

EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

APPROVED EXPERIMENTS CERN PROTON SYNCHROTRON

JANUARY 1967

- Table 1A : PS Counter Experiments on the Floor
- Table 1B : PS Counter Experiments not yet on the Floor
- Table 1C : PS Counter Experiments Finished in the Period October 1966 to January 1967
- Table 2 : Bubble Chamber Experiments Scheduled for the Next Months
- Table 3 : Emulsion and Nuclear Structure Experiments

- Fig. 1 : Beam Layout, South Hall
- Fig. 2 : Beam Layout, North Hall

PS Co-ordinator
A.N. Diddens

PS COUNTER EXPERIMENTS APPROVED BY NPRC

Table 1A
EXPERIMENTS ON THE FLOOR

Expt. Code	Beam		Description of Experiment	Authors	Date of Approval by NPRC	Conditions of Approval	Status
	Code	Description					
S33	h_3	Fast ejected protons 12 GeV/c	Precision measurement of g-2 of muon, by measurement of spin precession of 1.3 GeV/c muons in storage ring	Bailey, Bartl, Brown, Farley, Jöstlein, van der Meer, Picasso	7.4.65	--	In Production
S58	d25	Unseparated counter beam π^-, K^-, \bar{p} 3 to 15 GeV/c	Test of large gap spark chambers in missing mass spectrometer for purpose of vertex analysis of the missing boson, produced in $\pi^- p \rightarrow p + B^-$ at ≈ 6 GeV/c	Chikovani, Fischer, Focacci, Kienzle, Lechanoine, Levrat, Neal, Maglič, Schübelin	16.11.66	2 weeks	Started January 1967
S52	d _{25a}	Unseparated π^-, K^-, \bar{p} 3 to 15 GeV/c	Measurement of decay of $\eta^0, \omega^0, \chi^0, \phi^0$ into $\pi^+ \pi^- \gamma$ and other decay modes. Production reaction: $\pi^- p \rightarrow n + B^0$ at 6 GeV/c. Detection in magnet spark chamber, triggered by π^+, \bar{n} and γ	CERN-ETH: Astbury, Brautti, Codling, Michelini, Websdale, Beusch, Fischer, Mühlemann, Pepin, Polgar	11.5.66	4 weeks for test	Test started October '66
S51	a_{4e}	Separated counter beam π, K, \bar{p} below 2.5 GeV/c	Search for electromagnetic decays of ρ, ω and ϕ mesons into $e^+ e^-$. Determination of ω - ϕ mixing angle. Production reaction: $\pi p \rightarrow B^0 (\rightarrow e^+ e^-) + n$ at about 2.5 GeV/c. Detectors: Time of flight for neutrons, heavy plate spark chambers for electrons	Dalpiaz, Fortunato, Bühler, Massam, Th.Muller, Schneegans, Zetti, Zichichi	23.3.66	4 weeks for test on ϕ production	Test started November '66
S48	a_{4b}	Separated counter beam π, K, \bar{p} ~ 2 GeV/c	Scattering of 0.9 to 2 GeV/c Kaons on a polarized target. Phase shift analysis	CERN-HOLLAND: Daum, Erné, Lagneaux, Sans, Steuer, Udo	17.11.65	--	Started November '66
S46	q_{3a}	Unseparated π, p < 3.5 GeV/c	Neutral decays of neutral resonances. Production reaction: $\pi^- p \rightarrow n + B^0$ at about 2 GeV/c. Detector: Time of flight for neutrons and heavy plate spark chambers for gammas	CERN-KARLSRUHE: Citron, Deinet, Buniatov, Muller, Schmitt, Staudenmaier, Zavattini	6.10.65	---	In Production

PS COUNTER EXPERIMENTS APPROVED BY NPRC

Table 1A (cont'd)
Experiments on the Floor

Expt. Code	Beam		Description of Experiment	Authors	Date of Approval by NPRC	Conditions of Approval	Status
	Code	Description					
S55	d	Unseparated π^- , 11 GeV/c	Angular distribution of $\pi^- p \rightarrow \Delta^0 (\Sigma^0) K^0$ in the forward direction in the energy range 4 to 16 GeV/c. Detection method: $K^0 \rightarrow \pi^+ \pi^-$, measured in spark chambers	ORSAY-PISA-SACLAY: Manelli, Scribano, Sergiampietri, Vincelli, Caverzasio, Guillaud, Holloway	11.5.66	4 weeks for lower energies	11 GeV/c finished
S49	b ₁₃	Neutral beam derived from slowly ejected protons (e ₃)	Interference of $K_1^0 \rightarrow \pi^+ + \pi^-$ with $K_2^0 \rightarrow \pi^+ + \pi^-$ from K^0 decay. Interfer- ence experiment close to a primary target. Detectors: Spark chambers, magnetic analysis of $\pi^+ \pi^-$	AACHEN-CERN: Böhm, Darriulat, Grosso, Kaftanov, Kleinknecht, Lynch, Rubbia, Ticho, Tittel	8.12.66	-	Started January '67
S38 a,b	e ₂	Slow ejected protons	a) Precise shape of angular distribu- tions around 90° c.m. of elastic pp scattering at about 20 GeV/c	Allaby, Bellettini, Cocconi, Diddens, Matthiae, Sacharidis, Wetherell	12.1.66	6 weeks from 1.6.66	In Production
			b) Bremsstrahlung in large angle pp scattering at about 20 GeV/c, Aim: dynamics of large angle scattering		23.3.66		In Production

PS COUNTER EXPERIMENTS APPROVED BY NPRC

Table 1B

EXPERIMENTS NOT YET ON THE FLOOR

Expt. Code	Beam		Description of Experiment	Authors	Date of Approval by NPRC	Condition of Approval	Status
	Code	Description					
S50	m _{4b}	Separated counter beam, π , K, \bar{p} , ~ 2 GeV/c	Beta decay of Ξ hyperon. Production reaction: $K^- p \rightarrow K^+ \Xi^-$ at 1.8 GeV/c. Detectors: Spark chambers	CERN-HEIDELBERG: Freytag, Heintze, T.W. Jones, Rieseberg, Schlüppmann, Siebert, Soergel	23.3.66	Continuation depending on result of Test	Test finished end Oct. 1966
S53	p ₁	Unseparated π^+ , K^+ , p^+ at 4-20 GeV/c, produced from slowly ejected proton beam ϵ_3	Elastic πp large momentum transfer scattering up to 180° . Detectors: wire spark chambers; magnetic analysis of both particles	Baker, Carlson, Kalbach, Krienen, Lundby, Nierhaus, Pretzl, Wouids	11.5.1966 17.8.1966		Start Febr. 1967
S54	d	π^- , 5-18 GeV/c	Measurements of the parameters A and R in $\pi^- p$ scattering, using a longitudinally polarized target and a spark chamber polarimeter	SACLAY: Ducros, Merjo, Movchet, Sonderegger, van Rossum	11.5.1966	π^- only	Start summer 1967
S56	ν	Neutrino beam	Muon number conservation. Measurement of μ^+/μ^- ratio of events produced by a pure neutrino beam and A dependence of inelastic ν reactions. Detectors: Spark chambers and HLBC 120	CERN-FRIBOURG: Hahn, Hofer, Krienen	22.6.1966	Parasitic on HLBC ν run	March 1967
S59	p ₂	Unseparated π^+ , K^+ , p^+ at 4-20 GeV/c, produced from slowly ejected proton beam ϵ_3	Measurement on the parameter P_0 in $\pi^+ p$, $K^+ p$, $p^+ p$ scattering, using a transversally polarized target and counter hodoscopes	Borghini, Dick, di Lella, Macq, Olivier, Cronenberger, Kuroda, Michalowicz, Poulet, Bellettini, Bemporad, Braccini, Foà	8.12.1966		Start summer 1967

PS COUNTER EXPERIMENTS APPROVED BY NPRC
Table IC
EXPERIMENTS FINISHED IN THE PERIOD OCTOBER 1966 TO JANUARY 1967

Expt. Code	Beam		Description of Experiment	Authors	Date of Approval by NPRC	Date of Completion	Total Nr. of weeks*	Status
	Code	Description						
S31b	d ₂₅	Unseparated π^-, K^-, p 3 to 15 GeV/c	Missing mass spectrometer. Search for negatively charged boson resonances in the mass range 1.5 to 3 GeV, produced in the reaction $\pi^- p \rightarrow p + B^-$ at 13 GeV/c in the angular range determined by the Jacobian peak	Chikovani, Dubal, Focacci, Kienzle, Lechanoine, Levrat, Neal, Maglic, Nef, Schübelin	23.3.66	20.11.1966	7	Analysis
S57	d ₂₆	Unseparated negative beam of 25 GeV/c	Background test for experiment on search for fractional charged particles	Allaby, Cocconi, Diddens, Matthiae, Sacharidis, Wetherell	16.11.66	23.12.1966	2	Finished
S45	q _{3b}	Unseparated π, p < 1.8 GeV/c	Precision measurement of the parameter β in Δ decay. Production reaction: $\pi^- p \rightarrow K^0 \Delta^0$ at 1.03 GeV/c. Detectors: Carbon spark chamber polarimeter for proton polarization measurement	CERN-GENEVA-LUND: Bienlein, Cleland, Conforto, Eaton, Gerber, Reinharz, Von Dardel, Gautschi, Heer, Renevey, Henriksson, Jariskog	7.7.65	23.12.1966	21	Analysis
S42	d _{22a}	Unseparated π^- , 11 GeV/c	Electromagn. decays of p and ω into $\mu^+ \mu^-$. Production reaction: $\pi p \rightarrow \mu^+ \mu^- + \dots$ at 11 GeV/c. Detectors: spark chambers; magnetic analysis for muons; triggering on muon pair	CERN-MUNICH: Hyams, Koch, Lorenz, Lütjens, Pellett, Potter, Stierlin, von Lindern, Weilhammer	7.4.65 17.8.66	15.1.1966 67	25	Analysis

* Sum of weeks in which protons were used, for setting up, testing and data taking.

BUBBLE CHAMBER EXPERIMENTS APPROVED BY NPRC

CPS/EXP/8
3.1.1967

Table 2
EXPOSURES SCHEDULED FOR THE NEXT MONTHS OF OPERATION

Expt Code	Beam and Chamber	Subject	Summary	Groups	Apprvd.Nr. of px/wks	Date appr. NPRC	Start operation	Nr.appr.px. already taken, 3.1.67	Total Nr.this type px already taken at CERN in same chamber
T80	u ₆ Electrostatic separated beam, 2 < K < 4 GeV/c 1 < π, p̄ < 5 GeV/c HBC 200	p̄, 3.6 GeV/c	To study $\bar{Y}\bar{Y}$, $\bar{Y}\bar{Y}^*$ and $Y^*\bar{Y}$ production and annihilation into Ks and πs (for $KK\pi$, $K\pi\pi$, etc.resonances) with 10 times statistics of previous expt.	CERN, Orsay	200.000	7.5.65		105.000	314.000
T88		p̄, 2.5 GeV/c	Production de $\Delta\bar{\Delta}$ et corrélations de polarisation. Analyse des événements avec K_1^0 pour étudier les systèmes $K\pi\pi$ (isospin $3/2$ en particulier). Investigation de l'annihilation $p\bar{p} \rightarrow n\pi$.	Ecole Polytechn. Paris	100.000	11.5.66	Oct'66	0	122.000
T112	H ₂	K ⁻ , 2.8-4.5 GeV/c	Mécanismes de production. Extension des statistiques sur les propriétés des résonances (états finals $Y^*\pi$, Δ^0 boson neutre, nucléon K [*]). Production de Ξ .	Ecole Polytechn. Paris, Oxford, Saclay	400.000	11.5.66	Oct'66	280.000	280.000
T129		p̄, 1.2 GeV/c	Study of the quantum numbers of the D ⁰ meson ($K\bar{K}\pi$) in the $K\bar{K}3\pi$ and $KK4\pi$ final states of $p\bar{p}$ annihilations at 1.2 GeV/c, and accessorially all the other physical results.	CERN, Collège de France, Inst. Radium, Liverpool	200.000	11.5.66	Oct'66	0	0
T36	u ₃ RF separated beam, K ⁺ , ≥ 10 GeV/c HBC 200	p̄, 12 GeV/c	Study of 1) general characteristics of high-energy p-p̄ interactions (inelastic, annihilation cross sections), 2) strange particle states (exchange mechanisms in $p\bar{p} \rightarrow \bar{Y}\bar{Y}$, new resonances with B = 0, S = 1 and B = 1, S = 1), 3) special S = 0 interactions ($p\bar{p} \rightarrow N^*N^*$, $n\bar{p}$ - interact.)	Hamburg, Padua, Pisa	100.000	11.5.66	1967	0	0
T82		H ₂	p, 19 GeV/c	A. General structure of the frequent topologies; in particular their content of quasi-two-body reactions. B. Reaction channels with strange particle or Baryon pair production.	Copenhagen, Oslo, Stockholm	100.000	12.1.66	May'66	19.000
T64	H ₂	K ⁻ , 10 GeV/c	Production, decay and quantum numbers of resonances (especially $K\pi\pi$), reaction mechanisms at high energy, Ω and Ξ production.	Aachen, Berlin, CERN, Imp. Coll., Vienna	200.000	17.11.65	May'66	132.000	132.000
T107		π ⁻ , 16 GeV/c	High-energy interactions, quasi two-body processes, study of resonances, comparison with 8 GeV/c π ⁺ results.	Aachen, Berlin, Bonn, CERN, Krakow, Warsaw	100.000	11.5.66	Begin 1967	0	0
T116	H ₂	p, 16 GeV/c	To extend work done at 10 GeV/c on resonance production in four-body, four-constraint final states.	Cambridge, Imp. College	100.000	23.3.66	May'66	57.000	57.000

BUBBLE CHAMBER EXPERIMENTS APPROVED BY NPRC

Table 2 (cont'd)

EXPOSURES SCHEDULED FOR THE NEXT MONTHS OF OPERATION

Expt Code	Beam and Chamber	Subject	Summary	Groups	Apprvd.Nr. of px/wks.	Date appr. NPRC	Start operation	Nr. Appr.px. already taken, 3.1.67	Total Nr. this type px already taken at CERN in same chamber
T102	k_7 Electrostatic separated K's, 800-1200 MeV/c HBC 80	$K^-, 0-400$ MeV/c	Measurement of the Σ^\pm and Λ leptonic decay rates (test of CVC, $\Delta S = \Delta Q$ rule, symmetry breaking in Cabibbo theory), of the $\Sigma^0 - \Lambda^0$ form factor ratio (and test of time reversal invariance). Study of hyperon-proton scatt.	Heidelberg	10^6 in 2 years	8.12.66	May'66	525.000	825.000
T123	H_2	$\bar{p}, 700$ MeV/c	Study of the production of the $C^0(K\pi\pi)$, the D^0 and the E^0 mesons ($KK\pi$) in the $KK2\pi$ and $KK3\pi$ final states of \bar{p} annihilations at 700 MeV/c, and accessorially all the other physical results.	CERN, Collège de France, Liverpool	200.000	11.5.66	Oct.'66	100.000	100.000
T126		$K^-, 510-750$ MeV/c	Systematic study of $\bar{K}N$ interaction especially existence and properties of hyperon resonances in mass-range 1700-1850 MeV.	CERN, Heidelberg, Saclay	100.000	11.5.66	Oct!66	195.000	195.000
T96	74e Fast ejected beam HLC 120 C_3H_8	$\nu + p \rightarrow N^{*+} + \mu^-$	Study of the process $\nu + p \rightarrow N^{*+} + \mu$ on free protons in propane and extension of the previous investigation with more precise data and with improved spectrum measurements.	CERN	6 wks	23.3.66	March 1967	0	0

EMULSION AND NUCLEAR STRUCTURE EXPERIMENTS APPROVED BY NPROC

Table 3

Expt. Code	B e a m		Description of Experiment	Group	Approved Nr. of shifts or particles	Date of approval by NPROC	Status
	Code	Description					
E52	e ₂	Ejected protons ≥ 10 GeV/c	Study of heavy fragments emitted in the interaction of high-energy protons with complex nuclei. Detectors: Emulsion, spectrometer	CERN, Clermont-Ferrand, Valencia, Warsaw	3 shifts	17.3.1965 (12.1.1966)	Testing
E54	u ₃	RF separated beam, K ⁻ ≥ 10 GeV/c	Hyperfragment Studies. K ⁻ exposures, 10 or 14 GeV/c	European K-Collaboration, Belgrade, Delhi, Hamburg, Strasbourg	4 · 10 ⁵ K ⁻ in u ₃ beam	17.11.1965 8.12.1966	Scheduled
E56	e ₂	Slow ejected protons	Fission studies in various nuclei at high energy. Mica detectors.	CERN, Naples, Warsaw	3 shifts	2.12.1964	Used 1.2 shifts
E58	a ₉	Low-energy secondary beam, produced from e ₂ (Fast ejection)	Magnetic moment of Δ hyperon. 250 kGauss pulsed magnet, Emulsion detectors. Production reaction: π ⁻ p → K ⁰ Δ at 1.05 GeV/c	Ankara, CERN, Lausanne, Munich, Rome	10 weeks, 1/10	25.2.1966	Installed. Testing
NSC/ 10/65	h ₃	Fast ejected protons, 12 GeV/c	Nuclear reactions at high energy, studied with a mass spectrometer	Bernas, Klapisch, Chaumont, Philippe, (Orsay)	2 weeks	23.3.1966	1967
P1	e ₃	Slowly ejected protons, ~ 15 GeV/c	Fission studies with solid state detectors (in uranium)	Heidelberg, Warsaw	2 weeks parasitically on S38	8.12.1966	Scheduled

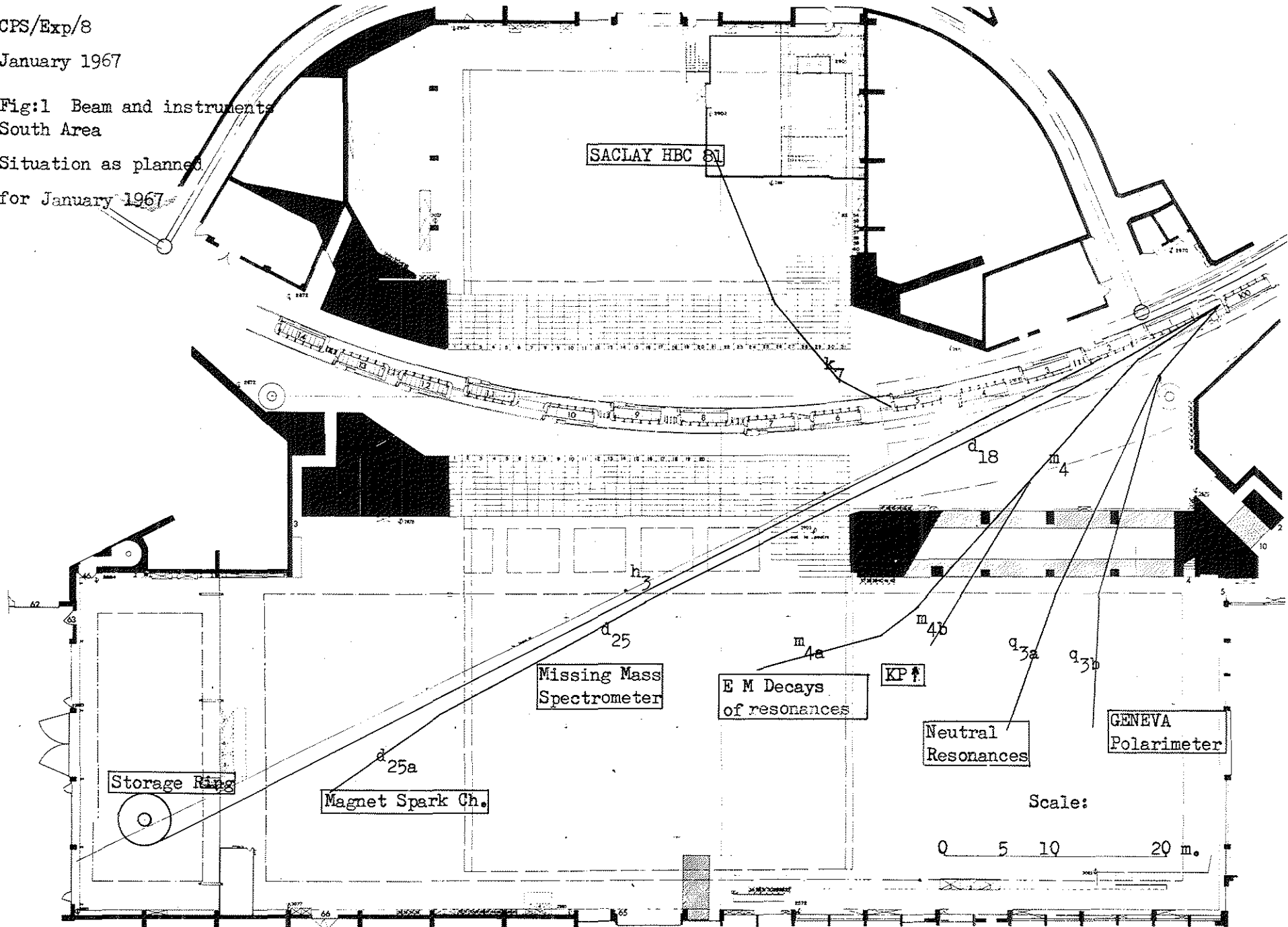
CPS/Exp/8

January 1967

Fig:1 Beam and instruments
South Area

Situation as planned

for January 1967



CPS/Exp/8
January 1967

Fig. 2 Beams and instruments EAST AREA
Situation as planned
for January 1967

