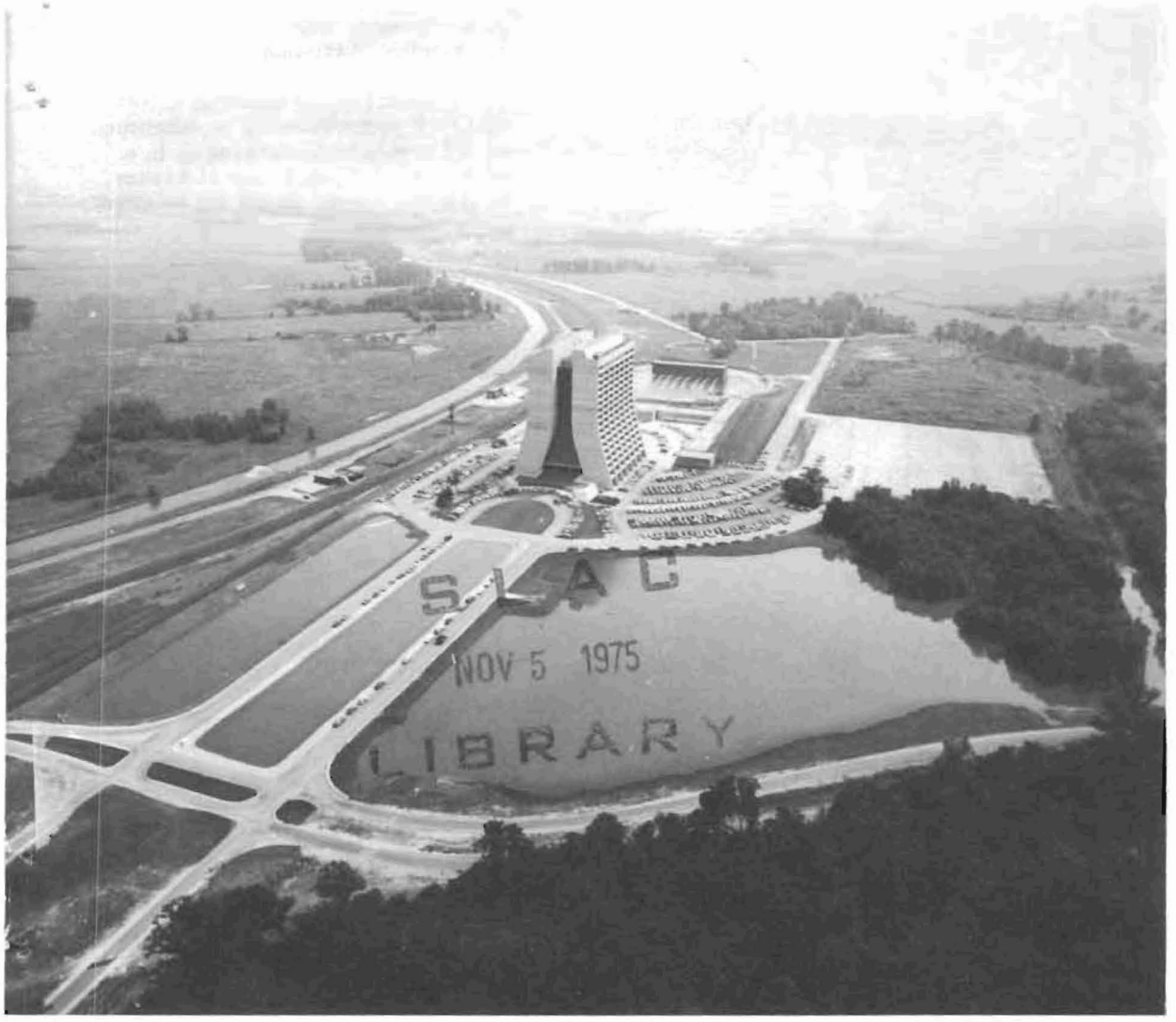
NALREP



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Monthly Report of the Fermi National Accelerator Laboratory

October 1975

Fermi National Accelerator Laboratory

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

J. R. Sanford, Editor
N. Stiening, Assistant Editor

The presentation of material in NALREP is not intended to substitute for or preclude its publication in a professional journal, and reference to articles herein should not be cited in such journals.

Contributions and comments should be addressed to the Program Planning Office. Requests for copies should be addressed to the Publications Office.

FERMILAB-75-10 0090.01

THE COVER: This aerial view of the site was taken in July 1975. The main accelerator ring is visible on the left of the causeway leading to the Central Laboratory. The main entrance road to the Laboratory enters the woods on the right of Swan Lake.

Operated by Universities Research Association Inc. under contract with the Energy Research and Development Administration

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PHYSICS OF THE ENERGY DOUBLER/SAVER

Whenever a new accelerator is proposed, one of the first questions an experimentalist asks is "Is the energy range appropriate for interesting experiments?" An answer can be given for the Fermilab Energy Doubler/Saver by selecting the most significant experiments which have been done in elementary particle physics since 1972, and seeing whether the Energy Doubler will be an appropriate facility with which to follow up on the most promising leads which these experiments have uncovered. Five experimental discoveries of unquestioned importance are:

- --Weak neutral currents
- --Narrow resonances
- --Unexpectedly large secondary muon/pion ratios
- --Dilepton production by neutrinos
- --Unexpectedly large cross sections for particle production at large transverse momenta in hadron collisions

Although each of these discoveries came as a surprise, there were theoretical ideas that predicted the gross features of the phenomena. For example, gauge theories predicted the existence of weak neutral currents. This type of theory, which unifies electrodynamics and the weak interactions, establishes a mass scale for the weak interactions since it predicts the mass of the intermediate vector boson. Clearly, this is a promising and exciting lead that should be investigated further.

The results of experiments that have already followed up on the above-mentioned discoveries have not always been in harmony with the theoretical ideas which were initially advanced to explain the discovery. For example, the explanation of the narrow resonances as bound states of a

charmed quark-antiquark is both appealing and consistent with many of the facts, but the theory of charmed quarks predicts that charmed particles should exist with masses between 2 GeV/c and 3 GeV/c. Production of these particles should be possible at energies presently available at Fermilab, the ISR, and SPEAR. That they have not been discovered presents a serious difficulty to that theory.

The physical laws which describe these new phenomena could well be even more complex than the theoretical framework which now exists. These results suggest that a new scale of masses has been reached. The present energy of the Fermilab accelerator, 400 GeV, certainly extends into that domain, but it does not span it, as the following example shows. Gauge theories predict that the mass of the charged intermediate vector boson, $W^{\pm}$, is greater than 37 GeV/c^2. Experiments using 150-GeV neutrinos produced by 300-GeV protons have ruled out the existence of a $W^{\pm}$ particle less massive then 10 GeV/c^2. Improvements in those experiments which can now be done with neutrinos produced with 400-GeV protons will raise the limit to 30 GeV/c^2. However, if 1000-GeV protons were available at an intensity of 10^{12} protons/sec, a useful flux of 750-GeV neutrinos could be obtained. The same type of experiment would be sensitive to the existence of the $W^{\pm}$ if its mass were $\leq$ 60 GeV/c^2.

Such an accelerator, equipped with superconducting magnets, could produce a circulating proton beam with an energy of up to 1000 GeV. A wide variety of measurements could be made with the internal target at the C-0 straight section of the Doubler during the acceleration cycle. The

experiments would have to be modest in size in order to fit either into the main-ring tunnel or into the new spectrometer room which has been built to accommodate a 6-GeV spectrometer. This spectrometer can be used for observing recoil protons from various p-p scattering processes. Threshold effects can be detected, since the processes can be studied at any energy between 300 GeV and 1000 GeV. Very low-momentum recoils can be measured with solid-state recoil spectrometers. In turn, this permits very precise measurements of p-p elastic scattering and related exclusive and inclusive processes.

It is proposed to extract a beam of 1000-GeV protons to both the Neutrino and Proton Areas. Ninety per cent of the protons could be transmitted to the Neutrino Area in a single sharp spike or in a sequence of millisecond spikes, while the remainder of the beam could be slow-extracted to the Proton Area. The fast beam could be used with either a proposed high-energy dichromatic beam or a broad-band focusing system to produce neutrino beams for the 15-foot bubble chamber and for electronic detectors. The remainder of the beam, slow-extracted to the Proton Area, could in turn be split and transported to targets in all three branches of that area.

A high energy, high-intensity pion beam is scheduled for construction in Proton-West next year. This beam, which will contain superconducting magnets, has been designed for a peak energy of 1000-GeV when all magnets are in place. It will also have the capability of operating as a high-purity electron beam. Upstream of the secondary-beam production target, there are two transmission target stations which are presently used to study

inclusive particle production and elastic scattering. The Proton-East branch contains a broad-band photon beam and a tagged photon beam. The Proton-Center branch contains an area for the study of rare processes such as massive lepton-pair production by protons, and hopefully a hyperon beam in the future.

Rather than consider the many possible experiments which could be done at energies up to 1000 GeV, only the experiments and the facilities which bear upon the discoveries already mentioned will be discussed in the following paragraphs.

Neutrino Physics

W Particles. As mentioned before, the discovery of weak neutral currents makes it plausible that some type of gauge theory is correct. On the basis of these theories, the $W^{\pm}$ mass is expected to be between 40 GeV/c^2 and 60 GeV/c^2. In a typical week of operation with the Doubler, it will be possible to target 10^{17} 1000-GeV protons. On the basis of the extrapolation of pion and kaon production at present Fermilab energies up to 1000 GeV, the neutrinos produced by such exposure would produce several hundred events per week with a total energy greater than 750 GeV in a detector involving about 1000 tons of iron. The measurement of the q^2 dependence of the neutrino cross section obtained from these events will be sensitive to the existence of $W^{\pm}$ bosons if the W mass is less than 60 GeV/c^2.

Narrow Resonances and New Particles. Gauge theories predict that either a strangeness-changing neutral current exists or that additional quarks conspire to suppress the strangeness-changing neutral currents.

Experimentally, the strangeness-changing neutral currents, if they exist, are several orders of magnitude weaker than the strangeness-nonchanging neutral currents. Therefore, new particles such as charmed hadrons should be expected. The narrow resonances may be related to such a family of particles.

The energy dependence of the total neutrino cross section can be a good indicator of such new phenomena. In the energy range of 1 to 100 GeV, the cross section is proportional to the energy; the constant of proportionality is 0.78×10^{-38} cm^2/GeV. If a family of charmed particles with masses between 2 to 3 GeV/c^2 exists, this proportionality constant will increase significantly in the energy range between 100 GeV and 750 GeV.

The 15-foot bubble chamber filled with either liquid hydrogen or deuterium should be an excellent detector for these new particles. The neutrino can transform a proton or a neutron into a charmed baryon very cleanly. Other than the outgoing μ^-, there may be no other particles. On the other hand, for charmed particles to be produced by hadrons, they must be produced in pairs. Moreover, there will probably be a few more pions produced, to make such an event complicated and difficult to interpret. On the other hand, the neutrino-induced event in hydrogen or deuterium will be simple and straightforward to interpret.

Dilepton Phenomena. The neutrino-induced dilepton events seen in the present electronic detectors should be studied in much more detail. Measurements of the dynamics of their production over the full range of neutrino energies can be provided by the Doubler. Such measurements may

present surprises, since the source of these events is not yet known. Because of the increase in the flux of neutrinos above 50 GeV, some of these phenomena could be investigated using the 15-foot bubble chamber filled with a neon-hydrogen mixture.

It is worth stressing that in many instances the neutrino is the most energy-economical probe with which to search for new particles, since all of its energy can go into producing such a particle. This is particularly true when the search is for a heavy "gauge" lepton.

Hadron Physics

Experiments with hadrons can be expected to reveal more about narrow resonances and large transverse momentum phenomena. The center-of-mass energy afforded by the Doubler/Saver is comparable to that available at the ISR, while the available luminosity is five orders of magnitude larger in the Doubler/Saver than in the ISR.

Hadron Jets. Results from the ISR suggest that hadron jets which carry away a large amount of transverse momentum may exist. Nevertheless, the limited interaction rate makes it difficult to establish this phenomenon conclusively. To observe it, each jet must have at least 6 to 8 GeV/c transverse momentum, perhaps with one leading particle having half of the momentum. The requirement that the transverse momentum must balance implies that 16 GeV of energy is in the jets. This, in turn, would consume 60% of the available center-of-mass energy when the Fermilab accelerator is operated at 400 GeV. Because of the constraint that momentum conservation imposes upon the amount of available phase space,

400 GeV is too low an energy to see those effects. If the experiment were done with 1000-GeV protons, the center-of-mass energy would be increased by another 16 GeV. This should be enough to see these processes without the distorting effects resulting from constraints of momentum conservation.

Does the Doubler provide enough intensity to observe events such as these? The answer is yes. The precursors of these experiments have been done or will be done in the existing Proton Area. Those experiments have rarely used more than 10^{11} protons/sec, since the detectors could not handle higher instantaneous counting rates. Because the Doubler offers the possibility of an intensity of the order of 10^{12} protons/sec and a 30 to 40% duty cycle with a factor-of-four finer rf structure, this type of experiment should be easier with the Doubler than with the present machine.

Massive Dilepton Pairs. The production of a particle or jet of particles having a transverse momentum of more than 6 GeV can be thought to be a consequence of the parton or quark structure of hadrons. In the parton model the hadronic granularity can manifest itself in other ways. The production of massive dilepton pairs is such an example. Experiments exploring this possibility are now in progress at Fermilab. The sensitivity of an experiment to large masses, for example from 5 to 20 GeV/c^2, is limited in the first instance by the counting rate that the experiment can handle. The beam intensity available has usually been two orders of magnitude greater than what could actually be handled by the detectors. If the protons were 1000 GeV, the dilepton mass range could be extended to 40 GeV/c^2. The sensitivity would be at least two orders of magnitude greater

than for a comparable experiment at the ISR. This type of experiment has been a particularly exciting area of study; it was in such an experiment that the narrow resonances appeared quite unexpectedly. One must be prepared for more surprises.

Narrow Resonances. The study of the production of the known narrow resonances, and perhaps some unknown ones, will be important using protons from 400 to 1000 GeV and pions from 300 to 750 GeV. If charm or the new degree of freedom connected with these resonances has not been discovered by the time the Doubler/Saver is operating, investigation of the energy dependence and the $p_\perp$ dependence of the production of the narrow resonances at higher energies could be a clue to a rather deep mystery. These experiments are quite simple to do at Fermilab. An experiment done here, following the line of the original Brookhaven experiment, was run quite easily in a neutron beam of only 10^6 interacting neutrons per 7-sec pulse of 300-GeV protons. The event rate was approximately two per hour. Follow-up experiments at 400 GeV are underway, with event rates one or two orders of magnitude higher than that. The reason for the ease of measurement is that the production cross section has risen more than two orders of magnitude between 30 GeV and 400 GeV.

Other Physics

It is important to measure the production of the narrow resonances in secondary beams. For example, the photoproduction of the $\psi(3.1)$ and $\psi(3.7)$ which was done at first at Fermilab in the broad-band beam, can be extended to photon energies of 600 GeV. Of more importance is the fact that

the flux of photons in the range of 75 to 225 GeV will be sufficiently intense that the applicability of vector dominance to the process can be tested. Because of the design of these experiments, it is not sufficient just to target more protons at 400 GeV to get the answer; the photon spectrum must be hardened. Furthermore, the first experiment was limited to 10^{11} protons/sec by the accidental counting rate. The better duty factor of the Doubler/Saver would make it possible to make substantial improvements in the counting rate of these experiments.

Because of its large acceptance, the Proton-West pion beam will be able to provide fluxes of more than 10^7 negative pions/sec at 400 GeV, even when the production target is illuminated with only 5×10^{10} protons. This is a better average intensity than that of any existing pion beam in the Meson Area. That pion flux could easily be increased by an order of magnitude and thus permit the study of massive dilepton production by pions. The comparison of pion and proton production of these pairs is very important. Thus the production of narrow resonances could be carried out in this beam. One could also study jet phenomena induced by meson-nucleon collisions. It is important to stress that a comparison of those processes which probe the granularity of the hadrons with different projectiles is very significant since the quark or parton content is quite different in each case. As long as free quark beams are not available, the only way to test for quark effects will be by using particle beams with different quark and antiquark compositions. Of course, one will also look for the production of free quarks.

This review presents only a small sampling of the kinds of experiments which could surely be carried out using the higher energies which would become available from the Doubler/Saver. Essentially, every experiment which has been conceived for the present Fermilab accelerator would be interesting to carry out at higher energies. Even more important, however, would be the probability that the first exploratory work at Doubler energies would expose significant new and unexpected phenomena which would suggest whole classes of new experiments. Such experiments, just as has been the case with the present accelerator, may contribute the most to our understanding of the structure of matter.

Reported by J. Peoples

Editors note: Another version of this article will appear in the "Energy Doubler/Saver Proposal" to be published by Fermilab. Complete references to the theoretical predictions and experimental results mentioned herein will be available in that booklet.

REPORT FROM THE USERS EXECUTIVE COMMITTEE

P. Koehler, of Fermilab, was elected to replace J. Peoples on the Users Executive Committee and was welcomed by the Committee at the September meeting. Also at that meeting, subcommittees were chosen to focus on specific aspects of Laboratory activities for the coming year. These are:

Bubble Chambers	D. Cline, R. Lander, H. Lubatti, M. Widgoff
Computers	D. Reeder, L. Stutte
Energy Doubler/Saver	G. Kalbfleisch, P. Koehler, J. Peoples, M. L. Stevenson
Experimental Areas	
Internal Target	R. Lander, M. Widgoff
Meson	W. Busza, H. Lubatti, J. Pine
Neutrino	G. Kalbfleisch, D. Reeder, M. L. Stevenson, L. Stutte
Proton	D. Caldwell, U. Nauenberg
Housing	U. Nauenberg, J. Pine
Recreation	W. Busza, M. L. Stevenson
Site	U. Nauenberg

The Users Executive Committee will continue to meet every two months. Suggestions for the agenda should be sent to any of the Committee members or to the Chairman, in care of the Users Office.

The Committee has been asked by J. Sanford to suggest possible revisions for the Procedures for Experimenters booklet, which is being updated. Comments or questions regarding this handbook are invited from the users, and should be directed to the Chairman.

Reported by L. Hand
Chairman, Users Executive Committee

NOTES AND ANNOUNCEMENTS

MORE ABOUT THE SHORT-LIVED PARTICLE BEAM FACILITY WORKSHOP. . .

Plans are being developed for this workshop which will be held at Fermilab on Thursday and Friday, December 18-19, 1975. (Some preliminary information about the meeting appeared in the August issue of NALREP.) At present, some of the items included in the tentative program are a review of the characteristics of existing hyperon beams, discussion of proposed experiments involving charged and neutral hyperons and possibly K_S^0 mesons, and a review of the relevant theory with regard to the new physics that would become accessible with a short-lived particle beam facility. A report will be given on the status of the Proton Department design for the facility, and the latter portion of the meeting will be devoted to a discussion of this subject.

The workshop will be an open meeting and all physicists interested in research utilizing this type of proposed facility are invited to attend. Interested individuals are urged to communicate their ideas to Fermilab in the form of proposals (or letters of intent). This material will be organized for presentation and discussion at the meeting.

To permit adequate time to organize this workshop, contributors are urged to submit written materials to be considered at the meeting to Fermilab by November 14, 1975. Questions regarding the meeting should be addressed to T. Groves in the Directors Office, Ext. 3211.

NEW SCHEDULE FOR MEETINGS RELATING TO THE SPRING PAC MEETING . . .

Our experience in preparing for the November 1975 Program Advisory Committee meeting has convinced us that some changes in the scheduling of future meetings would be desirable. We believe the revised schedule for deadlines and meetings relating to the spring 1976 PAC meeting indicated below will be more effective than that which appeared in the July issue of NALREP:

January 23, 1976	Deadline for receipt of new proposals and other written materials to be considered at the March meeting of the Program Advisory Committee.
February 5-6, 1976	Proposal Presentation Meeting.
March 4-5, 1976	Spring meeting of the Fermilab Program Advisory Committee.

Please note that January 23 is now the general deadline for the receipt, in the Directors Office, of all written materials to be considered at the Spring PAC meeting. There will be opportunities for the oral presentation of proposals at both the Proposal Presentation Meeting scheduled for early February and the regular PAC meeting in March.

Topics to be discussed at the spring PAC meeting will be announced in the November issue of NALREP.

SITUATION REPORT-OCTOBER 1975

FERMI NATIONAL ACCELERATOR LABORATORY

J. R. SANFORD

17 OCT 1975

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 OCTOBER 1, 1975. 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). PUBLICATIONS HAVE BEEN PREPARED OR TALKS GIVEN ABOUT THE EXPERIMENTS MARKED WITH AN '*'.

TOTAL NUMBER OF APPROVED EXPERIMENTS - 223

A. EXPERIMENTS THAT HAVE COMPLETED DATA TAKING (108):

AREA-BEAM		SPOKESPERSON	EXTENT OF RUN TO DATE	DATE COMPLETED
MA -M1	*ELASTIC SCATTERING #7	MEYER	7,350 HOURS	28 JAN 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	LURATTI	400 HOURS	1 JUL 75
-M2	*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	1,450 HOURS	22 SEP 75
	*PARTICLE SEARCH #365	GARELICK	200 HOURS	5 FEB 75
	FRAGMENTATION PARTICLES #426	FURUI	8 STACKS	18 AUG 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	SOBRI	1,400 HOURS	14 APR 75
	PARTICLE SEARCH #366	ABOLINS	1,150 HOURS	7 JUL 75
-M4	*QUARK #72	LEIPUNER	500 HOURS	11 JUN 73
	*K ZERO REGENERATION #82	ARONSON	3,500 HOURS	5 JUL 75
	PARTICLE SEARCH #330	GUSTAFSON	150 HOURS	7 JUL 75
-M6	*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	HERBRT	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 FROM EXP #171	20 SEP 72
	SUPER-HEAVY ELEMENTS #147	DERBAUVAIS	4 EXPOSURES	11 JUN 75
	*DI-MUON #337	EARTLY	5 HOURS	7 FEB 75
NA -NEUTRINO	*NEUTRINO #1A	CLINE	7,850 HOURS	30 JUN 75
	15-FOOT NEUTRINO/HZENE #28A	FRY	97K PIX	11 JUN 75
	15-FOOT ANTI-NEUTRINO/HZONE#180	ERMALOV	76K PIX	2 JUN 75
	*15-FOOT EMI TEST #155	PETERSON	14K PIX	30 NOV 74
	*NEUTRINO #262	BARISH	400 HOURS	20 MAR 74
	*NEUTRINO #370	CLINE	400 HOURS	19 MAR 75
-MUON/HADRON	*MUON #76	HAND	900 HOURS	16 APR 74
	*MUON #98	ANDERSON	1,800 HOURS	17 FEB 75
	TEST PARTICLE SEARCH #369	KIRK	150 HOURS	21 APR 75
-15-FT	*15-FOOT ENGINEERING RUN #234	HUSON	57K PIX	5 NOV 74
-30-IN	*30-INCH HYBRID #28	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 - PENE @ 300 #161	HAPP	51K PIX	25 JUN 74
	*30-INCH PI- - NUE @ 200 #163A	WALKER	52K PIX	18 JUN 74
	*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	FERREL	37K PIX	15 APR 74
	*30-INCH P-P @ 100 #252	FERREL	33K PIX	6 DEC 72
	30-INCH HYBRID #281	SMITH	301K PIX	28 SEP 75
	*30-INCH PRAR - 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
	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	GOERRL	2 HOURS	14 NOV 73
	LONG-LIVED PARTICLES #239	FRATI	350 HOURS	3 FEB 74
	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
	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	HERBRT	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
	EMULSION/PROTONS @ 300 #275	ENGE	4 STACKS	20 OCT 73
	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
PA -PE	*PARTICLE SEARCH #100A	PIRONE	1,150 HOURS	4 APR 74
	*DI-MUON #358	LEE	400 HOURS	1 OCT 75
-PF	*LEPTON #70	LEDERMAN	2,800 HOURS	1 DEC 74
	*PARTICLE SEARCH #187	LEDERMAN	200 HOURS	6 NOV 73
ITA-C-D	*PROTON-PROTON SCATTERING #36A	COOL	700 HOURS	24 JUN 73
	*PHOTON SEARCH #63A	WALKER	2,600 HOURS	13 MAR 75

PAGE 2 EXPERIMENTAL PROGRAM SITUATION REPORT (CONT'D)

AREA-BEAM		SPOKESPERSON	EXTENT OF RUN TO DATE	DATE COMPLETED
	*PROTON-PROTON MISSING MASS #67A	SANNES	600 HOURS	8 AUG 73
	*PHOTON SEARCH #120	CLINE	1,200 HOURS	29 MAY 73
	*PARTICLE SEARCH #184	WANDERER	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	MUKHIN	1,250 HOURS	16 SEP 75
	PARTICLE SEARCH #363	OLSEN	650 HOURS	9 APR 75

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B. EXPERIMENTS THAT ARE IN PROGRESS (31):

MA -M1	*TOTAL CROSS SECTION #104	KYCIA	1,400 HOURS
	PION DISSOCIATION #86A	LUBATTI	350 HOURS
	FORM FACTOR #216	STORK	900 HOURS
-M2	*NEUTRAL HYPERON #8	PONDROM	2,100 HOURS
-M3	NEUTRON ELASTIC SCATTERING #248	LONGO	600 HOURS
-M6	*ELASTIC SCATTERING #69A	MARX	2,250 HOURS
-OTHER	*NUCLEAR CHEMISTRY #81A	KAUFMAN	118 BOMBARDMENTS
NA -NEUTRINO	*NEUTRINO #21A	BARISH	2,100 HOURS
	*15-FOOT NEUTRINO/H2 #45A	ROE	67K PIX
	*15-FOOT ANTI-NEUTRINO/H2 #31A	DERRICK	26K PIX
	*NEUTRINO #320	SCIULLI	500 HOURS
	NEUTRINO #254	KALBFLEISCH	450 HOURS
-MUON/HADRON	*MT-MUON #331	PILCHER	500 HOURS
-15-FT	15-FOOT P - P @ 300 #343	ENGELMANN	7K PIX
	15-FOOT PI- - P @ 100 #83A	KITAGAKI	11K PIX
	15-FOOT PI- - PENE @ 200 #89	FRETTER	4K PIX
-30-IN	*30-INCH P - D @ 200 #290	FIELDS	64K PIX
	*30-INCH P - D @ 100 #194	MURPHY	41K PIX
	*30-INCH P - D @ 300 #209	DAO	55K PIX
	*30-INCH PI+ & P - D @ 200 #295	YEKUTIELI	54K PIX
	30-INCH HYBRID #299	PLESS	158K PIX
-OTHER	*MONOPOLE #76	CARRIGAN	5 TARGETS EXPOSED
	SUPER-HEAVY ELEMENTS #285	LEDERMAN	3 TARGETS EXPOSED
	QUARK #276	VAN GINNEKIN	3 TARGETS BEING EXPOSED
	TACHYON MONOPOLE #202	BARTLETT	COSMIC RAY RUNNING
PA -PE	*PHOTOPRODUCTION #87A	LEE	1,800 HOURS
	PHOTON TOTAL CROSS SECTION #25A	CALDWELL	400 HOURS
-PC	DI-LEPTON #288	LEDERMAN	1,100 HOURS
	*MUON SEARCH #48	ADAIR	250 HOURS
-PW	PHOTON SEARCH #95A	COX	450 HOURS
ITA-C-0	PARTICLE PRODUCTION #418	SANNES	600 HOURS

****

C. EXPERIMENTS THAT ARE IN TEST STAGE (7):

MA -M1	HADRON JETS #236A	MOCKETT	300 HOURS
-M2	PARTICLE SEARCH #357	MEYER	350 HOURS
-M6	HADRON JETS #260	MCLEOD	950 HOURS
NA -MUON/HADRON	PARTICLE SEARCH #382	HAND	10 HOURS
PA -PW	PARTICLE PRODUCTION #284	WALKER	150 HOURS
	TEST PROTON-PROTON ELASTIC#177A	OREAR	150 HOURS
ITA-C-0	PROTON-PROTON INELASTIC #321	LEE-FRANZINI	5 HOURS

****

D. EXPERIMENTS BEING INSTALLED (13):

			EXTENT OF APPROVAL
MA -M1	POLARIZED SCATTERING #61	CHAMBERLAIN	800 HOURS
	INCLUSIVE SCATTERING #324	WEISBERG	500 HOURS
-M3	PARTICLE SEARCH #397	ROSEN	500 HOURS
-M4	K ZERO REGENERATION #425	ARONSON	600 HOURS
-M6	MULTIPARTICLE #110A	MCLEOD	750 HOURS
	INCLUSIVE SCATTERING #118A	FRIEDMAN	600 HOURS
NA -NEUTRINO	NEUTRINO #310	CLINE	2 X 10 TO 18TH PROTONS
	PARTICLE SEARCH #247	BURHOP	2X 10 TO 18TH WITH E #310
PA -PE	PARTICLE SEARCH #300	CRONIN	600 HOURS
	DI-MUON #325	CRONIN	RUN WITH EXP #300
-PC	DI-MUON #436	ADAIR	100 HOURS
ITA-C-0	PROTON-NUCLEON SCATTERING #198A	OLSEN	800 HOURS
	PROTON-PROTON POLARIZATION #313	NEAL	1,000 HOURS

****

E. EXPERIMENTS TO BE SET UP WITHIN A YEAR (38):

MA -M1	PARTICLE SEARCH #354	BAKER	200 HOURS
-M2	INCLUSIVE NEUTRAL MESON #350	KENNEY	400 HOURS
	SUPER-HEAVY ELEMENTS #371	JURIC	1 EXPOSURE
	PARTICLE PRODUCTION #415	PONDROM	100 HOURS
-M4	TEST K ZERO REGENERATION #226	TELEGDI	500 HOURS
-M6	HADRON DISSOCIATION #396	GOULIANOS	600 HOURS
	BACKWARD SCATTERING #290	BAKER	900 HOURS
NA -NEUTRINO	15-FOOT NEUTRINO/H2 & NE #53A	BALTAY	100K PIX
	15-FOOT ANTI-NEUTRINO/H2&NE#172	BINGHAM	50K PIX
-MUON/HADRON	MUON #319	CHEN	500 HOURS
	MUON #398	ANDERSON	800 HOURS
-15-FT	15-FOOT PI+ & P - P @ 150 #341	KO	25K PIX
	PARTICLE SEARCH #379	WOJCICKI	200 HOURS
-30-IN	30-INCH P - D @ 400 #196	ENGELMANN	100K PIX
	30-INCH PI- - D @ 400 #338	MORIYASU	50K PIX
	30-INCH PI- - P @ HI E #215	GOLDHABER	100K PIX
	30-INCH PBAR - P @ 30-60 #344	GUTAY	100K PIX
	30-INCH PBAR - D @ 100 #365	EKSPONG	100K PIX
	30-INCH PI+ & P - P @ 300 #277	BARNES	100K PIX
-OTHER	EMULSION/NEW PARTICLES #386	LORD	EMULSION EXPOSURE
	EMULSION/PROTONS @ 400 #238	LORD	EMULSION EXPOSURE
	EMULSION/PROTONS @ 400 #243	NIU	EMULSION EXPOSURE
	EMULSION/PROTONS @ 400 #245	JAIN	EMULSION EXPOSURE
	EMULSION/PROTONS @ 400 #249	WOLTER	EMULSION EXPOSURE
	EMULSION/PROTONS @ 400 #251	KUSUMOTO	EMULSION EXPOSURE
	EMULSION/PROTONS @ 400 #265	YOUNG	EMULSION EXPOSURE
	EMULSION/PROTONS @ 400 #279	KING	EMULSION EXPOSURE
	EMULSION/PROTONS @ 400 #292	GOTTFRIED	EMULSION EXPOSURE
	EMULSION/PROTONS @ 400 #336	OGATA	EMULSION EXPOSURE
	EMULSION/PROTONS @ 400 #346	EKSPONG	EMULSION EXPOSURE

PAGE 3 EXPERIMENTAL PROGRAM SITUATION REPORT (CONT'D)

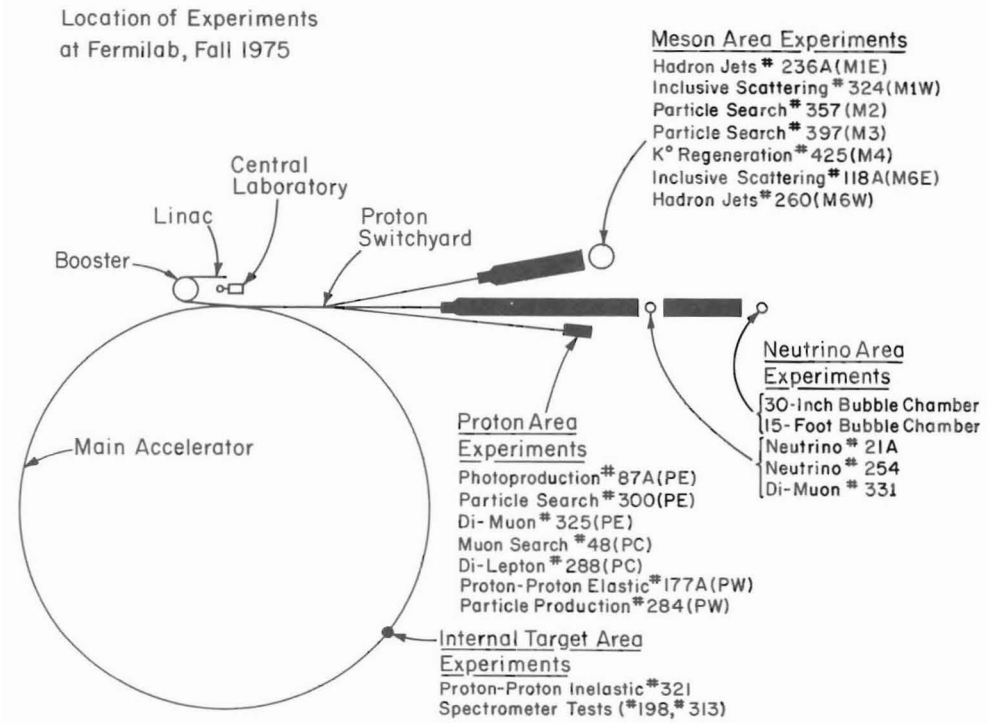
AREA-BEAM		SPOKESPERSON	EXTENT OF APPROVAL
	EMULSION/PROTONS @ 400 #385	PRAKASH	EMULSION EXPOSURE
	EMULSION/PROTONS @ 400 #423	SUGIMOTO	EMULSION EXPOSURE
	EMULSION/PROTONS @ 400 #428	HEARFT	EMULSION EXPOSURE
	EMULSION/PROTONS @ 400 #434	DAKE	EMULSION EXPOSURE
PA -PE	EMULSION/ELECTRONS @ HI E #340	DAKE	EMULSION EXPOSURE
	EMULSION/ELECTRONS @ >100 #399	GOLDEN	5 STACKS
	PARTICLE SEARCH #400	PEOPLES	400 HOURS
ITA-C-D	PROTON-NUCLEON SCATTERING #381	MALAMUD	300 HOURS

F. OTHER APPROVED EXPERIMENTS (26):

MA -M1	HADRON DISSOCIATION #272	FERREL	600 HOURS
-M2	PARTICLE SEARCH #411	GARELICK	250 HOURS
	PARTICLE SEARCH #413	GARELICK	150 HOURS
	HADRON JETS #395	SELOVE	450 HOURS
	CHARGED HYPERON #97	LACH	400 HOURS
-M6	ASSOCIATED PRODUCTION #99	RITSON	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	2 X 10 TO 18TH PROTONS
	NEUTRINO #253	MO	1,000 HOURS PARASITIC
	15-FOOT NEUTRINO/H2 & NE #380	BALTAY	200K PIX
	15-FOOT ANTI-NEUTRINO/H2&NE#388	STEVENSON	200K PIX
-MUON/HADRON	MUON #203A	KERTH	1 X 10 TO 18TH PROTONS
	MUON #391	STROVINK	RUN WITH EXP #203A
-30-IN	30-INCH P - P @ 500 #207	ENGELMANN	50K PIX
-OTHER	DETECTOR DEVELOPMENT #206	PETERSON	PARASITIC RUNNING
	DETECTOR DEVELOPMENT #32	HOFSTADTER	100 HOURS
PA -PE	PHOTOPRODUCTION #401	GORMLEY	300 HOURS
	PHOTOPRODUCTION #1529	NEUSCH	350 HOURS
	RHO PHOTOPRODUCTION #263	CHEN	600 HOURS
-PC	PARTICLE SEARCH #372	BECKER	1,400 HOURS
-PW	PION INCLUSIVE #258	PIRONE	800 HOURS
	C-TEST #302	GESTER-REGGE	400 HOURS
	MULTIGAMMA #192	GUTRAGOSSIAN	400 HOURS
ITA-C-D	PROTON-HELIUM SCATTERING #289	MALAMUD	700 HOURS

PROPOSALS BEING CONSIDERED (66):

			EXTENT OF REQUEST
MA -M1	DETECTOR DEVELOPMENT #427	YUAN	50 HOURS
-M2	K-SHORT REGENERATION #351	ARONSON	3,000 HOURS
	LAMBDA BETA DECAY #361	MARCH	300 HOURS
	PARTICLE SEARCH #439	GARELICK	500 HOURS
	LAMBDA MAGNETIC MOMENT #440	BUNCE	160 HOURS
	LAMBDA POLARIZATION #441	PONDROM	150 HOURS
-M3	PARTICLE SEARCH #437	FERREL	300 HOURS
	NEUTRON-NUCLEUS INELASTIC #438	JONES	500 HOURS
	MULTIPARTICLE #445	ROSEN	500 HOURS
-M6	INELASTIC SCATTERING #165	RITSON	475 HOURS
	HADRON DISSOCIATION #312	EDELSTEIN	1,000 HOURS
	ELASTIC SCATTERING #406	MARX	600 HOURS
NA -NEUTRINO	NEUTRINO #316	NYGREN	1,250 HOURS EST.
	15-FOOT ANTI-&NEUTRINO/H2NE#352	STEVENSON	400K PIX
	NEUTRINO #355	BARISH	1,400 HOURS
	15-FOOT NEUTRINO/H2&NE #389	TENNER	100K PIX
-MUON/HADRON	EMULSION/MUONS @ 50-100 #373	JAIN	EMULSION EXPOSURE
	PION DISSOCIATION #318	ASCOLI	400 HOURS
	MUON #348	WILSON	400 HOURS
	EMULSION/MUONS @ 200 #424	WATA	EMULSION EXPOSURE
	DI-MUON #443	PILCHER	400 HOURS
	DI-MUON #444	SMITH	400 HOURS
-15-FT	15-FOOT K0-P @ 20-60 #65	LAT	250K PIX
	15-FOOT PI+ - D @ 60 #85	GUTAY	600K PIX
	15-FOOT PHOTON - P 320-750 #145	WALKER	250K PIX
	15-FOOT K+ - P @ HI E #179	ERWIN	300K PIX
	15-FOOT P - P @ > 08 - 300 #208	TAKIMOEV	75K PIX
	15-FOOT SIGMA- - P @ 50-200#214	RUSHBROOKE	275K PIX
	15-FOOT PI- -P @ 100 #267	MORRISON	100K PIX
	15-FOOT P - PENE @ 100&400 #291	MANN	50K PIX
	15-FOOT NEUTRON - P950-750 #303	SEIDL	100K PIX
	15-FOOT PI- - P/NE @ 495 #309	ERWIN	250K PIX
	15-FOOT K- - P @ 200 #333	RUSHBROOKE	100K PIX
	15-FOOT K+ - P @ 200 #334	RUSHBROOKE	100K PIX
	15-FOOT PI- -P/NE @ 200 #342	KENNEY	210K PIX
	15-FOOT PI- - P2 > 08 = 250#384	HUSON	300K PIX
	15-FOOT PBAR - PED @ 50&80 #422	FRIDMAN	150K PIX
	15-FOOT PI- - P @ 100 #429	MORRISON	50K PIX
	15-FOOT PI- - P @ 400 #430	MORRISON	50K PIX
	15-FOOT PI- - P @ 350 #431	THOMPSON	50K PIX
	15-FOOT SIGMA- - D @ 240 #432	FRIDMAN	60K PIX
-30-IN	30-INCH PEPI- - HI Z @ 200 #224	JONES	100K PIX
	30-INCH P - PENE @100-500 #273	OREN	50K PIX
	30-INCH PEPI- -PENF&100&400#298	MALHOTRA	15K PIX
	30-INCH PI- - HI7 @ 200 #304	WALKER	100K PIX
	30-INCH K+ - P @ 150 #375	RUBIN	400K PIX
	30-INCH K- - P @ 150 #376	LUDLAM	100K/FRACTION OF K
	30-INCH PI- - P @ 300 #377	HAFEN	200K PIX
	30-INCH PI- - P @ 75 #378	YAMAMOTO	200K PIX
	30-INCH PBAR - P@160 OR 200#392	NEALE	100K PIX
	30-INCH PI- - P @ 150 #393	PLESS	1,000K EXPANSIONS
	30-INCH PBAR - P @ 100 #394	WHITMORE	400K PIX
	30-INCH PI+ - P @ 250 #407	BUGG	300K PIX
	30-INCH PBAR - P @ 75 #408	PLANO	300K PIX
	30-INCH PI+ - P @ 75 #409	WATTS	200K PIX
	30-INCH K+&K- - P @ 75 #410	PEVSNER	200K/FRACTION OF K
PA -PC	CHARGED HYPERON #353	ECKLUND	600 HOURS
	LAMBDA POLARIZATION #417	NAUENBERG	1,000 HOURS
	MULTI-MUON #433	WALKER	700 HOURS
	MUON SEARCH #435	ADAIR	250 HOURS
-PW	HADRON JETS #246	SELOVE	600 HOURS
	ELASTIC SCATTERING #301	GETTNER	1,000 HOURS
	DI-MUON #326	PIRONE	RUN WITH EXP #258
	ELASTIC SCATTERING #347	WALKER	1,200 HOURS
	HADRON-NUCLEON SCATTERING #420	GUTRAGOSSIAN	1,100 HOURS
ITA-C-D	NUCLEAR FRAGMENTS #442	TURKOT	400 HOURS


Location of Experiments
at Fermilab, Fall 1975
Meson Area Experiments
Hadron Jets # 236A(M1E)
Inclusive Scattering # 324(M1W)
Particle Search # 357(M2)
Particle Search # 397(M3)
K° Regeneration # 425(M4)
Inclusive Scattering # 118A(M6E)
Hadron Jets # 260(M6W)
Central Laboratory
Linac
Proton Switchyard
Booster
Main Accelerator
Neutrino Area Experiments
30-Inch Bubble Chamber
15-Foot Bubble Chamber
Neutrino # 21A
Neutrino # 254
Di-Muon # 331
Proton Area Experiments
Photoproduction # 87A(PE)
Particle Search # 300(PE)
Di-Muon # 325(PE)
Muon Search # 48(PC)
Di-Lepton # 288(PC)
Proton-Proton Elastic # 177A(PW)
Particle Production # 284(PW)
Internal Target Area Experiments
Proton-Proton Inelastic # 321
Spectrometer Tests (# 198, # 313)

FACILITY UTILIZATION SUMMARY--SEPTEMBER 1975

There was steady improvement in the operation of the accelerator at 400 GeV during September, particularly in terms of both average and integrated accelerated beam intensities. Much of the unscheduled down-time followed the weekly accelerator maintenance and development periods. Start-up of the high energy physics research program was delayed each week, but these setbacks were customarily followed by extended periods of running with few unscheduled interruptions. The net result was a noticeable increase in the effectiveness and reliability of available beam as compared with the performance in August. Failures of main-ring feeder cable splices, booster chokes and vacuum, and the 95° cooling water system accounted for a major fraction of the down-time; most of these problems are related only indirectly to 400-GeV operation. Average operating efficiency for the experimental physics program was 75%, with 430 hours of the scheduled 572 hours actually delivered. The improved performance realized during September did not result from greater reliability of components, but rather because structure in the slowly spilled beam was greatly reduced. Furthermore, the main-ring cycle time could be lowered to 10 seconds as a result of the paralleling of electrical feeder cables which improved the current distribution. These efforts produced a beam for use in the experimental areas with about twice the duty factor available during previous 400-GeV operation. Other achievements during September included the testing and installation of a 47th harmonic ripple filter in the main-ring pulsed power supply and the successful operation of the 30-inch bubble chamber at the rate of six pulses per accelerator cycle.

Good progress was made in the experimental physics research program during September. Once again, work in the Neutrino Area was concentrated on neutrino/antineutrino cross section measurements by Neutrino #21A and Neutrino #254. Neutrino data were taken at four energies and antineutrino data at one. Between the positive and negative runs, the accelerator was set up to send 200-GeV beam to the Neutrino Area only for two shifts, to enable these two experimental groups to calibrate their monitors. The changeover from 400 GeV to 200 GeV and back again proceeded very smoothly, taking only a few hours in all. During the 400-GeV operating periods, a 300,000-picture run was completed for Hybrid #281 at the 30-inch bubble chamber. In the Muon Laboratory, Particle Search #382 tuned the N-1 beam for hadrons and carried out some preliminary emulsion tests for several hours, causing only minor disruption to Neutrino #21A. The Quark #276 target continued to receive beam from the N-0 slow spill.

In the Proton Area, Proton-East was turned off early in September for installation of Di-Muon #358. Following several days of tune-up and testing work, neutron production data were collected for nearly three weeks. Di-Lepton #288 took electron-positron data in Proton-Central throughout September, while in Proton-West, p-p Elastic Scattering #177A completed their planned tests shortly after the first week, and then turned the beam over to Photon Search #95A. The latter group spent the rest of the month tuning, testing, and calibrating their apparatus.

In the Meson Area, six experimental groups were in various stages of data collecting and two others did tune-up and testing work. Hadron Jets

#260 continued set-up and equipment checking early in the month, and Particle Search #357 was engaged in similar work for almost the last three weeks. Neutral Hyperon #8 tuned their apparatus after being off since early July, and were taking data by the end of September. Particle Search #357 continued to run in a compatible parasitic mode. Neutron Elastic Scattering #248 completed setting up and testing, and began taking preliminary data. At the same time, Elastic Scattering #69A and Form Factor #216 continued steady data-taking, while Photon Inclusive #268 completed their run by mid-month. In addition, Nuclear Chemistry #81A parasitically exposed four targets to the beam in Meshall.

At the Internal Target Area, most of the research activity was carried out by Particle Production #418 using the rotating fiber target. Running time was used to check and complete earlier data and also to test some new phenomena observed during analysis. Proton-Proton Inelastic #321 spent considerable time debugging their warm jet and other apparatus, and used a small amount of beam time for testing purposes.

The facility utilization summary for the month of September is as follows:

I. Summary of Accelerator Operations

		Hours	
A. Accelerator use for physics research			
Accelerator physics research		51.0	
High energy physics research		430.5	
Research during other use		(25.0)	
	Subtotal		481.5

	Hours	
B. Other activities		
Accelerator setup and tuning to experimental areas	9.5	
Programmed interruption	54.2	
Unscheduled interruption	174.8	
Subtotal		238.5
C. Unmanned time		
Total		720.0

II. Summaries of High Energy Physics Research Use

	# of Expts.	Hours	Results
A. Counter experiments	16	3197.9	
B. Bubble chamber experiments	1	286.2	297,534 pictures
C. Emulsion experiments	-	-	
D. Special target experiments	2	416.5	5 targets
E. Test experiments	2	85.9	
F. Engineering studies and tests	-	-	
G. Other beam use	-	76.2	Beam tuning
	21	4062.7	

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

	@200 GeV	@400 GeV	Totals
A. Beam accelerated in main ring	0.008	1.277	1.285
B. Beam delivered to experimental areas			
Meson Area	-	0.293	0.293
Neutrino Area			
Main beam	0.002	0.819	0.821
Bubble chamber beam (estimated)	-	0.012	0.012
Proton Area	-	0.019	0.019
Totals	0.002	1.143	1.145

IV. Beam Utilization by Experiment

	Hours
A. Meson Area	
Neutral Hyperon # 8	122.8
Elastic Scattering # 69A	226.6

	Hours	
Nuclear Chemistry #81A	-	4 targets
Form Factor #216	381.7	
Neutron Elastic Scattering #248	301.8	
Hadron Jets #260	108.6	
Photon Inclusive #268	243.9	
Particle Search #357	42.0	Tests
B. Neutrino Area		
Neutrino #21A	391.2	
Neutrino #254	169.1	
Quark #276	416.5	1 target
30" Hybrid #281	286.2	297,534 pictures
Test Particle Search #382	7.7	
C. Proton Area		
Photon Total Cross Section #25A	5.8	
Photon Search #95A	257.5	
Test p-p Elastic Scattering #177A	78.2	
Di-Lepton #288	259.3	
Di-Muon #358	279.3	
D. Internal Target Area		
Proton-Nucleon Inelastic #317	210.0	
p-p Inelastic #321	4.1	Tests
Particle Production #418	194.2	
TOTAL	3986.5	

Reported by H. Allen

PROPOSALS RECEIVED DURING AUGUST AND SEPTEMBER 1975

No.	Title	Submitted by
428	400-GeV Proton Interactions in Nuclear Emulsion	J. D. Hebert
429	Proposal to Study Interactions of 100-GeV/c Negative Pions in the 15-Foot FNAL Hydrogen Bubble Chamber	D. R. O. Morrison
430	Proposal to Search for New Short-Lived Particles in 400 GeV/c π^--p Interactions	D. R. O. Morrison
431	350 GeV/c π^--p Experiment in the 15-Foot Bubble Chamber	M. A. Thompson
432	Proposal to Study 50,000 Σ^-n Multiprong Events at About 240 GeV/c by Means of the 15-Foot Bubble Chamber	A. Fridman
433	A Proposal to Study Multi-Muon Production in Hadron Collisions	J. K. Walker
434	Cascade Showers Originated in Jet Showers	S. Dake
435	Measurement of the Polarization of Prompt Muons at X = 0.14 at p_t = 0 and p_t = 1.5 GeV/c	R. K. Adair
436	Determination of the Possible Di-Muon Character of the Prompt Muon Flux	R. K. Adair
437	Proposal to Search for New Long-Lived Particles	T. Ferbel
438	Inelastic Cross Sections of Neutrons on Nuclei	L. W. Jones
439	High Sensitivity Search for New States which Decay into Muons	D. C. Garelick
440	A Proposal for a New Measurement of the Magnetic Moment of the Lambda Hyperon	G. Bunce
441	A Proposal to Study Lambda Polarization in the Inclusive Reaction Proton-Proton to Lambda + Anything with a Liquid Hydrogen Target	L. G. Pondrom

No.	Title	Submitted by
442	Study of Nuclear Fragment Emission in Proton Heavy Nucleus Collisions from 10 to 500 GeV	F. Turkot
443	A Proposal for Continued Studies of Hadron-Induced Muon Pairs in a Large-Acceptance Spectrometer	J. E. Pilcher
444	A Special Request for High-Priority Running to Measure High-Mass Muon Pairs	A. J. S. Smith
445	Proposal to Study Multihadron Systems which Include Charged and Neutral Mesons	J. Rosen

DATES TO REMEMBER

November 7, 1975	BISON-NET Workshop at Fermilab.
November 14, 1975	Materials to be considered at the Workshop on the Short-Lived Particle Beam Facility should be received in the Directors Office.
November 20-21, 1975	Fall meeting of the Fermilab Program Advisory Committee.
December 18-19, 1975	Workshop on the Short-Lived Particle Beam Facility.
January 23, 1976	Deadline for receipt of new proposals and other written materials to be considered at the March meeting of the Program Advisory Committee.
February 5-6, 1976	Proposal Presentation Meeting.
March 4-5, 1976	Spring meeting of the Fermilab Program Advisory Committee.