

**ENTRY NO. 126**

NAME OF MACHINE ..... U-200  
INSTITUTION ..... Joint Institute for Nuclear Research  
ADDRESS ..... Dubna, USSR  
TEL ..... TELEX ..... MSK DUBNA 412621  
IN CHARGE ..... G.N.Flerov ..... REPORTED BY .....

**HISTORY AND STATUS**

DESIGN, date ..... 1966 ..... Model tests .....  
ENG DESIGN, date ..... 1966-1967 .....  
CONSTRUCTION, date ..... 1966-1967 .....  
FIRST BEAM, date (or goal) ..... 1968 .....  
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 ..... 30 ..... hr/wk. On target ..... 25 ..... 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) ..... 200 ..... cm, R-extraction ..... 86 ..... cm  
R injection ..... cm  
GAP, min ..... 3 ..... cm, Field ..... 26 ..... kG }  
max ..... 15 ..... cm, Field ..... 14 ..... kG } at .....  $0,59 \times 10^6$  .....  
AVERAGE FIELD at R ext ..... 20 ..... kG } Ampere turns  
B max/ < B > ..... 1,3 .....  
NUMBER OF SECTORS { compact ..... 4 ..... } Spiral, max ..... deg  
{ separated ..... - ..... }  
SECTOR ANGLE (SSC) ..... deg  
TRIMMING COILS ..... 7 ..... circular .....  
..... 4 ..... harmonic .....  
CONDUCTOR, material and type ..... Cu .....  
STORED ENERGY (cryogenic) ..... MJ  
POWER: main coils ..... 350 max kW: current stability .....  $10^{-4}$  .....  
trimming coils ..... 20 max kW: current stability .....  $10^{-3}$  .....  
WEIGHT: Fe ..... 220 tons: coils ..... 1,1,5 ..... tons  
COOLING system ..... Demineralized water .....  
ION ENERGY (Bending limit) E/A = .....  $1,45 \dots q^2/A^2$  MeV/amu  
(Focusing limit) E/A = ..... 20 ..... q/A MeV/amu

**ACCELERATION SYSTEM**  
DEES, number ..... 2,42 ..... angle ..... deg  
BEAM APERTURE ..... 2,5 ..... cm; DC Bias ..... 0 ..... kV  
TUNED by, coarse ..... MS ..... fine ..... VC .....  
RF ..... 12 ..... to ..... 21,5 ..... MHz, stable  $\pm$  .....  $10^{-5}$  .....  
Orb F ..... 3 ..... to ..... 10,7 ..... MHz  
HARMONICS, RF/Orb F, used ..... 2,3 .....  
DEE-Gnd, max ..... 75 ..... kV, min gap ..... 4 .....  $10^{-2}$  ..... cm  
STABILITY, (pk-pk noise)/(pk RF volt) .....  $10^{-2}$  .....  
ENERGY GAIN, max ..... 275 ..... kV/turn  
RF PHASE, stable to  $\pm$  ..... 4 ..... deg  
RF POWER input, max ..... 50 ..... kW  
FREQUENCY MODULATION, rate ..... /s  
modulator, type .....  
beam pulse, width .....

**VACUUM SYSTEM**  
OPERATING PRESSURE .....  $2 \times 10^{-6}$  ..... Torr or mbar  
PUMPS, No, Type, Size ..... 2 oil diffusion pumps  
..... 4000 l s ..... each

**ION SOURCES**  
..... Arc type with heated cathode .....

**INJECTION SYSTEM**

**EXTRACTION SYSTEM**  
Stripping + magnetic channel

**FACILITIES FOR RESEARCH**  
SHIELDED AREA, fixed ..... 225 ..... m<sup>2</sup>; movable ..... m<sup>2</sup>  
TARGET STATIONS ..... 4 ..... in ..... 2 ..... rooms  
STATIONS served at same time, max ..... 1 .....  
MAG SPECTROGRAPH, type .....  
COMPUTER model .....  
OTHER FACILITIES .....

**CHARACTERISTIC BEAMS**

PARTICLE	ENERGY (MeV)		CURRENT ( $\mu$ A)	
	Goal	Achieved	Internal	External
$^4\text{He}^{1+}$	39	37	600	60
$^{12}\text{C}^{3+}$	208	198	20	10
$^{40}\text{Ar}^{8+}$	230	220	0,012	0,006

SECONDARY ..... (part/s)

**BEAM PROPERTIES**

MEASURED ..... CONDITIONS  
PULSE WIDTH 30 ..... RF deg .....  $\mu$  A of ..... MeV ..... ions  
PHASE EXC. max ..... RF deg .....  $\mu$  A of ..... MeV ..... ions  
EXTRACT eff 40-10% .....  $\mu$  A of ..... MeV ..... ions  
RESOL  $\Delta E/E$  .1. % .....  $\mu$  A of ..... MeV ..... ions  
EMITTANCE  
( $\pi$  mm-mrad) 30 ..... axial ..... 5 .....  $\mu$  A of 37 ..... MeV  $\alpha$ -particles  
70 ..... rad

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

**REFERENCES/NOTES**

- 1) Proc. of the Vth Int. Cyclotron Conf., New York, 232, 1972
- 2)

**PLAN VIEW OF FACILITY, COMMENTS, ETC.**