

ENTRY NO. **C27** Date August 95
 Name of Machine CP 42 H (KAZ)
 Institution Forschungszentrum Karlsruhe, Technik und Umwelt, Cyclotron-Laboratory
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HISTORY
MILESTONE DATES:
 Design 1978 Model Tests 1980
 Construction 1982 First Beam 1983
DESIGN/CONSTRUCTION BY:
 in house other TCC
COST: Accelerator \$ 2.000.000 Facility \$ 8.000.000
FUNDED BY: Federal Government + State of Bad. Württ.

STATUS
STAFF: Machine - Engineers 2
 Scientists Technicians 6 Students
 Research (in house/external)
 Scientists 1 / Engineers 1 /
 Technicians 2 / Students 2 /
BUDGET: Machine \$ 2.000.000 Funded by Income
 Research Funded by
TIME DISTRIBUTION:
 Basic Research (in house/external) 10 % / 90 %
 Applied Program (in house/external) 90 % / 10 %
 Maintenance 10 % Development 4 %

MAGNET
POLE PARAMETERS:
 Diameter 120 cm $R_{extract}$ 53 cm R_{inject} cm
HILL PARAMETERS: Gap (min) 5 cm B_{max} 2.4 T
 (@ AT) Gap (max) cm B_{min} T
VALLEY PARAMETERS: Gap (min) 12 cm B_{max} 1.6 T
 (@ AT) Gap (max) cm B_{min} T
AVERAGE FIELD: $\langle B \rangle_{min}$ T $\langle B \rangle_{max}$ 1.84 T
NUMBER OF SECTORS: compact/separated 3 /
 sector angle deg. spiral (max) 64 deg.
FIELD TRIMMING: Trim Coils 6
 Harmonic Coils
 Other
CURRENT: Main Coils 400 Amps Stability 10
 Trim Coils Amps Stability
 Stored Energy (cryogenic) MJ
WEIGHT: Iron 35 tons Conductor 3 tons
ION ENERGY: Bending Limit E/A = 42 q²/A² MeV/u
 Focusing Limit E/A = q/A MeV/u

ACCELERATION SYSTEM
FUNDAMENTAL ACCELERATION:
 Description: self excited systems 2 Dees
 No. of Gaps/turn 4 dE/dn(max) 0.100 MeV/q
 Voltage (max) 0.035 MV Harmonic f_H/f_{ion} 1
 Freq 26.8 MHz Power in(max) 0.100 MW
 Stability: Phase 10⁻⁴ Voltage
OTHER CAVITIES (Flattopping or otherwise):
 Description:
 Region of Influence: R_{min} cm R_{max} cm
 No. of Gaps/turn dE/dn(max) MeV/q
 Voltage (max) MV Harmonic f_H/f_{ion}
 Freq MHz Power in(max) MW
 Stability: Phase Voltage

VACUUM SYSTEM
OPERATING PRESSURE: 6 x 10⁻⁶ Hz
PUMPS: (No. and type) Four 10 inches Diff. pumps

ION SOURCE(S)

Type	Intensity (mA)	@	$\epsilon_n = \beta\gamma\epsilon$ (π mm mrad)	Ion Species
(a) PIG	0.200			H ⁻
(b)				
(c)				
(d)				

INJECTION SYSTEM
 Efficiency %

EXTRACTION SYSTEM
 Charge Exchange Foil Efficiency 100 %

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current (part μ A)	Internal	External
(a) H ⁻	42	200	200 p	
(b)				
(c)				
(d)				

Secondary Particles E (MeV) part/sec
 (a)
 (b)
 (c)

EXTRACTED BEAM PROPERTIES:
 For 200 μ A of 42 MeV/u ions
 $\Delta E/E$ 1 % $\Delta\phi$ °rf
 $\epsilon_n = \beta\gamma\epsilon$ x 10 π mm mrad z 10 π mm mrad

FACILITIES FOR RESEARCH
SHIELDED AREA: Fixed: 350 m² Moveable m²
 Target Stations: 1 No. Served At Same Time:
MAGNETIC SPECTROMETERS:
OTHER FACILITIES:
 8 Target Stations for Isotope Production

REFERENCES/NOTES
 (a) Proc. 9th Int. Conf. on Cyclotrons, p. 125
 (b) Proc. 13th Int. Conf. on Cyclotrons, p. 110

PLAN VIEW OF FACILITY, COMMENTS