

ENTRY No. 116

NAME OF MACHINE Texas A&M K500 Cyclotron DATE May 3, 1989
INSTITUTION Texas A&M University
ADDRESS College Station, Texas, USA 77843-3366
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IN CHARGE D. H. Youngblood REPORTED BY R. C. Rogers

HISTORY AND STATUS

DESIGN, date 1980 Model tests
ENG DESIGN, date 1981-1986
CONSTRUCTION, date 1982-1988
FIRST BEAM, date (or goal) June 13, 1988
MAJOR ALTERATIONS

COST, ACCELERATOR \$8,500,000
COST, FACILITY, total \$36,000,000 (replacement cost)
FUNDED BY Texas A&M University, Welch Foundation

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT
SCIENTISTS 4 ENGINEERS 5
TECHNICIANS 11 CRAFTS 7

GRAD STUDENTS involved during year 3
OPERATED BY Research staff or X Operators
OPERATION 88 hr/wk, On target 40 hr/wk

TIME DISTR. in house 100 % Outside %
BUDGET, op & dev \$2,000,000
FUNDED BY State of Texas, DOE

RESEARCH STAFF, not included above
USERS, in house 25 outside 4
GRAD STUDENTS involved during year 29
RESEARCH BUDGET, in house \$700,000
FUNDED BY DOE, Welch Foundation

MAGNET
POLE FACE, diameter (compact) 142 cm, R extraction 67 cm
R injection cm
GAP, min 6.35 cm, Field 58 kG
max 91.4 cm, Field 43 kG } at 4.7x10^6
AVERAGE FIELD at R ext 49 kG } Ampere turns
B max/ < B >

NUMBER OF SECTORS { compact 3 } Spiral, max 13, 5 deg
{ separated }
SECTOR ANGLE (SSC) deg
TRIMMING COILS 13

CONDUCTOR, material and type NbTi in Cu
STORED ENERGY (cryogenic) 22 MJ
POWER: main coils 0 max, kW; current stability
trimming coils 50 max, kW; current stability

WEIGHT: Fe 100 tons; coils .8 tons
COOLING system He bath
ION ENERGY (bending limit) E/A = 520 q^2/a^2 MeV/amu
(focusing limit) E/A = 160 q^2/a^2 MeV/amu

ACCELERATION SYSTEM
DEES, number 3; angle 53 deg
BEAM APERTURE 2.5 cm; DC Bias 0 kV
TUNED by, coarse Sliding Short fine VC
RF 9 to 28 MHz, stable +/- 10^-7
Orb F 1.3 to 28 MHz

HARMONICS, RF/Orb F, used 1, 2, 3, 4, 5, 7
DEE - Gnd, max 80 kV, min gap 1.0 cm
STABILITY, (pk-pk noise)/(pk RF volt) 10^-4
ENERGY GAIN, max 240 kV/turn
RF PHASE, stable to +/- 0.1 deg
RF POWER input, max 240 kW

FREQUENCY MODULATION, rate /s
modulator, type
beam pulse, width

VACUUM SYSTEM
OPERATING PRESSURE 1-2x10^-6 Torr or mbar
PUMPS, No, Type, Size 3, Turbomolecular, 510 l/s

ION SOURCES
Internal cold cathode, External ECR (under construction)

INJECTION SYSTEM

Axial injection (under construction)

EXTRACTION SYSTEM

2 Electrostatic deflectors & magnetic channels

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 720 m^2; movable m^2
TARGET STATIONS 12 in 5 rooms
STATIONS served at same time, max 1

MAG SPECTROGRAPH, type Enge Split Pole
COMPUTER model VAX 11/780, MICROVAX II

*OTHER FACILITIES 4n neutron calorimeter, Momentum Achromat
Recoil Spectrometer, 100 Element BaF array, Di-proton
spectrometer, Orange spectrometer

CHARACTERISTIC BEAMS

Table with columns: PARTICLE, ENERGY (MeV) Goal, Achieved, CURRENT (pA) Internal, External. Rows include 14N5+, 40Ar4+, 4He2+.

SECONDARY (part/s)

BEAM PROPERTIES

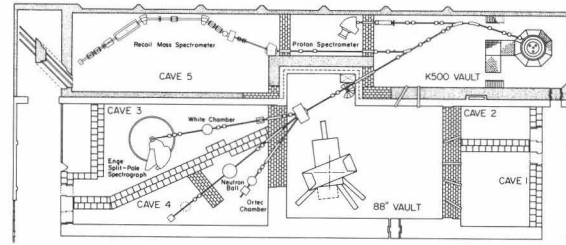
MEASURED CONDITIONS
PULSE WIDTH RF deg pA of MeV ions
PHASE EXC, max RF deg pA of MeV ions
EXTRACT eff .44 % .125 pA of 280 MeV 14N4 ions
RESOL dE/E % pA of MeV ions
EMITTANCE

(pi mm. mrad) { axial } pA of MeV ions
{ rad }

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

REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS Projected 1990



*Under construction, various completion dates 1989 - 1991.