

ENTRY No. 129

NAME OF MACHINE CI-100 DATE  
INSTITUTION Joint Institute for Nuclear Research, Laboratory of Nuclear Reactions  
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IN CHARGE REPORTED BY

#### HISTORY AND STATUS

DESIGN, date 1974 Model tests 1984  
ENG DESIGN, date 1984  
CONSTRUCTION, date 1984-1985  
FIRST BEAM, date (or goal) May, 1985  
MAJOR ALTERATIONS  
COST, ACCELERATOR  
COST, FACILITY, total  
FUNDED BY  
ACCELERATOR STAFF, OPERATION AND DEVELOPMENT  
SCIENTISTS ENGINEERS  
TECHNICIANS CRAFTS  
GRAD STUDENTS involved during year  
OPERATED BY Research staff or Operators  
OPERATION hr/wk, On target hr/wk  
TIME DISTR. in house %, Outside %  
BUDGET, op & dev  
FUNDED BY  
RESEARCH STAFF, not included above  
USERS, in house outside  
GRAD STUDENTS involved during year  
RESEARCH BUDGET, in house  
FUNDED BY  
MAGNET  
POLE FACE, diameter (compact) 105 cm, R extraction 46 cm  
R injection cm  
GAP, min 2 cm, Field 25 kG } at 0.17.10<sup>6</sup>  
max 11 cm, Field 11 kG } Ampere turns  
AVERAGE FIELD at R ext 19.4 kG  
B max/ <B> 1.25  
NUMBER OF SECTORS { compact 4 } Spiral, max 0 deg  
SECTOR ANGLE (SSC) 56 deg  
TRIMMING COILS  
CONDUCTOR, material and type Copper  
STORED ENERGY (cryogenic) MJ  
POWER: main coils 110 max, kW; current stability 10<sup>-4</sup>  
trimming coils max, kW; current stability  
WEIGHT: Fe 43 tons; coils 0.7 tons  
COOLING system Demineralized water  
ION ENERGY (bending limit) E/A = 40 q<sup>2</sup>/a<sup>2</sup> MeV/amu  
(focusing limit) E/A = q<sup>2</sup>/a<sup>2</sup> MeV/amu  
ACCELERATION SYSTEM  
DEES, number 2; angle 34 deg  
BEAM APERTURE 2 cm; DC Bias 0 kV  
TUNED by, coarse MS, fine VC  
RF 20.4 to 20.9 MHz, stable ± 10<sup>-5</sup>  
Orb F 5.1 to 5.22 MHz  
HARMONICS, RF/Orb F, used 4  
DEE - Gnd, max 70 kV, min gap 3.5 cm  
STABILITY, (pk-pk noise)/(pk RF volt)  
ENERGY GAIN, max 200 kV/turn  
RF PHASE, stable to ± deg  
RF POWER input, max 25 kW  
FREQUENCY MODULATION, rate /s  
modulator, type  
beam pulse, width  
VACUUM SYSTEM  
OPERATING PRESSURE (5-10) 10<sup>-6</sup> Torr or mbar  
PUMPS, No, Type, Size 3 oil diffusion pumps  
one 4000 L/S, two 500 L/S (each)  
ION SOURCES  
Arc type with heated cathode

#### INJECTION SYSTEM

##### EXTRACTION SYSTEM

dc electrostatic and stripping  
FACILITIES FOR RESEARCH  
SHIELDED AREA, fixed m<sup>2</sup>; movable m<sup>2</sup>  
TARGET STATIONS in rooms  
STATIONS served at same time, max 1  
MAG SPECTROGRAPH, type  
COMPUTER model  
OTHER FACILITIES

##### CHARACTERISTIC BEAMS

| PARTICLE           | ENERGY (MeV) |          | CURRENT (pA) |          |
|--------------------|--------------|----------|--------------|----------|
|                    | Goal         | Achieved | Internal     | External |
| 12C <sup>2+</sup>  |              | 13       | 12           | 5        |
| 16O <sup>3+</sup>  |              | 20       | 1            | 1        |
| 22Ne <sup>4+</sup> |              | 27       | 1            | 0.5      |
| 40Ar <sup>7+</sup> |              | 46       | 0.5          | 0.25     |

SECONDARY (part/s)

##### BEAM PROPERTIES

|                | MEASURED                          | CONDITIONS     |
|----------------|-----------------------------------|----------------|
| PULSE WIDTH    | RF deg                            | pA of MeV ions |
| PHASE EXC, max | RF deg                            | pA of MeV ions |
| EXTRACT eff    | 50 %                              | pA of MeV ions |
| RESOL ΔE/E     | %                                 | pA of MeV ions |
| EMITTANCE      | (π mm. mrad) { axial }<br>{ rad } | pA of MeV ions |

OPERATING PROGRAMS, time distribution  
BASIC NUCLEAR PHYSICS - SOLID STATES PHYSICS 100%  
BIOMEDICAL APPLICAT. ISOTOPE PRODUCTIONS

##### REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES,  
COMMENTS