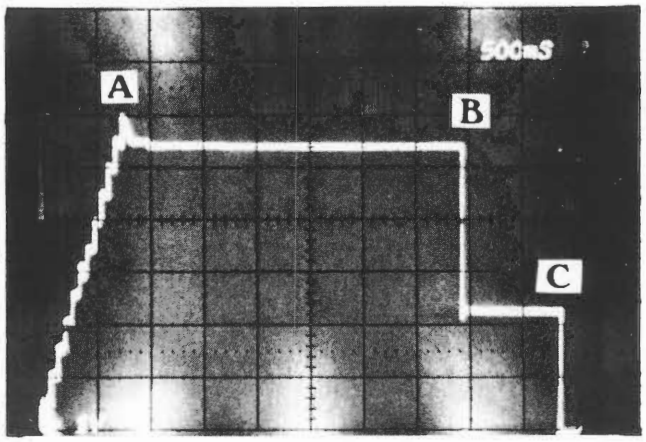
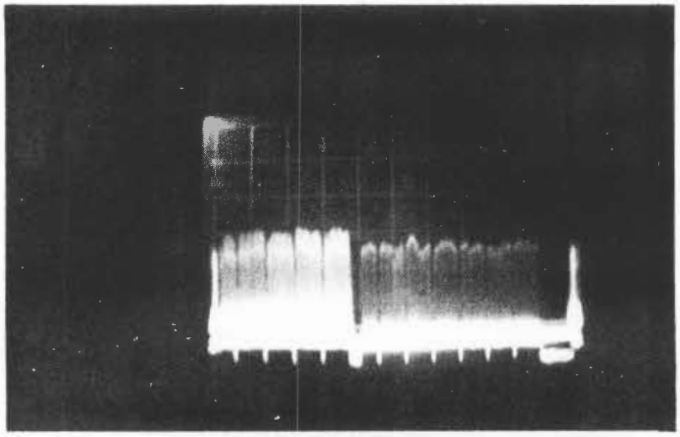
fermilab report

Fermi National Accelerator Laboratory Monthly Report

April 1977





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-77/4 Fermi National Accelerator Laboratory 0090.01

THE COVER:

The cover photographs are oscilloscope traces of double-pulse extraction tests carried out in March. The upper trace is the familiar Main-Ring intensity trace. The "staircase" at A is the injection of twelve Booster batches. Seven of these batches are extracted in a fast mode at B and the remaining five at C.

The lower trace shows the twelve Booster batches in the Main Ring. Seven are fainter in this time exposure because they are extracted first.

At the same time, the 15-ft Bubble Chamber was being expanded and taking pictures on both fast pulses. Approximately 2,000 pictures were taken during the 6 hours of the test.

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TRIMUON EVENTS

Eight examples of a new kind of phenomenon, trimuon events, have been found in two neutrino experiments at Fermilab. In these events, three muons are detected. Events with two muons have been seen for several years and are now predominantly ascribed to charmed-particle decay, although this interpretation is not certain. The trimuon events occur roughly at the rate of one event per several thousand single-muon events.

Both major neutrino experiments, the Caltech-Fermilab-Rockefeller collaboration (E21) and the Fermilab-Harvard-Pennsylvania-Rutgers-Wisconsin collaboration (E310), have observed trimuons. Experiment #310 has six events. In five of these, the highest-energy particle is a μ^- of energy at least 48 GeV. Calorimeter measurements available on three events indicate that most of the mesons have high energy, giving rise to the speculation that they come from the neutrino vertex.

The two events of the other experiment, Experiment # 21, have total visible energies of 90 and 175 GeV, respectively. For both events, more than half the energy is in the hadronic shower cascade, while approximately 30% is in the most energetic muon. Many interpretations of the limited data are possible, including associated charm production, direct lepton-pair production, or production of a new lepton at the neutrino vertex. It is hoped that future experimental runs will shed light on these interpretations.

At his retirement party, Bradley Bennett of URA greets Fred Mattmueller of ERDA. (Mr. Mattmueller worked very closely with the Laboratory throughout the construction period.) Ms L. Goldwasser is behind Mr. Mattmueller.

COMPUTING AT FERMILAB

A. E. Brenner

Batch-processing computation at Fermilab has been bumping up against the limit stops of saturation for some months now. The three CPU system currently installed is not capable of substantial further enhancement or expansion and our plans for the future are for large new equipment. In the FY 78 President's budget there is an item of $12 M for this equipment. We shall discuss the status and possible parameters of this new equipment in this article.

The Laboratory acquired its first CDC 6600 in December 1973 on transfer from LBL. A second CDC 6600 was added in 1975 and a CDC 6400 was installed as a "front end" for the 6600's in 1976. Thus all the Fermilab computers were acquired used. We have slowly enhanced the peripheral equipment supporting these computers, but it is still very lean. In addition, Fermilab has a PDP 10 acquired in 1971 when the Princeton-Pennsylvania Accelerator closed. It was initially used as a fast turn-around computer, a role now taken over by the 6600's. Since then it has been enhanced and is now used as a time-sharing computer with some interactive capability. Also in 1971, a second PDP 10 was donated by the Digital Equipment Corporation to Universities Research Association. It is used in the Film Analysis Facility to operate the Fermilab automatic measuring machine, SAMM.

The major aim of the Fermilab computing facility is to provide fast turn-around service for experiments while they are running. Currently

most of our computing is of this variety; only 20% is post-run analysis by Fermilab physicists and all other kinds of computing use comparatively small amounts of time. We have always worked at a level very close to the saturation limit of our facilities and it will very likely become particularly acute in the next six months. We have imposed a new priority system and more stringent accounting rules. These measures give some help, but our computing needs are much larger than we can hope to meet with our present computers. There are no funds assigned for enhancing the currently installed equipment. Furthermore, there isn't any more space for new equipment in the "Antique Computing Museum" on the Seventh Floor West where our venerable equipment is located.

We are therefore looking toward a modern integrated system more appropriate to Fermilab's needs. Although the Fermilab computer is in the President's Fiscal Year 1978 budget, there are also many other computers in that budget and it is not certain that all will survive. If all goes well with our computer, it will be installed and available in October, 1978. By that time, our existing system will have had to turn away much of the load. Exactly how we proceed depends, among many other things, on whether there is a conversion problem. If the new system is not compatible with existing 6600 programs, we will have a conversion period of up to a year.

We are beginning to work seriously on the specification of the system. Almost for sure the new system will be required to have two or more Central Processing Units plus a front end. The total computing power will be comparable to that of eight 6600's--about four times our present power. This

will give Fermilab a computation system comparable in power to the present systems of CERN, LBL, SLAC, and BNL. It will also help our difficult space problem on the seventh and eighth floors, once the transition to the new equipment is accomplished.

We will go out for bids with essentially no preconditions or limitations on the manufacturers. The Request for Proposals will define a figure of merit, a point system for quantitative analysis of the cost/performance ratio of the proposed machines and bids will be judged on the basis of this figure of merit.

The manufacturer will be expected to provide for continuation of our BISON-NET system and for continuation of our Remote Job Entry Terminals. New features that will be included in the RFP is a "mass-store" device, with a storage capacity of approximately 10^{12} bits. Such devices, which are improvements over the early "chip-store" devices (one of the three ever manufactured is installed at LBL) are now available commercially. This mass-store device, accessible to either CPU, allows the system to access the equivalent of many tapes for each user without operator intervention.

Another feature that is being considered is a limited interactive ("chit-chat") front end to this major computing system. There will be limitations on the level of interaction allowed in order to maintain a high level of efficiency for the whole system. As a tradeoff, the full Laboratory data file will be available at all times to users of both the batch system and the interactive system. The more fully interactive PDP 10 system will continue to operate as a stand-alone facility until it is no longer needed.

We are very desirous of input from users to tell us features appear to be lacking in the system currently installed and what attributes they would like to have in the new system. We are also looking for benchmarks, copies and documentation of large programs we can use to test proposed systems. With this help, we hope to provide greatly improved computing here at Fermilab.

RESEARCH ACTIVITIES DURING MARCH 1977

James MacLachlan

The accelerator was run at 400 GeV for the entire month of March. Beam was delivered for high-energy physics for 447 hours or 72% of the scheduled 618 hours. An average of 100 hours of beam per week was available, but accelerator performance was not steady. Several Main-Ring magnet failures made major contributions to unscheduled interruption. A total of four bending magnets failed in service, on three separate occasions. The failure mode was different each time; two magnets failed when an electrical transient caused power supplies to misbehave, a beam-induced vacuum leak was probably caused by power-supply regulations problems, and one of the oldest magnets apparently expired with a turn-to-turn short.

For the first half of the month, the accelerator was easily delivering a total of approximately 1.8×10^{13} p/pulse, providing both a slow spill required by the program and approximately 1.2×10^{13} p/pulse 20-μsec fast spill for the focusing horn, with an 11-sec cycle period. An eight-hour test was made of extracting two 10-μsec pulses separated by one second to provide for double pulsing of the 15-ft bubble chamber. Two cleanly extracted pulses were provided, but it did not prove possible to obtain useful slow spill between the pulses during this initial test. Because of difficulties in the Neutrino Area, on March 15 the flattop length was changed to 2 seconds with about a 15-sec cycle to improve the duty factor for the counter program. For the next week, however, only approximately 10^{13} p/pulse were required. When the high-intensity program resumed March 24 with a request for

2-msec spill, the accelerator could not deliver because of high extraction losses. Although a ragged transition period must be expected when such a pronounced change is made in accelerator operating mode, problems persisted longer than usual. Despite intensive efforts by accelerator operators and system specialists, the accelerator ended the month averaging about 1.3×10^{13} protons/pulse.

The Neutrino Area started the month with the 15-ft chamber in steady production (5-6K pictures/day) for 15 ft ν/H_2&Ne #180. This run ended March 3 with a total of 93K pictures taken since February 3. A run for 15 ft ν/H_2 & Ne #53A started with the test of double pulsing of the chamber on March 3. Although the pictures taken during the second pulse on this test were somewhat obscured by unrecompressed bubbles from the first pulse, measurements of fiducials showed the pictures to be generally satisfactory. A later test run by the bubble chamber produced second-pulse pictures that were indistinguishable from those taken on the first pulse. A separation as short as 700 msec between expansions appears possible in the Ne/H_2 mixture. E-53A ran until the first focusing horn failed March 15, accumulating 47K pictures. The failure appears to have been caused by fatigue in a weld on the inner conductor of the upstream horn. On March 16, it was discovered that the 15-ft chamber piston shaft seals were not working correctly. Further inspection revealed that serious galling of the shaft had torn the seals. Major reconditioning is required for the metal piston shaft and the chamber is being prepared to run in May with the plastic piston. During the time the sign-selected bare target was being readied to replace the horn

train, Particle Search #379 ran in the N5 line. The train replacement was complete by March 24, and Neutrino #310 was completing its startup tests by the end of the month with the polarity set for antineutrinos.

March saw the completion of K^o-Charge Radius #226 in the M4 line, which brought to a close a long-standing program of K^o physics. The M4 beam is now being converted for charged particles. The neutral-hyperon experimenters began and completed an 0(1%) measurement of the magnetic moment of the Λ in the M2 beam line by exploiting their previous observation of substantial polarization in Λ production and the spin precession produced by their sweeping magnet. The K form-factor experiment, E-456, ran steadily all month in M1 as the area's top priority. The change to 2-sec flattop has brought this work nearly to its goal of 4000 clean K^--e scatters. The multiparticle spectrometer in M6W had some very fruitful setup and test time. The Multiparticle #110A experimenters commissioned a number of new proportional chambers employing a current division measurement to give a two-dimensional readout, including a cylindrical chamber around the target with wires along the beam direction.

The program in the Proton Area was very simple; p-p Elastic Scattering #177A ran all month at an intermediate-high setting of their spectrometer for $|t|$ in the range of 10 to 15 $(GeV/c)^2$. In Proton-Central and Proton-East, installation was underway for Di-Lepton #288 and Photoproduction #401 respectively. P-East saw a few hours of test beam at the end of the month.

The Internal-Target Area started with p-N Scattering #198A using the superconducting spectrometer. p-N Scattering #381 started taking data a

week later and continued throughout the month when adequate liquid helium was being produced. p-p Polarization #313 took over March 10, but was seriously slowed down during most of their run because the accelerator intensity was far below their expectations. They also suffered a setback when a conical Mylar baffle shielding the buffer volume was damaged during a pumpdown after a diffusion-pump repair. Experiment #381 was completed on March 30.

FACILITY UTILIZATION SUMMARY -- MARCH 1977

I. Summary of Accelerator Operations

			Hours	
A. Accelerator use for physics research				
Accelerator physics research			60.9	
High energy physics research			447.0	
Research during other use			(11.9)	
		Subtotal		507.9
B. Other activities				
Accelerator setup and tuning to experimental areas			12.0	
Program interruption	Scheduled	46.0	47.6	
	Ad hoc	1.6		
Unscheduled interruption			176.5	
		Subtotal		236.1
C. Unmanned time				
		Total		744.0

II. Summaries of High Energy Physics Research Use

	# of Expts.	Hours	Results
A. Counter experiments	14	2503.5	2 experiments
B. Bubble chamber experiments	2	185.6	59.9K pictures
C. Emulsion experiments	1	-	1 stack in progress
D. Special target experiments	1	8.9	1 target
E. Test experiments	-	-	
F. Engineering studies and tests	(1)	41.1	transition rad. detector tests
G. Other beam use	(3)	9.6	beam tuning
	18	2748.7	

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

A. Beam accelerated in Main Ring				1.85
B. Beam delivered to experimental areas				
Meson Area			0.68	
Neutrino Area			0.81	
	Slow Spill	0.02		
	Fast Spill	0.79		
Proton Area			0.04	
		Total		1.53

BEAM UTILIZATION BY

	Beam	Run Dates	Hours
MESON AREA			
Nuclear Chemistry #81A	M0	3/6-3/7	8.9
Multiparticle #110A	M6W	3/1-3/21	278.0
K^0 Charge Radius #226	M4	3/1-3/17	196.1
Backward Scattering #290	M6W	3/24-3/31	59.5
n-N Inelastic #438	M3	3/17-3/31	118.0
Λ Magnetic Moment #440	M2	3/11-3/29	274.4
Form Factor #456	M1	3/1-3/31	385.6
NEUTRINO AREA			
15' ν/H_2&Ne #53A	N0	3/3-3/15	150.4
15' $\bar{\nu}/H_2$&Ne #180	N0	3/1-3/2	35.2
Neutrino #310	N0	3/24-3/31	57.8
Particle Search #369	N1	3/1-3/3, 3/8-3/9	48.5
Particle Search #379	N5	3/3-3/7, 3/10-3/31	198.0
Emulsion/ν #536	N0	3/3-3/31	
PROTON AREA			
p-p Elastic #177A	PW	3/1-3/31	271.2
Photoproduction #401	P1	3/28-3/31	14.4
INTERNAL TARGET AREA			
p-N Scattering #198A	C0	3/1-3/9	119.4
p-p Polarization #313	C0	3/11-3/30	263.9
p-N Scattering #381	C0	3/6-3/19 3/27-3/30	218.7
HOURS FOR EXPERIMENTS			2698.0
HOURS FOR TESTS AND BEAM TUNING			50.7
TOTAL HOURS FOR HIGH ENERGY PHYSICS RESEARCH USE			2748.7

EXPERIMENT -- MARCH 1977

Activities

data: 1 U target with Pb secondary absorber exposed to 400 GeV p to look for polyneutrons

test: trigger studies and commissioning of new PWC's including 2 dimensional readout

data: complete; charge radius determined from $K_L^o e$ scattering

test: setup and PWC tests

data: scattering of neutrons by beryllium, carbon, and tungsten targets

data: complete measure μ_Λ by precession of polarized Λ spin in sweeping magnet

data: $K^- e$ scattering at 250 GeV to determine kaon form factor

data: pictures in a 62% Ne/H_2 mix with the 2 horn target train

data: pictures in a 62% Ne/H_2 mix with 2 horn target train and 0° beam plug

setup: preparations for $\bar{\nu}$ running with the sign selected bare target train

tests: trigger studies of single μ, multi μ, and P_T trigger using π^- to the cyclotron spectrometer

tests and data: 400-GeV protons to a variable density calorimeter and μ spectrometer

data: bare emulsion stack in ν and $\bar{\nu}$ beam

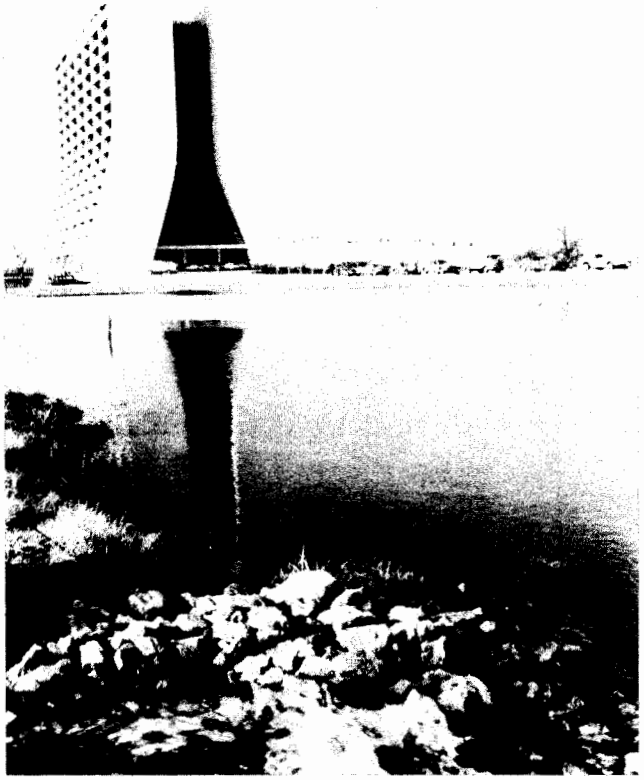
data: p-p elastic scattering in the range $10 \leq |t| \leq 15$ with forward and recoil arms

setup: production of high mass final states by a broadband photon beam

data: p-p scattering ~20-40 GeV and 100-200 GeV up to $|t| \sim 2$

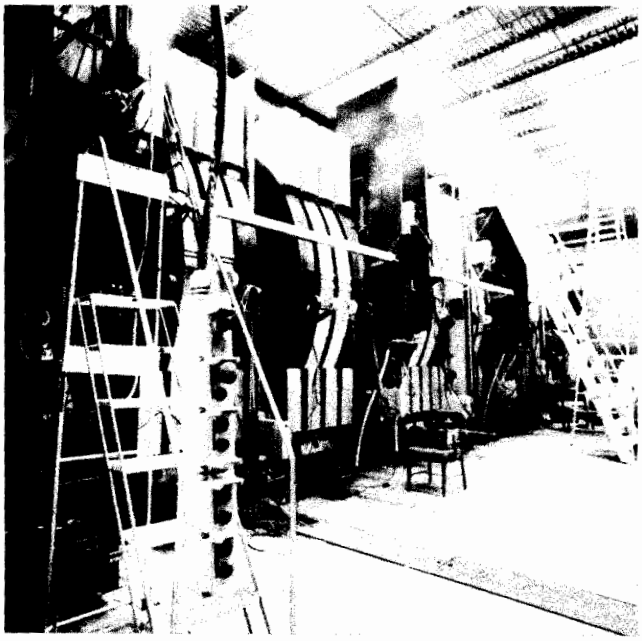
data: polarization in p-p scattering to $t = -1$ by rescattering of recoil proton

data: complete; p-p elastic and inelastic scattering at 50-400 GeV



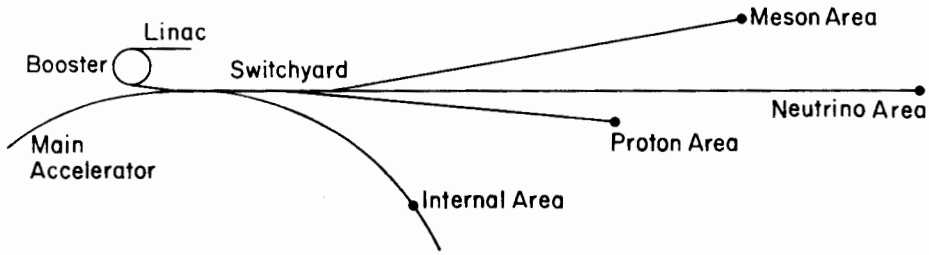
As we bid farewell to the last vestige of winter in front of the Central Laboratory Building. . .

. . . we once again welcome the long-awaited promise of May, the May apples.
(Photographs by Anthony R. Donaldson)



Detectors for Experiment 379 in Lab E.

Fermi National Accelerator Laboratory



Experiments in the Research Areas

APRIL - JULY 1977

Internal Area	Proton Area	Neutrino Area	Meson Area
PROTON-NUCLEON SCATT. #198A	PROTON EAST: PHOTOPRODUCTION #401	HADRON BEAM: PARTICLE SEARCH #379	M1 BEAM: FORM FACTOR #456 HIGH ENERGY CHANNELING #507 HADRON JETS #236A
PROTON-HELIUM SCATT. #289	PROTON CENTER: DI-LEPTON #288	NEUTRINO BEAM: NEUTRINO #310 15-FT BUBBLE CHAMBER	M2 BEAM: PARTICLE SEARCH #439 HADRON JETS #395 LAMBDA POLARIZATION #441
NUCLEAR FRAGMENTS #442	PROTON WEST: P-P ELASTIC #177A PHOTON SEARCH #95A	MUON/HADRON BEAM: PARTICLE SEARCH #369	M4 BEAM: INCLUSIVE K_S^0 #383
			M6 BEAM: BACKWARD SCATTERING #290 MULTIPARTICLE #110A INCLUSIVE SCATTERING #118A

SITUATION REPORT - APRIL 1977

PAGE 1 — FERMI NATIONAL ACCELERATOR LABORATORY — PROGRAM PLANNING OFFICE
15 APR 1977

EXPERIMENTAL PROGRAM SITUATION REPORT

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 APRIL 1, 1977. 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: MESON AREA (MA), NEUTRINO AREA (NA), PROTON AREA (PA), INTERNAL TARGET AREA (ITA).

TOTAL NUMBER OF APPROVED EXPERIMENTS - 271

AREA-BEAM		SPOKESPERSON	EXTENT OF RUN TO DATE	DATE COMPLETED
A. EXPERIMENTS THAT HAVE COMPLETED DATA TAKING (182):				
(ONLY EXPERIMENTS COMPLETED SINCE 1 JAN 1977 ARE LISTED BELOW)				
MA-M2	INCLUSIVE NEUTRAL MESON #350	KENNEY	900 HOURS	24 FEB 1977
	LAMBDA MAGNETIC MOMENT #440	BUNCE	250 HOURS	22 MAR 1977
-M4	K ZERO CHARGE RADIUS #226	TELEGDI	1,200 HOURS	17 MAR 1977
	K ZERO CROSS SECTION #486	WINSTEIN	950 HOURS	17 MAR 1977
PA-PE	PARTICLE SEARCH #325	CRONIN	1,500 HOURS	28 FEB 1977
-PC	DI-HADRON #494	GOOD	1,950 HOURS	21 FEB 1977
ITA-C-0	PROTON-NUCLEON SCATTERING #381	MALAMUD	600 HOURS	30 MAR 1977
B. EXPERIMENTS THAT ARE IN PROGRESS (29):			EXTENT OF RUN TO DATE	DATE OF RECENT RUN
MA-M1	TOTAL CROSS SECTION #104	BAKER	1,400 HOURS	1 JAN 1975
	INCLUSIVE SCATTERING #324	WEISBERG	900 HOURS	1 JAN 1977
	HADRON JETS #236A	MOCKETT	1,200 HOURS	1 OCT 1976
	POLARIZED SCATTERING #61	CHAMBERLAIN	1,300 HOURS	1 APR 1977
	FORM FACTOR #456	STORK	1,300 HOURS	1 APR 1977
-M3	NEUTRON-NUCLEUS INELASTIC #438	JONES	100 HOURS	1 APR 1977
-M6	HADRON DISSOCIATION #396	GOULIANOS	600 HOURS	1 APR 1977
	INCLUSIVE SCATTERING #118A	FRIEDMAN	2,150 HOURS	1 JAN 1977
-OTHER	NUCLEAR CHEMISTRY #81A	KAUFMAN	152 BOMBARDMENTS	1 APR 1977
NA-NO-WB HORN	15-FOOT NEUTRINO/H2 #45A	PETERSON	162K PIX	1 APR 1976
	EMULSION/NEUTRINO #536	NIU	EMULSION EXPOSURE	1 APR 1977
	15-FOOT ANTI-NEUTRINO/H2 #31A	DERRICK	64K PIX	1 APR 1976
	15-FOOT ANTI-NEUTRINO/H2&NE#180	MUKHIN	174K PIX	1 APR 1977
	15-FOOT NEUTRINO/H2 & NE #53A	BALTAY	109K PIX	1 APR 1977
-NO-TRIPLET	NEUTRINO #310	CLINE	1,300 HOURS	1 APR 1977
-MUON/HADRON	TEST MUON INFORMATION #501	LANDE	2 TARGETS EXPOSED	1 JAN 1977
-15-FT	15-FOOT PI- - P @ 100 #83A	KITAGAKI	11K PIX	1 APR 1975
	PARTICLE SEARCH #379	WOJCICKI	650 HOURS	1 APR 1977
	15-FOOT PI- - P&NE @ 200 #09	FRETTER	4K PIX	1 JUL 1975
	15-FOOT PI- - P @ 360 #384	HUSON	20K PIX	1 APR 1976
-30-IN	30-INCH HYBRID #299	PLESS	431K PIX	1 JAN 1977
	30-INCH BEAM - D @ 100 #345	EKSPONG	61K PIX	1 OCT 1976
PA-PE	NUCLEAR FRAGMENTS #466	KAUFMAN	5 TARGETS EXPOSED	1 APR 1977
-PC	DI-LEPTON #268	LEDERMAN	2,900 HOURS	1 JUL 1976
-PW	PROTON SEARCH #95A	COX	1,850 HOURS	1 OCT 1976
	PROTON-PROTON ELASTIC #177A	CRIAR	2,250 HOURS	1 APR 1977
ITA-C-0	PROTON-NUCLEON SCATTERING #195A	OLSEN	600 HOURS	1 APR 1977
	PROTON-PROTON POLARIZATION #313	NEAL	850 HOURS	1 APR 1977
	NUCLEAR FRAGMENTS #442	TURKOT	200 HOURS	1 JAN 1977
C. EXPERIMENTS THAT ARE IN TEST STAGE (7):			EXTENT OF RUN TO DATE	DATE OF RECENT RUN
MA-M2	MULTI-MUON #439	GARELICK	150 HOURS	1 JAN 1977
-M6	BACKWARD SCATTERING #290	BAKER	200 HOURS	1 APR 1977
	MULTIPARTICLE #110A	DZIERBA	500 HOURS	1 APR 1977
NA-NO-TRIPLET	NEUTRINO #482	BARISH	250 HOURS	1 JAN 1977
-MUON/HADRON	PARTICLE SEARCH #369	KIRK	300 HOURS	1 APR 1977
-OTHER	MONOPOLE #502	BARTLETT	COSMIC RAY RUNNING	1 APR 1977
PA-PE	PHOTOPRODUCTION #401	GORBLEY	10 HOURS	1 APR 1977
D. EXPERIMENTS BEING INSTALLED (4):			EXTENT OF APPROVAL	
MA-M4	INCLUSIVE K-SHORT #383	KOBRAK	500 HOURS	
NA-NO-TRIPLET	NEUTRINO #253	MO	PARASITIC RUNNING	
PA-PE	PHOTOPRODUCTION #152B	HEUSCH	350 HOURS	
ITA-C-0	PROTON-HELIUM SCATTERING #289	MALAMUD	700 HOURS	
E. EXPERIMENTS TO BE SET UP WITHIN A YEAR (27):			EXTENT OF APPROVAL	
MA-M1	PARTICLE SEARCH #354	BAKER	PARASITIC RUNNING	
	HADRON DISSOCIATION #272	FERBEL	600 HOURS	
-M2	HADRON JETS #395	SELOVE	450 HOURS	
	LAMBDA-BAR PRODUCTION #495	HELLER	400 HOURS	
	LAMBDA POLARIZATION #441	PONDROM	150 HOURS	
	INCLUSIVE NEUTRON #404	JONES	PARASITIC RUNNING	
	PARTICLE SEARCH #468	STEINBERG	300 HOURS	
	MUON SEARCH #453	FRISCH	600 HOURS	
	PARTICLE SEARCH #411	VON GOELER	250 HOURS	
	PARTICLE SEARCH #413	VON GOELER	150 HOURS	
-M6	ASSOCIATED PRODUCTION #99	DIEBOLD	500 HOURS	
	INCLUSIVE SCATTERING #451	BARTON	400 HOURS	
	PARTICLE SEARCH #490	SANDWEISS	TEST RUNNING	
NA-NO-DICHROM	NEUTRINO #356	BARISH	1,000 HOURS	
-NO-WB HORN	15-FOOT NEUTRINO/D2 #151A	SNOW	100K PIX	
	15-FOOT NEUTRINO/D2 #227	ENGELMANN	100K PIX	
	15-FOOT ANTI-NEUTRINO/D2 #390	GABRINKEL	300K PIX	
-MUON/HADRON	DI-MUON #444	SMITH	400 HOURS	
	MUON #203A	KERTH	500 HOURS	
	MUON #391	KERTH	PARASITIC RUNNING	
	MUON #448	WILSON	300 HOURS	
-OTHER	EMULSION/PI- @200 #481	TAKAHASHI	EMULSION EXPOSURE	
	EMULSION/PI- @ > OR = 200 #503	OGATA	EMULSION EXPOSURE	
	EMULSION/PI- @ > OR = 200 #506	DAKE	EMULSION EXPOSURE	
	EMULSION/PIONS @ >300 #525	WILKES	EMULSION EXPOSURE	
PA-PE	PARTICLE SEARCH #400	PEOPLES	400 HOURS	
	PHOTOPRODUCTION #458	LEE	1,000 HOURS	
F. OTHER APPROVED EXPERIMENTS (22):			EXTENT OF APPROVAL	
MA-M1	PARTICLE SEARCH #515	ROSEN	800 HOURS	
-M3	PI-MU ATOMS #533	ARONSON	500 HOURS	
-M6	FORM FACTOR #446	ECKLUND	500 HOURS	

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

ARRANGEMENTS FOR POSSIBLE OPERATION OF THE 30-INCH BUBBLE CHAMBER DURING 1977 ARE BEING DISCUSSED.

PAGE 2 EXPERIMENTAL PROGRAM SITUATION REPORT (CONT'D) 15 APR 1977

AREA-BEAM		SPOKESPERSON	EXTENT OF APPROVAL
NA-NO-DICHROM	15-FOOT NEUTRINO/H2 & NE #380	BALTAY	200K PIX
	15-FOOT ANTI-NEUTRINO/H2&NE#388	STEVENSON	200K PIX
-NO-WB HORN	NEUTRINO #531	REAY	1,500 HOURS
-15-FI	15-FOOT P - P & NE @ 400 #291	MANN	25K PIX
-30-IN	30-INCH PI+ & P - P @ 300 #277	BARNES	300K PIX
	30-INCH PBAR - P @200 #392	WEALE	100K PIX
	30-INCH PI- - P @ 150 #393	FLESS	400K PIX
	30-INCH PI- - HI Z @ 300 #304	WALKER	200K PIX
	30-INCH P - P @ 500 #207	ENGELMANN	50K PIX
-OTHER	DETECTOR DEVELOPMENT #206	YODH	PARASITIC RUNNING
	EMULSION/PROTONS @ 400-500 #499	IWAI	EMULSION EXPOSURE
	EMULSION/PROTONS @ 500 #508	WOLTER	EMULSION EXPOSURE
	EMULSION/PROTONS @ 500 #524	WILKES	EMULSION EXPOSURE
PA-PE	PHI PHOTOPRODUCTION #263	CHEN	600 HOURS
-PC	CHARGED HYPERON #497	LACH	400 HOURS
-PW	PION INCLUSIVE #258	PIROUE	800 HOURS
	DI-MUON #326	PIROUE	800 HOURS
	C-TEST #202	CESTER-REGGE	400 HOURS
	MULTIGAMMA #192	GUIRAGOSSIAN	400 HOURS

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PENDING PROPOSALS (48): EXTENT OF REQUEST

MA-M1	DETECTOR DEVELOPMENT #427	YUAN	200 HOURS
	HIGH ENERGY CHANNELING #507	GIBSON	250 HOURS
-M2	LAMBDA BETA DECAY #361	PONDROM	300 HOURS
	NUCLEAR CHEMISTRY #529	TUBKEVICH	100 HOURS
-M3	K STAR PRODUCTION #449	ABOLINS	600 HOURS
	NEUTRON-DEUTERON ELASTIC #479	ROBERTS	300 HOURS
	PARTICLE SEARCH #540	LONGO	1,900 HOURS
-M6	HADRON DISSOCIATION #312	EDELSTEIN	1,000 HOURS
	PARTICLE SEARCH #469	CUTTS	150 HOURS
	MULTIPARTICLE #523	DZIEFBA	1,000 HOURS
NA-NO-DICHROM	NEUTRINO #355	BABISH	1,400 HOURS
	NEUTRINO #541	SESSOMS	
-NO-WB HORN	15-FOOT NEUTRINO/H2&HIZ #489	WEZRICK	300K PIX
	NEUTRINO #496	CHEN	1,000 HOURS
	15-FOOT NEUTRINO/D2 &HIZ #521	VANDER VELDE	200K PIX
	15-FOOT ANTINEUTRINO/D2&HIZ#539	BINGHAM	300K PIX
	15-FOOT ANTINEUTRINO/D2&HIZ#542	GARFINKEL	500K PIX
	15-FOOT ANTINEUTRINO/D2&HIZ#543	KITAGAKI	400K PIX
	15-FOOT ANTINEUTRINO/H2&HIZ#544	KAFTANOV	500K PIX
-NO-NB HORN	15-FOOT NEUTRINO/H2 & NE #389	TENNER	100K PIX
	15-FOOT NEUTRINO/HE & NE #455	PETERSON	200K PIX
-MUON/HADRON	PION DISSOCIATION #318	ASCOLI	400 HOURS
	MUON #348	WILSON	900 HOURS
	DI-MUON #443	PILCHER	400 HOURS
	TEST PARTICLE SEARCH #457	BRANDENBURG	100 HOURS
	MUON #487	SESSOMS	800 HOURS
-15-FI	15-FOOT P - P @ > OR = 300 #208	TAKIBAEV	75K PIX
	15-FOOT PBAR - D @ 100 #526	LANDER	150K PIX
	15-FOOT PBAR - D @ 100 #527	LANDER	150K PIX
	DETECTOR DEVELOPMENT #528	ROBERTS	100 HOURS
	15-FOOT PI- - D @ 100&360 #538	FRETTER	150K PIX
-30-IN	30-INCH HYBRID #394	WHITMORE	2,250K PIX
	30-INCH HYBRID #488	FLESS	2,500K PIX
	30-INCH SIGP - PENE @100 #504	GULJAMOV	30K PIX
	30-INCH PBAR - D @ 200 #511	FRIDMAN	150K PIX
PA-PE	PHOTOPRODUCTION #450	CALDWELL	600 HOURS
	PHOTOPRODUCTION #516	NASH	1,000 HOURS
-PC	CHARGED HYPERON #353	ECKLUND	600 HOURS
-PW	HADRON JETS #246	SELOVE	600 HOURS
	ELASTIC SCATTERING #301	GETTNER	1,000 HOURS
	ELASTIC SCATTERING #347	WALKER	1,200 HOURS
	HADRON-NUCLEON SCATTERING #420	GUIRAGOSSIAN	1,100 HOURS
	ELECTROPRODUCTION #454	GUIRAGOSSIAN	1,500 HOURS
	QUARK SEARCH #532	BROWN	600 HOURS
	K-LONG SCATTERING #535	HAUENBERG	400 HOURS
	PARTICLE SEARCH #537	COX	1,700 HOURS
ITA-C-O	PROTON-PROTON SCATTERING #500D	FRANZINI	1,000 HOURS
	PROTON POLARIZATION #522	OGDEN	840 HOURS

Prairie volunteers Lynn and Pauline Lattyak clean seeds from a prairie goldenrod at the recent threshing bee in the Village Barn. Over 400 pounds of hand-harvested, native prairie seeds were cleaned, bagged, and refrigerated, a necessary ingredient in helping the seeds to break dormancy once they are planted in June. (Photograph by Rick Fenner)

PROPOSALS RECEIVED DURING MARCH AND APRIL 1977

No.	Title	Spokesperson
536	Study of Neutrino Interactions by Nuclear Emulsions	N. Niu
537	Proposal to Study $\bar{p}N$ Interactions in the P-West High Intensity Laboratory	B. Cox
538	Proposal to Study ~ 100 GeV $\pi^- d$ Interactions in Conjunction with a Corresponding $\bar{p}d$ Exposure: Also to Study ~ 360 GeV $\pi^- d$ Interactions	W. Fretter
539	Proposal to Study Antineutrino Interactions in Deuterium and Nuclei with an Internal Target and Converter System in the Fermilab 15-Ft Bubble Chamber	H. Bingham
540	A Search for New Metastable Particles Trapped in Matter	M. Longo
541	A Proposal to Study Neutral Current Neutrino and Antineutrino Interactions	A. Sessoms
542	Proposal for an Extension of E-31/390 to Study $\bar{\nu}p/\bar{\nu}n$ Interactions in the 15-Ft Bubble Chamber with γ-Converting Plates	A. Garfinkel
543	Proposal to Study Antineutrino Interactions in the Liquid Deuterium 15-Ft Bubble Chamber with a Converter Plate System	T. Kitagaki
544	Proposal to Study Antineutrino Interactions in Hydrogen and Nuclei with an Internal Target and Converter System in the 15-Ft Bubble Chamber	V. Kaftanov

For the second consecutive spring, the Main-Ring prairie restoration was burned to reduce competition from introduced Eurasian weeds, such as those seen in the foreground. The prairie grasses, hidden among the weeds, provided the necessary fuel for a good fire in the first eight-acre section planted in 1975. (Photograph by Anthony R. Donaldson)

POSSIBLE STANDBY STATUS FOR THE MESON LABORATORY

As a result of budgetary constraints in FY 78, consideration is being given to the possibility of putting the Meson Laboratory in standby status for the last part of the year. Such a standby might also extend several months into FY 79. The idea would be to conserve operating funds in the Research Division by reducing the crew in the Meson Laboratory by about one half.

This possible shutdown of the Meson Laboratory is only in the very early stages of consideration at this time. It will be discussed with the PAC at the time of their extended meeting this summer. The time that has been discussed for such a shutdown is April of 1978. That marks a time when many of the present major experiments are due to be completed. During the months of standby one half of the Meson Lab personnel could be preparing all beam lines for the next running period in a coherent way. The other half of the Meson Laboratory personnel could be used in other projects in the Laboratory. A decision will be made during the coming summer.

DATES TO REMEMBER

May 6, 1977	Deadline for receipt of all new proposals and other written materials to be considered at the Summer meeting of the Program Advisory Committee.
May 13, 1977	Users Annual Meeting.
May 19-21, 1977	Proposal Presentation Meeting.
May 27, 1977	Third Colliding Beam Experimental Workshop. This workshop will be held in Curia II at 1:30 p.m. Progress on beam storage, beam structure studies, interaction scheme design, and background studies will be described and discussed.
June 18-24, 1977	Summer meeting of the Fermilab Program Advisory Committee.

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