

**ENTRY No.** 34

NAME OF MACHINE Jülich Compact Cycl. (CV28). DATE .. SERT. ..81.....  
 INSTITUTION .. Kernforschungsanlage Juelich .. IFF.....  
 ADDRESS .. Postfach 1913, D-5170 Juelich, Germany.....  
 TEL .. .. TELEX .. ..  
 IN CHARGE R. Holzle, W. Kogler REPORTED BY .. R. Holzle.....

**HISTORY AND STATUS**

DESIGN, date .. 1969 .. Model tests .. 1973.....  
 ENG DESIGN, date .. 1970.....  
 CONSTRUCTION, date .. 1973-1975.....  
 FIRST BEAM, date (or goal) .. Oct. 1975.....  
 MAJOR ALTERATIONS .. ..

COST, ACCELERATOR .. \$ 1 Mio.....  
 COST, FACILITY, total .. \$ 2 Mio.....  
 FUNDED BY .. German Government.....

**ACCELERATOR STAFF, OPERATION AND DEVELOPMENT**  
 SCIENTISTS .. .. ENGINEERS .. 2.....  
 TECHNICIANS .. 4 .. CRAFTS .. ..

GRAD STUDENTS involved during year .. ..  
 OPERATED BY .. Research staff or .. 4 .. Operators  
 OPERATION .. 80 .. hr/wk, On target .. 72 .. hr/wk  
 TIME DISTR. in house .. 40 .. % , Outside .. 80 .. %  
 BUDGET, op & dev .. 100,000 per year.....  
 FUNDED BY .. German Government.....

**RESEARCH STAFF, not included above**  
 USERS, in house .. 6 .. outside .. 20.....  
 GRAD STUDENTS involved during year .. ..  
 RESEARCH BUDGET, in house .. ..  
 FUNDED BY .. ..

**MAGNET**  
 POLE FACE, diameter (compact) .96 cm, R extraction 42 cm  
 R injection .. cm  
 GAP, min .. 5 .. cm, Field .. kG }  
 max .. 10 .. cm, Field .. kG } at  $2 \times 10^6$  ..  
 AVERAGE FIELD at R ext .. 18.5 .. kG } Ampere turns  
 B max/ <B> .. ..

NUMBER OF SECTORS { compact .. 3 .. } Spiral, max 60 deg  
 separated .. .. }  
 SECTOR ANGLE (SSC) .. deg  
 TRIMMING COILS .. ..

CONDUCTOR, material and type .. Copper.....  
 STORED ENERGY (cryogenic) .. M.....  
 POWER: main coils .. 60 .. max, kW ; current stability  $5 \times 10^{-6}$  ..  
 trimming coils .. 50 .. max, kW ; current stability .. ..  
 WEIGHT: Fe .. total 23 .. tons ; coils .. tons  
 COOLING system .. Demineralized water.....  
 ION ENERGY (bending limit) E/A = .. 28 ..  $q^2/a^2$  MeV/amu  
 (focusing limit) E/A = .. ..  $q^2/a^2$  MeV/amu

**ACCELERATION SYSTEM**  
 DEES, number .. 2 .. ; angle .. 90 .. deg  
 BEAM APERTURE .. 2.5 .. cm ; DC Bias .. 0.5-2 .. kV  
 TUNED by, coarse short plane .. fine .. Var. cap ..  
 RF .. 6 .. to .. 26 .. MHz, stable  $\pm 1/10^6$  ..  
 Orb F .. to .. MHz  
 HARMONICS, RF/Orb F, used .. fundamental.....  
 DEE - Gnd, max .. kV, min gap .. 1.27 .. cm  
 STABILITY, (pk-pk noise)/(pk RF volt) ..  $1 \times 10^{-3}$  ..  
 ENERGY GAIN, max .. kV/turn  
 RF PHASE, stable to  $\pm$  .. deg  
 RF POWER input, max .. 75 .. kW  
 FREQUENCY MODULATION, rate .. /s  
 modulator, type .. ..  
 beam pulse, width .. ..

**VACUUM SYSTEM**  
 OPERATING PRESSURE ..  $5 \times 10^{-5}$  .. Torr or mbar  
 PUMPS, No, Type, Size .. ..  
 .. 2 x 1500 l/s Turbo.....

**ION SOURCES**  
 .. "cold cathode" Penning or thermionic.....

**INJECTION SYSTEM**

**EXTRACTION SYSTEM**  
 .. dc electrostatic + mag. channel.....

**FACILITIES FOR RESEARCH**  
 SHIELDED AREA, fixed .. 200 m<sup>2</sup> ; movable .. m<sup>2</sup>  
 TARGET STATIONS .. 8 .. in .. 4 .. rooms  
 STATIONS served at same time, max .. 1.....  
 MAG SPECTROGRAPH, type .. none.....  
 COMPUTER model .. PDP 11-40 (1981).....  
 OTHER FACILITIES .. Pneumatic transfer for internal.....  
 .. and external target.....

**CHARACTERISTIC BEAMS**

PARTICLE	ENERGY (MeV)		CURRENT (pA)	
	Goal	Achieved	Internal	External
p	2-24	2-24	500	70
d	3-14	3-14	500	100
<sup>3</sup> He <sup>++</sup>	5-36	5-36	100	70
a	6-28	6-28	100	50

**SECONDARY** .. .. (part/s)  
 .. 3 x 10<sup>12</sup> ..

**BEAM PROPERTIES**  
 MEASURED .. .. CONDITIONS .. ..  
 PULSE WIDTH .. RF deg .. pA of .. MeV .. ions  
 PHASE EXC, max .. RF deg .. pA of .. MeV .. ions  
 EXTRACT eff .. % .. pA of .. MeV .. ions  
 RESOL  $\Delta E/E$  .. % .. pA of .. MeV .. ions  
 EMITTANCE .. ..  
 ( $\pi$  mm. mrad) { 15 axial } .. 5 .. pA of .. 24 MeV p .. ions  
 { 15 rad } .. ..

**OPERATING PROGRAMS, time distribution**  
 BASIC NUCLEAR PHYSICS .. SOLID STATES PHYSICS 40 ..  
 BIOMEDICAL APPLICAT. 20 .. ISOTOPE PRODUCTIONS 40 ..

**REFERENCES/NOTES**  
 J. Hemmerich, R. Holzle, W. Kogler,  
 Kerntechnik 19 (1977)

**PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS**