ENTRY No. C73

NAME OF MACHINE NAVAL RESEARCH LABORATORY CYC DATE 7/24/78
INSTITUTION NAVAL RESEARCH LABORATORY, Radiation Technology Division
ADDRESS Washington, D.C. 20375, USA
TEL ..... TELEX .....
IN CHARGE Rollon O. Bondelid REPORTED BY Rollon O. Bondelid

HISTORY AND STATUS

DESIGN, date 1) Model tests 1)
ENG DESIGN, date 1963-1964
CONSTRUCTION, date 1965-1967
FIRST BEAM, date (or goal) int. 1967, ext. 1968
MAJOR ALTERATIONS 2)
COST, ACCELERATOR $ 1.8 10^6
COST, FACILITY, total $ 6.0 10^6
FUNDED BY U.S. Navy Department

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT

SCIENTISTS 0 ENGINEERS 4
TECHNICIANS 6 CRAFTS 2
GRAD STUDENTS involved during year 3
OPERATED BY Research staff or Operators
OPERATION 52 hr/wk, On target 50 hr/wk
TIME DISTR. in house 60 %, Outside 40 %
BUDGET, op & dev
FUNDED BY Office of Naval Research & Users

RESEARCH STAFF, not included above

USERS, in house 11 outside 3
GRAD STUDENTS involved during year 3
RESEARCH BUDGET, In house 725 k
FUNDED BY Office of Naval Research

MAGNET

POLE FACE, diameter (compact) 19.3 , R extraction .... cm
R injection ..... cm
GAP, min 19 cm, Field 22.7 kG
max 71 cm, Field 12.7 kG } at .....
AVERAGE FIELD at R ext 17 kG } Ampere turns
B max/ <B> 1.3
NUMBER OF SECTORS { compact 3. / separated ..... } Spiral, max 30 deg
SECTOR ANGLE (SSC) ..... deg
TRIMMING COILS Harmonic correction; 3/sect
10 circular coils
CONDUCTOR, material and type
STORED ENERGY (cryogenic) 6.5 MJ
POWER : main coils 800 max, kW ; current stability 5 10^{-5}
trimming coils 350 max, kW ; current stability .....
WEIGHT : Fe 250 tons ; coils 45 tons
COOLING system Demineralized water
ION ENERGY (bending limit) E/A = ... q^2/a^2 MeV/amu
(focusing limit) E/A = 75 q^2/a^2 MeV/amu

ACCELERATION SYSTEM

DEES, number 1 ; angle 180 deg
BEAM APERTURE 4.5 cm ; DC Bias 0 kV
TUNED by, coarse ..... fine VC, auto
RF 7.5 to 22.5 mHz, stable ± 10^{-6}
Orb F 1.5 to 22.5 mHz
HARMONICS, RF/Orb F, used 1,3
DEE - Gnd, max 70 kV, min gap 1 cm
STABILITY, (pk-pk noise)/(pk RF volt) 0.005
ENERGY GAIN, max 100 kV/turn
RF PHASE, stable to ± 3 deg
RF POWER input, max 300 kW
FREQUENCY MODULATION, rate ..... /s
modulator, type
beam pulse, width

VACUUM SYSTEM

OPERATING PRESSURE 10^{-5} Torr or mbar
PUMPS, No, Type, Size 2 diffusion 30", 32"
(32 K & 50 kl/s)

ION SOURCES

Hot filament

INJECTION SYSTEM

EXTRACTION SYSTEM

Electrostatic with magnetic channel

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 868 m² ; movable ..... m²
TARGET STATIONS 4 In 3 rooms
STATIONS served at same time, max 1
MAG SPECTROGRAPH, type
COMPUTER model SEL 32/55
OTHER FACILITIES Double focusing 2.75 m beam analyzing magnet; provision for 11 beam paths, 8 with analyzed beam; beam pickoff unit for T.O.F. measurements

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
p	70	52	30	10
d	40	40	30	12
α	78	78	30	10
^{3}He	120	90		
SECONDARY			(part/s)	

BEAM PROPERTIES

MEASURED	CONDITIONS
PULSE WIDTH 5 RF deg	pμ A of .... MeV ... ions
PHASE EXC, max 30 RF deg	pμ A of .... MeV ... ions
EXTRACT eff 40 %	pμ A of .... MeV ... ions
RESOL ΔE/E ..... %	pμ A of .... MeV ... ions
EMITTANCE	
(π mm. mrad) { axial / rad }	pμA of ..... MeV ... ions

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 0% SOLID STATES PHYSICS 40%
BIOMEDICAL APPLICAT. 60% ISOTOPE PRODUCTIONS 0%

REFERENCES/NOTES

1) Horizontal median plane version of ORIC
2) Conversion to RCA4648 power tetrode from RCA 6949 in late 1976. New computer installed July 1976

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS