Entry: C70
Machine Name: Harper Hospital K100
Address: Harper Hospital, 3990 John R St., Detroit, MI 48201, USA
In Charge of the cyclotron: Richard L. Maughan
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Date: June 1998
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HISTORY
Design by: NSCL, E. Lansing, MI
Construction time: 6 Years
First beam: 1990 (At Harper Hospital)

CHARACTERISTIC BEAMS
ions / energy (MeV/n) / current (pps) / power (W) :
- Deuteron 24.25 MeV/r 15μA
- Beam RF IS Pulsed 2 ms on 8ms off
- Peak Pulse Beam 180 μA
transmission efficiency (total)
- typical: % - best: %
transverse emittance (rms)
- vertical: π mmmrad
- horizontal: π mmmrad
longitudinal emittance (rms) ΔE/E.deg RF

USES
basic research: 10 % therapy: 70 %
development: 5 % isotope production: % %
other applications: % maintenance: 15 %
beam tuning: %
total time: 3000 h/year

TECHNICAL DATA
a) magnet
type: Superconducting
Kb: MeV/A Kf: MeV/A
average field (min-max): 40.7 - 55.3 T
number of magnet sectors: 3
- angle: - deg
- spiral (max): - deg
pole parameters
- diameter: 0.30 m
- injection radius: - m
- extraction radius: - m
hill gap: 0.038 m valley gap: 0.406 m
field trimming
- trim coils
  - number: NONE
  - current (max): A
- harmonic coils
  - number: NONE
  - current (max): A
- others
  - number: NONE
  - current (max): A
main coils:
- number: -
- Ampere-turns: - A.T.
- current: 203 A
stored energy: 2.0 MJ
weight : - iron: 24 US Tons coils: t
power
- main coils (total): kW
- trim coils (total max): NONE kW
- refrigerator (cryogenic): kW
b) RF
- acceleration
- frequency range: 105 MHz
- harmonic modes: -
- number of dees: 3 DEE/6 Stems Galvanically Coupled
- angular aperture: - deg
- voltage:- average (min-max): 0.033 kV
- variation with radius: -
-
- power in (max): 25 kW
- stability: - phase: - deg - voltage: - %
- other cavities
- purpose: -
- frequency range: - MHz
- region of influence: - m
- voltage (max): - kV
- power in (max): - kW
- stability:- phase: - deg - voltage: - %
c) injection
- internal source: -
- external (radial/axial):
- elements:
- source voltage: kV
- injection energy: MeV/n
- buncher:
- injection efficiency: %
d) ion sources/injector
COLD CATHODE d
e) extraction
- elements, characteristics:
-
-
-
-
- efficiency
- typical: % - best: %
f) vacuum
- pumps: 2 TURBO 300 L/S
- achieved vacuum: 5×10^{-6} torr Pa

REFERENCES
Blosser et al IEEE Trans Nucl Sci. NS-32 (1985) 3287

EXPERIMENTAL FACILITIES
Used as source of fast neutron for Radiation Therapy

PLAN VIEW OF FACILITY

COMMENTS
Internal Beryllum Stopping Target Gives 48 Gy/min of Fast Neutron Beam