 100 %

REFERENCES/NOTES

1) G.O. Hendry et al., Design and Performance of a
2) Compact H^- Cyclotron, Proceedings of this Conference

PLAN VIEW OF FACILITY, COMMENTS, ETC.