ENTRY NO. 108

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
min 15 cm, Field 14 kG } at $0,59 \times 10^6$ Ampere turns

AVERAGE FIELD at R ext 20 kG

B max/ < B > 1,3

NUMBER OF SECTORS { compact 4 / separated - } Spiral, max - deg

SECTOR ANGLE (SSC) ..... deg

TRIMMING COILS 7 circular
4 harmonic

CONDUCTOR, material and type Cu

STORED ENERGY (cryogenic) ~4 MJ

POWER: main coils 350 max, kW; current stability 10^{-3}
trimming coils 20 max, kW; current stability 10^{-5}

WEIGHT: Fe 220 tons; coils 11,5 tons

COOLING system Demineralized water

ION ENERGY (bending limit) E/A = 145 q^2/a^2 MEV/amu
(focusing limit) E/A = 20 q/a MeV/amu

ACCELERATION SYSTEM

DEES, number 2,42° deg

BEAM APERTURE 2,5 cm; DC Bias 0 kV

TUNED by, coarse MS fine VC

RF 12 to 21,5 mHz, stable ± 10^{-5}

Orb F 3 to 10,7 mHz

HARMONICS, RF/Orb F, used 2,3

DEE—Gnd, max 75 kV, min gap 4 ~2 cm

STABILITY, (pk-pk noise)/(pk RF volt) 10^{-4}

ENERGY GAIN, max 275 kV/turn

RF PHASE, stable to ± 4 deg

RF POWEP input, max 50 kW

FREQUENCY MODULATION, rate - /s

modulator, type -

beam pulse, width -

VACUUM SYSTEM

OPERATING PRESSURE 2×10^{-6} Torr or mbar

PUMPS, No, Type, Size 2 oil diffusion pumps
4000 l s^{-1} each

ION SOURCES

Arc type with heated cathode

INJECTION SYSTEM

EXTRACTION SYSTEM

Stripping + magnetic channel

FACILITIES FOR RESEARCH

SHIELDED AREA, fixed 225 m^2; movable ..... m^2

TARGET STATIONS 4 in 2

STATIONS served at same time, max 1

MAG SPECTROGRAPH, type .....

COMPUTER model .....

OTHER FACILITIES .....

CHARACTERISTIC BEAMS

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

BEAM PROPERTIES

MEASURED		CONDITIONS		
PULSE WIDTH 30	RF deg	pμ A of	MeV	ions
PHASE EXC. max	RF deg	pμ A of	MeV	ions
EXTRACT eff 40-100	%	pμ A of	MeV	ions
RESOL ΔE/E 1	%	pμ A of	MeV	ions
EMITTANCE (π mm. mrad) 30 axial / 70 rad		,5 pμ A of 37	MeV	α-particles

OPERATING PROGRAMS, time distribution

BASIC NUCLEAR PHYSICS 100 SOLID STATES PHYSICS .....

BIOMEDICAL APPLICAT..... ISOTOPE PRODUCTIONS .....

REFERENCES/NOTES

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

PLAN VIEW OF FACILITY, COMMENTS, ETC.