

CERN 25 GeV PROTON SYNCHROTRON

European Organization for Nuclear Research, (CERN), Geneva

(No status report presented)

SYNCHROTRON DATA

Person in charge J. B. Adams Person supplying data M. G. N. Hine

History and Status

Design study	1953-1954	Scheduled operation	112 hr/wk by end 1960
Model tests	1954-1957	Magnet cost	Sw. Fr. 10 million
Engineering design	1955-1958	Total cost	Sw. Fr. 100 million
Construction started	1956		incl. buildings and general expenses
Completion date	1960		

Design Specifications

Magnet

Focusing, type	Strong, a. g.
Focusing, order	$\frac{1}{2}FO \frac{1}{2}F \frac{1}{2}DO \frac{1}{2}D$
Field index, n	288.4
Orbit radius	70.08 m
Mean radius	100.00 m
Sectors, number	100
Field, at inj.	147 G
Field, maximum	12-14 kG
Power input, maximum	27-32 000 kW
Storage system	Flywheel
Rise time	1.0-1.2 s
Weight	Fe 3 400; Al 130 ton

Aperture

Width	14 cm
Height	7 cm
Shielding	5.5 m baryte concrete

Design Goals

Particle accelerated	Protons
Energy	25-28 GeV
Pulse rate	20-12/min
Output	$\sim 10^{10}$ part/pulse

Injector System

Type	Linac
Energy	50 MeV
Injector output	~ 1 mA
Injection period	1 turn
Inflector type	Pulsed electric

Acceleration System

Frequency	3 to 10 MHz
Accel. cavities	16
Harmonic number	20
Orbit freq. final	0.5 MHz
Gain, average	54 keV/turn
Input to RF, maximum	16×6 kW

Published Articles Describing Machine

1. Conference on the alternating-gradient proton synchrotron. Geneva. October 26-8, 1953. Lectures on the theory and design of an alternating-gradient proton synchrotron. Geneva, CERN Proton Synchrotron Group, 1953.
2. CERN Symp. 1956. *I*.
3. Regenstreif, E. Le synchrotron à protons du CERN (1^{re} partie). CERN (*) 58-6a, 1^{er} juillet 1958.
The CERN proton synchrotron (1st part) CERN (*) 59-29, 21st August, 1959.
4. Regenstreif, E. Le synchrotron à protons du CERN (2^e partie). Ch. V. L'injection des particules. CERN (*) 59-26, 31 juillet, 1959.

(*) See note on reports, p. 696.

No status report on the CERN Proton Synchrotron was presented at the Conference: instead, the participants were invited to visit the P.S. Division on the evening of September 15th, and were shown the machine.

During the Conference, studies of the injected beam in the synchrotron were in progress, and on September 16th this beam made one revolution of the vacuum chamber for the first time.

ADDITIONAL PAPERS

The following papers, related to the subject of this session, were not read but are included in the Appendix.

Bolotin, L. I. et al. A linear accelerator of multicharged ions.

see p. 643

Bolotin, L. I. et al. Strong focusing in linear accelerators.

see p. 644

Vorob'ev, A. A. et al. Some aspects of the theory of cyclic waveguide electron accelerators.

see p. 680
