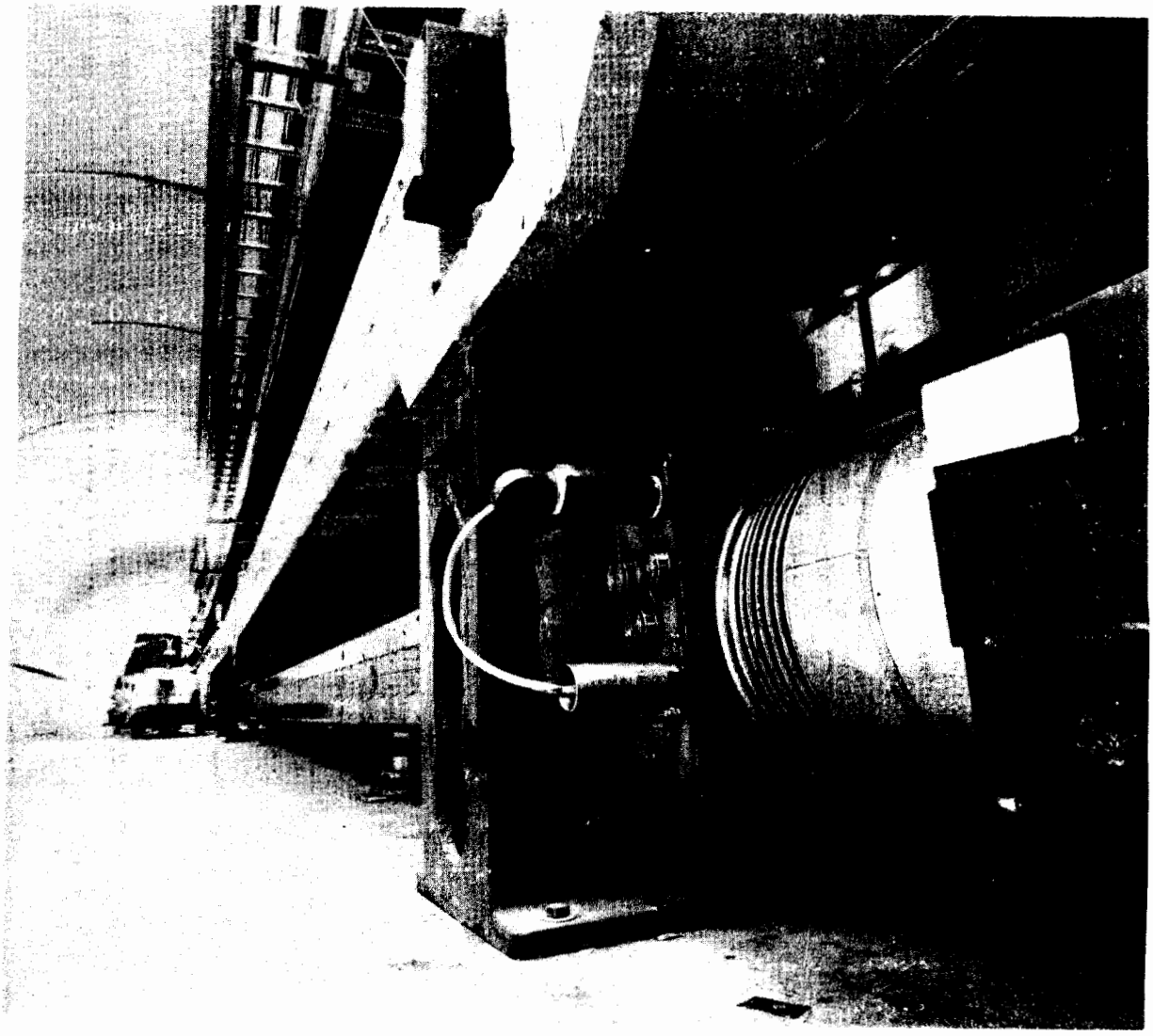
fermilab report

Fermi National Accelerator Laboratory Monthly Report

January 1979



fermilab report is published monthly by the Fermi National Accelerator Laboratory, P. O. Box 500, Batavia, Illinois 60510.

F. T. Cole, Editor R. Donaldson, Assistant Editor

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FERMILAB-79/1 **Fermi National Accelerator Laboratory** 0090.01

THE COVER: A worm's eye view of the Sector Test. The bottom of the Main-Ring magnet is above and the saddle coils can just be seen. The end of the Doubler magnet has several pressure-relief tubes visible. Electrical connections between magnets are all in the helium system inside the large bellows.
(Photograph by Fermilab Photo Unit)

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CONTENTS JANUARY 1979

PROGRESS IN THE SECTOR TEST

J. R. Orr

There has been noteworthy progress in the Sector Test. The entire string has been cooled down and powered. Further, a 100 GeV/c proton beam has been injected and transported part of the way through the system.

The Sector Test is at present a string of 20 dipoles and 5 quadrupoles of the Tevatron installed in the Main-Ring tunnel from A-12 to A-17. The purpose of this test is to learn experimentally about the installation and operation of a superconducting magnet ring. One of the first goals of the Sector Test is to transport a beam of 100 GeV/c protons (injection energy into the Tevatron) through the system. The magnet string and the tests are to be extended through the complete A Sector.

Throughout the fall, there were considerable learning experiences in installation, particularly in checking out the vacuum system. It was not until well into December that the group could begin to cool the system down. Cooldown to superconducting temperature took a week, a good part of which was taken up by equipment breakdowns. The cooldown time could be shortened by boosting the satellite refrigerator with liquid helium from a dewar, which would require another transfer line.

A system to bring a fast-extracted proton beam from the Main Ring has also been built. Approximately 1.5×10^{10} protons of 100 GeV/c momentum were initially injected. Later in the tests, the intensity was reduced to 5×10^{9} protons.

The initial tests were beset by instrumentation difficulties. The current readout of the magnet power supply was inaccurate; it was not possible to use beam to tune up the system because beam could not be detected in the new position monitors, perhaps because of bunching problems. Beam was not detected at the end of the system at A-17.

It is known that beam was injected into the system because there were 5 beam-induced quenches in the first and second Tevatron dipoles. What was particularly encouraging was that recovery from these quenches was very rapid. A 30 - sec timing-out period is programmed into the system and the system was immediately superconducting at the end of this period in every case.

Not all the objectives of the Sector Test were met but it has now been shown that it is possible to meet them. The Sector Test group continues its work with optimism and vigor.

Rich Orr writing in the log book during the Sector Test work described on the preceding pages.

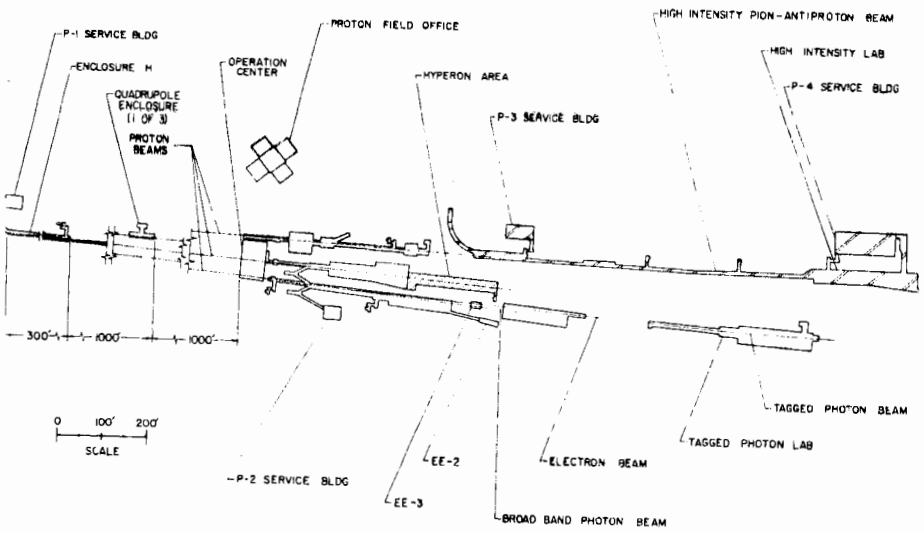
(Photograph by Fermilab Photo Unit)

THE HIGH-INTENSITY LABORATORY

B. Cox

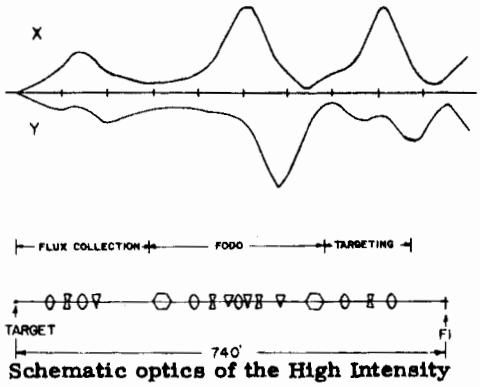
After a major installation effort during the summer of 1978, the High Intensity Laboratory situated in the west branch of the Proton Area has been commissioned and the first round of experiments has started. At this time it is appropriate to report on the results of the first measurements of the properties of the high intensity pion and antiproton transport and to describe the area and the current layout of the beams and the experiments.

The geography of the High Intensity Laboratory is shown on the next two pages. Over 1000 feet of tunnel and experimental hall were constructed during 1976 and 1977 in preparation for the installation and testing of the high intensity transport system. The general features of both the physical plant and the transport system have been described in the P-West High Intensity Laboratory Design Report. The initial installation of the beam transport for the commissioning of the High Intensity Laboratory was composed of conventional magnets (except for an Energy Doubler dipole whose performance has been described in Fermilab Internal Report TM-828-A). Twenty-seven conventional magnets (16 quadrupoles and 11 dipoles) provide focusing and bending for a 400-GeV incident proton beam and ~300-GeV secondary beam. During the commissioning period in August and September of 1978, the secondary beam was operated at energies up to 250 GeV. The philosophy of the optics of the secondary transport system is shown on page 6. As can be seen, the transport consists of a flux-collecting quadrupole triplet, a FODO channel, and a targeting triplet which focuses

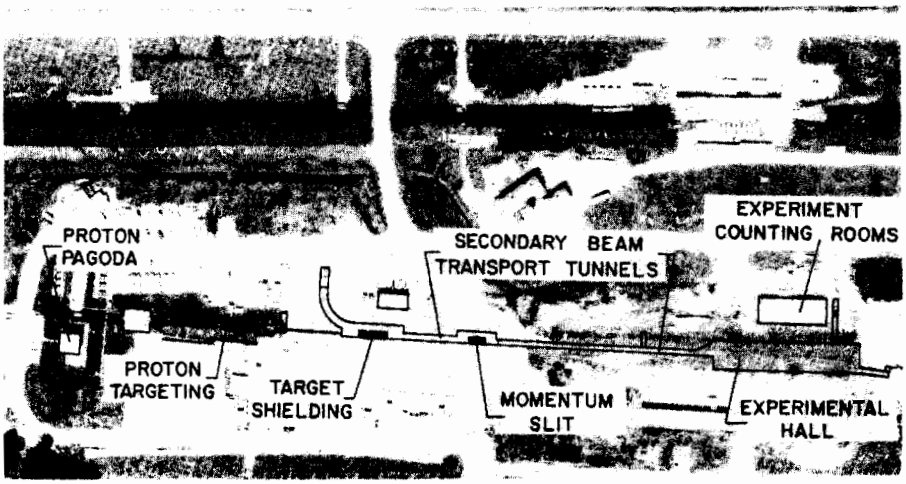


Proton Area layout.

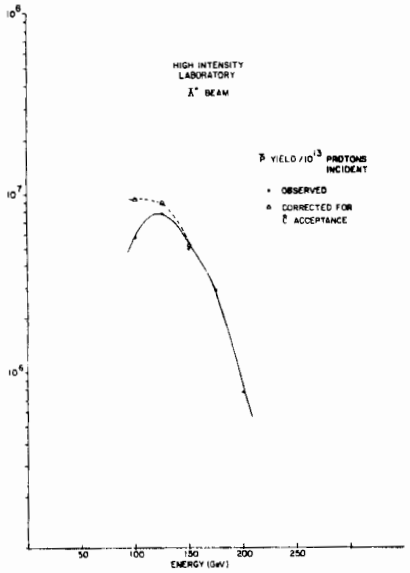
the secondary beam onto the three experimental target points in the 230-ft experimental hall. The bend of the beam is configured in a manner to minimize momentum dispersion in angle and position at these experimental targets. There are two basic modes in which this transport can be operated. The first of these consists of a tune in which a sharp momentum bite can be obtained and the second and third order chromatic aberrations of the beam minimized for best spot size. With this tune the beam can be sextupole corrected. The second type of tune is one in which maximum transmission of pions or antiprotons is achieved with slightly broader spot sizes. The measured yield curves for this "broad band" tune



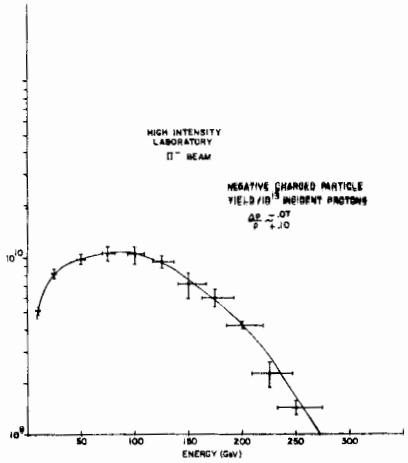
Schematic optics of the High Intensity transport system.



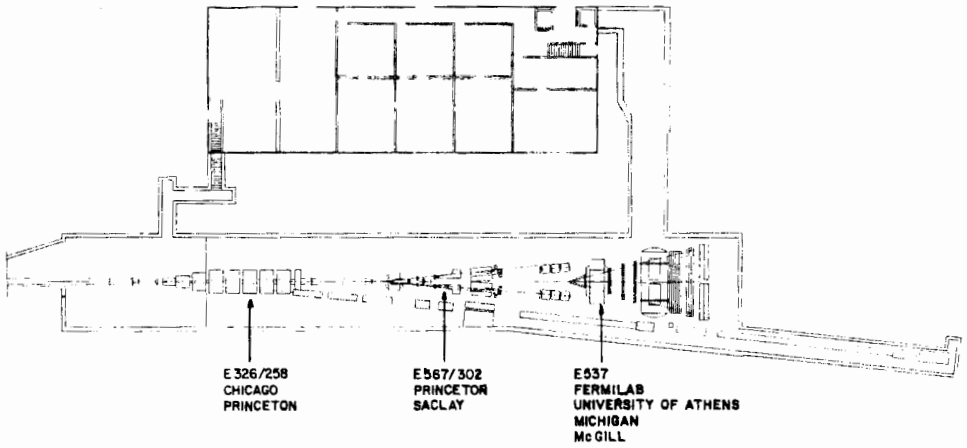
Aerial photograph of the High Intensity Laboratory.



Antiproton yield curve.

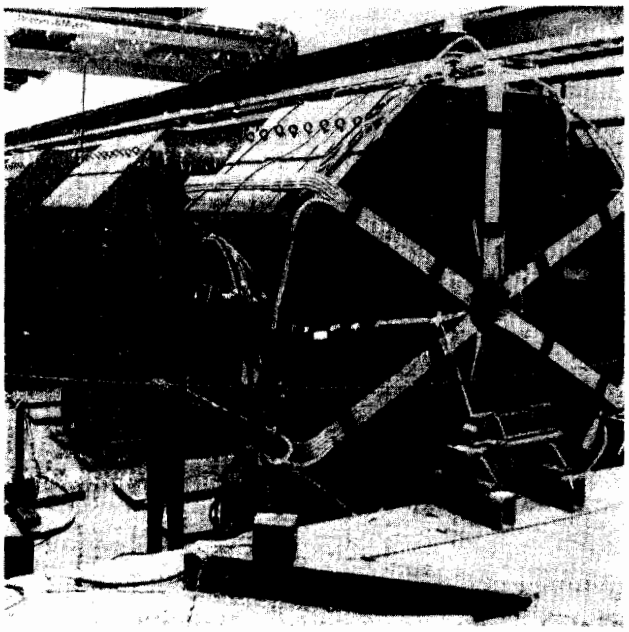


Negative pion yield curve.



Experimental layout of the High Intensity Laboratory Experimental Hall.

The drawing above shows the layout of the three experimental setups which are either in place or are being installed. Because of intense negative pion and antiproton fluxes which are available, the possibilities for studying quark-antiquark interactions are very attractive in the High Intensity Laboratory. Both the study of high intensity pion production of dileptons, which will be performed by a Chicago-Princeton group using a toroidal iron spectrometer situated at the upstream focus in the experimental hall and the study of antiproton production of dileptons, which will be undertaken by a Fermilab-University of Athens-University of Michigan-McGill University group using a large aperture forward spectrometer seated at the downstream end of the hall, will investigate quark-antiquark interactions. At the intermediate target point between these two experimental setups is a double-arm experiment being conducted by a Princeton-Saclay group who intend to first study the production of charmed particles by pions and then to look for



High Intensity Laboratory experimental hall.
(Photograph by Fermilab Photo Unit)

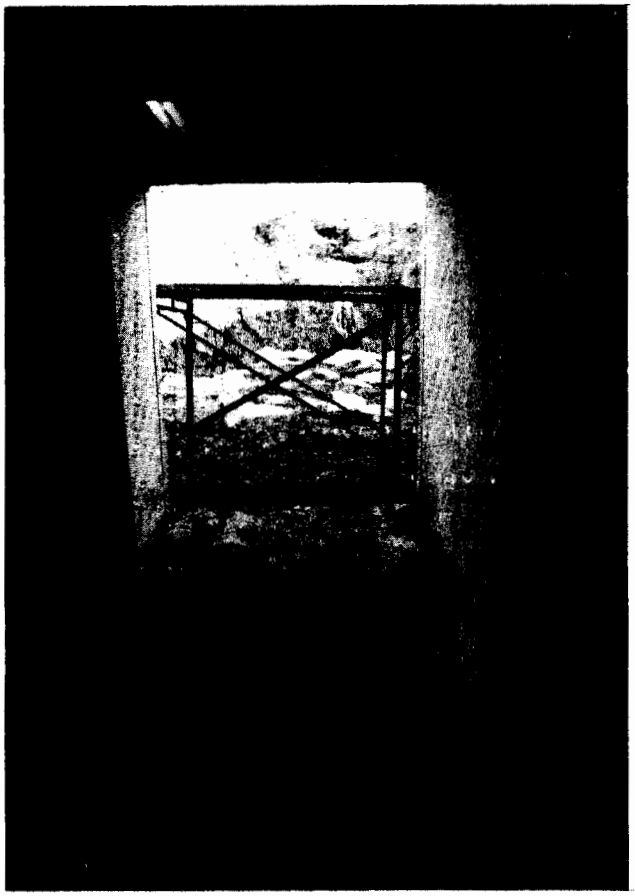
charge conjugation violations in antiproton interactions. The final experimental apparatus in the hall is a forward spectrometer built by the Chicago-Princeton group which will measure 90° production high $p_\perp$ of hadrons by pions to complement their previous measurements of high $p_\perp$ production of hadrons by protons. This single-arm spectrometer and the double-arm spectrometer of Princeton-Saclay have at the time of this writing had shake-down runs in which some preliminary data were taken.

Finally, future plans for the High Intensity Laboratory include a gradual conversion of the conventional transport to a superconducting transport. Construction and testing of a large aperture dipole (described in Fermilab Internal Report TM-822) has already taken place and He refrigerator

installation is underway. The final configuration is outlined in the area design report. It is expected that the superconducting transport capabilities of the High Intensity Laboratory will be implemented in time to take full advantage of the Energy Doubler.

Many people have contributed to the design, construction, installation, and testing of the High Intensity Laboratory. In particular, all the groups of the Proton Department contributed essential skills to this endeavor. In addition R. M. Baltrusaitis, R. Wagner, C. Hojvat, M. Binkley, P. Mazur, and D. Stairs from the Fermilab-Athens-Michigan-McGill group, R. Webb and R. Weatherall from the Princeton-Saclay group, and B. Pope and R. Sumner from the Chicago-Princeton group were very instrumental in the commissioning of the High Intensity Laboratory.

Bill Noe, Jr., Proton Department, working on the extraction mechanism for the High Intensity Laboratory target-box components.
(Photograph by Fermilab Photo Unit)



Construction work has begun in the Meson Department on installation of the M1 enclosure from 810 to 882, one of the three areas under construction. This area of work is to connect existing enclosures and replace a vacuum beam transport buried in the berm. Its construction consists of an 8 ft × 8 ft box culvert assembly tied to the existing concrete structure by a poured in place concrete transition section. The above photograph shows a view of the berm excavation, looking north. The end wall of the upstream enclosure has been removed in preparation for the transition section. The scaffolding seen was utilized when cutting the opening. In the distance, barely discernible, is the end wall of the downstream M1 enclosure awaiting removal.

(Photograph by Fermilab Photo Unit)

SUMMARY OF OPERATIONS - DECEMBER 1978

Program Planning Office

Research activities underway during December were a continuation of a program that actually began full operation in mid-November. The accelerator continued to operate well at 350 GeV with a 0.5 sec flattop. During the two weeks preceding the Christmas interruption, more protons were provided for experimental use than in any previous similar period. In one week, from December 11 to 18, a total of 1.3×10^{18} protons were placed on targets. The delivery of large proton fluxes was possible because of high per pulse intensity (at times above 2.5×10^{13}), good reliability (about 80%), and shortened cycle time (a steady 6.9 sec).

The experimental program in the Neutrino Area flourished. The 15-ft bubble chamber took 167,000 pictures of interactions in liquid deuterium from an exposure of neutrinos produced by about 3.4×10^{18} protons. Also in operation were two emulsion experiments, one with a downstream electronic detector and another with the emulsion target inside the 15-ft chamber. Another electronic experiment collected data to study ν_μ-electron scattering.

The experimental program in the West Branch of the Proton Area changed during December. Pion Inclusive #258 completed its startup phase and collected data for about two weeks using a 200-GeV pion beam. This experiment was then followed by Particle Search #567 which began checkout of new apparatus.

FERMI NATIONAL ACCELERATOR LABORATORY
MONTHLY OPERATIONS HISTORY
DECEMBER 1978

Date		Accelerator	Internal Target Area	Proton Area	Neutrino Area	Meson Area
Fri.	12/1	>1.9x10^{13}ppp @350 GeV (0.5 sec flattop)	Internal Target Area OFF	π Incl. 258(PW) OFF for installation (PE,PC)	15'ν/D_2 545 & 15'&Emul./ν 564, Neutrino 531, Neutrino 253	Meson Area OFF
Sat.	12/2					
Sun.	12/3	Repairs:ES40&ES41				
Mon.	12/4	Accelerator Maintenance & Development			Neutrino 553 (NO) Beam Tests (N5)	
Tue.	12/5					
Wed.	12/6	Accelerator Startup				
Thu.	12/7	Repairs: 13.8 KV Accelerator Tuneup & Septa Alignment				
Fri.	12/8	Problems in experimental areas, ad hoc accelerator studies				
Sat.	12/9	>1.9x10^{13}ppp @350 GeV (0.5 sec flattop)	Internal Target Area OFF	Proton Dept. Tests	15'ν/D_2 545 & 15' & Emul./ν564, Neutrino 531, Neutrino 253, Neutrino 553 (NO) Neut.356 Calib. (N5)	
Sun.	12/10			Part.Search 567 (PW) OFF for installation (PE,PC)		
Mon.	12/11					
Tue.	12/12	Switch to M- & Reprs:MR Magnet				
Wed.	12/13	>2.0x10^{13}ppp @350 GeV (0.5 sec flattop)				
Thu.	12/14					
Fri.	12/15					
Sat.	12/16			Part.Sch. 567 (PW) Test for Part. Sch. 608 (PC) OFF (PE)		
Sun.	12/17					
Mon.	12/18					
Tue.	12/19					
Wed.	12/20	Accelerator Studies				
Thu.	12/21					
Fri.	12/22					
Sat.	12/23	Christmas Standby Period				
Sun.	12/24					
Mon.	12/25					
Tue.	12/26	Accelerator Maintenance & Startup				
Wed.	12/27	1.8x10^{13}ppp @350 GeV	Internal Target Area OFF	Part.Sch. 567 (PW) OFF (PE,PC)	15'ν/D_2 545 & 15'&Emul./ν564, Neutrino 531, Neutrino 253, Neutrino 553, (NO) Neut. 356 Calib. (N5)	
Thu.	12/28	Reprs:MR Vac.leak,MR magnet				
Fri.	12/29	Reprs: Preacc.				
Sat.	12/30	Reprs:Preacc,Linac,Safety				
Sun.	12/31					

BEAM UTILIZATION BY

	Beam	Hours
PROTON AREA		
π Inclusive #258	PW	50
Particle Search #567	PW	290
Particle Search #608	PC	80
NEUTRINO AREA		
Neutrino #253	N0	390
Hadron Beam Tests	N5	90
Neutrino #356	N5	230
Nuclear Fragments #466	-	-
Monopole #502	-	-
Neutrino #531	N0	380
15' ν/D_2 #545	N0	-
Neutrino #553	N0	380
15' & Emulsion/ν #564	N0	-
TOTAL HOURS FOR HIGH ENERGY PHYSICS		1890

Activities

data: study of particle production at large transverse momentum by pions at 200 GeV

tuneup and tests of apparatus to search for charmed particle decays into three charged hadrons

tests of trigger rates and backgrounds in a search for η_c through its decay to $\phi\phi$

data: for study of ν_μ-electron scattering

tuneup and tests in preparation for detector calibration and experiment usage

calibration of the electronic neutrino detector located in Lab E using a secondary hadron beam

data: 1 target exposed for nuclear chemistry studies

data: search for magnetic monopoles occurring in cosmic rays and collected by the field of the 15-ft bubble chamber magnet

data: to study charmed particle production by neutrinos in emulsion plates

data: 167,000 pictures of neutrino interactions in liquid deuterium using a wide-band horn focusing system

tuneup and tests of apparatus to study charmed particle production by neutrinos in emulsion plates

parasitic exposure of emulsion located within the volume of the 15-ft bubble chamber to study production of charmed particles

FACILITY UTILIZATION SUMMARY - DECEMBER 1978

I. Summary of Accelerator Operations

		Hours	
A.	Accelerator use for physics research		
	High energy physics research	394.2	
	Accelerator physics research	67.8	
	Subtotal		462.0
B.	Other activities		
	Program interruption	80.2	
	Accelerator setup and tuning to experimental areas	48.4	
	Subtotal		128.6
C.	Unscheduled interruption		89.4
D.	Unmanned time (Christmas Standby)		64.0
	Total		744.0

II. Summaries of High Energy Physics Research Use

		# of Expts.	Hours	Results
A.	Counter experiments	6	1720	
B.	Bubble chamber expts.	1	-	167K pictures in 15 ft
C.	Emulsion experiments	1	-	Inside 15 ft chamber
D.	Special target experiments	1	-	1 target exposed
E.	Test experiments	1	80	Tests for P-608
F.	Engineering studies and tests	1	90	N5 hadron beam tests
G.	Other beam use	1	-	
	Totals	12	1890	

III. Number of Protons Accelerated and Delivered ($\times 10^{18}$ ppp) at 350 GeV

A.	Beam accelerated in Main Ring		3.72
B.	Beam delivered to experimental areas		3.66
	Proton Area		0.18
	Neutrino Area	Slow Spill	0.01
		Fast Spill	3.47
	Meson Area		Off

SITUATION REPORT -- JANUARY 1979

FERMI NATIONAL ACCELERATOR LABORATORY
EXPERIMENTAL PROGRAM SITUATION REPORT

PROGRAM PLANNING OFFICE
15 JAN 1979

THE EXPERIMENTAL PROGRAM SITUATION AT FERMILAB IS SUMMARIZED BELOW. THE EXPERIMENTS ARE LISTED SEPARATED BY EXPERIMENTAL AREA UNDER CATEGORIES THAT BEST DESCRIBE THEIR CIRCUMSTANCE AS OF JANUARY 1, 1979. FOR EXPERIMENTS WHICH HAVE BEEN COMPLETED OR HAVE RECEIVED BEAM THERE IS INDICATION OF THE AMOUNT OF RUNNING TIME OR EXPOSURE. THE EXPERIMENTAL AREA NAMES ARE ABBREVIATED AS FOLLOWS: MUON AREA (MA), NEUTRINO AREA (NA), PROTON AREA (PA), INTERNAL TARGET AREA (ITA).

TOTAL NUMBER OF APPROVED EXPERIMENTS = 296

AREA-BEAM		SPOKESPERSON	EXTENT OF RUN TO DATE	DATE COMPLETED
A. EXPERIMENTS THAT HAVE COMPLETED DATA TAKING (243):				
(ONLY EXPERIMENTS COMPLETED SINCE 1 JAN 1978 ARE LISTED BELOW)				
MA-M1	DETECTOR DEVELOPMENT #427	YUAN	40 HOURS	10 JAN 1978
-M2	MULTI-MUON #439	GABRIELSE	1,700 HOURS	19 MAY 1978
	XI-ZERO PRODUCTION #495	MILLER	700 HOURS	28 AUG 1978
	PROTON POLARIZATION #505	YAMIN	50 HOURS	27 AUG 1978
-M3	PARTICLE SEARCH #540	LONGO	600 HOURS	21 FEB 1978
-M4	INCLUSIVE K-SHORT #383	KOBRAK	2,200 HOURS	7 MAY 1978
-M6	ASSOCIATED PRODUCTION #99	DIEBOLD	750 HOURS	24 JAN 1978
	MULTIPARTICLE #110A	DIERKER	1,600 HOURS	9 APR 1978
	BACKWARD SCATTERING #290	BAKER	1,500 HOURS	31 JUL 1978
	INCLUSIVE SCATTERING #451	BARTON	500 HOURS	6 SEP 1978
	PARTICLE SEARCH #469	COYNE	400 HOURS	15 MAY 1978
MA-MO-HORN	NEUTRINO #310	CLINE	3,400 HOURS	31 AUG 1978
-MO-TRIPLET	NEUTRINO #462	BABISH	1,600 HOURS	3 JAN 1978
	15-FOOT NEUTRINO/H2BBLE #546	NELSON	375K PIX	26 JAN 1978
-MUON/HADRON	MUON #203A	KEITH	1,200 HOURS	18 MAY 1978
	MUON #391	KEITH		18 MAY 1978
	DI-MUON #484	SMITH	1,100 HOURS	3 JAN 1978
	MUON #448	LOOMIS	900 HOURS	7 MAY 1978
	PARTICLE SEARCH #596	LEDERMAN	200 HOURS	21 MAY 1978
-OTHER	EMULSION/PI- @ 300 #481	TAKAHASHI	7 STACKS	18 JAN 1978
	EMULSION/PI- @ 300 #503	OGATA	4 STACKS	18 JAN 1978
	EMULSION/PI- @ 300 #526	DAHL	2 STACKS	15 JAN 1978
	EMULSION/PI- @ 300 #548	WILSON	2 STACKS	18 JAN 1978
	EMULSION/PI- @ 300 #568	HEBERT	3 STACKS	15 JAN 1978
	EMULSION/PI- @ 300 #573	USHIDA	3 STACKS	15 JAN 1978
	EMULSION/PI- @ 300 #574	WOLTER	4 STACKS	18 JAN 1978
	EMULSION/PROTONS @ 400 #499	IWAI	5 STACKS	15 JAN 1978
	EMULSION/PROTONS @ 400 #567	JACQUOT	24 STACKS	15 JAN 1978
	EMULSION/PROTONS @ 400 #575	LORD	2 STACKS	15 JAN 1978
PA-PE	PHOTOPRODUCTION #87A	CHALLOBAN	4,400 HOURS	7 MAY 1978
	PHOTOPRODUCTION #152B	MEUSCH	1,950 HOURS	13 NOV 1978
-PC	DI-LEPTON #288	LEDERMAN	6,850 HOURS	23 JUL 1978
-PW	NUCLEAR SCALING #592	FRANKEL	500 HOURS	17 JUL 1978
ITA-C-O	PROTON POLARIZATION #522	OGREN	700 HOURS	21 MAR 1978
	P-N SCATTERING #552	SAMMES	950 HOURS	9 APR 1978

B. EXPERIMENTS THAT ARE IN PROGRESS (19):			EXTENT OF RUN TO DATE	DATE OF RECENT RUN
MA-M1	PARTICLE SEARCH #490	SANDWEISS	850 HOURS	1 OCT 1978
	HADRON DISSOCIATION #272	FERBEL	950 HOURS	1 OCT 1978
-M2	PI-MU ATOMS #533	SCHWARTZ	600 HOURS	1 OCT 1978
-M4	KAON CHARGE EXCHANGE #585	ABOLINS	1,100 HOURS	1 OCT 1978
-OTHER	NUCLEAR CHEMISTRY #81A	KAUFMAN	197 BOMBARDMENTS	1 OCT 1978
MA-MO-DICHROM	NEUTRINO #356	SCIULLI	1,300 HOURS	1 JAN 1979
	15-FOOT NEUTRINO/H2BBLE #380	BALTAY	96K PIX	1 OCT 1978
-MO-WB HORN	15-FOOT NEUTRINO/H2BBLE #53A	BALTAY	163K PIX	1 JUL 1977
	15-FOOT ANTI-NEUTRINO/H2BBLE#160	ERBOLOV	273K PIX	1 JUL 1977
	NEUTRINO #253	SO	1,200 HOURS	1 JAN 1979
	15-FOOT NEUTRINO/D2BBLE #545	SNOW	254K PIX	1 JAN 1979
	NEUTRINO #531	PEAT	700 HOURS	1 JAN 1979
	15-FOOT & EMULSION/NEUTRINO#564	VOYVODIC	PARASITIC RUNNING	1 JAN 1979
-15-PT	15-FOOT PI- - P @ 100 #83A	KITAGAKI	11K PIX	1 APR 1975
	15-FOOT PI- - P&NE @ 200 #89	FRETTER	4K PIX	1 JUL 1975
	15-FOOT PI- - P @ 360 #384	LANNUTTI	20K PIX	1 APR 1976
-OTHER	MONOPOLE #502	BARTLETT	COSMIC RAY RUNNING	1 JAN 1979
	NUCLEAR FRAGMENTS #466	KAUFMAN	22 TARGETS EXPOSED	1 JAN 1979
PA-PW	PION INCLUSIVE #258	SHOCHET	450 HOURS	1 JAN 1979

C. EXPERIMENTS THAT ARE IN TEST STAGE (5):			EXTENT OF RUN TO DATE	DATE OF RECENT RUN
MA-M4	LAMBDA BETA-DECAY #361	BONDORN	198 HOURS	1 OCT 1978
MA-WB-HORN	NEUTRINO #483	HAND	668 HOURS	1 JAN 1979
-OTHER	QUARK #549	LONGO	1 TARGET EXPOSED	1 OCT 1978
PA-PE	PHOTOPRODUCTION #401	GOBALET	30 HOURS	1 JUL 1978
-PW	PARTICLE SEARCH #567	WITHERELL	300 HOURS	1 JAN 1979

D. EXPERIMENTS BEING INSTALLED (11):			EXTENT OF APPROVAL
MA-M1	PARTICLE SEARCH #515	ROSEN	800 HOURS
-M6	HADRON JETS #557	MALAMUD	1,600 HOURS
MA-WO-DICHROM	NEUTRINO #594	TAYLOR	PARASITIC RUNNING
-MO-WB HORN	15-FOOT ANTI-NEUTRINO/D2 #390	GARFINKEL	300K PIX
-15-PT	PARTICLE SEARCH #595	RODEK	600 HOURS
PA-PE	PHOTOPRODUCTION #516	MASH	1,500 HOURS
-PC	CHARGED HYPERON #497	LACH	400 HOURS
-PW	DI-MUON #326	SHOCHET	800 HOURS
	[illegible] #308	WITHERELL	600 HOURS
	DI-MUON #411	GRAY	1,000 HOURS
ITA-C-O	PARTICLE SEARCH #491	GOTAY	800 HOURS

E. EXPERIMENTS TO BE SET UP WITHIN A YEAR (4):			EXTENT OF APPROVAL
MA-M2	NEUTRAL HYPERON #555	DEVLIN	450 HOURS
-M3	PARTICLE SEARCH #584	WINSTEIN	300 HOURS
-M6	PARTICLE SEARCH #540	JENKINS	800 HOURS
	ELASTIC SCATTERING #477	ROBERTSON	1,000 HOURS

NOTE: THE ABILITY TO SET UP THESE EXPERIMENTS DURING THE NEXT YEAR IS CONTINGENT ON THE AVAILABILITY OF FUNDS.

PAGE 2 EXPERIMENTAL PROGRAM SITUATION REPORT (CONT'D) 15 JAN 1979

AREA-BEAM		SPOKESPERSON	EXTENT OF APPROVAL
F. OTHER APPROVED EXPERIMENTS (18):			
NA-42	HADRON JETS #604		UNSPECIFIED
	BEAM DUMP #613	ROE	1,000 HOURS
NA-NO-DICHROM	15-FOOT ANTI-NEUTRINO/N26NE#388	PETERSON	200K PIX
-MUON/HADRON	PARTICLE SEARCH #619	KIRK	1,000 HOURS
-15-FT	15-FOOT P - P & NE A 400 #291	YAMN	25K PIX
-30-IN	30-INCH HYBRID #570	PLESS	1,500 HOURS
	30-INCH HYBRID #565	YAMAMOTO	PARASITIC RUNNING
	30-INCH HYBRID #597	WHITMORE	1,000 HOURS
-OTHER	EMULSION/PROTONS @ 500 #508	WOLTER	EMULSION EXPOSURE
	EMULSION/PROTONS @ 500 #524	WILKES	EMULSION EXPOSURE
	EMULSION/PROTONS @ 500 #576	HEBERT	3 STACKS
PA-PE	PHOTON DISSOCIATION #612	GOULIANOS	1,150 HOURS
	PARTICLE SEARCH #400	PEOPLES	UNSPECIFIED
	PHOTOPRODUCTION #458	LEE	UNSPECIFIED

PENDING PROPOSALS (18):			EXTENT OF REQUEST
NA-41	HIGH MASS PAIRS #605	BROWN	4,000 HOURS
	PHOTON SEARCH #614	ROSEN	300 HOURS
	FORWARD SEARCH #615	PILCHER	1,000 HOURS
-42	DI-MUON #589	MOCKETT	750 HOURS
-43	POLARIZED SCATTERING #581	YOKOSAWA	1,200 HOURS
-46	MULTIPARTICLE #523	DZIEWIA	800 HOURS
NA-NO-HORN	15-FOOT NEUTRINO/N26NIZ #489	MEZNICK	450K PIX
	15-FOOT ANTINEUTRINO/N26NIZ#544	KAFTANOV	500K PIX
-MUON/HADRON	PION DISSOCIATION #318	ASCOLI	400 HOURS
-15-FT	15-FOOT P - P @ > OR = 300 #208	TAKIBAEV	75K PIX
	DETECTOR DEVELOPMENT #528	ROBERTS	100 HOURS
-30-IN	30-INCH PION - P&NE @100 #504	GULIAMOV	20K PIX
	DETECTOR DEVELOPMENT #550	ATAC	TEST RUNNING
	PARTICLE SEARCH #606	MUGENTOBLER	750 HOURS
PA-PC	CHARGED HYPERON #353	ECKLUND	600 HOURS
	FORM FACTOR #446	ECKLUND	800 HOURS
	PARTICLE SEARCH #608	BROWN	100 HOURS
ITA-C-0	PROTON-PROTON SCATTERING #5000	FRANZINI	1,000 HOURS

MANUSCRIPTS AND NOTES PREPARED FROM DECEMBER 8, 1978 TO JANUARY 10, 1979

Copies of preprints with Fermilab publication numbers can be obtained from the Publications Office or Theoretical Physics Department, 3rd floor east, Central Laboratory. Copies of some articles listed are on the reference shelf in the Fermilab Library.

Experimental Physics

J. Whitmore (Experiment #2B/ #281)	Inclusive Resonance Production (Mini Rapporteur Talk presented at the XIX International Conf. on High Energy Physics, Tokyo, August 23-30, 1978)
K. W. Chen (Experiment #26/ #319)	Review of Deep Inelastic Electron and Muon Scattering and Recent Fermilab Results at High q^2 (Invited paper presented at the International Meeting on the Frontier of Physics, Singapore, August 14-18, 1978)
K. Ueno et al. (Experiment #288)	Evidence for the T'' and A Search for New Narrow Resonances (FERMILAB-Pub-78/96-EXP; submitted to Phys. Rev. Lett.)
C. P. Bust et al. (Experiment #311)	Diffraction and Resonance Production in Exclusive $\bar{p}p$ Interactions at 100 GeV/c [Nucl. Phys. B140, 409 (1978)]
D. R. Ward et al. (Experiment #311)	Δ^{++} and $\bar{\Delta}^{++}$ Production in 100 GeV/c $\bar{p}p$ Interactions [Nucl. Phys. B141, 203 (1978)]
C. P. Ward et al. (Experiment #311)	General Features of Charged Particle Production in $\bar{p}p$ Interactions at 100 GeV/c (Submitted to Nucl. Phys. B)
C. P. Ward et al. (Experiment #311)	New Results on Charged Particle Production in $\bar{p}p$ Interactions at 100 GeV/c (Presented at the IV European Antiproton Symposium, Strasbourg, France, June 25-30, 1978)
R. C. Ball et al. (Experiment #319)	Measurement of Nucleon Structure Function in Muon Scattering at High q^2 (Submitted to Phys. Rev. Lett.)
R. C. Ball et al. (Experiment #319)	Deep Inelastic Muon Scattering at 275 GeV (Submitted to the XIX International Conf. on High Energy Physics, Tokyo, August 23-30, 1978)

G. Warren et al. (Experiment #552)	Proton-Deuteron Elastic Scattering from 25 to 210 GeV/c (Submitted to Phys. Lett. B)
A. L. Sessoms et al. (Proposal #602D)	The Segmented Calorimeter: A Study of Hadron Shower Structure (FERMILAB-Pub-79/13-EXP; submitted to Nucl. Instrum. Methods)
A. Roberts (No Experiment #)	Monte Carlo Simulation of Inelastic Neutrino Scattering in DUMAND (FERMILAB-Conf-78/95-EXP; to appear in the Proceedings of the 1978 DUMAND Summer Workshop)
F. Halzen and P. McIntyre (No Experiment #)	Extending the Mass Range of the Fermilab Energy Doubler by Colliding 1 TeV "Antiquarks" on Heavy Nuclei (FERMILAB-Pub-78/98-EXP)

Theoretical Physics

D. Wilkinson and F. A. Bias	Exact SU(N) Monopole Solutions with Spherical Symmetry (FERMILAB-Pub-78/77-THY; submitted to Phys. Rev. D)
H. Bergknoff	Lattice Gauge Theory Spectrum for Broken SU(4) (FERMILAB-Pub-78/81-THY; submitted to Phys. Rev. D)
C. Quigg	Quantum Mechanics and Quarkonium: An Introductory Review (FERMILAB-Conf-78/82-THY; presented at the International Meeting on the Frontier of Physics, Singapore, August 14-18, 1978, and at the Seoul Symposium on Elementary Particle Physics, September 1-5, 1978)
R. J. Oakes and K. O. Mikaelian	Higgs Boson Production by Very High Energy Neutrinos (FERMILAB-Conf-78/87-THY; submitted to the 1978 DUMAND Workshop, LaJolla, California, July 24 - September 25, 1978)
C. H. Albright and J. Smith	Use of the $\Delta\phi$-Angle Test to Rule Out Neutral Heavy Leptons (FERMILAB-Pub-78/92-THY; submitted to Phys. Rev. Comments and Addenda)
C. Quigg and J. L. Rosner	Multilepton Final States and the Weak Interactions of the Fifth Quark (FERMILAB-Pub-78/99-THY; submitted to Phys. Rev. D)

DATES TO REMEMBER

February 8-9, 1979	Proposal Presentation Meeting.
March 8-9, 1979	Spring meeting of the Physics Advisory Committee.
March 30, 1979	Deadline for request for Fermilab Summer Housing. Registrations are now being processed. The housing assignments will be made early in April based on the expected running schedule for the summer, and responses will be mailed out by April 17. Please register as soon as possible. Details of summer occupancy will be published in the next issue.
April 28, 1979	Fermilab Users Organization Annual Meeting. Details of the program will be mailed to members the end of March.
May 4, 1979	Deadline for receipt of all new proposals and other written materials to be considered at the summer meeting of the Physics Advisory Committee.
May 17-18, 1979	Proposal Presentation Meeting.
June 16-22, 1979	Summer meeting of the Physics Advisory Committee (Aspen).