

ENTRY NO. CM24 Date  
 Machine Name CS-15  
 Manufacturer The Cyclotron Corporation (a)  
 Address 950 Gilman Street, Berkeley, CA 94710 USA  
 Tel (510) 524-8844 Telex 910-366-7116  
 Fax (510) 527-9336 EMAIL  
 In Charge: n/a Reported by: F.A. Ramsey

HISTORY AND STATUS  
 DATES: Design 1965 First Machine OCT 1967  
 SALES: No. Sold/Operational 3 / 3 Currently Available n/a  
 COST: Accelerator Facility

MAGNET  
 POLE PARAMETERS:  
 Diameter .81 cm  $R_{extract}$  .35 cm  $R_{inject}$  cm  
 HILL PARAMETERS: Gap (min) .5 cm  $B_{max}$  .20 T  
 (@ . . . . . AT) Gap (max) cm  $B_{min}$  T  
 VALLEY PARAMETERS: Gap (min) cm  $B_{max}$  T  
 (@ . . . . . AT) Gap (max) .10 cm  $B_{min}$  .12 T  
 AVERAGE FIELD:  $\langle B \rangle_{min}$  T  $\langle B \rangle_{max}$  T  
 NUMBER OF SECTORS: compact/separated .3 / . . . . .  
 sector angle . . . . . deg. spiral (max) . . . . . deg.  
 FIELD TRIMMING: Trim Coils none  
 Harmonic Coils One set - outer  
 Other  
 CURRENT: Main Coils .250 Amps Stability 0.01%  
 Trim Coils Amps Stability  
 Stored Energy (cryogenic) MJ  
 WEIGHT: Iron 22,000 kg TOTAL Conductor  
 ION ENERGY: Bending Limit E/A =  $q^2/A^2$  MeV/u  
 Focussing Limit E/A =  $q/A$  MeV/u

ACCELERATION SYSTEM  
 FUNDAMENTAL ACCELERATION:  
 Description: Two 120° dees  
 No. of Gaps/turn 4 dE/dn(max) MeV/q  
 Voltage(max) 0.025 MV Harmonic  $f_{rf}/f_{ion}$   
 Freq .125 - .25 MHz Power in(max) 0.030 MW  
 Stability: Phase Voltage

VACUUM SYSTEM  
 OPERATING PRESSURE:  $10^{-5}$  torr  
 PUMPS: No. and type One oil diffusion pump

ION SOURCE(S)  

Type	Intensity (mA)	$\epsilon_n = \beta\gamma\epsilon$ ( $\pi$ mm mrad)	Ion Species
(a) Penning		not available	$H^+/D^+$
(b) "		"	$^3He^{++}/^4He^{++}$

INJECTION SYSTEM  
 Radial Efficiency 10-12 %

EXTRACTION SYSTEM  
 Electrostatic deflector and septum Efficiency 70 %

CHARACTERISTIC BEAMS  

Accelerated Ions	E/A (MeV/u)	Current (part. $\mu A$ )	
		Internal	External
(a) $H^+/D^+$	15/8	200/300	60/100
(b) $^3He^{++}/^4He^{++}$	20/16	135/90	60/40

 EXTRACTED BEAM PROPERTIES:  
 For  $\mu A$  of . . . . . MeV/u . . . . . ions  
 $\Delta E/E$  . . . . . 1 %  $\Delta\phi$  . . . . . °rf  
 $\epsilon_n = \beta\gamma\epsilon$  x . . . . .  $\pi$  mm mrad z . . . . .  $\pi$  mm mrad

REFERENCES/NOTES  
 (a) CII Cyclotron Systems, 950 Gilman St., Berkeley, CA  
 (b)

ENTRY NO. CM25 Date  
 Machine Name CS-22  
 Manufacturer The Cyclotron Corporation (a)  
 Address 950 Gilman Street, Berkeley, CA 94710 USA  
 Tel (510) 524-8844 Telex 910-366-7116  
 Fax (510) 527-9336 EMAIL  
 In Charge: n/a Reported by: F.A. Ramsey

HISTORY AND STATUS  
 DATES: Design 1969 First Machine SEPT. 1970  
 SALES: No. Sold/Operational 4 / 3 Currently Available n/a  
 COST: Accelerator Facility

MAGNET  
 POLE PARAMETERS:  
 Diameter .96 cm  $R_{extract}$  .42 cm  $R_{inject}$  cm  
 HILL PARAMETERS: Gap (min) .5 cm  $B_{max}$  .20 T  
 (@ . . . . . AT) Gap (max) cm  $B_{min}$  T  
 VALLEY PARAMETERS: Gap (min) cm  $B_{max}$  T  
 (@ . . . . . AT) Gap (max) .10 cm  $B_{min}$  .12 T  
 AVERAGE FIELD:  $\langle B \rangle_{min}$  T  $\langle B \rangle_{max}$  T  
 NUMBER OF SECTORS: compact/separated .3 / . . . . .  
 sector angle . . . . . deg. spiral (max) . . . . . deg.  
 FIELD TRIMMING: Trim Coils none  
 Harmonic Coils One set - outer  
 Other  
 CURRENT: Main Coils .250 Amps Stability 0.01%  
 Trim Coils Amps Stability  
 Stored Energy (cryogenic) MJ  
 WEIGHT: Iron 23,000 kg TOTAL Conductor  
 ION ENERGY: Bending Limit E/A =  $q^2/A^2$  MeV/u  
 Focussing Limit E/A =  $q/A$  MeV/u

ACCELERATION SYSTEM  
 FUNDAMENTAL ACCELERATION:  
 Description: Two 90° dees  
 No. of Gaps/turn 4 dE/dn(max) MeV/q  
 Voltage(max) 0.025 MV Harmonic  $f_{rf}/f_{ion}$   
 Freq .13 - .25 MHz Power in(max) 0.060 MW  
 Stability: Phase Voltage

VACUUM SYSTEM  
 OPERATING PRESSURE:  $10^{-5}$  torr  
 PUMPS: No. and type One oil diffusion pump

ION SOURCE(S)  

Type	Intensity (mA)	$\epsilon_n = \beta\gamma\epsilon$ ( $\pi$ mm mrad)	Ion Species
(a) Penning		not available	$H^+/D^+$
(b) "		"	$^3He^{++}/^4He^{++}$

INJECTION SYSTEM  
 Radial Efficiency 10-12 %

EXTRACTION SYSTEM  
 Electrostatic deflector and septum Efficiency 70 %

CHARACTERISTIC BEAMS  

Accelerated Ions	E/A (MeV/u)	Current (part. $\mu A$ )	
		Internal	External
(a) $H^+/D^+$	22/12	200/300	50/50
(b) $^3He^{++}/^4He^{++}$	32/24	135/90	50/50

 EXTRACTED BEAM PROPERTIES:  
 For  $\mu A$  of . . . . . MeV/u . . . . . ions  
 $\Delta E/E$  . . . . . 1 %  $\Delta\phi$  . . . . . °rf  
 $\epsilon_n = \beta\gamma\epsilon$  x . . . . .  $\pi$  mm mrad z . . . . .  $\pi$  mm mrad

REFERENCES/NOTES  
 (a) CII Cyclotron Systems, 950 Gilman St., Berkeley, CA  
 (b)