

ENTRY NO. **C41** Date **October 1995**  
 Name of Machine **V.U. AVF. Cyclotron**  
 Institution **Vrije Universiteit**  
 Address **De Boelelaan 1085 c 1081 HV AMSTERDAM NETHERLANDS**  
 Tel **(0)20 - 4449123** Telex Fax **(0)20 - 4449128** E-MAIL  
 In Charge: **P.J. van der Jagt** Reported by: **C. Hoekstra**

**HISTORY**  
**MILESTONE DATES:**  
 Design **Model Tests**  
 Construction **First Beam april 1965**  
**DESIGN/CONSTRUCTION BY:**  
 in house **other Philips**  
**COST: Accelerator Facility**  
**FUNDED BY: Vrije Universiteit**

**STATUS**  
**STAFF: Machine**  
 Scientists **1** Engineers **1**  
 Technicians **11** Students **0**  
 Research (in house/external)  
 Scientists **/** Engineers **/**  
 Technicians **/** Students **/**  
**BUDGET: Machine** Funded by  
 Research Funded by  
**TIME DISTRIBUTION:**  
 Basic Research (in house/external) **2** % / **2** %  
 Applied Program (in house/external) **2** % / **80** %  
 Maintenance **15** % Development **1** %

**MAGNET**  
**POLE PARAMETERS:**  
 Diameter **140** cm  $R_{extract}$  **59** cm  $R_{inject}$  **2** cm  
**HILL PARAMETERS:** Gap (min) **15** cm  $B_{max}$  **2** T  
 (@ **0.4e6** AT) Gap (max) **27** cm  $B_{min}$  **1** T  
**VALLEY PARAMETERS:** Gap (min) **cm**  $B_{min}$  **T**  
 (@ **AT**) Gap (max) **cm**  $B_{min}$  **T**  
**AVERAGE FIELD:**  $\langle B \rangle_{min}$  **0.3** T  $\langle B \rangle_{max}$  **1.5** T  
**NUMBER OF SECTORS:** compact/separated **3** /  
 sector angle **65** deg. spiral (max) **37** deg.  
**FIELD TRIMMING:** Trim Coils **10**  
 Harmonic Coils **3**  
 Other  
**CURRENT:** Main Coils **450** Amps Stability  
 Trim Coils **150** Amps Stability  
 Stored Energy (cryogenic) **MJ**  
**WEIGHT:** Iron **100** Conductor **20** tons  
**ION ENERGY:** Bending Limit  $E/A =$  **30**  $q^2/A^2$  MeV/u  
 Focusing Limit  $E/A =$   $q/A$  MeV/u

**ACCELERATION SYSTEM**  
**FUNDAMENTAL ACCELERATION:**  
 Description: **Single DEE-system**  
 No. of Gaps/turn **2**  $dE/dn(max)$  **0.05** MeV/q  
 Voltage (max) **0.050** MV Harmonic  $f_r/f_{ion}$  **1.3**  
 Freq **6 - 22** MHz Power in(max) **0.085** 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  $f_r/f_{ion}$   
 Freq **MHz** Power in(max) **MW**  
 Stability: Phase Voltage

**VACUUM SYSTEM**  
**OPERATING PRESSURE:** **2.e-6**  
**PUMPS: (No. and type)** **1 oil.diff 6000 l/sec**

**ION SOURCE(S)**  
 Type Intensity @  $\epsilon_n = \beta\gamma\epsilon$  Ion Species  
 (mA) ( $\pi$  mm mrad)  
 (a) Livingston **0.3** **p, d, He3,  $\alpha$**   
 (b)  
 (c)  
 (d)

**INJECTION SYSTEM**  
 Efficiency **%**

**EXTRACTION SYSTEM**  
 Electrostatic + Magnetic Channel Efficiency **70** %

**CHARACTERISTIC BEAMS**  
 Accelerated Ions E/A (MeV/u) Current (part  $\mu$ A)  
 Internal External  
 (a) **p** **6 - 28** **200** **35**  
 (b) **d** **3 - 16** **15**  
 (c) **He3** **10 - 45** **10**  
 (d)  **$\alpha$**  **6 - 32** **10**  
 Secondary Particles E (MeV) part/sec  
 (a)  
 (b)  
 (c)

**EXTRACTED BEAM PROPERTIES:**  
 For **30**  $\mu$ A of **24** MeV/u **p** ions  
 $\Delta E/E$  **0.3** %  $\Delta\phi$  **40** °rf  
 $\epsilon_n = \beta\gamma\epsilon$  x **5**  $\pi$  mm mrad z **5**  $\pi$  mm mrad

**FACILITIES FOR RESEARCH**  
 SHIELDED AREA: Fixed: **m<sup>2</sup>** Moveable **m<sup>2</sup>**  
 Target Stations: **No. Served At Same Time:**  
**MAGNETIC SPECTROMETERS:**  
**OTHER FACILITIES:**  
 Internal Isotope Production  
 External Isotope Production

**REFERENCES/NOTES**  
 (a)  
 (b)

**PLAN VIEW OF FACILITY, COMMENTS**

