ENTRY NO. FM4 **Date** August 14, 1992

Name of Machine Göttingen Synchrocyclotron

Institution University of Göttingen, II. Physikalisches Institut

Address Bunsenstr. 7-9, D-3400 Gottingen, F.R.G.

Tel 0049-(0)551-397632 **Telex** ..... **Fax** 0049-(0)551-394493 **EMAIL** "SCHMIDT_OTT@GWDG.DE"

In Charge: Prof. Schmidt-Ott **Reported by:** .....

HISTORY

MILESTONE DATES:
- Design 1958 Model Tests .....
- Construction 1960 First Beam 1962

DESIGN/CONSTRUCTION BY:
- in house ..... other 6 Philips, Eindhoven

COST: Accelerator 4.2x10 DM Facility 5.9x10 DM

FUNDED BY: F.R.G. + Land Niedersachsen

STATUS

STAFF: Machine
- Scientists 1 Engineers 1
- Technicians 2 Students .....

Research (in house/external)
- Scientists 3 / ..... Engineers ..... / .....
- Technicians ..... / ..... Students 3 / .....

BUDGET: Machine ..... Funded by Land Niedersachsen

Research ..... Funded by Land Niedersachsen

TIME DISTRIBUTION:
- Basic Research (in house/external) 80 % / 10 %
- Applied Program (in house/external) ..... % / ..... %
- Development ..... % Maintenance 10 %

MAGNET

POLE PARAMETERS:
- Diameter 180 cm $R_{extract}$ 75 cm R_{inject} 0 cm

HILL PARAMETERS: Gap (min) 35 cm B_{max} 1.45 T
- (@ ..... AT) Gap (max) ..... cm B_{min} 1.42 T

VALLEY PARAMETERS: Gap (min) ..... cm B_{max} ..... T
- (@ ..... AT) Gap (max) ..... cm B_{min} ..... T

AVERAGE FIELD: $< B >_{min}$ ..... T $< B >_{max}$ ..... T

NUMBER OF SECTORS: compact/separated ..... / .....
- sector angle ..... deg. spiral (max) ..... deg.

FIELD TRIMMING: Trim Coils .....
- Harmonic Coils .....
- Other 4

CURRENT: Main Coils 500 Amps Stability 3x10

Trim Coils ..... Amps Stability .....

Stored Energy (cryogenic) 5 MJ

WEIGHT: Iron 250 tons Conductor aluminium 2 tons

ION ENERGY: Bending Limit E/A = 13.9 q^2/A^2 MeV/u

Focussing Limit E/A = ... q/A MeV/u

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:
- Description: Dee+Dummy Dee, 7cm gap, freq. modulation
- No. of Gaps/turn 2 dE/dn(max) 13 MeV/q
- Voltage(max) 20 MV Harmonic f_{rf}/f_{ion} 1
- Freq 10.6-11.1 MHz Power in(max) 0.18 MW
- Stability: Phase ..... 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_{rf}/f_{ion} .....
- Freq ..... MHz Power in(max) ..... MW
- Stability: Phase ..... Voltage .....

VACUUM SYSTEM

OPERATING PRESSURE: 10^{-6} mbar

PUMPS: No. and type 6000 l/s + 1000 l/s diffusion

ION SOURCE(S)

	Type	Intensity (mA)	@	$\epsilon_n = \beta\gamma\epsilon$ (πmm mrad)	Ion Species
(a)	gas discharge				α, d
(b)					
(c)					
(d)					

INJECTION SYSTEM

..... Efficiency ..... %

EXTRACTION SYSTEM

magn. channel (Le Couteur) ..... Efficiency 5 %

CHARACTERISTIC BEAMS

	Accelerated Ions	E/A (MeV/u)	Current(part μA) Internal	External
(a)	α	13.5	0.3	
(b)	d	13.5	8	0.4
(c)				
(d)				

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

EXTRACTED BEAM PROPERTIES:
- For 0.4 μA of 13.5 MeV/u d ions
- $\Delta E/E$ < 0.1 % $\Delta\phi$ ..... °rf
- $\epsilon_n = \beta\gamma\epsilon$ x 100 πmm mrad z 100 πmm mrad

FACILITIES FOR RESEARCH

SHIELDED AREA: Fixed 160 m^2 Moveable ..... m^2

Target Stations: 1 No. Served At Same Time: 1

MAGNETIC SPECTROMETERS: .....

OTHER FACILITIES: gas transport, cooled internal target

REFERENCES/NOTES

(a) Philips Techn. Rev. Vol. 12, No. 3

(b) CERN Report 63-19, 80

PLAN VIEW OF FACILITY, COMMENTS