NALREP

Monthly Report of the Fermi National Accelerator Laboratory

August 1976

Fermi National Accelerator Laboratory

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THE COVER: The annual summer study was again held in the peaceful surroundings of the Rocky Mountains. (Photograph by Tim Toohig)

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MANUSCRIPTS AND NOTES PREPARED DURING JULY AND AUGUST 1976

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

A. Benvenuti et al. Experiment #1A and Experiment #370	Evidence for Parity Non-Conservation in the Weak Neutral Current (Submitted to Phys. Rev. Lett.)
W. M. Morse et al. Experiment #2B	π^+p, K^+p, and pp Topological Cross Sections and Inclusive Interactions at 100 GeV Using a Hybrid Bubble Chamber-Spark Chamber System and a Tagged Beam (Submitted to Phys. Rev.)
D. M. Stevens et al. Experiment #22	Search for Multiphoton Events from Proton-Nuclei Interactions at 300 GeV/c (Submitted to Phys. Rev. D)
K. W. Chen Experiment #26	Dimuon and Trimuon Production in Deep Inelastic Muon Interactions at 150 GeV (Talk given at the International Conf. on New Particles with New Quantum Numbers, University of Wisconsin, Madison, Wisconsin, April 21-23, 1976)
D. R. Fortney and N. T. Porile Experiment #81A	Evidence for Sideward Emission of Sc Fragments in the Interaction of ^{238}U with 400-GeV Protons (Submitted to Phys. Rev. C)
B. Knapp et al. Experiment #87A	High Energy Photoproduction of $\mu\mu$ and μE Events (Talk presented by A. Wattenberg at the XVIII International Conf. on High Energy Physics, Tbilisi, USSR, July 14-21, 1976)
A. V. Barnes et al. Experiment #111	Pion Charge Exchange Scattering at High Energies (Submitted to Phys. Rev. Lett.)
O. I. Dahl et al. Experiment #111	The Reaction $\pi^-p \rightarrow \eta n$ at High Energies (Submitted to Phys. Rev. Lett.)
M. Awschalom et al. Experiment #211	Measurements and Calculations of Cascades Produced by 300-GeV Protons Incident on a Target Inside a Magnet (FERMILAB-Pub-76/48-EXP; submitted to Nucl. Instrum. Methods)

H. Fuchi et al. Experiment #242	Analysis of 303 GeV/c Proton Interactions Tagged by by High Energy γ Rays (Submitted to the XVIII International Conf. on High Energy Physics, Tbilisi, USSR, July 14-21, 1976)
H. Fuchi et al. Experiment #243	X Particles and Their Backgrounds in 400 GeV/c Proton Interactions (Submitted to the XVIII International Conf. on High Energy Physics, Tbilisi, USSR, July 14-21, 1976)
S. Childress et al. Experiment #321	Proton-Proton Inelastic Scattering at 0.5 TeV
E. W. Beier et al. Experiment #324	The Approach to Scaling in Single-Particle Inclusive Hadron Scattering from 4 to 250 GeV/c (Submitted to the XVIII International Conf. on High Energy Physics, Tbilisi, USSR, July 14-21, 1976)
K. J. Anderson et al. Experiment #331	The Contribution of Muon Pairs to the Yield of Single Prompt Muons (Submitted to the XVIII International Conf. on High Energy Physics, Tbilisi, USSR, July 14-21, 1976)
K. J. Anderson et al. Experiment #331	Inclusive μ-Pair Production at 150 GeV by π^+ Mesons and Protons (Submitted to the XVIII International Conf. on High Energy Physics, Tbilisi, USSR, July 14-21, 1976)
D. Bintinger et al. Experiment #357	Search for Charmed Particles in Proton-Nucleus Collisions at 400 GeV/c
M. Binkley et al. Experiment #358	Limit on Production of Charmed Particles in Association with the J (FERMILAB-Pub-76/54-EXP; submitted to Phys. Rev. Lett.)
H. L. Anderson et al. Experiment #398	Generalized Vector Dominance and the Low q^2 μp and μd Inelastic Scattering at 150 GeV (Submitted to the XVIII International Conf. on High Energy Physics, Tbilisi, USSR, July 14-21, 1976)
H. Fukushima General Review	An Interpretation of Inelastic Hadron-Nucleus Interactions (Submitted to Nuovo Cimento)
A. Roberts et al. General	DUMAND: The Ocean as a Neutrino Detector (FERMILAB-Pub-76/51-EXP; submitted to Science)

Theoretical Physics

A. A. Golestaneh	The η Decay into Three Pions and the On-Mass-Shell Current Algebra (FERMILAB-Pub-76/18-THY; submitted to Phys. Rev. D)
W. A. Bardeen and M. Bander	Phase Transition in an O(N) Gauge Model in Two Dimensions (FERMILAB-Pub-76/38-THY; submitted to Phys. Rev.)
C. H. Albright et al.	Neutrino-Proton Elastic Scattering: Implications for Weak Interaction Models (FERMILAB-Pub-76/40-THY; submitted to Phys. Rev.)
M. W. Roth	Lattice Gauge Theories and the Continuum Limit in Two Dimensions (FERMILAB-Pub-76/43-THY; submitted to Phys. Rev.)
C. H. Albright et al.	Gauge Theories and νp Elastic Scattering (FERMILAB-Pub-76/45-THY; submitted to Phys. Rev. Lett.)
P. Sorba et al.	The Weak Charges of Charmed Particles (FERMILAB-Pub-76/46-THY; submitted to Lettere al Nuovo Cimento)
C. H. Albright and R. E. Shrock	Inclusive Charged Current Neutrino Reactions: Implications for Gauge Models with Heavy Quarks and Right-Handed Currents (FERMILAB-Conf-76/50-THY; submitted to the XVIII International Conf. on High Energy Physics, Tbilisi, USSR, July 14-21, 1976)
V. A. Matveev	Hydrodynamic Model of Collective Resonances in Hadronic Matter (FERMILAB-Pub-76/52-THY; submitted to Phys. Rev. D)
L. A. Balázs	Vacuum Singularities in a Dual Multiperipheral Model (FERMILAB-Pub-76/56-THY; submitted to Phys. Rev. D)

General

D. C. Carey et al.	Calculating the Effect of Beam Line Magnet Misalignments with TRANSPORT (FERMILAB-76/44)

Physics Notes

R. J. Stefanski and H. B. White FN-292	Neutrino Flux Distributions
A. G. Ruggiero FN-293	Computer Simulation of the Main Ring Beam Colliding with Another Beam
A. G. Ruggiero FN-293-A	Further Simulations of the Main Ring Beam Colliding with Another Beam
M. Atac et al. FN-294	A Two-Dimensional Drift Chamber

DATES TO REMEMBER

September 25, 1976	Illinois Prairie Day: "Prairie Panorama." Auditorium, 8 p.m.
October 1, 1976	Deadline for receipts of all new proposals and other written materials to be considered at the November meeting of the Program Advisory Committee.
October 2, 9, and 16, 1976	Prairie Seed Harvesting at Gensberg-Markham Prairie in Markham and at The Morton Arboretum in Lisle for Fermilab Prairie Restoration Project.
October 14-15, 1976	Proposal Presentation Meeting.
November 11-12, 1976	Autumn meeting of the Fermilab Program Advisory Committee.
November 15, 1976	Deadline for receipt of written materials to be considered at the Multiparticle Spectrometer Workshop.
December 9-10, 1976	Multiparticle Spectrometer Workshop.

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THE ACCELERATOR: JANUARY 1976 TO JULY 1976

P. V. Livdahl

Introduction

The 18-month period covered by this report may be characterized as a time in which operation for high-energy physics experimentation was consolidated into a stable routine. There have been spectacular one-shot achievements, but there has also been a steady growth in average performance and improved reliability. At the same time, the flexibility of the accelerator has been extended. The accelerator has operated at energies from 200 to 500 GeV; an energy of 400 GeV became standard in July 1975 and the flattop at this energy has been as long as 2 seconds.

The intensity of the accelerator has increased steadily during this period. A new intensity record of 2×10^{13} protons per pulse was achieved in January 1976. The average intensity per pulse is now more than 10^{13} protons (including pulses on which acceleration was not even attempted) for periods of a month or more. We have operated with many different spill modes, mixing fast and slow spill to support the variegated program of the Laboratory.

There have also been a number of very significant improvements in various systems of the accelerator. In this report, we shall discuss these activities in more detail.

Accelerator Energy

In July 1975, a decision was made to operate the accelerator at a standard energy of 400 GeV. The higher energy had previously been used for particular experiments, but it was desired to utilize it on a broader scale to provide more intense secondary beams and to provide an opportunity to solve the operational problems that had beset the occasional 400-GeV operation. These hopes have been realized; 400-GeV operation is providing higher-intensity beams for experiments with reliability equal to that of lower energies.

A long series of power-supply developments and improvements continued through this time. A principal development has been the capacitor tree in the Laboratory substation. It is a system designed to match the impedances of the main-ring pulsed-power system and the Commonwealth Edison distribution system. The technical problems of protecting this system against the effects of ferro-resonances developing in the main-ring distribution system have been extremely challenging. Our ability to run at higher energies with good intensity has been directly related to the solution of these problems.

All these developments culminated in reaching 500 GeV on May 14. We have always regarded 500 GeV as the ultimate energy attainable with the present main-ring magnets and it was gratifying not only to reach it, but to sustain it for some hours. I expect that we will operate at 500 GeV for long high-energy physics runs within a year or so.

Accelerator Intensity

The new intensity records and higher average intensity has come from the combined efforts of many groups. A new larger-aperture column in the preaccelerator has made it possible to accelerate larger intensities in the linac--up to 235 mA, more than twice the design intensity. The higher linac intensity has made it possible to use single-turn injection into the booster, with a concomitant improvement in early losses. At the same time, a new control program for the main-ring magnet power supply was developed and the individual power supplies were modified and improved. Mode dampers for suppressing parasitic modes in the accelerating cavities that had been inducing beam instabilities were also developed. Dampers have now been installed in both booster and main-ring systems. Two new accelerating stations have also been constructed and installed in each accelerator to increase the accelerating voltage available to the beam.

Accelerator Reliability

Not incidental to the accomplishment of all of the programs of the division has been a continuous effort at improvement of reliability of all of the various systems. One of the most productive of the improvement programs has been the development of techniques for predicting magnet deterioration within the Main Ring. This program has resulted in a marked decrease in the number of magnet failures that occur during operation. In the past year, an average of less than one magnet per month has failed during operation. Another important improvement program has been the replacement of all the original ceramic insulators in the main-ring rf system and many associated improvements in the cavities and electronic equipment. Booster rf equipment has also shown steady improvement in reliability over this period of time. The two additional rf stations for both the booster and the Main Ring have increased redundancy, as well as increasing the ability of the systems to accelerate larger beam currents. The improvement program of main ring power supplies that has been important in increased energy has also improved reliability. This program is still in progress and it will not be completed for another few months.

Beam-Utilization Work

The flexibility of beam spills has increased in this period. The accelerator has operated with a 2-second flattop at 400 GeV, made possible by the capacitor tree. The accelerator has also operated with a front porch of 1 second at 200 GeV and a flattop of 2 seconds at 300 GeV, giving a spill duty factor of 35%.

There have also been many different spill modes, some delivering large beam current in fast spills for neutrino experiments and simultaneous slow spill to different areas for counter experiments. There have also been multiple fast spills to the bubble chambers during a long spill for counters.

Another important development within the division has been the completion of the Internal Target Area expansion program, which provides increased floor space for spectrometer systems to experiments using the internal beam. This expansion allows a wider scope of experiments to be performed in this area and provides facilities for more precise measurements.

Also completed during this period was the triple-split arrangement, which allows beam to be delivered to each of the three Proton Laboratories concurrently. This arrangement has completed the provision for servicing a total of six external beam-production targets concurrently, with beam also being supplied to as many as two targets in the Internal Target Area on each accelerator pulse.

Cancer Therapy Facility

The Cancer Therapy Facility has progressed through the phase of initial investigation development of a basic shielding arrangement for the facility, initial dosimetry, and radiobiology measurements and has now been upgraded to allow operation of the facility with the objective of beginning patient treatment in the very near future.

Energy Doubler

Meanwhile, the work in the Superconductor Group has resulted in the production of magnets that have now raised our enthusiasm and enabled us to look forward to a new generation of superconducting accelerators for Fermilab that will increase the available energy and again test the abilities of the accelerator operators and the experimenters to utilize spills at much higher energies and with much longer spill lengths than have ever been available before. These activities present enormous challenges to the entire division and to the Laboratory for the future.

In looking back at this period, it is apparent that the achievements are due to the long-term effort of many people. These efforts realize in accelerator performance months and even years after the inception of the programs. This, I am confident, is the way it will be in the future. Those programs designed to produce improvements in intensity for high-energy physics use such as higher peak linac intensity, larger booster, etc., will have their results on the time scale of a year or more. The efforts must be supported by the dedication of consistent periods of time for accelerator studies as well as manpower and dollars. With this support the outlook is very bright.

It has been a privilege and pleasure to act as the leader of the Accelerator Division in this past year. I should like to take this opportunity to thank all of those in the entire Laboratory as well as the division for their efforts in this period and wish that everyone will have as much success under the new division leadership.

1976 SUMMER STUDY ON THE UTILIZATION OF THE ENERGY DOUBLER/SAVER

Joseph Lach

For the first time since 1973, a summer study to consider future projects at Fermilab was held. The Energy Doubler/Saver has reached a stage of reality where serious planning for experiments and the upgrading of existing facilities must begin.

Summer studies to chart future physics and facility plans are a method that has been used in the past to focus the attention of both our users and staff on long-range goals. The summer studies of 1968, 1969, and 1970 provided major input for the design of our present experimental areas. In 1973, a study was held which focused on long-range accelerator projects. Here many of the ideas that went into the Energy Doubler/Saver and POPAE arose. All the summer studies except that of 1970 were held in Aspen, Colorado; the 1970 study was held at Fermilab.

It was generally felt that the 1970 study was not as productive as the others, mainly because it was difficult for people to concentrate their efforts on the topics of the study. As the Laboratory experimental program became more active, both outside users and staff found the "distractions" of the Laboratory too great. It became clear to us that if a summer study was to be successful, it had to be away from Fermilab where a concentrated effort could be mounted on our long-range problems without the many distractions (some very exciting!) of Fermilab.

The 1976 summer study lasted for two weeks (June 28 - July 9). It followed directly the summer Program Advisory Committee (PAC) meeting in Aspen. To maximize the interaction among the participants, the group was kept relatively small--about 40 people at any given time. The group contained about 15 Fermilab staff members and 25 outside users drawn from all over the country, as well as two participants from CERN.

Work at the study very soon divided itself into two broad categories. First was the use of the Energy Doubler/Saver as a colliding-beam device (either pp or $\bar{p}p$) and second was the use of 1000-GeV protons in the external experimental areas (Neutrino, Proton, or Meson Laboratories). Interest in the use of the Energy Doubler/Saver as a collider had been mounting all spring and a proposal had been received for studying pp collisions at very high center-of-mass energies, using collisions between the Doubler and the present Main Ring (P-491). At about the same time, a set of proposals (P-492, P-493) had been submitted to inject antiprotons into the Doubler to produce $\bar{p}p$ collisions at very high center-of-mass energies. A somewhat earlier proposal (P-478) had advocated building a small storage ring and colliding its protons with those in the Main Ring. These had generated a great deal of excitement and all were to be acted upon the PAC the week before the summer study. As reported by E. L. Goldwasser in the previous issue, the PAC rejected all of these proposals, thus giving the summer study a clean slate with which to work.

Although the PAC has rejected the specific proposals, they recommended that the uses of the Doubler as a collider be vigorously pursued. The 1976

Energy Doubler/Saver Progress Report and the above experimental proposals served as the major input for this portion of the study. The discussions were far-ranging and covered both the new physics that would be probed and its input to the design of the Doubler itself. For example, the number and geometry of the collision regions were discussed at length and all of us were impressed with the wide variety of options that were available. Although there were few firm conclusions, an attempt was made to better define the problems and to catalog the possible solutions. There were approximately 40 papers either written or promised that dealt with either pp or $\bar{p}p$ collisions.

While the colliding beam aspects had clearly caught everyone's fancy, there was still great interest in the utilization of 1000-GeV protons in the three external experimental areas. Groundwork has been started earlier this year with the organization of working groups in each of the three departments. These groups consisted of interested outsider users as well as Fermilab staff members and met at regular intervals right up to the time of the study. Their preliminary work served as an effective starting point for the study.

The interest in the Neutrino Laboratory centered on the physics that could be done with the higher-energy neutrino beams that the Doubler would provide. This is probably one of the most exciting fields to explore at Doubler energies and a great deal of the discussion was centered on how to provide separate targeting for the neutrino, muon, and hadron beams that now exist but have considerable interference. Specific geometries were proposed that could solve this problem. As in all previous summer studies, the adequacy of the neutrino shield was much discussed and the same inconclusive conclusions reached.

A significant portion of the Proton Laboratory program is already being developed with 1000 GeV in mind. The high-intensity pion beam is being built as a 1000-GeV transport and will be able to target the full Doubler intensity. The planned Proton-Center charged-hyperon facility would also be able to utilize Doubler energies without modification to explore hyperon production at medium ranges of the Feynman variable x. The Proton Laboratory, with its unique ability to have multiple target stations utilizing 1000 GeV, was recognized as the place where new experiments might uncover unexpected phenomena at 1000 GeV.

There was renewed interest in the Meson Laboratory program at 1000 GeV, perhaps because the 1975 Energy Doubler/Saver Design Proposal mentioned bringing 1000-GeV beams to the Neutrino and Proton Laboratories, but did not mention the Meson Laboratory. It was pointed out that a very significant increase in the intensity of the present secondary beams could be achieved with no other modifications if the proton energy were raised to 1000 GeV.

Although modifications to the Internal Target Area and what a new Quark area might look like were both discussed, it was really the colliding-beam potential of the Doubler and its 1000-GeV proton use in the three external areas that the study concentrated its efforts on. It is planned to have the summer study proceedings available in the fall.

RESEARCH ACTIVITIES DURING JULY 1976

Halsey Allen

Reduced accelerator operation and slower progress on the research program effort during July were a direct reflection of the restrictive financial climate at the Laboratory during the July 1 through September 30 Transition Quarter. As a matter of fact, only 312 hours of beam time were scheduled for high-energy physics research as compared with a normal 600 or more. Of those, beam was delivered for 255 hours giving a performance reliability of 82%. All the running was at 400 GeV and an average intensity above 1.5×10^{13} protons/pulse, with slow-spilled beam from a four-second flattop being extracted to all three external experimental areas. The only major downtime occurred on the second weekend of the month when problems with a linac power amplifier and the failure of an extraction septum resulted in one 18-hour period when there was little useful beam.

Partially as an economy measure, but also to allow the maximum number of Fermilab personnel and users to celebrate bicentennial activities with their families, the accelerator and experimental areas were placed in standby from Friday evening, July 2, until midnight on Monday, July 5. The skeleton operating crew scheduled to monitor accelerator status during this period maintained a minimum level of machine operation and, with several staff members, carried out a number of accelerator research experiments during this period. With this flying start, operation for high-energy physics was underway promptly on July 6 and continued for the next two weeks.

Except for one day booster studies, a three-week facility shutdown began on Monday morning, July 19, and continued into August. Budget limitations necessitated this action and the time was used to complete a number of routine maintenance tasks on a low-key basis by essentially having crews working on only five day shifts per week, an unusual situation at Fermilab. Major accelerator projects accomplished during the shutdown included the moving of the computer control room from the Cross Gallery basement into a new facility across the hall from the main control room, the installation of a new and improved accelerating column in the preaccelerator, and the rebuilding of the 13.8-kV primary-power feeder cables and splices in the so-called P-71 manhole, an area in the main ring power-distribution system that had been subject to an abnormally large number of failures in the past year. Work on these, as well as on many smaller preventive and corrective maintenance projects, was nearing completion by month's end in preparation for initial startup activities.

The Neutrino Area continued its customary role as the largest consumer of the accelerated 400 GeV proton beam in July. The Muon # 319 experiment that started on June 22 continued collecting high-momentum data using 275-GeV muons in the N1 beam. At the start of the three-week facility shutdown, their first run had been completed with some 7.7×10^{17} protons having been delivered on their production target. Meanwhile, Particle Search # 379 continued to work on equipment testing and tuning in Lab E, using low-intensity slow-spill in the N7/N5 bypass line. The Muon Irradiation # 467 experiment, running in the N1 beam behind Muon # 319, parasitically exposed two thallium and trichloroethylene targets in the Muon Lab during the week prior to the shutdown.

Prior to the July 4 standby period, Muon Search # 435 completed the data-taking phase of the experiment in Proton-Central. Elsewhere in the Proton Area, e/γ beam tests were continued in the Proton-East line and Photon Search # 95A collected data in Proton-West. Following the July 2 to 5 standby period, P-Central was off for four days to change over to the Di-Hadron # 494 experiment, which then spent the remaining nine days of running in tuneup and preliminary data-taking work. Photon Total Cross Section # 25A also began using the tagged-photon beam in Proton-East for apparatus tuneup, checkout, and some preliminary data collection. During this same two-week interval, Photon Search # 95A collected data in the P-West Area for one week, after which Particle Production # 284 took over the beam for a week of tuning and testing prior to the shutdown, in order to be ready for a fast startup when the program resumes in August.

The research program in the Meson Area involved four secondary beam lines and six major experiments in July. Hadron Jets # 236A completed a rather long and successful first data run in M1E at -200 and +100 GeV, a run that began in early June and also included some +200-GeV data. Likewise, Inclusive Neutral Meson # 350 finished the first phase of their experiment, taking ±100 GeV incident pion data in the M2 beam. Particle Search # 397 used the M3 beam for data collection, with Particle Search # 366 running parasitically behind them to make some calibration checks and gather further statistics on a di-hadron decay mode of interest from earlier running in the high-mass region. In the M6-West beamline, Hadron Jets #260 was taking data in relatively smooth fashion throughout the July running period, making use of the multiparticle spectrometer and their cryogenic analyzing magnet. Meanwhile, for Hadron Dissociation #396 there was setup and testing work in the upstream portion of this same beam, parasitic to running for Hadron Jets #260. In addition to these major experiments, Nuclear Chemistry #81A has exposed eight targets to the primary proton beam in the Meson target hall since their last report, four during June and four in July. The M5 test beam was also used by various groups for some incidental equipment tests.

Three main experiments accounted for most of the running time logged for research at the Internal Target Area. p-p Polarization #313 had priority use of the beam through July 7 and collected data at 15, 90, and 190 GeV during most of this period, using the spectrometer with the superconducting dipole and quadrupole magnets operational. p-N Scattering #198A did some parasitic running during the early portion of this time and then took data at 20 to 30, 90, and 190 GeV on a priority basis from July 8 until the shutdown. An electronics malfunction caused the position controller for p-p Inelastic #321's warm jet to fail and damage both the vacuum system and the jet on the first of July. Repairs were completed and the jet was reinstalled about a week later, after which the group was able to run compatibly with the other two experiments. During the next one and one-half weeks of running, they collected data while pulsing the jet at six different energies from 50 to 400 GeV. Nuclear Fragments #442 and p-N Scattering #381 were also actively engaged in preparations for future running and on that basis made some incidental use of the beam.

In addition to routine maintenance and development work in the experimental areas during the shutdown, a number of projects of special interest were completed. In the Neutrino Area, a new target station was installed in the decay pipe. In Proton-West, construction began on the new Pion Area. In the Meson Area, the entire safety interlock system was modified and improved. In the Internal Target Area, a new cold-gas jet was installed for E-381, thorough wire-orbit measurements were carried out on the superconducting quadrupole for the spectrometer, and improvements were made in the liquid-helium transport system.

FACILITY UTILIZATION SUMMARY -- JULY 1976

I. Summary of Accelerator Operations

		Hours	
A.	**Accelerator use for physics research**		
	Accelerator physics research	42.1	
	High energy physics research	255.3	
	Research during other use	(60.3)	
	Subtotal		297.4
B.	**Other activities**		
	Accelerator setup and tuning to experimental areas	12.0	
	Scheduled interruption	370.0	
	Unscheduled interruption	64.6	
	Subtotal		446.6
C.	**Unmanned time**		——
	Total		744.0

II. Summaries of High Energy Physics Research Use

		# of Expts.	Hours	Results
A.	Counter experiments	15	2258.7	-
B.	Bubble chamber experiments	-	-	-
C.	Emulsion experiments	-	-	-
D.	Special target experiments	2	219.2	10 Targets (total)
E.	Test experiments	1	5.0	Partial test
F.	Engineering studies and tests	1	26.4	Beam studies
G.	Other beam use	-	3.6	Beam tests
		19	2512.9	2 expts. completed

III. Number of Protons Accelerated and Delivered at 400 GeV ($\times 10^{18}$)

A.	Beam accelerated in Main Ring		0.907
B.	Beam delivered to experimental areas		
	Meson Area	0.171	
	Neutrino Area		
	Slow Spill	0.547	
	Fast Spill	0.000	
	Proton Area	0.035	
	Total		0.753

IV. Beam Utilization by Experiment

	Hours	Results
A. Meson Area		
Nuclear Chemistry # 81A	-	8 Targets
Hadron Jets # 236A	231.1	Data
Hadron Jets # 260	202.0	Data
Inclusive Neutral Meson # 350	227.5	Data
Particle Search # 366	29.3	Data; complete
Particle Search # 397	238.1	Data
Tests for Particle Production # 415	5.0	Tests
B. Neutrino Area		
Muon # 319	219.2	Data
Tests for Particle Search # 379	153.0	Tuneup and tests
Test Muon Irradiation # 467	219.2	2 Targets
C. Proton Area		
Photon Total Cross Section # 25A	213.6	Tuneup; prelim. data
Photon Search # 95A	115.6	Data
Particle Production # 284	93.0	Tuneup
Muon Search # 435	30.6	Data; complete
Di-Hadron # 494	87.2	Data
D. Internal Target Area		
p-N Scattering # 198A	212.5	Data
p-p Polarization # 313	36.0	Data
p-p Inelastic # 321	170.0	Data
Total	2482.9	

NOTES AND ANNOUNCEMENTS

A REVIEW OF FORTHCOMING PAC-RELATED MEETINGS. . .

The current schedule for PAC-related meetings for the period September, 1976 to January, 1977 is in this issue of NALREP under "Dates to Remember." A preliminary notification of the schedule for these meetings appeared in the July issue of NALREP at the end of the article by E. L. Goldwasser.

The deadline for the receipt of material to be considered at the November PAC meeting is Friday, October 1. It is our present intention to schedule as many of the oral presentations of new proposals as possible for the Proposal Presentation Meeting on October 14 and 15. (This Presentation Meeting is an open one, and all interested physicists are welcome to attend and to participate in the discussion to the extent time permits.) Opportunities for oral presentations at the November meeting will be very limited.

The Multiparticle Spectrometer (MPS) Workshop scheduled for December 9 and 10 will provide an opportunity to discuss the future experimental program for that facility. Tentative plans call for a review of what has been learned to date during the course of Hadron Jets #260 with regard to both operating experience and the physics potential of the facility. A review of the future plans of the Meson Laboratory as they relate to the MPS will also be included. Groups having an interest in next-generation experiments for the use of this facility should submit proposals in advance of the November 15 deadline. Additional information pertaining to the arrangements for this workshop will be announced in future issues of NALREP.

Questions about any of these meetings should be addressed to T. Groves in the Director's Office.

BOOK OF SUMMARIES OF FERMILAB PROPOSALS NOW AVAILABLE. . .

A book of summaries of Fermilab proposals is available from the Director's Office at a price of $5.00 each. The book contains a collection of one-page summaries of proposals which were approved or pending prior to the 1976 Summer Meeting of the Program Advisory Committee.

SITUATION REPORT - JULY 1976

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23 JULY 1976

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 JULY 1, 1976. 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: INTERNAL TARGET AREA (ITA), MESON AREA (MA), NEUTRINO AREA (NA), PROTON AREA (PA).

TOTAL NUMBER OF APPROVED EXPERIMENTS - 252

A. EXPERIMENTS THAT HAVE COMPLETED DATA TAKING (152):

AREA-BEAM		SPOKESPERSON	EXTENT OF RUN TO DATE	DATE COMPLETED
MA -M1	ELASTIC SCATTERING #7	MEYER	2,350 HOURS	28 JAN 75
	PION DISSOCIATION #86A	LUBATTI	800 HOURS	22 MAR 76
	FORM FACTOR #216	STORK	900 HOURS	1 OCT 75
	DETECTOR DEVELOPMENT #229	YUAN	300 HOURS	16 NOV 74
	DETECTOR DEVELOPMENT #261	WANG	600 HOURS	20 NOV 74
	MUON SEARCH #335	FACKLER	300 HOURS	6 JUN 75
	PARTICLE SEARCH #416	LUBATTI	400 HOURS	1 JUL 75
-M2	NEUTRAL HYPERON #8	PONDROM	2,450 HOURS	22 MAR 76
	MULTIGAMMA #22	COLLINS	350 HOURS	26 JUN 74
	MISSING MASS #51A	VON GOELER	800 HOURS	23 OCT 74
	QUARK #75	YAMANOUCHI	1,050 HOURS	8 SEP 73
	BEAM DUMP #108	AWSCHALOM	350 HOURS	2 JUN 75
	PION CHARGE EXCHANGE #111	TOLLESTRUP	1,800 HOURS	19 SEP 74
	INCLUSIVE PHOTON #268	MELLEMA	1,850 HOURS	11 FEB 76
	PARTICLE SEARCH #357	MEYER	1,700 HOURS	7 JUN 76
	PARTICLE SEARCH #365	GARELICK	200 HOURS	5 FEB 75
-M3	NEUTRON CROSS SECTION #4	LONGO	1,450 HOURS	20 MAR 74
	NEUTRON BACKWARD SCATTERING #12	REAY	1,300 HOURS	2 DEC 74
	NEUTRON DISSOCIATION #27A	ROSEN	850 HOURS	24 APR 74
	MULTIGAMMA #230	LONGO	50 HOURS	24 APR 74
	NEUTRON DISSOCIATION #305	GOBBI	1,400 HOURS	14 APR 75
	PARTICLE SEARCH #366	ABOLINS	2,500 HOURS	2 JUL 76
-M4	QUARK #72	LEIPUNER	500 HOURS	11 JUN 73
	K ZERO REGENERATION #82	TELEGDI	3,500 HOURS	5 JUL 75
	PARTICLE SEARCH #330	GUSTAFSON	150 HOURS	7 JUL 75
	K ZERO REGENERATION #425	TELEGDI	1,400 HOURS	17 MAY 76
-M6	ELASTIC SCATTERING #69A	LACH	2,800 HOURS	3 MAR 76
	ELASTIC SCATTERING #96	RITSON	2,550 HOURS	17 FEB 75
	MULTIPLICITIES #178	BUSZA	800 HOURS	14 AUG 75
-OTHER	EMULSION/PROTONS @ 200 #90	WOLTER	4 STACKS	20 SEP 72
	EMULSION/PROTONS @ 200 #103	KING	1 STACK	20 SEP 72
	EMULSION/PROTONS @ 200 #105	MALHOTRA	1 STACK	20 SEP 72
	EMULSION/PROTONS @ 200 #114	JAIN	1 STACK	20 SEP 72
	EMULSION/PROTONS @ 200 #116	HEBERT	5 STACKS	20 SEP 72
	EMULSION/PROTONS @ 200 #117A	KUSUMOTO	11 STACKS	20 SEP 72
	EMULSION/PROTONS @ 200 #156	NIU	13 STACKS	20 SEP 72
	EMULSION/PROTONS @ 200 #171	LORD	6 STACKS	20 SEP 72
	EMULSION/PROTONS @ 200 #183	TRETJAKOVA	3 STACKS	20 SEP 72
	EMULSION/PROTONS @ 200 #189	RITSON	2 PLATES	20 SEP 72
	SUPER-HEAVY ELEMENTS #147	DEBEAUVAIS	4 EXPOSURES	11 JUN 75
	DI-MUON #337	EARTLY	5 HOURS	7 FEB 75
	SUPER-HEAVY ELEMENTS #371	JURIC	2 STACKS	20 DEC 75
	FRAGMENTATION PARTICLES #426	FUKUI	16 STACKS	20 MAR 76
NA -NEUTRINO	NEUTRINO #1A	CLINE	2,850 HOURS	30 JUN 75
	15-FOOT NEUTRINO/H2&NE #28A	FRY	97K PIX	11 JUN 75
	NEUTRINO #21A	BARISH	2,450 HOURS	2 NOV 75
	15-FOOT EMI TEST #155	PETERSON	14K PIX	30 NOV 74
	15-FOOT ANTI-NEUTRINO/H2&NE#172	BINGHAM	49K PIX	25 MAY 76
	15-FOOT ANTI-NEUTRINO/H2&NE#180	ERMOLOV	76K PIX	2 JUN 75
	NEUTRINO #254	KALBFLEISCH	550 HOURS	15 OCT 75
	NEUTRINO #262	BARISH	400 HOURS	20 MAR 74
	NEUTRINO #320	SCIULLI	500 HOURS	1 OCT 74
	NEUTRINO #370	CLINE	400 HOURS	19 MAR 75
-MUON/HADRON	MUON #26	HAND	900 HOURS	16 APR 74
	MUON #98	ANDERSON	1,800 HOURS	17 FEB 75
	DI-MUON #331	PILCHER	1,400 HOURS	22 MAR 76
	PARTICLE SEARCH #382	HAND	200 HOURS	19 DEC 75
-15-FT	15-FOOT ENGINEERING RUN #234	HUSON	57K PIX	5 NOV 74
	15-FOOT P - P @ 400 #341	KO	34K PIX	21 DEC 75
	15-FOOT P - P @ 300 #343	ENGELMANN	27K PIX	13 JAN 76
-30-IN	30-INCH HYBRID #2B	SMITH	479K PIX	22 APR 74
	30-INCH P-P @ 300 #37A	MALAMUD	51K PIX	1 JUN 73
	30-INCH PI+ & P - P @ 100 #121A	LANDER	104K PIX	23 JAN 74
	30-INCH PI- - P @ 100 #125	MORRISON	53K PIX	28 AUG 73
	30-INCH PI- - P @ 200 #137	HUSON	48K PIX	10 MAR 73
	30-INCH P-P @ 400 #138	VANDER VELDE	52K PIX	26 AUG 75
	30-INCH P-P @ 200 #141A	FIELDS	67K PIX	27 NOV 72
	30-INCH PI- - P @ 300 #143A	KALBFLEISCH	51K PIX	10 APR 74
	30-INCH HYBRID #154	PLESS	105K PIX	13 MAR 74
	30-INCH P - P&NE @ 300 #161	MAPP	51K PIX	25 JUN 74
	30-INCH PI- - P&NE @ 200 #163A	WALKER	52K PIX	18 JUN 74
	30-INCH P - D @ 400 #196	ENGELMANN	109K PIX	20 OCT 75
	30-INCH P - D @ 300 #209	DAO	106K PIX	7 OCT 75
	30-INCH PI+ & P - P @ 200 #217	LANDER	85K PIX	15 MAY 74
	30-INCH PI- - D @ 200 #218	YAGER	72K PIX	18 SEP 74
	30-INCH PI+ & P - P @ 60 #228	FERBEL	37K PIX	15 APR 74
	30-INCH P-P @ 100 #252	FERBEL	33K PIX	6 DEC 72
	30-INCH P - D @ 200 #280	FIELDS	103K PIX	11 OCT 75
	30-INCH HYBRID #281	SMITH	301K PIX	28 SEP 75
	30-INCH PI+ & P - D @ 200 #295	YEKUTIELI	156K PIX	2 NOV 75
	30-INCH PBAR - P @ 100 #311	NEALE	98K PIX	27 JAN 75
-OTHER	MONOPOLE #3	EBERHARD	4 TARGETS EXPOSED	4 SEP 74
	PROTON-PROTON INELASTIC #14A	FRANZINI	140 HOURS	21 JUN 73
	MONOPOLE #76	CARRIGAN	5 TARGETS EXPOSED	1 DEC 74
	LONG-LIVED PARTICLES #115	STEVENSON	6 HOURS	23 NOV 74
	SUPER-HEAVY ELEMENTS #142	STOUGHTON	1 TARGET	4 JUN 75
	MASSIVE PARTICLE SEARCH #199	FRANKEL	2 TARGETS EXPOSED	22 AUG 73
	BEAM DUMP #211	GOEBEL	2 HOURS	14 NOV 73
	LONG-LIVED PARTICLES #239	FRATI	350 HOURS	3 FEB 74
	QUARK #276	VAN GINNEKIN	3 TARGETS EXPOSED	2 NOV 75
	DETECTOR DEVELOPMENT #34	HUGGETT	50 HOURS	26 JUN 74
	QUARK #297	LEIPUNER	50 HOURS	10 JUL 74
	DETECTOR DEVELOPMENT #327	ALLISON	50 HOURS	7 FEB 75
	PLASTIC DETECTORS #275	ENGE	4 STACKS	20 OCT 73
	EMULSION/PROTONS @ 300 #181	CARY	3 STACKS	20 OCT 73
	EMULSION/PROTONS @ 300 #195	LIM	3 STACKS	10 JUN 75
	EMULSION/PROTONS @ 300 #232	KING	2 STACKS	20 OCT 73
	EMULSION/PROTONS @ 300 #233	HEBERT	8 STACKS	20 OCT 73
	EMULSION/PROTONS @ 300 #237	LORD	5 STACKS	10 JUN 75
	EMULSION/PROTONS @ 300 #242	NIU	2 STACKS	20 OCT 73
	EMULSION/PROTONS @ 300 #244	JAIN	1 STACK	20 OCT 73
	EMULSION/PROTONS @ 300 #250	KUSUMOTO	1 STACK	20 OCT 73

PAGE 2 EXPERIMENTAL PROGRAM SITUATION REPORT (CONT'D)

AREA-BEAM		SPOKESPERSON	EXTENT OF RUN TO DATE	DATE COMPLETED
	EMULSION/PROTONS @ 300 #329	TRETJAKOVA	2 STACKS	10 JUN 75
	EMULSION/PROTONS @ 300 #374	DAVIS	1 STACK	10 JUN 75
	EMULSION/PROTONS @ 300 #419	GIACOMELLI	1 STACK	10 JUN 75
	EMULSION/PROTONS @ 300 #421	DZHELEPOV	1 STACK	24 JUN 75
	EMULSION/PROTONS @ 200 #271	GOTTFRIED	10 STACKS	10 JUN 75
	EMULSION/MUONS @ 150 #255	JAIN	1 STACK	16 OCT 73
	EMULSION/MUONS @ 150 #205A	KUSUMOTO	2 STACKS	16 OCT 73
	EMULSION/PI- @ 200 #264	YOUNG	2 STACKS	7 OCT 74
	EMULSION/PI- @ 200 #328	TRETJAKOVA	5 STACKS	7 OCT 74
	EMULSION/PI- @ 200 #339	WOLTER	4 STACKS	9 JUN 75
	EMULSION/PI- @ 200 #362	JAIN	1 STACK	9 JUN 75
	EMULSION/PI- @ 200 #387	WILKES	4 STACKS	9 JUN 75
	EMULSION/PROTONS @ 400 #238	LORD	9 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #243	NIU	7 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #245	JAIN	1 STACK	9 DEC 75
	EMULSION/PROTONS @ 400 #249	WOLTER	3 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #251	KUSUMOTO	3 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #265	YOUNG	3 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #279	KING	3 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #292	GOTTFRIED	12 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #336	OGATA	2 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #346	EKSPONG	1 STACK	9 DEC 75
	EMULSION/PROTONS @ 400 #385	PRAKASH	1 STACK	9 DEC 75
	EMULSION/PROTONS @ 400 #423	SUGIMOTO	4 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #428	HEBERT	14 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #434	DAKE	3 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #461	LORD	6 STACKS	9 DEC 75
	EMULSION/PROTONS @ 400 #462	GIACOMELLI	1 STACK	9 DEC 75
	EMULSION/PROTONS @ 400 #463	TRETJAKOVA	2 STACKS	9 DEC 75
	TACHYON MONOPOLE #202	BARTLETT	COSMIC RAY RUNNING	19 MAY 76
PA -PE	PHOTOPRODUCTION #87A	LEE	2,500 HOURS	21 DEC 75
	PARTICLE SEARCH #100A	PIROUE	1,150 HOURS	4 APR 74
	PARTICLE SEARCH #300	CRONIN	750 HOURS	24 APR 76
	DI-MUON #358	LEE	400 HOURS	1 OCT 75
-PC	MUON SEARCH #48	ADAIR	500 HOURS	1 DEC 75
	LEPTON #70	LEDERMAN	2,800 HOURS	1 DEC 74
	PARTICLE SEARCH #187	LEDERMAN	200 HOURS	6 NOV 73
	MUON SEARCH #435	ADAIR	250 HOURS	2 JUL 76
	DI-MUON #436	ADAIR	200 HOURS	29 OCT 75
ITA-C-0	PROTON-PROTON SCATTERING #36A	COOL	700 HOURS	24 JUN 73
	PHOTON SEARCH #63A	WALKER	2,600 HOURS	13 MAR 75
	PROTON-PROTON MISSING MASS #67A	SANNES	600 HOURS	8 AUG 73
	PHOTON SEARCH #120	CLINE	1,200 HOURS	29 MAY 73
	PARTICLE SEARCH #184	WANOERER	800 HOURS	29 MAY 74
	PROTON-DEUTERON SCATTERING #186	MELISSINOS	450 HOURS	19 AUG 74
	PROTON-NUCLEON INCLUSIVE #188	SANNES	1,050 HOURS	9 MAY 73
	PROTON-PROTON INELASTIC #221	FRANZINI	950 HOURS	5 SEP 74
	PROTON-NUCLEON INELASTIC #317	COOL	1,400 HOURS	1 NOV 75
	PARTICLE SEARCH #363	OLSEN	650 HOURS	9 APR 75
	PARTICLE PRODUCTION #418	SANNES	900 HOURS	22 OCT 75

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B. EXPERIMENTS THAT ARE IN PROGRESS (31):

			EXTENT OF RUN TO DATE	DATE OF RECENT RUN
MA -M1	TOTAL CROSS SECIION #104	KYCIA	1,400 HOURS	1 JAN 75
	INCLUSIVE SCATTERING #324	WEISBERG	400 HOURS	1 APR 76
	HADRON JETS #236A	HOCKETT	950 HOURS	1 JUL 76
	POLARIZED SCATTERING #61	CHAMBERLAIN	700 HOURS	1 JUL 76
-M2	INCLUSIVE NEUTRAL MESON #350	KENNEY	200 HOURS	1 JUL 76
-M3	NEUTRON ELASTIC SCATTERING #248	LONGO	1,150 HOURS	1 APR 76
	PARTICLE SEARCH #397	ROSEN	750 HOURS	1 JUL 76
-M6	HADRON JETS #260	MCLEOD	1,650 HOURS	1 JUL 76
	INCLUSIVE SCATTERING #118A	FRIEDMAN	1,200 HOURS	1 JUL 76
-OTHER	NUCLEAR CHEMISTRY #81A	KAUFMAN	136 BOMBARDMENTS	1 JUL 76
NA -NEUTRINO	15-FOOT NEUTRINO/H2 #45A	ROE	162K PIX	1 APR 76
	15-FOOT ANTI-NEUTRINO/H2 #31A	DERRICK	64K PIX	1 APR 76
	PARTICLE SEARCH #247	BURHOP	350 HOURS	1 JUL 76
	15-FOOT NEUTRINO/H2 & NE #53A	BALTAY	64K PIX	1 JUL 76
-MUON/HADRON	MUON #319	CHEN	350 HOURS	1 JUL 76
	TEST MUON IRRADIATION #467	FREEDMAN	2 TARGETS EXPOSED	1 JUL 76
-15-FT	15-FOOT PI- - P @ 100 #83A	KITAGAKI	11K PIX	1 APR 75
	15-FOOT PI- - P&NE @ 200 #89	FRETTER	4K PIX	1 JUL 75
	15-FOOT PI- - P @ 360 #384	HUSON	20K PIX	1 APR 76
-30-IN	30-INCH P - D @ 100 #194	MURPHY	41K PIX	1 OCT 74
	30-INCH HYBRID #299	PLESS	158K PIX	1 APR 75
-OTHER	SUPER-HEAVY ELEMENTS #285	LEDERMAN	3 TARGETS EXPOSED	1 JUL 75
PA -PE	PHOTON TOTAL CROSS SECTION #25A	CALDWELL	400 HOURS	1 JUL 76
	PARTICLE SEARCH #325	CRONIN	700 HOURS	1 JUL 76
-PC	DI-LEPTON #288	LEDERMAN	2,900 HOURS	1 JUL 76
-PW	PHOTON SEARCH #95A	COX	1,750 ROURS	1 JUL 76
	PARTICLE PRODHCTION #284	WALKER	550 HOURS	1 APR 76
	PROTON-PROTON ELASTIC #177A	OREAR	750 HOURS	1 APR 76
ITA-C-0	PROTON-PROTON INELASTIC #321	LEE-FRANZINI	1,300 HOURS	1 JUL 76
	PROTON-NUCLEON SCATTERING #198A	OLSEN	1,100 HOURS	1 JUL 76
	PROTON-PROTON POLARIZATION #313	NEAL	1,050 HOURS	1 JUL 76

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C. EXPERIMENTS THAT ARE IN TEST STAGE (6):

MA -M2	PARTICLE PRODUCTION #415	PONDROM		1 JUL 76
-M6	HADRON DISSOCIATION #396	GODLIANOS	50 HOURS	1 JUL 76
NA -MUON/HADRON	MUON #398	WILSON	150 HOURS	1 JUL 76
-15-FT	PARTICLE SEARCH #379	WOJCICKI	10 HOURS	1 JUL 76
PA -PE	NUCLEAR FRAGMENTS #466	KAUFMAN		1 JUL 76
-PC	DI-HADRON #494	LEDERMAN		1 JUL 76

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D. EXPERIMENTS BEING INSTALLED (9):

			EXTENT OF APPROVAL
MA -M1	FORM FACTOR #456	STORK	500 HOURS
-M2	PARTICLE SEARCH #472	STANFIELD	600 HOURS
-M4	K ZERO CROSS SECTION #486	WINSTEIN	200 HOURS
	K ZERO REGENERATION #226	TELEGDI	600 HOURS
-M6	MULTIPARTICLE #110A	MCLEOO	600 HOURS
NA -NEUTRINO	NEUTRINO #310	CLINE	1,000 HOURS
	DI-MUON #482	BARISH	PARASITIC RUNNING

PAGE 3 EXPERIMENTAL PROGRAM SITUATION REPORT (CONT'D)

AREA-BEAM		SPOKESPERSON	EXTENT OF APPROVAL
ITA-C-0	PROTON-NUCLEON SCATTERING #381	MALAMUD	300 HOURS
	NUCLEAR FRAGMENTS #442	TURKOT	400 HOURS

E. EXPERIMENTS TO BE SET UP WITHIN A YEAR (25):

MA -M1	PARTICLE SEARCH #354	BAKER	200 HOURS
-M2	LAMBDA MAGNETIC MOMENT #440	BUNCE	160 HOURS
	PARTICLE SEARCH #411	GARELICK	250 HOURS
	PARTICLE SEARCH #413	GARELICK	150 HOURS
	PARTICLE SEARCH #439	GARELICK	400 HOURS
	HADRON JETS #395	SELOVE	450 HOURS
-M3	NEUTRON-NUCLEUS INELASTIC #438	JONES	200 HOURS
-M4	INCLUSIVE K-SHORT #383	KOBRAK	500 HOURS
-M6	BACKWARD SCATTERING #290	BAKER	900 HOURS
	ASSOCIATED PRODUCTION #99	DIEBOLD	500 HOURS
NA -NEUTRINO	NEUTRINO #253	MO	1,000 HOURS
-MUON/HADRON	PARTICLE SEARCH #369	KIRK	600 HOURS
	MUON #203A	KERTH	500 HOURS
	MUON #391	KERTH	250 HOURS
-30-IN	30-INCH PI- - D @ 360 #338	MORIYASU	50K PIX
	30-INCH PBAR - D @ 100 #345	EKSPONG	100K PIX
	30-INCH PBAR - P @ 50 #344	GUTAY	100K PIX
	30-INCH PI+ & P - P @ 300 #277	FARNES	300K PIX
-OTHER	EMULSION/NEW PARTICLES #386	LORD	EMULSION EXPOSURE
PA -PE	DETECTOR DEVELOPMENT #498	GRUHN	PARASITIC RUNNING
	EMULSION/ELECTRONS @ HI E #340	DAKE	EMULSION EXPOSURE
	EMULSION/ELECTRONS @ >100 #399	GOLDEN	5 STACKS
	PHOTOPRODUCTION #152B	HEUSCH	350 HOURS
	PARTICLE SEARCH #400	PEOPLES	400 HOURS
ITA-C-0	PROTON-HELIUM SCATTERING #289	MALAMUD	700 HOURS

F. OTHER APPROVED EXPERIMENTS (29):

MA -M1	HADRON DISSOCIATION #272	PERBEL	600 HOURS
-M2	LAMBDA POLARIZATION #441	PONDROM	150 HOURS
	INCLUSIVE NEUTRON #404	JONES	500 HOURS
	MUON SEARCH #453	FRISCH	600 HOURS
-M6	INCLUSIVE SCATTERING #451	BARTON	400 HOURS
	PARTICLE SEARCH #490	SANDWEISS	600 HOURS
	FORM FACTOR #446	ANKENBRANDT	500 HOURS
NA -NEUTRINO	15-FOOT NEUTRINO/D2 #151A	SNOW	100K PIX
	15-FOOT NEUTRINO/D2 #227	ENGELMANN	100K PIX
	15-FOOT ANTI-NEUTRINO/D2 #390	GARFINKEL	300K PIX
	NEUTRINO #356	BARISH	1,000 HOURS
	15-FOOT NEUTRINO/H2 & NE #380	BALTAY	200K PIX
	15-FOOT ANTI-NEUTRINO/H2&NE#388	STEVENSON	200K PIX
-MUON/HADRON	EMULSION/MUONS @ 200 #424	WADA	EMULSION EXPOSURE
	DI-MUON #444	SMITH	400 HOURS
-15-FT	15-FOOT P - P & NE @ 400 #291	MANN	25K PIX
-30-IN	30-INCH P - P @ 500 #207	ENGELMANN	50K PIX
	30-INCH PBAR - P @ 200 #392	NEALE	100K PIX
	30-INCH PI- - P @ 150 #393	PLESS	300K PIX
	30-INCH PI- - HI Z @ 300 #304	WALKER	200K PIX
-OTHER	DETECTOR DEVELOPMENT #206	YODH	200 HOURS
	EMULSION/PI- @ 200 #481	TAKAHASHI	EMULSION EXPOSURE
PA -PE	PHOTOPRODUCTION #401	GORMLEY	300 HOURS
	PHOTOPRODUCTION #458	LEE	300 HOURS
	PHI PHOTOPRODUCTION #263	CHEN	600 HOURS
-PC	CHARGED HYPERON #497	LACH	400 HOURS
-PW	PION INCLUSIVE #258	PIROUE	800 HOURS
	C-TEST #302	CESTER-REGGE	400 HOURS
	MULTIGAMMA #192	GUIRAGOSSIAN	400 HOURS

PENDING PROPOSALS (31):

			EXTENT OF REQUEST
MA -M1	DETECTOR DEVELOPMENT #427	YUAN	50 HOURS
-M2	LAMBDA BETA DECAY #361	PONDROM	300 HOURS
	PARTICLE SEARCH #477	WEINSTEIN	500 HOURS
	LAMBDA-BAR PRODUCTION #495	HELLER	400 HOURS
-M3	K* PRODUCTION #449	ABOLINS	600 HOURS
	NEUTRON-DEUTERON ELASTIC #479	ROBERTS	300 HOURS
-M6	HADRON DISSOCIATION #312	EDELSTEIN	1,000 HOURS
	PARTICLE SEARCH #469	CUTTS	150 HOURS
NA -NEUTRINO	NEUTRINO #355	BARISH	1,400 HOURS
	15-FOOT NEUTRINO/H2 & NE #389	TENNER	100K PIX
	15-FOOT NEUTRINO/H2 & NE #455	PETERSON	200K PIX
	NEUTRINO #496	CHEN	1,000 HOURS
-MUON/HADRON	PION DISSOCIATION #318	ASCOLI	400 HOURS
	MUON #348	WILSON	400 HOURS
	EMULSION/MUONS @ 50-100 #373	JAIN	EMULSION EXPOSURE
	DI-MUON #443	PILCHER	400 HOURS
	MUON #448	WILSON	300 HOURS
	TEST PARTICLE SEARCH #457	BRANDENBURG	100 HOURS
	MUON #487	SESSOMS	800 HOURS
-15-FT	15-FOOT P - P @ > OR = 300 #208	TAKIBAEV	75K PIX
-30-IN	30-INCH K+ - P @ 150 #375	RUBIN	400K PIX
	30-INCH PBAR - P @ 100 #394	WHITMORE	2,000K PIX
	30-INCH HYBRID #488	PLESS	2,500K PIX
PA -PE	PHOTOPRODUCTION #450	CALDWELL	600 HOURS
-PC	CHARGED HYPERON #353	ECKLUND	600 HOURS
-PW	HADRON JETS #246	SELOVE	600 HOURS
	ELASTIC SCATTERING #301	GETTNER	1,000 HOURS
	DI-MUON #326	PIROUE	400 HOURS
	ELASTIC SCATTERING #347	WALKER	1,200 HOURS
	HADRON-NUCLEON SCATTERING #420	GUIRAGOSSIAN	1,100 HOURS
	ELECTROPRODUCTION #454	GUIRAGOSSIAN	1,500 HOURS