

**ENTRY NO. FM-1**

NAME OF MACHINE THE BUENOS AIRES 180 cm SYNCHROCYCLOTRON  
 INSTITUTION Comisión Nacional de Energía Atómica (CNEA)  
 ADDRESS Ay. del Libertador 8250, (1429) Buenos Aires, Argentina  
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 IN CHARGE N.A. Fazzini REPORTED BY N.A. Fazzini

**HISTORY AND STATUS**

DESIGN, date Model tests  
 ENG DESIGN, date  
 CONSTRUCTION, date 1952  
 FIRST BEAM, date (or goal) November, 1954  
 MAJOR ALTERATIONS 1968  
 COST, ACCELERATOR  $10^6$  dollars  
 COST, FACILITY, total  $2 \times 10^9$  dollars  
 FUNDED BY CNEA

**ACCELERATOR STAFF, OPERATION AND DEVELOPMENT**

SCIENTISTS 3 ENGINEERS 4  
 TECHNICIANS 6 CRAFTS 1  
 GRAD STUDENTS involved during year 4  
 OPERATED BY CNEA Research staff or X Operators  
 OPERATION 90 hr/wk, On target 80 hr/wk  
 TIME DISTR. in house 90 % outside 10 %  
 BUDGET, op & dev 70,000 dollars  
 FUNDED BY CNEA

**RESEARCH STAFF, not included above**

USERS, in house 11 outside 3  
 GRAD STUDENTS involved during year 5  
 RESEARCH BUDGET, in house 60,000 dollars  
 FUNDED BY CNEA

**MAGNET**

POLE FACE, diameter (compact) 180 cm, R-extraction 76 cm  
 R injection 0 cm  
 GAP, min cm, Field kG  
 max 35.5 cm, Field 14.4 kG at  
 AVERAGE FIELD at R ext kG Ampere turns  
 B max / <B>

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

CONDUCTOR, material and type Aluminium  
 STORED ENERGY (cryogenic) MJ  
 POWER: main coils 220 max kW; current stability 10 parts/ $10^6$   
 trimming coils max kW; current stability  
 WEIGHT: Fe 180 tons; coils 9 tons  
 COOLING system water  
 ION ENERGY (Bending limit) E/A =  $q^2/A^2$  MeV/amu  
 (Focusing limit) E/A =  $q/A$  MeV/amu

**ACCELERATION SYSTEM**

DEES, number One 180 angle deg  
 BEAM APERTURE 10 cm; DC Bias 0.5 kV  
 TUNED by, coarse fine  
 RF 10.1 to 10.5 MHz, stable  $\pm 10/10^6$   
 Orb F to MHz  
 HARMONICS, RF/Orb F, used  
 DEE-Gnd, max 12 kV, min gap 10 cm  
 STABILITY, (pk-pk noise)/(pk RF volt)  
 ENERGY GAIN, max kV/turn  
 RF PHASE, stable to  $\pm$  deg  
 RF POWER input, max 29 kW  
 FREQUENCY MODULATION, rate 2,000 /s  
 modulator, type rotating capacitor  
 beam pulse, width 30  $\mu$ sec

**VACUUM SYSTEM**

OPERATING PRESSURE  $1.9 \cdot 10^{-5}$  Torr or mbar  
 PUMPS, No, Type, Size 2, oil diffusion  
 5,000 1/sec. and 12,000 1/sec.

**ION SOURCES**

arc and filament

**INJECTION SYSTEM**

conventional

**EXTRACTION SYSTEM**

regenerative with magnetic channels

**FACILITIES FOR RESEARCH**

SHIELDED AREA, fixed  $17 \text{ m}^2$ ; movable  $\text{m}^2$   
 TARGET STATIONS 2 in one room rooms  
 STATIONS served at same time, max one  
 MAG SPECTROGRAPH, type  
 COMPUTER model  
 OTHER FACILITIES internal beam

**CHARACTERISTIC BEAMS**

PARTICLE	ENERGY (MeV)		CURRENT ( $\mu$ A)	
	Goal	Achieved	Internal	External
d	28	27.2	14	0.020
$\alpha$	56	55	3	0.0013

SECONDARY (part/s)

**BEAM PROPERTIES**

MEASURED	CONDITIONS	
	$\mu$ A of	MeV ions
PULSE WIDTH RF deg	$\mu$ A of	MeV ions
PHASE EXC. max RF deg	$\mu$ A of	MeV ions
EXTRACT eff %	$\mu$ A of	MeV ions
RESOL $\Delta E/E$ 1 %	$\mu$ A of	MeV ions
EMITTANCE		
( $\pi$ mm-mrad)	50 axial 70 rad	3 $\mu$ A of 27 MeV d

**OPERATING PROGRAMS, time distribution**

BASIC NUCLEAR PHYSICS 70% SOLID STATES PHYSICS 10%  
 BIOMEDICAL APPLICAT 20% ISOTOPE PRODUCTIONS

**REFERENCES/NOTES**

- 1)
- 2)

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