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MEASUREMENT OF ENERGY DEPOSITED BY CHARGED PARTICLE BEAMS IN COMPOSITE TARGETS

K. Crase, W. E. Farley, H. Kruger, D. Selway and G. S. Sidhu

November 3, 1977

MASTER

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University of California, Livermore, California, 94550

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ABSTRACT

We have measured the energies deposited in composite targets by proton beams from 0.8 to 28.5 GeV energy and by an electron beam at 0.5 GeV energy. The targets consisted of various thicknesses of ^{238}U shower plates backed by a composite detector plate consisting of a 5-cm-thick CH_2 moderator and a 0.635-cm ^{238}U plate. The spacing between the shower and detector plates was varied to allow different spreading of the shower between plates. We used passive detectors (thermoluminescence dosimeters, Lexan fission track recorders, photographic emulsions, and removable ^{238}U pieces) to measure the fission-fragment dose and the non-fission dose at various depths and radial positions in the targets. Plots and numerical values of the measured doses are presented for comparison with computer code calculations. To provide a basis for comparison of the effects of different particle beam energies, we present data along the beam axes as specific dose (cal/g per incident integrated kJ/cm^2). In general, the higher the incident proton energy, the larger is the dose in the back of the target relative to that in the front.

INTRODUCTION

Beams of high-energy charged particles can penetrate thick target materials and deposit their energy directly: the many types of secondary particles generated by means of complex nuclear interactions also behave this way. Studies of the energy deposited in targets provide information that can be useful for shielding problems or when verifying assumptions about production of particle showers and their subsequent transport. One can use charged-particle transport codes such as the nucleon-meson codes NMTC¹ and HETC² or the coupled electron-photon code SANDYL³ to calculate the energy deposited by such charged particles. However, the incomplete knowledge of the interactions, approximations, and compromises made in the codes can make their results unreliable. Direct measurements of the energies deposited at various depths in a simple target are necessary for comparison with code calculations. Once the performance and reliability of a code are established, it can then be used for calculating energy transport in other targets of interest.

We have measured the energy deposited and fissions induced at various depths and radial posi-

tions in selected targets from incident beams of high-energy protons and electrons. Preliminary results of some measurements made with incident protons of kinetic energy 0.8, 2.1, and 4.88 GeV from the University of California Bevatron in Berkeley, California, were described in a previous report.⁴ In this report, we have included the proton data at these energies, the results of similar measurements with 11.4-GeV-energy protons from the Zero Gradient Synchrotron (ZGS) accelerator at the Argonne National Laboratory (ANL) in Argonne, Illinois, and those with 28.5-GeV-energy protons from the Alternating Gradient Synchrotron (AGS) accelerator at the Brookhaven National Laboratory (BNL) in Upton, New York. To compare the transport of protons with electrons, we exposed our targets to 500-MeV electrons from the Stanford Mk. III accelerator at Stanford, California. In the future, we intend to extend the proton measurement down to 370 MeV or lower. At the Lawrence Livermore Laboratory (LLL), work is in progress with the codes to calculate the energies deposited from charged particle beams to compare them with the measurements.

EXPERIMENTAL METHOD

One target plate arrangement during an irradiation is shown in Fig. 1. The assembly consists of 7-in. (17.8-cm) square variable-thickness shower plates of ^{238}U * located in front of and separated from a 2-in.-thick polyethylene block and a thin ^{238}U plate, with variable spacing between the two portions. The purpose of the spacing is to radially spread the shower generated in the uranium plates to increase the radial resolution of the detectors adjacent to the polyethylene block. The polyethylene moderates the shower neutrons, which are then detected in a thin

^{238}U plate and a 10-mil-thick ^{235}U † foil. The ^{235}U foil is shielded with a thin ($\sim 0.1 \text{ g/cm}^2$) layer of ^{10}B to protect it from the highly thermalized neutrons present as a part of the shower or accelerator background, which would otherwise dominate the fission density detected in the foil. Because the ^{238}U detector is sensitive to neutrons with energy in excess of about 1 MeV, and the ^{10}B -shielded ^{235}U detector to neutron energies above a few eV, a measure of the neutron spectrum is attained by using this combination of neutron detectors.

*Actual composition in atom %: 99.774% ^{238}U ; 0.201% ^{235}U ; 0.01% ^{234}U ; 0.01% ^{236}U ; 0.005% ^{233}U .

†Actual composition in atom %: 93 atom % ^{235}U ; 0.2% each ^{233}U , ^{234}U , ^{236}U ; remainder ^{238}U .

Fig. 1. Standard shower plate and detector assembly.

For some of the measurements, the shower plates were removed and the back portion of the target irradiated directly by the incident beam. The target arrangements for various runs at each particle energy are illustrated in Figs. 1 through 5. The planar dimensions of materials and detectors, e.g., lucite detector holder (Lu), photographic film (F), plastic (Lexan) foil (Lx), etc., were nearly the same as those of the ^{238}U plates (D).

For a typical run, passive energy-dose integrating detectors in the flat plate target assembly were located at different positions in the assembly. At selected depths along the beam transport path, we were therefore able to measure the radial distribution of dose deposited by the proton beam and by secondary light nuclei and by beta, gamma, and x rays using thermo-luminescence dosimeters (TLD's). The TLD's were nominally 3-mm square, and 1-mm

Fig. 2. Target setup for Berkeley Bevatron at 0.8, 2.1, and 4.88 GeV runs (2 through 5).

Fig. 3. 500-MeV electron irradiation targets, Stanford Mk. III accelerator.

Fig. 4. Target configurations for Brookhaven runs with 28.5-GeV protons.

thick; they were packaged in lucite holders in a pattern shown in Fig. 6 and the packages were positioned adjacent to ^{238}U plate surfaces. In later runs, additional TLD's were embedded in cylindrical holes in the ^{238}U plates and the remainder of each hole was covered with a cylindrical plug. A barrier was always provided to prevent fission fragments from entering the TLD's. The pattern of TLD's embedded in this manner is shown in Fig. 7. The cylindrical plugs were made from the same material as the ^{238}U plates but, in some locations, we used ^{235}U plugs to measure the fissions expected in ^{238}U . Photographic emulsion films were also used to measure dose, except the dose from fission fragments. This technique provides spatially continuous data and a gross visual check of the energy-deposition pattern. The film dosimeters and the TLD's had been calibrated with a known-intensity gamma source.

The contribution of fission fragments to energy deposition was measured by 3-mil Lexan foils. The fission-fragment track-recorder foils were placed in contact with uranium surfaces to measure the fission density at the corresponding positions in the target assembly. The calibration constant, relating the fission/g in uranium to the number of tracks per unit area (track density) in the Lexan foil in contact with the surface of a thick uranium plate, had been measured in a separate run with a 14-MeV neutron source of known intensity. The result was 2×10^4 fissions/g per track/mm². When the fission density in a surface is large, the fission fragment tracks begin to overlap until the fissions measured by this method are no longer reliable. Further, this constant appears to vary with the surface condition of the uranium used in the calibration. The results of the experiment can be compromised unless the surface condition is identical with that used in the calibration. Therefore, in later runs, we adopted the method of counting total, residual, fission gamma rays and the gamma rays from selected fission products (like ^{140}Ba). We used these gamma-ray counts to estimate the fission levels extrapolated back to the irradiation times. The removable cylindrical plugs in the ^{238}U plates were of convenient size for use in fission gamma counting.

In a typical run, the appropriate beam intensity and dimensions were first obtained on a blank target. At low intensities, a polaroid picture of the beam was taken but usually, because of the high intensities, a radio-chromic film or the auto-radiograph of an irradiated plastic sheet on polaroid film was found more suitable. The following procedure was then taken: (1) the beam was blocked by a massive beam plug, (2) the real target was aligned with the help of the blank target, (3) the accelerator rf was turned off temporarily

to allow removal of the beam plug, and (4) the rf was turned back on to allow the beam on the target. The appropriate number of particles per unit area of the beam was obtained usually during a running time of one to several minutes in a suitable number of pulses. After the exposure, the photographic emulsions and the TLD packages were removed from the target assembly but the TLD's embedded in the uranium plates were disassembled normally three or four days after each irradiation.

During each run, the integrated particle-beam intensity was monitored by a secondary emission chamber based on electrons emitted from Al foils in the beam, or by the current in an ion chamber in the beam. To obtain the absolute number of protons, the chambers at Berkeley and Brookhaven were calibrated by the amount of ^{11}C (20-min half-life) produced by the ^{12}C (p, pg) ^{11}C reaction in a thin polystyrene sheet placed in the beam. The Argonne ion chamber was calibrated by the amount of ^{149}Tb (alpha emitter) produced in gold foil placed in the beam. The chamber vs Faraday-cup calibration available for the 500-MeV electron beam at the Stanford Mk.III accelerator was assumed correct.

In auxiliary runs (runs 65, 66, 75, and 76), we tried to calibrate fission-track density in Lexan against ^{140}Ba -gamma activity produced in the 2-in.-diam ^{238}U foils. The results from the two techniques are generally in the same range, but the accuracy of the measurements is not good enough for the results to be a calibration standard.

In another auxiliary experiment, we directly measured the heat produced in two similar targets, ^{238}U and Ta placed in the proton beams (see target geometry in runs 68, Fig. 5, and 78, Fig. 6). Because the two thin (0.035-in.) targets have known masses, densities, and specific heats, the temperature rise could be used to measure the amounts of heat generated and therefore the total energy deposited by the incident proton beam. The excess heat produced in the ^{238}U , relative to that produced in the Ta is a direct measure of the fission contribution because the fission cross section of ^{238}U at these energies is at least 20 X larger than that of Ta. From the measured excess heat, an estimate can be made of the energy deposited per fission if one knows the proton flux or measures the number of fission events.

We measured the temperature rise of several disks in a stack with thermocouples. Each beam pulse induced a small temperature rise. The thermocouples with their associated equipment and strip-chart recorders were calibrated prior to the experiments. To insure that the system was working properly, we made preliminary runs: 69a and 69b at BNL; 77 and 79 at ANL. A sample of the raw data from a typical

16 places equally spaced on:	5.500-in.-diam bolt circle
16 places equally spaced on:	4.500-in.-diam bolt circle
16 places equally spaced on:	3.500-in.-diam bolt circle
16 places equally spaced on:	2.500-in.-diam bolt circle
12 places as shown on a 1.925-in.-diam bolt circle	
Total: 76 places	

Fig. 6. Pattern of TLDs packaged in a Lucite holder for measurement of radial dose distribution in plates at specified depths in the target assembly.

Coordinates

R = Radius in cm

T = Angle in degrees

R(1)=2.214	T(1)=108.43	R(19)=0.0	T(19)=0.0	R(36)=2.10	T(36)=270.0	R(53)=7.5	T(53)=135.
R(2)=2.10	T(2)=90.0	R(20)=0.70	T(20)=0.0	R(37)=2.214	T(37)=268.43	R(54)=3.0	T(54)=180.
R(3)=2.214	T(3)=71.57	R(21)=1.40	T(21)=0.0	R(38)=3.0	T(38)=0.0	R(55)=4.5	T(55)=180.
R(4)=1.980	T(4)=135.0	R(22)=2.10	T(22)=0.0	R(39)=4.5	T(39)=0.0	R(56)=6.0	T(56)=180.
R(5)=1.565	T(5)=18.57	R(23)=2.214	T(23)=96.43	R(40)=6.0	T(40)=0.0	R(57)=7.5	T(57)=180.
R(6)=1.40	T(6)=90.0	R(24)=1.565	T(24)=206.57	R(41)=7.5	T(41)=0.0	R(58)=3.0	T(58)=225.
R(7)=1.565	T(7)=63.43	R(25)=0.990	T(25)=225.0	R(42)=3.0	T(42)=45.0	R(59)=4.5	T(59)=225.
R(8)=1.980	T(8)=45.0	R(26)=0.70	T(26)=270.0	R(43)=4.5	T(43)=45.0	R(60)=6.0	T(60)=225.
R(9)=2.214	T(9)=161.57	R(27)=0.99	T(27)=315.0	R(44)=6.0	T(44)=45.0	R(61)=7.5	T(61)=225.
R(10)=1.565	T(10)=153.43	R(28)=1.565	T(28)=333.43	R(45)=7.5	T(45)=45.0	R(62)=3.0	T(62)=270.
R(11)=0.990	T(11)=135.0	R(29)=2.214	T(29)=341.57	R(46)=3.0	T(46)=90.0	R(63)=4.5	T(63)=270.
R(12)=0.70	T(12)=90.0	R(30)=1.980	T(30)=225.0	R(47)=4.5	T(47)=90.0	R(64)=6.0	T(64)=270.
R(13)=0.990	T(13)=45.0	R(31)=1.565	T(31)=243.43	R(48)=6.0	T(48)=90.0	R(65)=7.5	T(65)=270.
R(14)=1.565	T(14)=26.57	R(32)=1.40	T(32)=270.0	R(49)=7.5	T(49)=90.0	R(66)=3.0	T(66)=315.
R(15)=2.214	T(15)=18.43	R(33)=1.565	T(33)=296.57	R(50)=1.0	T(50)=135.	R(67)=4.5	T(67)=315.
R(16)=2.10	T(16)=180.0	R(34)=1.980	T(34)=315.0	R(51)=4.5	T(51)=135.	R(68)=6.0	T(68)=315.
R(17)=1.40	T(17)=180.0	R(35)=2.214	T(35)=251.57	R(52)=6.0	T(52)=135.	R(69)=7.5	T(69)=315.
R(18)=0.70	T(18)=180.0						

Fig. 7. Pattern of TLDs embedded in the surfaces of ^{238}U plates.

stack runs are shown in Fig. 8. The temperature increased over time during irradiation, with some small heat losses between beam pulses. In our two attempts at temperature measurements, we obtained excellent thermocouple data, even though very high doses were required. The main sources of uncertainty in the temperature measurements were in the actual proton

flux hitting the disks and in the yield of ^{140}Ba used to measure the number of fission events. (See Appendix F for details of this experiment.)

After each irradiation run, the passive detectors were removed from the target assembly and the data from each type of detector extracted according to the procedures described below.

Fig. 8. Record of thermocouple temperature (uncalibrated) vs time with Ta and ^{238}U targets. Step rise in temperature occurs as beam pulse hits target, the magnitude depending on the deposited energy and specific heats.

DATA ANALYSIS

The exposed photographic films were developed in the same way as the calibration films, which corresponded to the dose level expected. The films were then scanned by a densitometer to measure the radiation-produced opacity. The opacity vs dose calibration necessary to calculate the energy deposited at various locations in the target had been obtained earlier from the calibration films. Contour dose plots in a plane at each depth in the targets have not yet been completed. When completed, such measurements could provide a dose measurement similar to that obtained by TLD's.

The approximately 1000 TLD's irradiated during each run were removed from the lucite holders and ^{238}U surfaces, and their light output was measured at the LLL dosimetry facility. With the irradiation-dose vs light-output calibration curve, the TLD output was converted to energy deposited at the corresponding locations in the target assembly. Finally, the fission fragment tracks in Lexan foils were developed by etching them for 75 min in an NaOH solution (240 g of NaOH/1 H₂O at 60°C). The etching process enlarges the damage pits produced by the fragments,

rendering them visible through an optical microscope. The track density (tracks/mm² of foil area) was then measured by a Quantimet-pattern-recognition computer that operates together with a microscope and a television camera. By use of the calibration constant (2×10^4 fissions/g per track/mm² for ^{238}U) the tracks/mm² were converted to fissions/g at the corresponding locations in ^{238}U in contact with the Lexan foils. The fissions/g for the ^{10}B -shielded ^{235}U detector foils were similarly calculated.

The residual fission fragment activity was measured in gamma-ray counting equipment by the LLL Radiochemistry facility. One method of measurement we used was an NaI detector to count all gamma rays between the pulse-height biases of 600 keV and 3 MeV for selected ^{238}U cylindrical plugs. The second method we used was a germanium detector to count the number of gamma-rays in peaks identified with specific fission fragments such as ^{140}Ba . In the first method, we obtained fissions/g with the curves defining the relationships between fissions/g at irradiation time and total gamma counts. In the second

method, gamma peak activity of the selected fission fragment at counting time gives us an estimate of the amount of that isotope immediately after irradiation. With existing data on the fraction of fissions yielding

the isotope under consideration, we obtained fissions/g. For comparison with the TLD data, we have assumed a deposited energy of 180 MeV/fission and converted the fission data to rad.

RESULTS

In Appendices A-E we present detailed data, the most reliable and complete of which are from the dose measurements by TLD's. In Appendix A, the dose contours are shown on each page, indicating the energy deposited, in rad, in the plane, perpendicular to the beam, at the depth indicated by location number; these contour plots refer only to the detectors placed in lucite holders. For each plane, we have also plotted the dose along lines at 0°, 45°, 90°, and 135° to the horizontal axis of each plane. Figures 1 through 5 identify the locations of these detectors. All data are arranged chronologically. The ^{238}U shower plates were removed for some of the runs. As is apparent from the plots, the particle beam in most of the experiments was not centered in the target center, a result of uncontrollable accelerator variations. The numerical data corresponding to these contour plots are included in Appendix B, which may be used for quantitative comparison with computer calculations. The data from runs 2 through 5 are written in a configuration similar to the detector pattern, while the dose for the remainder of the runs is listed with the corresponding position coordinates or TLD position number.

The data in Appendices A and B represent only those TLD's packaged in lucite. Data from TLD's embedded in ^{238}U plates are plotted to represent the dose along vertical (90°) lines in all the plates except for run 80, which had full TLD loadings. In Appendix C are shown such plots for the 28.5- and 11.4-GeV proton runs as well as for the electron runs. The comparison of doses in Appendix A with the corresponding planes in Appendix C indicates that the dose in embedded TLD's is consistently higher by a factor of approximately two. The numerical values corresponding to the plots in Appendix C are presented in Appendix D for comparison with code calculations. The available fission doses derived from integral gamma-ray counting are also shown in Appendix D to compare the relative magnitude of fission dose with the TLD dose. Those holes which contained ^{235}U plugs are marked by heavy lines.

For most of the runs, fission was measured with Lexan-track recorders. The Lexan was usually scanned along the vertical and the horizontal direc-

tions. In Appendix E, we present the plots of fission dose in rad vs position along the axes through the center for different runs. The labels "surface A, B, C", etc., refer to the Lexan location as the beam sees them while passing through the target. The graphs are labeled to indicate the run number or particle energy, and position of each fission surface. The few Lexans that were in contact with ^{235}U rather than ^{238}U show higher fission density, usually two- to threefold. The gamma counting results show similar differences. The embedded Lexan track recorders indicate higher fission densities than the Lexan recorders on the outside surfaces just as the TLD's surrounded by ^{238}U read higher than those inside Lucite.

To save space, we plotted the fission data for more than one surface on a single page, wherever practical. The solid lines, drawn for one surface in each case, are merely to guide the eye and are not more reliable than the remainder of the data. Because of the Lexan scanning procedure, 2.5 or 5 mm was sometimes arbitrarily added at or near the center of a plot to aid in its analysis; such plots are labeled accordingly. Wherever available, we also plotted the fission dose from radiochemistry gamma-count data together with the Lexan measurements. Although the results from the two methods generally agree, discrepancies of twofold or more are not uncommon. Usually, we found it necessary to multiply the ^{235}U fission data by a factor of $\sim 1/2$ to plot it on the same scale as the ^{238}U data. The ^{140}Ba measurements taken on the 2-in. disk were made with the whole disk in the counter. The results, therefore, represent an integrated average over the entire disk.

Room and natural-U background doses given to the detectors were generally small compared with peak doses. No background corrections have been made to our data.

A result frequently useful to compare the effectiveness of energy transport by particles of various energy, is what we call the "specific dose." This is defined as the energy deposited (cal/g) divided by the total incident particle energy per unit area (kJ/cm^2). We have computed the maximum (on axis) specific dose for the various runs; the results are presented in Table 1. The maximum specific dose is usually

Table 1. Measured doses along beam axes at different depths in flat plate target assemblies

Run No.	Particle energy Total number of particles Beam area, FWHM	Detector designation ^a	TLD dose, rad	Fission dose, ^b rad	Specific dose, ^c cal/g per kJ/cm ²	
					TLD	Fission
2	4.88 GeV 3.5×10 ¹⁰ protons 7 cm ² area	P3	182	160	0.112	0.098
		P4	378	250	0.232	0.153
		P5	236	110	0.145	0.067
		P6	40	—	0.025	—
		P7	60	25(40)	0.040	0.015(0.025)
3	4.88 GeV 2.2×10 ¹⁰ protons 5 cm ² area	P8	156	—	0.117	—
		P9	302	52(104)	0.23	0.039(0.077)
4	2.1 GeV 0.97×10 ¹⁰ protons 2 cm ² area	P10	94	76	0.173	0.14
		P11	105	70	0.193	0.13
		P12	53	46	0.10	0.07
		P13	4.8	—	0.009	—
		P22	5.8	2(8)	0.01	0.004(0.02)
5	0.8 GeV 1.4×10 ¹¹ protons 9 cm ² area	P13	434	150	0.58	0.20
		P21	394	224	0.53	0.30
		P22	200	164	0.27	0.22
		P23	21	—	0.029	—
		P14	20	7(30)	0.026	0.01(0.04)
51	0.5 GeV 5.7×10 ¹¹ electrons 0.13 cm ² area	P19	40×10 ³	—	0.27	—
		D1	88×10 ³	10,000	0.60	0.068
		D2	1.3×10 ³	80	0.0089	0.00055
		P18	320	—	0.0022	—
		D3	40	—	0.00027	—
		P17	1	—	6.8×10 ⁻⁴	—
		P16	0.2	—	1.4×10 ⁻⁴	—
		P13	0.2	—	1.4×10 ⁻⁴	—
52	0.5 GeV 3.1×10 ¹³ electrons 0.13 cm ² area	D4	1.5×10 ⁶	(1.7×10 ⁵)	0.19	(0.022)
		D5	85×10 ³	(6×10 ³)	0.011	(0.0008)
		P6	18×10 ³	—	0.0023	—
		D6	230	(460)	0.000029	(5.8×10 ⁻⁶)
		P21	65	—	8.2×10 ⁻⁶	—
		P22	3	—	3.8×10 ⁻⁷	—
		D7	40	(80)	5.0×10 ⁻⁶	(1.0×10 ⁻⁵)
		P23	2	—	2.5×10 ⁻⁷	—
53	0.5 GeV 6.6×10 ¹¹ electrons 0.1 cm ² area	P12	50×10 ³	—	0.23	—
		D8	75×10 ³	(7,300)	0.34	(0.033)
		P11	80×10 ³	—	0.36	—
54	0.5 GeV 7.8×10 ¹¹ electrons 0.2 cm ² area	P4	40×10 ³	—	0.31	—
		D9	90×10 ³	5,000	0.70	0.04
		D10	4000	200	0.03	0.02
		P5	900	—	0.007	—
		P7	10	—	0.00008	—
		P9	17	(5)	0.0001	(0.00004)
61	28.5 GeV 1.94×10 ¹¹ protons 2 cm ² area	P3	3,500	—	0.019	—
		D6	8,700	(7,500)	0.047	(0.04)
		D7	29,000	(17,000)	0.160	(0.09)
		P4	16,000	—	0.087	—
		D8	20,000	(11,000)	0.11	(0.06)
		P5	10,000	—	0.054	—
		P6	1,200	—	0.0065	—
		D9	4,000	(1,600)	0.022	(0.009)
		P8	3,100	—	0.017	—
62	28.5 GeV 1.95×10 ¹¹ protons 1 cm ² area	P22	2,800	—	0.0075	—
		D10	9,700	(3,500)	0.026	(0.009)
		P24	7,200	—	0.019	—

Table I. Continued.

Run No.	Particle energy Total number of particles Beam area, FWHM	Detector designation ^a	TLD dose, rad	Fission dose, ^b rad	Specific dose, ^c cal/g per kJ/cm ²	
					TLD	Fission
63	28.5 GeV 9.1 × 10 ¹¹ protons 3.8 cm ² area	P9	7,400	—	0.016	—
		D1	18,000	(22,500)	0.039	(0.049)
		D2	51,000	(56,000)	0.11	—
		P10	38,000	—	0.083	(0.12)
		D3	47,000	(34,000)	0.10	(0.074)
		P11	25,000	—	0.055	—
		P13	2,500	—	0.0055	—
		D4	8,000	(1,100)	0.017	(0.009)
64	28.5 GeV 1.21 × 10 ¹² protons 2.8 cm ² area	P17	6,500	—	0.014	—
		P7	8,100	—	0.0098	—
		D5	23,000	(11,300)	0.028	(0.14)
66	28.5 GeV 2 × 10 ¹² protons 3.5 cm ² area	P19	23,000	—	0.028	—
		P16	11,000	—	0.010	—
71	11.4 GeV 3.5 × 10 ¹¹ 3.8 cm ² area	D	—	20,000	—	0.018
		P1	1,700	—	0.024	—
		D1	4,500	1,400(4,000)	0.063	0.020(0.057)
		D2	7,900	2,400(8,000)	0.113	0.034(0.114)
		P4	4,300	—	0.061	—
		D3	5,000	2,500(4,400)	0.071	0.036(0.063)
		P3	3,200	—	0.045	—
		P5	670	—	0.0095	—
		D4	1,400	600(800)	0.0198	0.009(0.011)
		P6	1,100	—	0.016	—
72	11.4 GeV 3.4 × 10 ¹¹ 3.6 cm ² area	P8	1,500	—	0.021	—
		D5	3,800	1,100(1,800)	0.053	0.015(0.025)
		P9	3,200	—	0.045	—
73	11.4 GeV 4.1 × 10 ¹¹ 4.9 cm ² area	P13	2,000	—	0.031	0.025
		D6	9,500	2,600(11,000)	0.149	0.041(0.172)
		P16	5,700	—	0.089	—
		P17	5,000	2,000	0.078	0.031
		D7	3,000	700(2,600)	0.047	0.011(0.041)
		P19	2,000	—	0.031	—
74	11.4 GeV 3.7 × 10 ¹¹ 4.1 cm ² area	P22	1,800	—	0.026	—
		D8	4,500	1,500(3,600)	0.065	0.022(0.052)
		D9	8,700	2,000(4,900)	0.126	0.029(0.071)
		P23	4,200	—	0.061	—
		P24	1,200	—	0.017	—
		D10	2,900	1,000(1,400)	0.042	0.015(0.020)
		P11	2,000	—	0.029	—
80	11.4 GeV 2.7 × 10 ¹² 7.1 cm ²	P10	12,000	—	0.041	—
		D8	27,000	13,000	0.093	0.045
		P19	38,000	—	0.131	—
		D9	47,000	20,000	0.162	0.049
		P23	22,000	—	0.076	—
		D10	37,000	16,000	0.128	0.055

^aP designates Lucite TLD holder; D, D-38 plate.^bThe fission dose within parentheses is for ²³⁵U, that without parentheses is for ²³⁸U.^cError estimated for the TLD data is ±15%. For the fission measurements the error is ~30% for the medium doses and may exceed 100% for very low and high doses.

derived from the average of three highest doses at each depth, except when the beam size is comparable to the dimensions of a single TLD or when the dose varies rapidly from one detector location to the next. The beam area was measured at full-width, half-maximum value of the dose contour for the first TLD plate in each experiment.

From the data in Table I, we have plotted in Fig. 9, part (a) the TLD specific dose as a function of depth for one measurement at each energy for visual comparison. By comparing the specific dose in the back of a target relative to that in front, we can qualitatively assess the penetration of the incident particles and of the secondary showers they produce. The specific doses from fission are plotted separately in Fig. 9, part (b), because the fission detectors were not located at all the TLD depth positions.

The specific dose data in Table I and Fig. 9 summarize the results for rough comparison of effects from incident particles of different energy.

TC Results

An example of the data reduction process for the ANI, thermocouple instrumented stack run (No. 78) is given in Appendix F. Four methods outlined in Appendix F are available to reduce the data. The preferred method yields a best estimate of 150-220 MeV/fission. Refinement of the experimental methods are needed, but we have demonstrated the potential of the technique.

Fig. 9. Specific dose at various depths from particle beams for (a) TLD data and (b) fission data. (Detectors at P locations were in Lucite plates. Detectors at D locations were in ²³⁸U plates.)

DISCUSSION AND CONCLUSIONS

The data we present here were taken from many experiments over a span of more than one year with suitable accelerator beams at different U.S. laboratories. The data provide detailed information on dose at different locations in selected targets from a variety of incident particle beams. Not all of the information contained in the raw data has yet been extracted. Additional useful results can be obtained with some effort and may be available in the future. The uncertainty of the TLD doses is $\pm 15\%$ in the dose range below 10^5 rad, and somewhat higher for doses $>10^5$ rad. The fission measurements either from Lexan-track counting or from residual gamma-ray counting are generally within a twofold difference of one another, although larger differences have sometimes been observed. These differences are a measure of the uncertainties in the results. The following are conclusions that can be drawn from our measurements.

1. Even if not measured in detail, there is some buildup at all incident energies, i.e., initially the energy density deposited increases as a function of target depth. The buildup is larger and the subsequent drop is slower for high-energy protons than for low-energy protons or electrons.

2. There are variations in specific dose results as a result of beam size and shape; thus, one should be cautious when comparing the results from one run to the next. For example, beam sizes in electron and most proton runs are different enough to invalidate absolute comparisons of specific dose. For a valid comparison, the beam size and shape from one incident beam to the next must be identical.

3. The 500-MeV-electron beam deposits most of its energy in the first few cm of the target. The TLD dose is reduced 25,000-fold after 4 in. of uranium, compared with a buildup factor of 2.5 in the 28.5-GeV proton run.

4. The fission dose is generally two- to fourfold lower than the TLD dose for protons in the front of the target. After the beam penetrates deep into the target, the measured fission dose often is comparable with the TLD dose, especially in ^{235}U , where low-energy neutrons may contribute to dose.

5. In general, the fission density observed in ^{235}U is two- or threefold higher than the density in ^{238}U . Considering that the high-energy fission cross sections might be comparable, this suggests a contribution from low-energy (<1 MeV) neutrons, comparable to that of high-energy particles.

6. One measure of deep penetration by beams is the energy deposited in the back of the target relative to the energy deposited in front. By comparing the doses from Table I and Fig. 10, we found that shower production and smaller attenuation of the high-energy proton beam is the most effective in depositing energy in the back of the target, while 0.5-GeV electrons are the least effective.

7. There are some problems that are not yet resolved. For example, (a) there is ~ 3.5 times as much ^{140}Ba produced in the proton experiments as would be calculated from fission events alone, (b) consistently higher doses are seen in TLD's embedded in ^{238}U compared with those TLD's in Lucite $\sim 1/4$ in. away, and (c) the measured fission density is higher inside the ^{238}U plates compared with the density on the surfaces.

REFERENCES

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4. G. Sidhu, *Measurement of Energy Transport by Charged Particle Beams*, Lawrence Livermore Laboratory, Livermore, Calif., Rept. D-76-9 (1976).

APPENDIX A
DOSE CONTOUR PLOTS
TLD DETECTORS IN LUCITE PLATES

(Location numbers are with respect to incident beam.)

DOSE - RADS
 B - 5.000E+00
 C - 1.000E+01
 D - 2.000E+01
 E - 3.500E+01
 F - 5.000E+01
 G - 6.500E+01
 H - 1.000E+02
 I - 1.700E+02
 J - 2.300E+02
 K - 3.500E+02

RUN DATE.....8/5/76
 PARTICLE.....PROTON
 BEAM ENERGY.....4.88 GEV
 TARGET.....FP RUN 2
 PLATE NO.....P3
 PLATE LOCATION..1

Fig. A-1.

DOSE - RADS
 B - 5.000E+00
 C - 1.000E+01
 D - 2.000E+01
 E - 3.500E+01
 F - 5.000E+01
 G - 6.500E+01
 H - 1.000E+02
 I - 1.700E+02
 J - 2.300E+02
 K - 3.500E+02

RUN DATE.....6/5/76
 PARTICLE.....PHOTON
 BEAM ENERGY....4.88 GEV
 TARGET.....FP RUN 2
 PLATE NO.....P4
 PLATE LOCATION..2

Fig. A-2.

*OSE - RADS
 J - 5.000E+00
 C - 1.000E+01
 D - 2.000E+01
 E - 3.500E+01
 F - 5.000E+01
 G - 6.500E+01
 H - 1.000E+02
 I - 1.700E+02
 J - 2.300E+02
 K - 3.500E+02

RUN DATE.....6/5/76
 PARTICLE.....PROTON
 BEAM ENERGY.....4.88 GEV
 TARGET.....FP RUN 2
 PLATE NO.....P5
 PLATE LOCATION..3

Fig. A-3.

DOSE - RADS
 B - 5.000E+00
 C - 1.000E+01
 D - 2.000E+01
 E - 3.500E+01
 F - 5.000E+01
 G - 6.500E+01
 H - 1.000E+02
 I - 1.700E+02
 J - 2.300E+02
 K - 3.500E+02

RUN DATE.....6/5/76
 PARTICLE.....PROTON
 BEAM ENERGY.....4.08 GEV
 TARGET.....FP RUN 2
 PLATE NO.....P6
 PLATE LOCATION..4

Fig. A-4.

DOSE - RADS
 B - 5.000E+00
 C - 1.000E+01
 D - 2.000E+01
 E - 3.500E+01
 F - 5.000E+01
 G - 6.500E+01
 H - 1.000E+02
 I - 1.700E+02
 J - 2.300E+02
 K - 3.500E+02

RUN DATE.....6/5/76
 PARTICLE.....PROTON
 BEAM ENERGY.....4.00 GEV
 TARGET.....FP RUN 2
 PLATE NO.....P7
 PLATE LOCATION..5

Fig. A-5.

DOSE - RADS
 B - 1.500E+00
 C - 1.000E+01
 D - 2.000E+01
 E - 5.000E+01
 F - 7.500E+01
 G - 1.000E+02
 H - 1.500E+02
 I - 2.000E+02
 J - 2.500E+02
 K - 3.000E+02

RUN DATE.....6/5/76
 PARTICLE.....PROTON
 BEAM ENERGY.....4.88 GEV
 TARGET.....FP RUN 3
 PLATE NO.....PB
 PLATE LOCATION..4

Fig. A-6.

DOSE - RADS
 B - 1.500E+00
 C - 1.000E+01
 D - 2.000E+01
 E - 5.000E+01
 F - 7.500E+01
 G - 1.000E+02
 H - 1.500E+02
 I - 2.000E+02
 J - 2.500E+02
 K - 3.000E+02

RUN DATE.....6/5/76
 PARTICLE.....PROTON
 BEAM ENERGY....4.88 GEV
 TARGET.....FP RUN 3
 PLATE NO.....P9
 PLATE LOCATION..5

Fig. A-7.

DOSE - RADS
 B - 2.000E+00
 C - 4.000E+00
 D - 5.500E+00
 E - 7.000E+00
 F - 1.000E+01
 G - 3.000E+01
 H - 5.000E+01
 I - 7.000E+01
 J - 9.000E+01
 K - 1.100E+02

RUN DATE.....6/5/76
 PARTICLE.....PROTON
 BEAM ENERGY.....2.10 GEV
 TARGET.....FP RUN 4
 PLATE NO.....P10
 PLATE LOCATION..1

Fig. A-8.

DOSE - RADS
 B - 2.000E+00
 C - 4.000E+00
 D - 5.500E+00
 E - 7.000E+00
 F - 1.000E+01
 G - 3.000E+01
 H - 5.000E+01
 I - 7.000E+01
 J - 9.000E+01
 K - 1.100E+02

RUN DATE.....6/5/76
 PARTICLE.....PROTON
 BEAM ENERGY.....2.10 GEV
 TARGET.....FP RUN 4
 PLATE NO.....P11
 PLATE LOCATION..2

Fig. A-9.

DOSE - RADS
 B - 2.000E+00
 C - 4.000E+00
 D - 5.500E+00
 E - 7.000E+00
 F - 1.000E+01
 G - 3.000E+01
 H - 5.000E+01
 I - 7.000E+01
 J - 9.000E+01
 K - 1.100E+02

RUN DATE.....6/5/76
 PARTICLE.....PROTON
 BEAM ENERGY.....2.10 GEV
 TARGET.....FP RUN 4
 PLATE NO.....P12
 PLATE LOCATION..3

Fig. A-10.

DOSE - RADS
 B - 2.000E+00
 C - 4.000E+00
 D - 5.500E+00
 E - 7.000E+00
 F - 1.000E+01
 G - 3.000E+01
 H - 5.000E+01
 I - 7.000E+01
 J - 9.000E+01
 K - 1.100E+02

RUN DATE.....6/5/76
 PARTICLE.....PROTON
 BEAM ENERGY.....2.10 GEV
 TARGET.....FP RUN 4
 PLATE NO.....P13
 PLATE LOCATION..4

Fig. A-11.

DDSE - RAD5
 B - 2.000E+00
 C - 4.000E+00
 D - 5.500E+00
 E - 7.000E+00
 F - 1.000E+01
 G - 3.000E+01
 H - 5.000E+01
 I - 7.000E+01
 J - 9.000E+01
 K - 1.100E+02

RUN DATE.....6/5/76
 PARTICLE.....PROTON
 BEAM ENERGY.....2.10 GEV
 TARGET.....FP RUN 4
 PLATE NO.....P22
 PLATE LOCATION..5

Fig. A-12.

DOSE - RADS
 B - 1.000E+01
 C - 1.500E+01
 D - 2.000E+01
 E - 2.200E+01
 F - 5.000E+01
 G - 1.000E+02
 H - 2.100E+02
 I - 3.000E+02
 J - 4.000E+02
 K - 4.500E+02

RUN DATE.....6/20/76
 PARTICLE.....PROTON
 BEAM ENERGY.....0.80 GEV
 TARGET.....FP RUN 5
 PLATE NO.....P13
 PLATE LOCATION..1

Fig. A-13.

DOSE - RAOS
 B - 1.000E+01
 C - 1.500E+01
 D - 2.000E+01
 E - 2.200E+01
 F - 5.000E+01
 G - 1.000E+02
 H - 2.100E+02
 I - 3.000E+02
 J - 4.000E+02
 K - 4.500E+02

RUN DATE.....6/20/76
 PARTICLE.....PROTON
 BEAM ENERGY.....0.80 GEV
 TARGET.....FP RUK 5
 PLATE NO.....P21
 PLATE LOCATION..2

Fig. A-14.

DOSE - RADS
 B - 1.000E+01
 C - 1.500E+01
 D - 2.000E+01
 E - 2.200E+01
 F - 5.000E+01
 G - 1.000E+02
 H - 2.100E+02
 I - 3.000E+02
 J - 4.000E+02
 K - 4.500E+02

RUN DATE.....6/20/76
 PARTICLE.....PROTON
 BEAM ENERGY.....0.80 GEV
 TARGET.....FP RUN 5
 PLATE NO.....P22
 PLATE LOCATION..3

Fig. A-15.

DOSE ~ RADS
 B - 1.000E+01
 C - 1.500E+01
 D - 2.000E+01
 E - 2.200E+01
 F - 5.000E+01
 G - 1.000E+02
 H - 2.100E+02
 I - 3.000E+02
 J - 4.000E+02
 K - 4.500E+02

RUN DATE.....6/20/76
 PARTICLE.....PROTON
 BEAM ENERGY.....0.80 GEV
 TARGET.....FP RUN 5
 PLATE NO.....P23
 PLATE LOCATION..4

Fig. A-16.

DOSE - RADS
 B - 1.000E+01
 C - 1.500E+01
 D - 2.000E+01
 E - 2.200E+01
 F - 5.000E+01
 G - 1.000E+02
 H - 2.100E+02
 I - 3.000E+02
 J - 4.000E+02
 K - 4.500E+02

RUN DATE.....6/20/76
 PARTICLE.....PROTON
 BEAM ENERGY.....0.80 GEV
 TARGET.....FP RUN 5
 PLATE NO.....P24
 PLATE LOCATION..5

Fig. A-17.

DOSE - RADS
 B - 3.000E+00
 C - 1.000E+01
 D - 4.000E+01
 E - 6.500E+01
 F - 1.250E+02
 G - 2.500E+02
 H - 6.000E+02
 I - 1.500E+03
 J - 5.000E+03
 K - 1.500E+04

RUN DATE.....9/15/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN 51
 PLATE NO.....P19
 PLATE LOCATION..1

Fig. A-18.

DOSE - RADS
 B - 3.000E+00
 C - 9.000E+00
 D - 2.000E+01
 E - 5.000E+01
 F - 7.500E+01
 G - 1.250E+02
 H - 2.000E+02
 I - 3.000E+02
 J - 1.000E+04
 K - 1.200E+04

RUN DATE.....9/15/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN 51
 PLATE NO.....P18
 PLATE LOCATION..2

Fig. A-19.

DOSE - RADS
 B - 2.500E-01
 C - 3.000E-01
 D - 4.000E-01
 E - 5.000E-01
 F - 6.000E-01
 G - 8.000E-01
 H - 1.250E+00
 I - 1.500E+00
 J - 1.000E+04
 K - 1.200E+04

RUN DATE.....9/15/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN 51
 PLATE NO.....P17
 PLATE LOCATION..3

Fig. A-20.

DOSE - RADS
 B - 1.860E-01
 C - 1.900E-01
 D - 1.950E-01
 E - 2.000E-01
 F - 1.500E+03
 G - 3.000E+03
 H - 5.000E+03
 I - 7.500E+03
 J - 1.000E+04
 K - 1.200E+04

RUN DATE.....9/15/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN 51
 PLATE NO.....P16
 PLATE LOCATION..4

Fig. A-21.

DOSE - RADS
 B - 2.300E-01
 C - 2.500E+02
 D - 5.000E+02
 E - 1.000E+03
 F - 1.500E+03
 G - 3.000E+03
 H - 5.000E+03
 I - 7.500E+03
 J - 1.000E+04
 K - 1.200E+04

RUN DATE.....9/15/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN 51
 PLATE NO.....P13
 PLATE LOCATION..5

Fig. A-22.

DOSE - RADS
 B - 7.500E+01
 C - 2.500E+02
 D - 5.000E+02
 E - 1.000E+03
 F - 1.500E+03
 G - 3.000E+03
 H - 5.000E+03
 I - 7.500E+03
 J - 1.000E+04
 K - 1.300E+04

RUN DATE.....9/15/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN 52
 PLATE NO.....P6
 PLATE LOCATION..2

Fig. A-23.

DOSE - RADS
 B - 2.500E+00
 C - 4.000E+00
 D - 6.000E+00
 E - 9.000E+00
 F - 1.500E+01
 G - 2.500E+01
 H - 3.500E+01
 I - 4.500E+01
 J - 5.500E+01
 K - 6.000E+01

RUN DATE.....9/15/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN 52
 PLATE NO.....P21
 PLATE LOCATION..3

Fig. A-24.

DOSE - RADS
 B - 1.100E+00
 C - 1.300E+00
 D - 1.500E+00
 E - 1.800E+00
 F - 2.000E+00
 G - 2.200E+00
 H - 2.400E+00
 I - 2.600E+00
 J - 1.000E+04
 K - 1.200E+04

RUN DATE.....9/15/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN 52
 PLATE NO.....P22
 PLATE LOCATION..4

Fig. A-25.

DOSE - RADS
 B - 8.000E-01
 C - 9.000E-01
 D - 1.200E+00
 E - 1.400E+00
 F - 1.600E+00
 G - 1.800E+00
 H - 2.000E+00
 I - 2.200E+00
 J - 2.400E+00
 K - 2.600E+00

RUN DATE.....9/15/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN 52
 PLATE NO.....P23
 PLATE LOCATION..5

Fig. A-26.

DOSE - RAD5
 B ~ 1.500E+00
 C ~ 2.000E+00
 D ~ 3.000E+00
 E ~ 5.000E+00
 F ~ 2.500E+01
 G ~ 1.000E+02
 H ~ 5.000E+02
 I ~ 3.000E+03
 J ~ 1.000E+04
 K ~ 3.000E+04

RUN DATE.....9/15/75
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN53
 PLATE NO.....P12
 PLATE LOCATION..4

Fig. A-27.

DOSE - RADS
 B - 7.500E+01
 C - 2.000E+02
 D - 3.000E+02
 E - 7.500E+02
 F - 1.000E+03
 G - 2.000E+03
 H - 5.000E+03
 I - 1.000E+04
 J - 2.000E+04
 K - 4.000E+04

RUN DATE.....9/16/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN 53
 PLATE NO.....P11
 PLATE LOCATION..5

Fig. A-28.

DOSE - RADS
 B - 2.000E+00
 C - 5.000E+00
 D - 1.000E+01
 E - 2.500E+01
 F - 5.000E+01
 G - 1.000E+02
 H - 3.000E+02
 I - 7.500E+02
 J - 7.500E+03
 K - 3.000E+04

RUN DATE.....9/15/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN 54
 PLATE NO.....P4
 PLATE LOCATION..2

Fig. A-29.

DOSE - RADS
 B - 5.000E+00
 C - 1.030E+01
 D - 2.500E+01
 E - 5.000E+01
 F - 7.500E+01
 G - 1.000E+02
 H - 2.000E+02
 I - 3.000E+02
 J - 5.000E+02
 K - 7.000E+02

RUN DATE.....9/16/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN 54
 PLATE NO.....P5
 PLATE LOCATION..3

Fig. A-30.

DOSE - RADS
 B - 3.000E+00
 C - 4.000E+00
 D - 5.000E+00
 E - 6.000E+00
 F - 7.000E+00
 G - 8.000E+00
 H - 9.000E+00
 I - 1.000E+01
 J - 1.000E+04
 K - 1.200E+04

RUN DATE.....5/16/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN 54
 PLATE NO.....P7
 PLATE LOCATION..4

Fig. A-31.

DOSE - RADS
 B - 3.000E+00
 C - 4.000E+00
 D - 5.000E+00
 E - 6.000E+00
 F - 7.000E+00
 G - 8.000E+00
 H - 9.000E+00
 I - 1.000E+01
 J - 1.300E+01
 K - 1.500E+01

RUN DATE.....5/16/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN 54
 PLATE NO.....P9
 PLATE LOCATION..5

Fig. A-32.

DOSE - RADS
 B - 5.000E-01
 C - 2.000E+00
 D - 3.000E+00
 E - 1.000E+01
 F - 4.000E+01
 G - 1.000E+02
 H - 3.000E+02
 I - 1.000E+03
 J - 7.500E+03
 K - 2.500E+04

RUN DATE.....5/16/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN 55
 PLATE NO.....P3
 PLATE LOCATION..I

Fig. A-33.

DOSE - RADS
 B - 2.000E+01
 C - 3.500E+01
 D - 5.500E+01
 E - 7.500E+01
 F - 1.250E+02
 G - 2.000E+02
 H - 5.000E+02
 I - 1.000E+03
 J - 1.500E+03
 K - 3.000E+03

RUN DATE.....12/9/76
 PARTICLE.....PROTON
 BEAM ENERGY.....20.5GEV
 TARGET.....FP RUN 61
 PLATE NO.....P3
 PLATE LOCATION..1

Fig. A-34.

DOSE - RADS
 B - 9.000E+01
 C - 2.500E+02
 D - 7.500E+02
 E - 1.500E+03
 F - 3.000E+03
 G - 5.000E+03
 H - 7.500E+03
 I - 1.000E+04
 J - 1.200E+04
 K - 1.400E+04

RUN DATE.....12/9/76
 PARTICLE.....PROTON
 BEAM ENERGY.....28.5GEV
 TARGET.....FP RUN 61
 PLATE NO.....P4
 PLATE LOCATION..2

Fig. A-35.

DOSE - RADS
 B - 7.500E+01
 C - 2.500E+02
 D - 5.000E+02
 E - 1.000E+03
 F - 1.500E+03
 G - 3.000E+03
 H - 5.000E+03
 I - 7.500E+03
 J - 1.000E+04
 K - 1.200E+04

RUN DATE.....12/9/76
 PARTICLE.....PROTON
 BEAM ENERGY.....28.5GEV
 TARGET.....FP RUN 61
 PLATE NO.....P5
 PLATE LOCATION..3

Fig. A-36.

DOSE - RADS
 B - 5.000E+01
 C - 6.000E+01
 D - 7.500E+01
 E - 1.000E+02
 F - 1.500E+02
 G - 2.500E+02
 H - 5.000E+02
 I - 7.500E+02
 J - 1.000E+03
 K - 1.200E+04

RUN DATE.....12/9/76
 PARTICLE.....PROTON
 BEAM ENERGY.....28.56EV
 TARGET.....FP RUN 61
 PLATE NO.....P6
 PLATE LOCATION..4

Fig. A-37.

DOSE - RADS
 B - 8.000E+01
 C - 1.000E+02
 D - 1.500E+02
 E - 2.500E+02
 F - 4.000E+02
 G - 7.500E+02
 H - 1.000E+03
 I - 1.50E+03
 J - 2.250E+03
 K - 2.750E+03

RUN DATE.....12/9/76
 PARTICLE.....PROTON
 BEAM ENERGY.....28.5GEV
 TARGET.....FP RUN 61
 PLATE NO.....PB
 PLATE LOCATION..5

Fig. A-38.

DOSE - RADS
 B - 5.000E+00
 C - 1.000E+01
 D - 2.500E+01
 E - 5.000E+01
 F - 7.500E+01
 G - 2.000E+02
 H - 5.000E+02
 I - 1.000E+03
 J - 1.500E+03
 K - 2.000E+03

RUN DATE.....12/9/76
 PARTICLE.....PROTON
 BEAM ENERGY.....28.5GEV
 TARGET.....FP RUN 62
 PLATE NO.....P22
 PLATE LOCATION..4

Fig. A-39.

DOSE - RADS
 B - 2.000E+01
 C - 5.000E+01
 D - 1.000E+02
 E - 2.000E+02
 F - 3.000E+02
 G - 5.000E+02
 H - 7.500E+02
 I - 1.500E+03
 J - 3.000E+03
 K - 6.000E+03

RUN DATE.....12/9/76
 PARTICLE.....PROTON
 BEAM ENERGY.....28.5GEV
 TARGET.....FP RUN 62
 PLATE NO.....P24
 PLATE LOCATION..5

Fig. A-40.

DOSE - RADS
 B - 9.000E+01
 C - 1.500E+02
 D - 2.250E+02
 E - 3.500E+02
 F - 7.500E+02
 G - 1.500E+03
 H - 3.000E+03
 I - 4.000E+03
 J - 5.000E+03
 K - 6.000E+03

RUN DATE.....12/9/76
 PARTICLE.....PROTON
 BEAM ENERGY.....28.5GEV
 TARGET.....FP RUN 63
 PLATE NO.....P9
 PLATE LOCATION..1

Fig. A-41.

DOSE - RADS
 B - 5.000E+02
 C - 9.000E+02
 D - 1.500E+03
 E - 2.500E+03
 F - 5.000E+03
 G - 7.500E+03
 H - 1.000E+04
 I - 1.500E+04
 J - 2.500E+04
 K - 3.300E+04

RUN DATE.....12/9/76
 PARTICLE.....PROTON
 BEAM ENERGY.....28.5GEV
 TARGET.....FP RUN 63
 PLATE NO.....P10
 PLATE LOCATION..2

Fig. A-42.

DOSE - RA05
 B - 4.000E+02
 C - 7.500E+02
 D - 1.500E+03
 E - 3.000E+03
 F - 5.000E+03
 G - 7.500E+03
 H - 1.000E+04
 I - 1.500E+04
 J - 2.000E+04
 K - 2.400E+04

RUN DATE.....12/9/76
 PARTICLE.....PROTON
 BEAM ENERGY.....28.56EV
 TARGET.....FP RUN 63
 PLATE NO.....P11
 PLATE LOCATION..3

Fig. A-43.

DOSE - RADS
 B - 7.500E+01
 C - 1.000E+02
 D - 2.500E+02
 E - 3.500E+02
 F - 5.000E+02
 G - 7.500E+02
 H - 1.000E+03
 I - 1.500E+03
 J - 2.000E+03
 K - 2.400E+03

RUN DATE.....12/9/76
 PARTICLE.....PROTON
 BEAM ENERGY.....28.5GEV
 TARGET.....FP RUN 63
 PLATE NO.....P13
 PLATE LOCATION..4

Fig. A-44.

DOSE - RADS
 B - 5.000E+02
 C - 7.500E+02
 D - 1.000E+03
 E - 1.500E+03
 F - 2.000E+03
 G - 3.000E+03
 H - 4.000E+03
 I - 5.000E+03
 J - 6.000E+03
 K - 6.800E+03

RUN DATE.....12/9/76
 PARTICLE.....PROTON
 BEAM ENERGY.....28.5GEV
 TARGET.....FP RUN 63
 PLATE NO.....P17
 PLATE LOCATION..5

Fig. A-45.

DOSE - RADS
 B - 5.000E+01
 C - 7.500E+01
 D - 1.000E+02
 E - 2.000E+02
 F - 4.000E+02
 G - 7.500E+02
 H - 1.500E+03
 I - 3.000E+03
 J - 5.000E+03
 K - 7.500E+03

RUN DATE.....12/9/76
 PARTICLE.....PROTON
 BEAM ENERGY.....28.5GEV
 TARGET.....FP RUN 64
 PLATE NO.....P7
 PLATE LOCATION..4

Fig. A-46.

DOSE - RADS
 B - 1.500E+02
 C - 2.500E+02
 D - 4.000E+02
 E - 7.500E+02
 F - 1.250E+03
 G - 2.500E+03
 H - 5.000E+03
 I - 1.000E+04
 J - 1.500E+04
 K - 2.200E+04

RUN DATE.....12/9/76
 PARTICLE.....PROTON
 BEAM ENERGY.....28.5GEV
 TARGET.....FP RUN 64
 PLATE NO.....P19
 PLATE LOCATION..5

Fig. A-47.

DOSE - RAD5
 B - 4.000E+01
 C - 7.500E+01
 D - 2.500E+02
 E - 5.000E+02
 F - 1.000E+03
 G - 1.500E+03
 H - 3.000E+03
 I - 5.000E+03
 J - 7.500E+03
 K - 1.000E+04

RUN DATE.....12/9/76
 PARTICLE.....PROTON
 BEAM ENERGY.....28.5GEV
 TARGET.....FP RUN 66
 PLATE NO.....P16
 PLATE LOCATION..I

Fig. A-48.

DOSE - RADS
 B - 2.000E+01
 C - 3.000E+01
 D - 6.500E+01
 E - 9.000E+01
 F - 1.750E+02
 G - 3.500E+02
 H - 5.000E+02
 I - 7.500E+02
 J - 1.000E+03
 K - 1.500E+03

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....FP RUN 71
 PLATE NO.....P1
 PLATE LOCATION..1

Fig. A-49.

DOSE - RADS
 B - 7.500E+01
 C - 1.500E+02
 D - 3.000E+02
 E - 5.000E+02
 F - 7.000E+02
 G - 1.000E+03
 H - 1.500E+03
 I - 2.000E+03
 J - 3.000E+03
 K - 4.000E+03

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....FP RUN 71
 PLATE NO.....P4
 PLATE LOCATION..2

Fig. A-50.

DOSE - RADS
 B - 7.500E+01
 C - 1.500E+02
 D - 2.000E+02
 E - 3.000E+02
 F - 5.000E+02
 G - 7.000E+02
 H - 1.000E+03
 I - 1.500E+03
 J - 2.000E+03
 K - 2.700E+03

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....FP RUN 71
 PLATE NO.....P3
 PLATE LOCATION..3

Fig. A-51.

DOSE - RADS
 B - 3.000E+01
 C - 4.000E+01
 D - 5.000E+01
 E - 1.000E+02
 F - 2.000E+02
 G - 3.000E+02
 H - 4.000E+02
 I - 5.250E+02
 J - 1.000E+04
 K - 1.200E+04

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY....12GEV
 TARGET.....FP RUN 71
 PLATE NO.....P5
 PLATE LOCATION..4

Fig. A-52.

DOSE - RADS
 B - 4.000E+01
 C - 7.500E+01
 D - 1.500E+02
 E - 2.500E+02
 F - 3.500E+02
 G - 5.000E+02
 H - 7.000E+02
 I - 1.000E+03
 J - 1.000E+04
 K - 1.200E+04

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....FP RUN 71
 PLATE NO.....P6
 PLATE LOCATION..5

Fig. A-53.

DOSE - RAD5
 B - 6.000E+00
 C - 1.000E+01
 D - 2.500E+01
 E - 4.000E+01
 F - 7.500E+01
 G - 2.500E+02
 H - 5.000E+02
 I - 9.000E+02
 J - 1.200E+03
 K - 1.200E+04

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....FP RUN 72
 PLATE NO.....PB
 PLATE LOCATION..4

Fig. A-54.

DOSE - RADS
 B - 2.000E+01
 C - 5.000E+01
 D - 7.500E+01
 E - 2.500E+02
 F - 5.000E+02
 G - 1.000E+03
 H - 1.500E+03
 I - 2.250E+03
 J - 3.000E+03
 K - 1.200E+04

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....FP RUN 72
 PLATE NO.....P9
 PLATE LOCATION..5

Fig. A-55.

DOSE - RAD5
 B - 2.500E+01
 C - 5.000E+01
 D - 7.500E+01
 E - 1.500E+02
 F - 2.500E+02
 G - 5.000E+02
 H - 1.000E+03
 I - 1.500E+03
 J - 1.750E+03
 K - 1.200E+04

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....FP RUN 73
 PLATE NO.....P13
 PLATE LOCATION..1

Fig. A-56.

DOSE - RADS
 B - 7.500E+01
 C - 1.250E+02
 D - 2.500E+02
 E - 5.500E+02
 F - 1.000E+03
 G - 1.500E+03
 H - 3.000E+03
 I - 5.000E+03
 J - 1.000E+04
 K - 1.200E+04

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....FP RUN 73
 PLATE NO.....P16
 PLATE LOCATION..2

Fig. A-57.

DOSE - RADS
 B - 7.500E+01
 C - 1.500E+02
 D - 2.500E+02
 E - 5.000E+02
 F - 1.000E+03
 G - 1.800E+03
 H - 2.300E+03
 I - 3.100E+03
 J - 1.000E+04
 K - 1.200E+04

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....FP RUN 73
 PLATE NO.....P17
 PLATE LOCATION..3

Fig. A-58.

DOSE - RADS
 B - 1.000E+02
 C - 1.750E+02
 D - 3.000E+02
 E - 5.000E+02
 F - 7.500E+02
 G - 1.000E+03
 H - 1.250E+03
 I - 1.700E+03
 J - 1.000E+04
 K - 1.200E+04

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....120EV
 TARGET.....FP RUN 73
 PLATE NO.....P19
 PLATE LOCATION..5

Fig. A-59.

DOSE - RADS
 B - 4.000E+01
 C - 6.000E+01
 D - 7.500E+01
 E - 1.000E+02
 F - 2.000E+02
 G - 3.000E+02
 H - 5.000E+02
 I - 7.500E+02
 J - 1.100E+03
 K - 1.600E+03

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....126EV
 TARGET.....FP RUN 74
 PLATE NO.....P22
 PLATE LOCATION..1

Fig. A-60.

DOSE - RADS
 B - 5.000E+01
 C - 1.000E+02
 D - 1.750E+02
 E - 2.500E+02
 F - 5.000E+02
 G - 1.000E+03
 H - 1.500E+03
 I - 2.250E+03
 J - 3.000E+03
 K - 3.800E+03

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....FP RUN 74
 PLATE NO.....P23
 PLATE LOCATION..2

Fig. A-61.

DOSE - RADS
 B - 8.000E+01
 C - 1.500E+02
 D - 3.000E+02
 E - 5.000E+02
 F - 7.500E+02
 G - 1.000E+03
 H - 5.000E+03
 I - 7.500E+03
 J - 1.000E+04
 K - 1.250E+04

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....FP RUN 74
 PLATE NO.....P24
 PLATE LOCATION..4

Fig. A-62.

DOSE - RADS
 B - 7.500E+01
 C - 1.250E+02
 D - 2.500E+02
 E - 5.000E+02
 F - 1.000E+03
 G - 1.500E+03
 H - 1.800E+03
 I - 7.500E+03
 J - 1.000E+04
 K - 1.200E+04

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....FP RUN 74
 PLATE NO.....P11
 PLATE LOCATION..5

Fig. A-63.

DOSE - RADS
 B - 2.000E+00
 C - 4.000E+00
 D - 8.000E+00
 E - 2.000E+01
 F - 5.000E+01
 G - 1.000E+02
 H - 2.000E+02
 I - 3.000E+02
 J - 5.000E+02
 K - 6.500E+02

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....FP RUN 75
 PLATE NO.....P18
 PLATE LOCATION..1

Fig. A-64.

DOSE - RADS
 B - 1.000E+01
 C - 3.700E+01
 D - 5.000E+01
 E - 7.500E+01
 F - 2.500E+02
 G - 5.000E+02
 H - 1.000E+03
 I - 1.500E+03
 J - 3.000E+03
 K - 5.000E+03

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....FP RUN 76
 PLATE NO.....P10
 PLATE LOCATION..1

Fig. A-65.

DOSE - RADS
 B - 7.500E+01
 C - 2.500E+02
 D - 5.000E+02
 E - 1.000E+03
 F - 1.500E+03
 G - 3.000E+03
 H - 5.000E+03
 I - 7.500E+03
 J - 1.000E+04
 K - 1.200E+04

RUN DATE.....6/14/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....RUN B0
 PLATE NO.....P10
 PLATE LOCATION..1

Fig. A-66.

DOSE - RADS
 B - 5.000E+02
 C - 6.000E+02
 D - 8.000E+02
 E - 1.000E+03
 F - 2.000E+03
 G - 4.000E+03
 H - 6.000E+03
 I - 1.000E+04
 J - 1.500E+04
 K - 1.750E+04

RUN DATE.....6/14/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....RUN 80
 PLATE NO.....P23
 PLATE LOCATION..3

Fig. A-67.

APPENDIX B DOSE CONTOUR PLOT NUMERICAL DATA

Figure B-1 shows the numbering system for the TLD detectors in Lucite. Figures B-2 through B-18 (runs 2 through 5) have the numerical data written into a pattern corresponding to their holder locations. The doses for the remainder of the runs are listed and the coordinates for each detector number are the same as those listed for run 51. Radius is in cm, dose in rad.

Plate code numbering system

See run-51 data for R, θ coordinates

Fig. B-1.

Beam energy 4.88 GeV
 Run date 6/8/76
 Particle Proton
 Plate No. P3
 Plate location 1

Fig. B-2.

Beam energy 4.88 GeV
 Run date 6/8/76
 Particle Proton
 Plate No. P4
 Plate location 2

Fig. B-3.

Beam energy 4.88 GeV
 Run date 6/8/76
 Particle Proton
 Plate No. P5
 Plate location 3

Fig. B-4.

Beam energy 4.88 GeV
 Run date 6/8/76
 Particle Proton
 Plate No. P6
 Plate location 4

Fig. B-5.

Beam energy 4.88 GeV
 Run date 6/8/76
 Particle Proton
 Plate No. P8
 Plate location 4

Fig. B-7.

Beam energy 4.88 GeV
 Run date 6/8/76
 Particle Proton
 Plate No. P9
 Plate location 5

Fig. B-8.

Beam energy 2.1 GeV
 Run date 6/8/76
 Particle Proton
 Plate No. P10
 Plate location 1

Fig. B-9.

Beam energy 2.1 GeV
 Run date 6/8/76
 Particle Proton
 Plate No. P11
 Plate location 2

Fig. B-10.

Beam energy 2.1 GeV
 Run date 6/8/76
 Particle Proton
 Plate No. P12
 Plate location 3

Fig. B-11.

Beam energy 2.1 GeV
 Run date 6/8/76
 Particle Proton
 Plate No. P13
 Plate location 4

Fig. B-12.

Beam energy 2.1 GeV
 Run date 6/8/76
 Particle Proton
 Plate No. P22
 Plate location 5

Fig. B-13.

Beam energy 0.8 GeV
 Run date 6/20/76
 Particle Proton
 Plate No. P13
 Plate location 1

Fig. B-14.

Beam energy 0.8 GeV
 Run date 6/20/76
 Particle Proton
 Plate No. P21
 Plate location 2

Fig. B-15.

Beam energy 0.8 GeV
 Run date 6/20/76
 Particle Proton
 Plate No. P22
 Plate location 3

Fig. B-16.

Beam energy 0.8 GeV
 Run date 6/20/76
 Particle Proton
 Plate No. P23
 Plate location 4

Fig. B-17.

Beam energy 0.8 GeV
 Run date 6/20/76
 Particle Proton
 Plate No. P24
 Plate location 5

Fig. B-18.

Table B-1.

RUN DATE.....9/15/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....300MEV
 TARGET.....P19
 PLATE NO.....
 PLATE LOCATION..1

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	3.786E+01	1	127.38	2.085	4.621E+01	2	119.06	1.883	5.466E+01	3	108.44	1.735	5.697E+01	4	99.72	1.582E+02	5.994E+01
4	96.34	1.656	6.435E+01	5	83.66	1.656	6.598E+01	6	71.57	1.735	6.454E+01	7	60.95	1.883	4.994E+01	8	52.13	1.810	5.715E+01
8	42.54	2.085	4.109E+01	9	45.00	2.328	3.751E+01	10	142.12	2.085	4.195E+01	11	135.00	1.810	5.715E+01	12	125.54	1.573	7.325E+01
16	66.80	1.393	9.256E+01	17	54.46	1.573	6.686E+01	18	45.00	1.610	5.115E+01	19	37.88	2.085	4.123E+01	20	150.95	1.883	5.290E+01
24	101.31	0.933	2.673E+02	25	78.69	0.533	2.392E+02	26	59.04	1.066	6.18E+02	27	45.00	1.293	9.838E+01	28	35.54	1.573	6.255E+01
32	149.04	1.066	1.74E+02	33	135.00	0.776	4.137E+02	34	108.44	0.578	6.058E+01	35	156.80	1.393	9.110E+01	36	45.00	0.776	3.240E+02
40	173.66	1.656	6.038E+01	41	171.87	1.293	1.046E+02	42	168.69	0.933	2.172E+02	43	151.57	0.578	9.029E+02	44	135.00	0.259	4.037E+04
48	8.13	1.293	8.892E+01	49	5.34	1.656	5.378E+01	50	186.34	1.656	5.787E+01	51	188.13	1.293	1.044E+02	52	191.31	0.933	2.181E+02
56	341.57	0.578	4.570E+02	57	348.69	0.933	1.701E+02	58	351.87	1.293	6.764E+01	59	353.66	1.656	5.132E+01	60	198.44	1.735	5.555E+01
64	251.57	0.578	9.330E+02	65	288.44	0.578	6.803E+02	66	315.00	0.776	5.420E+02	67	329.00	1.066	1.207E+02	68	251.57	1.393	7.45E+01
72	225.00	1.293	1.151E+02	73	239.04	1.066	1.646E+02	74	258.69	0.933	2.070E+02	75	281.31	0.933	1.735E+02	76	300.96	1.066	1.258E+02
80	217.88	2.085	4.095E+01	81	225.00	1.293	8.527E+01	82	234.46	1.573	6.507E+01	83	246.80	1.393	8.673E+01	84	251.87	1.573	9.965E+01
88	315.00	1.810	4.755E+01	89	322.13	2.085	3.939E+01	90	225.00	2.328	3.774E+01	91	232.13	2.085	4.137E+01	92	240.95	1.883	4.840E+01
96	288.44	1.735	4.925E+01	97	298.06	1.883	4.738E+01	98	263.66	1.656	6.002E+01	99	276.34	1.656	5.184E+01	100	0.	1.735	4.925E+01
104	0.	6.985	1.085E+00	105	22.50	3.175	3.921E+01	106	22.50	4.445	4.188E+01	107	22.50	4.445	4.285E+00	108	22.50	5.715	2.023E+00
112	45.00	5.715	2.081E+00	113	45.00	6.985	1.051E+00	114	67.50	2.445	3.816E+01	115	67.50	3.175	1.100E+01	116	67.50	4.445	2.042E+00
120	90.00	3.175	4.509E+00	121	67.50	5.715	2.042E+00	122	67.50	6.985	1.205E+00	123	90.00	2.445	3.824E+01	124	112.50	3.175	4.509E+00
128	112.50	2.445	3.752E+01	129	112.50	3.175	1.100E+01	130	112.50	4.445	5.219E+00	131	112.50	5.715	2.170E+00	132	135.00	6.985	1.095E+00
136	135.00	6.985	9.996E+01	137	157.50	2.445	3.773E+01	138	157.50	3.175	1.100E+01	139	157.50	4.445	4.766E+00	140	180.00	5.715	2.042E+00
144	180.00	4.445	4.315E+00	145	180.00	6.985	2.035E+00	146	202.50	2.445	3.757E+01	147	202.50	3.175	1.144E+01	148	222.50	3.175	1.267E+01
152	222.50	3.175	1.37E+01	149	225.00	4.445	4.451E+00	150	225.00	5.715	1.984E+00	151	225.00	6.985	1.027E+00	153	247.50	2.445	3.754E+01
156	247.50	2.445	3.754E+01	154	247.50	3.175	1.209E+01	155	247.50	4.445	4.842E+00	156	247.50	5.715	2.065E+00	157	270.00	6.985	1.007E+00
160	270.00	5.715	2.000E+00	161	270.00	6.985	1.108E+00	162	292.50	2.445	3.921E+01	163	292.50	3.175	1.182E+01	164	292.50	4.445	4.605E+01
168	292.50	4.445	4.213E+00	169	315.00	5.715	2.089E+00	170	315.00	6.985	9.874E+01	171	315.00	8.985	1.070E+01	172	337.50	4.445	4.213E+00
176	337.50	3.175	1.106E+01	173	337.50	4.445	4.803E+01	174	337.50	5.715	1.931E+00	175	337.50	6.985	1.028E+00				

Table B-2.

RUN DATE.....9/15/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....PP RUN 51
 PLATE NO.....F18
 PLATE LOCATION..2

NO	ANGLE	RADIUS	D0SE	NO	ANGLE	RADIUS	D0SE	NO	ANGLE	RADIUS	D0SE	NO	ANGLE	RADIUS	D0SE
0	135.00	2.328	2.808E+01	1	127.88	2.085	3.732E+01	2	119.06	1.843	4.822E+01	3	106.44	1.735	5.040E+01
4	96.34	1.656	5.522E+01	5	83.66	1.656	5.364E+01	6	71.57	1.735	5.064E+01	7	60.95	1.783	5.982E+01
8	52.13	2.085	3.025E+01	9	45.00	2.328	2.272E+01	10	142.10	2.085	3.814E+01	11	135.00	1.810	4.737E+01
12	125.34	1.573	6.619E+01	13	113.20	1.393	8.695E+01	14	98.13	1.293	9.075E+01	15	81.87	1.293	8.616E+01
16	66.80	1.393	7.107E+01	17	54.46	1.573	5.402E+01	18	45.00	1.810	4.334E+01	19	37.88	2.085	2.954E+01
20	150.95	1.883	5.005E+01	21	144.46	1.573	7.320E+01	22	135.00	1.293	9.284E+01	23	120.96	1.066	1.205E+02
24	101.31	0.932	1.320E+02	25	78.69	0.933	1.86E+02	26	59.04	1.066	1.024E+02	27	45.00	1.293	7.496E+01
28	35.34	1.573	5.236E+01	29	29.06	1.883	3.939E+01	30	161.57	1.735	5.794E+01	31	156.80	1.393	8.536E+01
32	149.04	1.066	1.224E+02	33	135.00	0.778	1.779E+02	34	108.44	0.578	2.255E+02	35	71.57	0.578	2.050E+02
36	45.00	0.776	1.460E+02	37	30.96	1.066	9.973E+01	38	23.20	1.393	6.374E+01	39	18.44	1.735	4.178E+01
40	173.66	1.656	6.440E+01	41	171.87	1.293	9.092E+01	42	168.69	0.933	1.463E+02	43	161.57	0.578	2.686E+02
44	135.00	0.259	3.186E+02	45	45.00	0.259	2.901E+02	46	18.44	0.578	1.821E+02	47	11.31	0.933	1.137E+02
48	8.13	1.293	7.929E+01	49	6.34	1.656	4.673E+01	50	186.34	1.656	6.414E+01	51	186.13	1.293	9.681E+01
52	191.31	0.933	1.548E+02	53	198.44	0.578	2.395E+02	54	225.00	0.259	3.130E+02	55	315.00	0.259	2.719E+02
56	341.57	0.578	1.777E+02	57	348.69	0.933	1.130E+02	58	351.87	1.293	7.301E+01	59	353.66	1.656	4.717E+01
60	198.44	1.735	5.706E+01	61	203.20	1.393	8.841E+01	62	210.96	1.066	1.223E+02	63	225.00	0.776	1.721E+02
64	251.57	0.578	2.346E+02	65	288.44	0.578	1.865E+02	66	315.00	0.776	1.421E+02	67	329.00	1.066	9.646E+01
68	338.80	1.393	6.883E+01	69	341.57	1.735	4.183E+01	70	209.05	1.883	4.692E+01	71	215.34	1.573	6.622E+01
72	225.00	0.933	6.769E+01	73	239.04	1.066	1.194E+02	74	258.69	0.933	1.387E+02	75	281.31	0.933	1.208E+02
76	300.96	1.066	1.054E+02	77	315.00	1.293	7.125E+01	78	324.46	1.573	5.513E+01	79	330.95	1.883	3.643E+01
80	217.88	2.085	3.512E+01	81	225.00	1.810	5.214E+01	82	234.46	1.573	6.260E+01	83	246.80	1.393	7.676E+01
84	261.87	1.293	7.995E+01	85	278.13	1.293	7.648E+01	86	293.20	1.393	6.731E+01	87	305.54	1.573	5.079E+01
88	315.00	1.810	3.980E+01	89	322.13	2.085	3.555E+01	90	225.00	2.328	2.605E+01	91	232.13	2.085	3.762E+01
92	240.96	0.933	4.506E+01	93	151.57	1.573	6.921E+01	94	263.66	1.656	6.233E+01	95	276.34	1.656	5.117E+01
96	288.44	1.735	4.455E+01	97	299.06	1.883	3.651E+01	98	307.88	2.085	2.873E+01	99	315.00	2.328	2.233E+01
100	0.	2.445	1.881E+01	101	0.	3.175	9.013E+00	102	0.	4.445	2.949E+00	103	0.	5.715	1.067E+00
104	0.	6.985	5.657E+01	105	22.50	2.445	2.049E+01	106	22.50	3.175	9.671E+00	107	22.50	4.445	2.735E+00
108	22.50	5.715	1.108E+00	109	22.50	6.985	5.305E+01	110	45.00	3.175	9.723E+00	111	45.00	4.445	8.924E+00
112	45.00	5.715	1.184E+00	113	45.00	6.985	5.439E+01	114	67.50	3.445	2.171E+01	115	67.50	3.175	8.993E+00
116	67.50	4.445	3.089E+00	117	67.50	5.715	1.258E+00	118	67.50	6.985	5.577E+01	119	90.00	2.445	2.291E+01
120	90.00	3.175	1.058E+01	121	90.00	4.445	3.212E+00	122	90.00	5.715	1.278E+00	123	90.00	6.985	5.705E+01
124	112.50	2.445	2.425E+01	125	112.50	3.175	1.155E+01	126	112.50	4.445	3.349E+00	127	112.50	5.715	1.292E+00
128	112.50	1.883	3.797E+01	129	135.00	1.735	1.192E+01	130	135.00	4.445	3.471E+00	131	135.00	5.715	1.376E+00
132	135.00	6.985	6.253E+01	133	157.50	2.445	2.547E+01	134	157.50	3.175	1.289E+01	135	157.50	4.445	3.480E+00
136	157.50	5.715	1.306E+00	137	157.50	6.985	6.255E+01	138	180.00	2.445	2.666E+01	139	180.00	3.175	1.134E+01
140	180.00	4.445	3.639E+00	141	180.00	5.715	1.325E+00	142	180.00	6.985	6.442E+01	143	202.50	2.445	2.506E+01
144	202.50	3.175	1.230E+01	145	202.50	4.445	3.360E+00	146	202.50	5.715	1.359E+00	147	202.50	6.985	3.951E+01
148	225.00	1.883	1.106E+01	149	225.00	3.175	1.176E+00	150	225.00	4.445	3.471E+00	151	225.00	5.715	1.385E+00
152	247.50	2.445	2.247E+01	153	247.50	3.175	1.055E+01	154	247.50	4.445	3.243E+00	155	247.50	5.715	1.157E+00
156	247.50	6.985	5.846E+01	157	270.00	2.445	2.188E+01	158	270.00	3.175	1.025E+01	159	270.00	4.445	3.151E+00
160	270.00	5.715	1.178E+00	161	270.00	6.985	5.597E+01	162	292.50	2.445	2.095E+01	163	292.50	3.175	9.814E+00
164	292.50	4.445	2.996E+00	165	292.50	5.715	1.110E+00	166	292.50	6.985	5.694E+01	167	315.00	3.175	9.285E+00
168	315.00	4.445	2.996E+00	169	315.00	5.715	1.176E+00	170	315.00	6.985	5.846E+01	171	315.00	8.985	1.963E+01
172	337.50	3.175	6.911E+00	173	337.50	4.445	1.037E+00	174	337.50	5.715	1.090E+00	175	337.50	6.985	6.479E+01

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RUN DATE      9/13/76
PARTICLE      ELECTRON
BEAM ENERGY  500MEV
TARGET        PP RUN 51
PLATE NO      P17
PLATE LOCATION 3

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172	168	164	160	156	152	148	144	140	136	132	128	124	120	116	112	108	104	100	96	92	88	84	80	76	72	68	64	60	56	52	48	44	40	36	32	28	24	20	16	12	8	4	0	NO																																										
337	333	329	325	321	317	313	309	305	301	297	293	289	285	281	277	273	269	265	261	257	253	249	245	241	237	233	229	225	221	217	213	209	205	201	197	193	189	185	181	177	173	169	165	161	157	153	149	145	141	137	133	129	125	121	117	113	109	105	101	97	93	89	85	81	77	73	69	65	61	57	53	49	45	41	37	33	29	25	21	17	13	9	5	1	0	NO
337	333	329	325	321	317	313	309	305	301	297	293	289	285	281	277	273	269	265	261	257	253	249	245	241	237	233	229	225	221	217	213	209	205	201	197	193	189	185	181	177	173	169	165	161	157	153	149	145	141	137	133	129	125	121	117	113	109	105	101	97	93	89	85	81	77	73	69	65	61	57	53	49	45	41	37	33	29	25	21	17	13	9	5	1	0	NO
337	333	329	325	321	317	313	309	305	301	297	293	289	285	281	277	273	269	265	261	257	253	249	245	241	237	233	229	225	221	217	213	209	205	201	197	193	189	185	181	177	173	169	165	161	157	153	149	145	141	137	133	129	125	121	117	113	109	105	101	97	93	89	85	81	77	73	69	65	61	57	53	49	45	41	37	33	29	25	21	17	13	9	5	1	0	NO
337	333	329	325	321	317	313	309	305	301	297	293	289	285	281	277	273	269	265	261	257	253	249	245	241	237	233	229	225	221	217	213	209	205	201	197	193	189	185	181	177	173	169	165	161	157	153	149	145	141	137	133	129	125	121	117	113	109	105	101	97	93	89	85	81	77	73	69	65	61	57	53	49	45	41	37	33	29	25	21	17	13	9	5	1	0	NO
337	333	329	325	321	317	313	309	305	301	297	293	289	285	281	277	273	269	265	261	257	253	249	245	241	237	233	229	225	221	217	213	209	205	201	197	193	189	185	181	177	173	169	165	161	157	153	149	145	141	137	133	129	125	121	117	113	109	105	101	97	93	89	85	81	77	73	69	65	61	57	53	49	45	41	37	33	29	25	21	17	13	9	5	1	0	NO
337	333	329	325	321	317	313	309	305	301	297	293	289	285	281	277	273	269	265	261	257	253	249	245	241	237	233	229	225	221	217	213	209	205	201	197	193	189	185	181	177	173	169	165	161	157	153	149	145	141	137	133	129	125	121	117	113	109	105	101	97	93	89	85	81	77	73	69	65	61	57	53	49	45	41	37	33	29	25	21	17	13	9	5	1	0	NO
337	333	329	325	321	317	313	309	305	301	297	293	289	285	281	277	273	269	265	261	257	253	249	245	241	237	233	229	225	221	217	213	209	205	201	197	193	189	185	181	177	173	169	165	161	157	153	149	145	141	137	133	129	125	121	117	113	109	105	101	97	93	89	85	81	77	73	69	65	61	57	53	49	45	41	37	33	29	25	21	17	13	9	5	1	0	NO
337	333	329	325	321	317	313	309	305	301	297	293	289	285	281	277	273	269	265	261	257	253	249	245	241	237	233	229	225	221	217	213	209	205	201	197	193	189	185	181	177	173	169	165	161	157	153	149	145	141	137	133	129	125	121	117	113	109	105	101	97	93	89	85	81	77	73	69	65	61	57	53	49	45	41	37	33	29	25	21	17	13	9	5	1	0	NO
337	333	329	325	321	317	313	309	305	301	297	293	289	285	281	277	273	269	265	261	257	253	249	245	241	237	233	229	225	221	217	213	209	205	201	197	193	189	185	181	177	173	169	165	161	157	153	149	145	141	137	133	129	125	121	117	113	109	105	101	97	93	89	85	81	77	73	69	65	61	57	53	49	45	41	37	33	29	25	21	17	13	9	5	1	0	NO
337	333	329	325	321	317	313	309	305	301	297	293	289	285	281	277	273	269	265	261	257	253	249	245	241	237	233	229	225	221	217	213	209	205	201	197	193	189	185	181	177	173	169	165	161	157	153	149	145	141	137	133	129	125	121	117	113	109	105	101	97	93	89	85	81	77	73	69	65	61	57	53	49	45	41	37	33	29	25	21	17	13	9	5	1	0	NO
337	333	329	325	321	317	313	309	305	301	297	293	289	285	281	277	273	269	265	261	257	253	249	245	241	237	233	229	225	221	217	213	209	205	201	197	193	189	185	181	177	173	169	165	161	157	153	149	145	141	137	133	129	125	121	117	113	109	105	101	97	93	89	85	81	77	73	69	65	61	57	53	49	45	41	37	33	29	25	21	17	13	9	5	1	0	NO
337	333	329	325	321	317	313	309	305	301	297	293	289	285	281	277	273	269	265	261	257	253	249	245	241	237	233	229	225	221	217	213	209	205	201	197	193	189	185	181	177	173	169	165	161	157	153	149	145	141	137	133	129	125	121	117	113	109	105	101	97	93	89	85	81	77	73	69	65	61	57	53	49	45	41	37	33	29	25	21	17	13	9	5	1	0	NO
337	333	329	325	321	317	313	309	305	301	297	293	289	285	281	277	273	269	265	261	257	253	249	245	241	237	233	229	225	221	217	213	209	205	201	197	193	189	185	181	177	173	169	165	161	157	153	149	145	141	137	133	129	125	121	117	113	109	105	101	97	93	89	85	81	77	73	69	65	61	57	53	49	45	41	37	33	29	25	21	17	13	9	5	1	0	NO
337	333	329	325	321	317	313	309	305	301	297	293	289	285	281	277	273	269	265	261	257	253	249	245	241	237	233	229	225	221	217	213	209	205	201	197	193	189	185	181	177	173	169	165	161	157	153	149	145	141	137	133	129	125	121	117	113	109	105	101	97	93	89	85	81	77	73	69	65	61	57	53	49	45	41	37	33	29	25	21	17	13	9	5	1	0	NO
337	333	329	325	321	317	313	309	305	301	297	293	289	285	281	277	273	269	265	261	257	253	249	245	241	237	233	229	225	221	217	213	209	205	201	197	193	189	185	181	177	173	169	165	161	157	153	149	145	141	137	133	129	125	121	117	113	109	105	101	97	93	89	85	81	77	73	69	65	61	57	53	49	45	41	37	33	29	25	21	17	13	9	5	1	0	NO
337	333	329	325	321	317	313	309	305	301	297	293	289	285	281	277	273	269	265	261	257	253	249	245	241	237	233	229	225	221	217	213	209	205	201	197	193	189	185	181	177	173	169	165	161	157	153	149	145	141	137	133	129	125	121	117	113	109	105	101	97	93	89	85	81	77	73	69	65	61	57	53	49	45	41	37	33	29	25	21	17	13	9	5	1	0	NO
337	333	329	325	321	317	313	309	305	301	297	293	289	285	281	277	273	269	265	261	257	253	249	245	241	237	233	229	225	221	217	213	209	205	201	197	193	189	185	181	177	173	169	165	161	157	153	149	145	141	137	133	129	125	121	117	113	109	105	101	97	93	89	85	81	77	73	69	65	61	57	53	49	45	41	37	33	29	25	21	17	13	9	5	1	0	NO
337	333	329	325	321	317	313	309	305	301	297	293	289	285	281	277	273	269	265	261	257	253	249	245	241	237	233	229	225	221	217	213	209	205	201	197	193	189	185	181	177	173	169	165	161	157	153	149	145	141	137	133	129	125	121	117	113	109	105	101	97	93	89	85	81	77	73	69	65	61	57	53	49	45	41	37	33	29	25	21	17	13	9	5	1	0	NO
337	333	329</																																																																																				

Table B-4.

RUN DATE.....8/15/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....300MEV
 TARGET.....FB RUN 51
 PLATE NO.....P10
 PLATE LOCATION..14

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	1.87DE-01	1	127.88	2.085	1.830E-01	2	119.05	1.883	1.855E-01	3	108.44	1.735	1.839E-01	4	108.44	1.735	1.839E-01
4	96.34	1.656	1.848E-01	5	83.68	1.656	1.861E-01	6	71.57	1.735	1.853E-01	7	60.35	1.863	1.863E-01	8	52.13	2.085	1.872E-01
8	52.13	2.085	1.828E-01	9	45.00	1.930	1.830E-01	10	142.10	2.085	1.878E-01	11	135.00	1.810	1.872E-01	12	125.54	1.573	1.868E-01
12	125.54	1.573	1.868E-01	13	113.20	1.393	1.860E-01	14	96.13	1.293	1.874E-01	15	81.87	1.293	1.895E-01	16	66.60	1.393	1.880E-01
16	66.60	1.393	1.880E-01	17	54.46	1.573	1.867E-01	18	45.00	1.810	1.841E-01	19	37.88	2.085	1.815E-01	20	150.95	1.863	1.854E-01
20	150.95	1.863	1.854E-01	21	144.46	1.573	1.868E-01	22	135.00	1.293	1.898E-01	23	120.36	1.066	1.861E-01	24	101.31	0.933	1.895E-01
24	101.31	0.933	1.895E-01	25	78.69	0.933	1.902E-01	26	59.04	1.066	1.898E-01	27	45.00	1.293	1.870E-01	28	35.54	1.573	1.872E-01
28	35.54	1.573	1.872E-01	29	29.08	1.853	1.843E-01	30	161.57	1.735	1.855E-01	31	156.80	1.393	1.876E-01	32	149.04	1.066	1.930E-01
32	149.04	1.066	1.930E-01	33	135.00	0.776	1.930E-01	34	108.44	0.578	1.957E-01	35	71.57	0.578	1.952E-01	36	45.00	0.776	1.930E-01
36	45.00	0.776	1.930E-01	37	30.96	1.066	1.932E-01	38	23.20	1.393	1.870E-01	39	18.44	1.735	1.835E-01	40	173.66	1.656	1.854E-01
40	173.66	1.656	1.854E-01	41	171.87	1.293	1.909E-01	42	168.69	0.933	1.920E-01	43	161.57	0.578	1.970E-01	44	135.00	0.259	2.004E-01
44	135.00	0.259	2.004E-01	45	45.00	0.259	2.017E-01	46	18.44	0.578	1.967E-01	47	11.31	0.933	1.954E-01	48	8.13	1.293	1.863E-01
48	8.13	1.293	1.863E-01	49	6.34	1.656	1.859E-01	50	166.34	1.656	1.852E-01	51	188.13	1.293	1.896E-01	52	191.31	0.933	1.915E-01
52	191.31	0.933	1.915E-01	53	188.44	0.578	1.930E-01	54	225.00	0.259	2.052E-01	55	315.00	0.259	2.072E-01	56	341.67	0.578	2.026E-01
56	341.67	0.578	2.026E-01	57	348.69	0.293	1.963E-01	58	351.87	1.293	1.962E-01	59	353.66	1.656	1.863E-01	60	158.44	1.735	1.839E-01
60	158.44	1.735	1.839E-01	61	203.20	1.393	1.859E-01	62	210.95	1.066	1.891E-01	63	225.00	0.776	1.946E-01	64	251.57	0.578	1.972E-01
64	251.57	0.578	1.972E-01	65	288.44	0.578	2.007E-01	66	315.00	0.776	1.972E-01	67	329.00	1.066	1.922E-01	68	335.80	1.393	1.878E-01
68	335.80	1.393	1.878E-01	69	341.37	1.735	1.874E-01	70	209.05	1.853	1.876E-01	71	213.54	1.573	1.837E-01	72	225.00	1.293	1.909E-01
72	225.00	1.293	1.909E-01	73	239.04	1.066	1.904E-01	74	258.69	0.933	1.896E-01	75	281.31	0.933	1.887E-01	76	300.96	1.066	1.889E-01
76	300.96	1.066	1.889E-01	77	315.00	1.293	1.854E-01	78	324.48	1.573	1.891E-01	79	330.35	1.863	1.843E-01	80	217.88	2.085	1.854E-01
80	217.88	2.085	1.854E-01	81	225.00	1.810	1.948E-01	82	234.48	1.573	1.850E-01	83	246.80	1.393	1.863E-01	84	251.87	1.293	1.872E-01
84	251.87	1.293	1.872E-01	85	278.13	1.293	1.867E-01	86	293.20	1.393	1.880E-01	87	305.54	1.573	1.859E-01	88	315.00	1.810	1.937E-01
88	315.00	1.810	1.937E-01	89	322.13	2.085	1.815E-01	90	225.00	2.328	1.828E-01	91	232.13	2.085	1.817E-01	92	240.95	1.863	1.815E-01
92	240.95	1.863	1.815E-01	93	251.37	1.735	1.859E-01	94	283.66	1.656	1.820E-01	95	276.34	1.656	1.856E-01	96	268.44	1.735	1.839E-01
96	268.44	1.735	1.839E-01	97	299.06	1.853	1.878E-01	98	307.88	2.085	1.833E-01	99	315.00	2.328	1.839E-01	100	0	0	1.828E-01
100	0	0	1.828E-01	101	22.50	2.175	1.824E-01	102	0	4.445	1.798E-01	103	22.50	3.175	1.833E-01	104	0	6.985	1.817E-01
104	0	6.985	1.817E-01	105	22.50	2.175	1.830E-01	106	22.50	3.175	1.835E-01	107	22.50	4.445	1.817E-01	108	22.50	5.715	1.787E-01
108	22.50	5.715	1.787E-01	109	22.50	6.985	1.796E-01	110	45.00	3.175	1.835E-01	111	45.00	4.445	1.817E-01	112	45.00	5.715	1.830E-01
112	45.00	5.715	1.830E-01	113	45.00	6.985	1.796E-01	114	87.50	2.445	1.826E-01	115	87.50	3.175	1.856E-01	116	87.50	4.445	1.855E-01
116	87.50	4.445	1.855E-01	117	87.50	5.715	1.846E-01	118	87.50	6.985	1.796E-01	119	90.00	2.445	1.856E-01	120	90.00	3.175	1.826E-01
120	90.00	3.175	1.826E-01	121	90.00	4.445	1.802E-01	122	110.00	5.715	1.817E-01	123	90.00	6.985	1.826E-01	124	112.50	2.445	1.859E-01
124	112.50	2.445	1.859E-01	125	112.50	3.175	1.830E-01	126	112.50	4.445	1.833E-01	127	112.50	5.715	1.822E-01	128	112.50	6.985	1.809E-01
128	112.50	6.985	1.809E-01	129	135.00	3.175	1.813E-01	130	135.00	4.445	1.809E-01	131	135.00	5.715	1.804E-01	132	135.00	6.985	1.785E-01
132	135.00	6.985	1.785E-01	133	157.50	2.445	1.809E-01	134	157.50	3.175	1.824E-01	135	157.50	4.445	1.826E-01	136	187.80	5.715	1.798E-01
136	187.80	5.715	1.798E-01	137	157.50	6.985	1.837E-01	138	180.00	2.445	1.824E-01	139	180.00	3.175	1.793E-01	140	180.00	4.445	1.805E-01
140	180.00	4.445	1.805E-01	141	180.00	5.715	1.783E-01	142	180.00	6.985	1.754E-01	143	200.00	2.445	1.826E-01	144	202.50	3.175	1.778E-01
144	202.50	3.175	1.778E-01	145	202.50	4.445	1.800E-01	146	202.50	5.715	1.756E-01	147	202.50	6.985	1.772E-01	148	225.00	3.175	1.804E-01
148	225.00	3.175	1.804E-01	149	225.00	4.445	1.811E-01	150	225.00	5.715	1.789E-01	151	225.00	6.985	1.750E-01	152	247.50	2.445	1.809E-01
152	247.50	2.445	1.809E-01	153	247.50	3.175	1.802E-01	154	247.50	4.445	1.789E-01	155	247.50	5.715	1.754E-01	156	247.50	6.985	1.737E-01
156	247.50	6.985	1.737E-01	157	270.00	2.445	1.811E-01	158	270.00	3.175	1.822E-01	159	292.50	4.445	1.805E-01	160	270.00	5.715	1.789E-01
160	270.00	5.715	1.789E-01	161	270.00	6.985	1.761E-01	162	292.50	2.445	1.822E-01	163	292.50	3.175	1.809E-01	164	292.50	4.445	1.785E-01
164	292.50	4.445	1.785E-01	165	292.50	5.715	1.770E-01	166	315.00	6.985	1.754E-01	167	315.00	3.175	1.815E-01	168	315.00	4.445	1.820E-01
168	315.00	4.445	1.820E-01	169	315.00	5.715	1.763E-01	170	315.00	6.985	1.759E-01	171	337.50	2.445	1.820E-01	172	337.50	3.175	1.813E-01
172	337.50	3.175	1.813E-01	173	337.50	4.445	1.789E-01	174	337.50	5.715	1.743E-01	175	337.50	6.985	1.813E-01				

Table B-5.

RUN DATE.....9/15/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN 51
 PLATE NO.....P13
 PLATE LOCATION..5

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.135	-01	1	127.88	2.185	-01	2	119.06	2.185	-01	3	108.44	1.735	-01	4	95.34	1.656	-01
5	82.13	2.038	-01	6	63.66	1.656	-01	7	41.50	1.485	-01	8	22.50	1.485	-01	9	13.00	1.485	-01
10	52.13	2.038	-01	11	34.46	2.328	-01	12	142.10	2.085	-01	13	98.13	1.293	-01	14	81.87	1.293	-01
15	126.54	1.573	-01	16	113.20	1.393	-01	17	98.13	1.293	-01	18	81.87	1.293	-01	19	63.66	1.293	-01
20	65.80	1.393	-01	21	54.46	1.573	-01	22	41.50	1.810	-01	23	22.50	1.810	-01	24	13.00	1.810	-01
25	150.95	1.883	-01	26	144.46	1.573	-01	27	135.00	1.293	-01	28	120.96	1.066	-01	29	108.44	1.066	-01
30	101.31	0.933	-01	31	78.69	0.933	-01	32	59.04	1.066	-01	33	41.50	1.293	-01	34	22.50	1.293	-01
35	35.54	1.573	-01	36	24.86	1.883	-01	37	161.57	1.735	-01	38	142.10	1.573	-01	39	126.54	1.573	-01
40	149.04	1.066	-01	41	135.00	0.776	-01	42	108.44	0.578	-01	43	98.13	0.578	-01	44	81.87	0.578	-01
45	45.00	0.776	-01	46	30.96	1.966	-01	47	23.20	1.393	-01	48	13.00	1.393	-01	49	6.34	1.393	-01
50	173.66	1.656	-01	51	171.87	1.293	-01	52	168.69	0.333	-01	53	154.46	0.333	-01	54	142.10	0.333	-01
55	135.00	0.259	-01	56	45.00	0.259	-01	57	18.44	0.578	-01	58	16.34	0.578	-01	59	14.46	0.578	-01
60	8.13	1.293	-01	61	6.34	1.656	-01	62	186.34	1.656	-01	63	173.66	1.656	-01	64	161.57	1.656	-01
65	191.31	0.933	-01	66	198.44	0.578	-01	67	225.00	0.259	-01	68	213.66	0.259	-01	69	201.31	0.259	-01
70	341.57	0.978	-01	71	348.69	0.933	-01	72	351.87	1.293	-01	73	348.69	1.293	-01	74	336.80	1.293	-01
75	196.44	1.735	-01	76	203.20	1.393	-01	77	210.96	1.066	-01	78	201.31	1.066	-01	79	191.31	1.066	-01
80	251.57	0.578	-01	81	268.44	0.578	-01	82	315.00	0.776	-01	83	303.20	0.776	-01	84	291.31	0.776	-01
85	336.80	1.393	-01	86	341.57	1.735	-01	87	363.66	1.883	-01	88	351.87	1.883	-01	89	341.57	1.883	-01
90	225.00	1.293	-01	91	239.04	1.066	-01	92	258.69	0.933	-01	93	268.44	0.933	-01	94	258.69	0.933	-01
95	300.96	1.066	-01	96	315.00	1.293	-01	97	324.46	1.573	-01	98	336.80	1.573	-01	99	348.69	1.573	-01
100	217.88	2.085	-01	101	215.00	1.810	-01	102	234.46	1.573	-01	103	251.57	1.573	-01	104	268.44	1.573	-01
105	261.87	1.293	-01	106	278.13	1.293	-01	107	293.20	1.393	-01	108	303.20	1.393	-01	109	315.00	1.393	-01
110	315.00	1.066	-01	111	322.13	2.085	-01	112	336.80	2.328	-01	113	348.69	2.328	-01	114	351.87	2.328	-01
115	248.44	1.883	-01	116	251.57	1.735	-01	117	268.44	1.656	-01	118	281.31	1.656	-01	119	291.31	1.656	-01
120	268.44	1.735	-01	121	279.06	1.683	-01	122	299.06	1.573	-01	123	315.00	1.573	-01	124	336.80	1.573	-01
125	0.00	2.445	-01	126	111.11	3.175	-01	127	225.00	4.445	-01	128	348.69	4.445	-01	129	363.66	4.445	-01
130	22.50	6.985	-01	131	45.00	2.328	-01	132	67.50	2.445	-01	133	90.00	2.445	-01	134	112.50	2.445	-01
135	45.00	6.715	-01	136	67.50	6.985	-01	137	90.00	6.985	-01	138	112.50	6.985	-01	139	135.00	6.985	-01
140	67.50	4.445	-01	141	90.00	4.445	-01	142	112.50	4.445	-01	143	135.00	4.445	-01	144	157.50	4.445	-01
145	90.00	3.175	-01	146	112.50	3.175	-01	147	135.00	3.175	-01	148	157.50	3.175	-01	149	180.00	3.175	-01
150	112.50	6.985	-01	151	135.00	6.985	-01	152	157.50	6.985	-01	153	180.00	6.985	-01	154	202.50	6.985	-01
155	135.00	6.985	-01	156	157.50	6.985	-01	157	180.00	6.985	-01	158	202.50	6.985	-01	159	225.00	6.985	-01
160	157.50	5.715	-01	161	180.00	5.715	-01	162	202.50	5.715	-01	163	225.00	5.715	-01	164	247.50	5.715	-01
165	180.00	4.445	-01	166	202.50	4.445	-01	167	225.00	4.445	-01	168	247.50	4.445	-01	169	270.00	4.445	-01
170	225.00	3.175	-01	171	247.50	3.175	-01	172	270.00	3.175	-01	173	292.50	3.175	-01	174	315.00	3.175	-01
175	247.50	2.445	-01	176	270.00	2.445	-01	177	292.50	2.445	-01	178	315.00	2.445	-01	179	337.50	2.445	-01
180	270.00	1.656	-01	181	292.50	1.656	-01	182	315.00	1.656	-01	183	337.50	1.656	-01	184	360.00	1.656	-01
185	292.50	1.393	-01	186	315.00	1.393	-01	187	337.50	1.393	-01	188	360.00	1.393	-01	189	382.50	1.393	-01
190	315.00	1.066	-01	191	337.50	1.066	-01	192	360.00	1.066	-01	193	382.50	1.066	-01	194	405.00	1.066	-01
195	337.50	0.776	-01	196	360.00	0.776	-01	197	382.50	0.776	-01	198	405.00	0.776	-01	199	427.50	0.776	-01
200	360.00	0.578	-01	201	382.50	0.578	-01	202	405.00	0.578	-01	203	427.50	0.578	-01	204	450.00	0.578	-01
205	382.50	0.333	-01	206	405.00	0.333	-01	207	427.50	0.333	-01	208	450.00	0.333	-01	209	472.50	0.333	-01
210	405.00	0.259	-01	211	427.50	0.259	-01	212	450.00	0.259	-01	213	472.50	0.259	-01	214	495.00	0.259	-01
215	427.50	0.181	-01	216	450.00	0.181	-01	217	472.50	0.181	-01	218	495.00	0.181	-01	219	517.50	0.181	-01
220	450.00	0.139	-01	221	472.50	0.139	-01	222	495.00	0.139	-01	223	517.50	0.139	-01	224	540.00	0.139	-01
225	472.50	0.106	-01	226	495.00	0.106	-01	227	517.50	0.106	-01	228	540.00	0.106	-01	229	562.50	0.106	-01
230	495.00	0.078	-01	231	517.50	0.078	-01	232	540.00	0.078	-01	233	562.50	0.078	-01	234	585.00	0.078	-01
235	517.50	0.058	-01	236	540.00	0.058	-01	237	562.50	0.058	-01	238	585.00	0.058	-01	239	607.50	0.058	-01
240	540.00	0.044	-01	241	562.50	0.044	-01	242	585.00	0.044	-01	243	607.50	0.044	-01	244	630.00	0.044	-01
245	562.50	0.033	-01	246	585.00	0.033	-01	247	607.50	0.033	-01	248	630.00	0.033	-01	249	652.50	0.033	-01
250	585.00	0.026	-01	251	607.50	0.026	-01	252	630.00	0.026	-01	253	652.50	0.026	-01	254	675.00	0.026	-01
255	607.50	0.020	-01	256	630.00	0.020	-01	257	652.50	0.020	-01	258	675.00	0.020	-01	259	697.50	0.020	-01
260	630.00	0.015	-01	261	652.50	0.015	-01	262	675.00	0.015	-01	263	697.50	0.015	-01	264	720.00	0.015	-01
265	652.50	0.011	-01	266	675.00	0.011	-01	267	697.50	0.011	-01	268	720.00	0.011	-01	269	742.50	0.011	-01
270	675.00	0.008	-01	271	697.50	0.008	-01	272	720.00	0.008	-01	273	742.50	0.008	-01	274	765.00	0.008	-01
275	697.50	0.006	-01	276	720.00	0.006	-01	277	742.50	0.006	-01	278	765.00	0.006	-01	279	787.50	0.006	-01
280	720.00	0.004	-01	281	742.50	0.004	-01	282	765.00	0.004	-01	283	787.50	0.004	-01	284	810.00	0.004	-01
285	742.50	0.003	-01	286	765.00	0.003	-01	287	787.50	0.003	-01	288	810.00	0.003	-01	289	832.50	0.003	-01
290	765.00	0.002	-01	291	787.50	0.002	-01	292	810.00	0.002	-01	293	832.50	0.002	-01	294	855.00	0.002	-01
295	787.50	0.001	-01	296	810.00	0.001	-01	297	832.50	0.001	-01	298	855.00	0.001	-01	299	877.50	0.001	-01
300	810.00	0.001	-01	301	832.50	0.001	-01	302	855.00	0.001	-01	303	877.50	0.001	-01	304	900.00	0.001	-01

Table B-6.

RUN DATE.....9/15/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN 52
 PLATE NO.....86
 PLATE LOCATION..2

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	1.506E+03	1	127.88	2.085	1.923E+03	2	119.06	1.883	2.403E+03	3	108.44	1.735	2.828E+03
4	96.34	1.656	3.094E+03	5	83.66	1.656	3.060E+03	6	71.57	1.735	2.873E+03	7	60.95	1.883	2.250E+03
8	52.13	2.085	1.899E+03	9	45.00	2.328	1.509E+03	10	142.10	2.085	1.886E+03	11	135.00	1.810	2.605E+03
12	12.54	1.573	3.622E+03	13	113.20	1.393	4.331E+03	14	98.13	1.293	4.493E+03	15	81.87	1.293	4.754E+03
16	66.80	1.393	4.027E+03	17	54.46	1.573	3.245E+03	18	45.00	1.910	2.637E+03	19	37.88	2.085	1.825E+03
20	150.95	1.883	2.556E+03	21	144.46	1.573	3.500E+03	22	135.00	1.293	4.935E+03	23	120.96	1.066	6.028E+03
24	101.31	0.933	7.490E+03	25	78.69	0.933	7.240E+03	26	59.04	1.066	6.335E+03	27	45.00	1.293	4.581E+03
28	35.54	1.573	3.302E+03	29	29.06	1.883	2.223E+03	30	161.57	1.735	2.818E+03	31	156.80	1.393	4.239E+03
32	149.04	1.066	6.474E+03	33	135.00	0.776	9.035E+03	34	108.44	0.578	1.242E+04	35	71.57	0.578	1.186E+04
36	45.00	0.776	8.267E+03	37	30.96	1.066	5.969E+03	38	23.20	1.393	4.135E+03	39	18.44	1.735	2.630E+03
40	173.66	1.656	2.936E+03	41	171.87	1.293	4.573E+03	42	168.69	0.933	7.686E+03	43	161.57	0.578	1.115E+04
44	135.00	0.259	1.320E+04	45	45.00	0.259	1.703E+04	46	18.44	0.578	1.096E+04	47	11.31	0.933	7.259E+03
48	8.13	1.293	4.635E+03	49	6.34	1.656	3.022E+03	50	186.34	1.656	3.154E+03	51	188.13	1.293	4.689E+03
52	191.31	0.933	7.265E+03	53	198.44	0.578	1.133E+04	54	225.00	0.259	1.616E+04	55	315.00	0.259	1.603E+04
56	341.57	0.578	1.098E+04	57	348.69	0.933	6.702E+03	58	351.87	1.293	4.357E+03	59	353.66	1.656	2.814E+03
60	199.44	1.735	2.838E+03	61	203.20	1.393	4.064E+03	62	210.96	1.066	6.324E+03	63	225.00	0.776	9.232E+03
64	251.67	0.578	1.114E+04	65	288.44	0.578	1.079E+04	66	315.00	0.776	9.013E+03	67	329.00	1.066	5.734E+03
68	336.80	1.393	3.965E+03	69	341.57	1.735	2.666E+03	70	209.05	1.883	2.439E+03	71	215.54	1.573	3.544E+03
72	228.00	1.293	4.307E+03	73	239.04	1.066	6.216E+03	74	258.69	0.933	7.482E+03	75	281.31	0.578	3.027E+03
76	300.96	1.066	6.013E+03	77	315.00	1.393	4.180E+03	78	324.46	1.573	3.356E+03	79	330.95	1.883	2.398E+03
80	217.88	2.085	1.890E+03	81	225.00	1.810	2.577E+03	82	234.46	1.573	3.400E+03	83	246.80	1.393	4.093E+03
84	261.87	1.293	4.515E+03	85	278.13	1.293	4.494E+03	86	293.00	1.573	3.859E+03	87	305.54	1.573	3.406E+03
88	315.00	1.810	2.530E+03	89	322.13	2.085	1.851E+03	90	225.00	2.328	1.451E+03	91	232.13	2.085	1.937E+03
92	240.95	1.883	2.315E+03	93	251.57	1.735	2.642E+03	94	263.66	1.656	2.986E+03	95	276.34	1.656	3.028E+03
96	288.44	1.735	2.541E+03	97	299.06	1.883	2.224E+03	98	307.88	2.085	1.891E+03	99	315.00	2.328	1.477E+03
100	0.	2.445	1.216E+03	101	0.	3.175	5.679E+02	102	0.	4.445	1.725E+02	103	0.	5.715	6.326E+01
104	0.	8.985	3.754E+01	105	22.50	2.445	1.284E+03	106	22.50	3.175	5.616E+02	107	22.50	4.445	1.681E+02
108	22.50	5.715	6.360E+01	109	22.50	6.985	3.751E+01	110	47.50	3.175	5.616E+02	111	47.50	4.445	1.682E+02
112	45.00	5.715	6.417E+01	113	45.00	6.985	3.752E+01	114	67.50	2.445	1.244E+03	115	67.50	3.175	5.947E+02
116	67.50	4.445	1.848E+02	117	67.50	5.715	6.380E+01	118	67.50	6.985	3.752E+01	119	90.00	2.445	1.276E+03
120	90.00	3.175	6.046E+02	121	90.00	4.445	1.748E+02	122	90.00	5.715	6.761E+01	123	90.00	6.985	3.786E+01
124	112.50	1.393	1.376E+03	125	2.50	3.175	6.484E+02	126	112.50	4.445	1.922E+02	127	112.50	5.715	7.124E+01
128	112.50	6.985	3.751E+01	129	135.00	3.175	6.484E+02	130	135.00	4.445	1.922E+02	131	135.00	5.715	7.124E+01
132	135.00	6.985	3.872E+01	133	157.50	2.445	1.400E+03	134	157.50	3.175	6.326E+02	135	157.50	4.445	1.775E+02
136	157.50	5.715	6.852E+01	137	157.50	6.985	3.883E+01	138	180.00	2.445	1.376E+03	139	180.00	3.175	6.415E+02
140	180.00	4.445	2.009E+03	141	180.00	5.715	6.924E+01	142	180.00	6.985	3.862E+01	143	202.50	2.445	1.400E+03
144	202.50	3.175	6.118E+02	145	202.50	4.445	1.796E+02	146	202.50	5.715	7.270E+01	147	202.50	6.985	3.760E+01
148	225.00	3.175	6.041E+02	149	225.00	4.445	1.938E+02	150	225.00	5.715	6.979E+01	151	225.00	6.985	3.760E+01
152	247.50	2.445	1.235E+03	153	247.50	3.175	5.963E+02	154	247.50	4.445	1.898E+02	155	247.50	5.715	6.453E+01
156	247.50	6.985	3.751E+01	157	270.00	2.445	1.213E+03	158	270.00	3.175	5.534E+02	159	270.00	4.445	1.785E+02
160	270.00	5.715	6.985E+01	161	270.00	6.985	3.760E+01	162	292.50	2.445	1.218E+03	163	292.50	3.175	6.415E+01
164	292.50	4.445	1.782E+02	165	292.50	5.715	6.525E+01	166	315.00	6.985	3.755E+01	167	315.00	3.175	6.132E+02
168	315.00	4.445	1.690E+02	169	315.00	5.715	6.290E+01	170	315.00	6.985	3.767E+01	171	337.50	2.445	1.263E+03
172	337.50	3.175	5.549E+02	173	337.50	4.445	1.757E+02	174	337.50	5.715	6.725E+01	175	337.50	6.985	3.754E+01

Table B-7

RUN DATE..... 9/15/76
 PARTICLE..... ELECTRON
 BEAM ENERGY..... 500MEV
 TARGET..... F21
 PLATE NO..... RUN 52
 PLATE LOCATION: 3

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	1.884E+01	1	127.88	2.085	2.180E+01	2	119.06	1.883	2.472E+01	3	108.44	1.735	2.605E+01
4	96.34	1.656	2.622E+01	5	83.66	1.636	2.642E+01	6	71.67	1.735	2.660E+01	7	60.95	1.893	2.276E+01
8	52.13	2.085	2.239E+01	9	45.00	2.328	1.860E+01	10	42.10	2.085	2.256E+01	11	135.00	1.810	2.417E+01
12	125.54	1.573	2.830E+01	13	113.20	1.393	3.008E+01	14	98.13	1.293	3.120E+01	15	81.87	1.293	3.172E+01
16	66.80	1.393	2.941E+01	17	54.48	1.573	2.618E+01	18	45.00	1.810	2.499E+01	19	37.88	2.085	2.180E+01
20	150.95	1.893	2.632E+01	21	144.46	1.573	2.795E+01	22	136.00	1.293	3.272E+01	23	120.96	1.066	3.752E+01
24	101.31	0.933	3.778E+01	25	78.69	0.933	4.025E+01	26	59.04	1.066	3.554E+01	27	45.00	1.293	3.068E+01
28	35.54	1.573	2.956E+01	29	29.08	1.893	2.271E+01	30	181.57	1.735	2.849E+01	31	156.80	1.393	3.055E+01
32	149.04	1.066	3.676E+01	33	135.00	0.776	4.348E+01	34	108.44	0.578	4.677E+01	35	71.57	0.578	4.927E+01
36	45.00	0.776	4.136E+01	37	30.96	1.066	3.367E+01	38	23.20	1.393	3.242E+01	39	18.44	1.735	2.407E+01
40	173.66	1.656	2.757E+01	41	171.87	1.293	3.283E+01	42	168.69	0.933	3.463E+01	43	161.57	0.578	5.340E+01
44	135.00	0.259	6.125E+01	45	45.00	0.259	6.218E+01	46	18.44	0.578	5.049E+01	47	11.31	0.933	3.717E+01
48	8.13	0.933	3.102E+01	49	5.34	1.656	2.686E+01	50	186.34	1.656	2.722E+01	51	188.13	1.293	3.502E+01
52	191.31	0.933	4.001E+01	53	198.44	0.578	4.919E+01	54	225.00	0.259	6.308E+01	55	315.00	0.259	5.720E+01
56	191.57	0.578	4.788E+01	57	348.69	0.933	3.861E+01	58	351.87	1.293	3.086E+01	59	353.66	1.656	2.748E+01
60	198.44	1.735	2.511E+01	61	203.20	1.393	3.222E+01	62	210.96	1.066	3.922E+01	63	225.00	0.776	4.823E+01
64	231.57	0.578	5.192E+01	65	288.44	0.578	4.471E+01	66	315.00	0.776	4.371E+01	67	329.00	1.066	3.593E+01
68	336.80	1.393	3.665E+01	69	341.57	1.735	2.581E+01	70	209.05	1.893	2.763E+01	71	215.54	1.573	2.944E+01
72	225.00	1.293	3.380E+01	73	239.04	1.066	3.826E+01	74	258.69	0.933	3.050E+01	75	281.31	0.933	4.055E+01
76	300.98	1.066	3.679E+01	77	315.00	1.293	3.157E+01	78	324.46	1.573	3.047E+01	79	330.95	1.893	2.332E+01
80	217.88	2.085	2.106E+01	81	225.00	1.810	2.517E+01	82	234.46	1.573	3.006E+01	83	246.80	1.393	2.632E+01
84	261.87	1.293	3.286E+01	85	276.13	1.293	3.445E+01	86	293.20	1.393	3.265E+01	87	305.54	1.573	2.962E+01
88	315.00	1.810	2.418E+01	89	322.13	2.085	2.165E+01	90	225.00	1.933	3.925E+01	91	232.13	2.085	2.177E+01
92	240.95	1.893	2.671E+01	93	251.57	1.735	2.603E+01	94	263.66	1.656	2.647E+01	95	276.34	1.656	2.933E+01
96	288.44	1.735	2.597E+01	97	299.06	1.893	2.445E+01	98	307.88	2.085	2.053E+01	99	315.00	2.328	1.950E+01
100	0.	2.445	1.897E+01	101	0.	3.175	1.193E+01	102	0.	4.445	0.018E+00	103	0.	5.715	3.388E+00
104	0.	6.985	1.984E+00	105	22.50	4.445	1.616E+01	106	22.50	3.175	1.270E+01	107	22.50	4.445	5.673E+00
108	22.50	5.715	3.305E+00	109	22.50	6.985	1.882E+00	110	45.00	3.175	1.54E+01	111	45.00	4.445	6.321E+00
112	45.00	5.715	3.243E+00	113	45.00	6.985	1.895E+00	114	67.50	2.445	1.785E+01	115	67.50	3.175	1.118E+01
116	67.50	4.445	6.216E+00	117	67.50	5.715	3.360E+00	118	67.50	6.985	1.869E+00	119	90.00	2.445	1.681E+01
120	90.00	3.175	1.286E+01	121	90.00	4.445	5.923E+00	122	90.00	5.715	3.275E+00	123	90.00	6.985	2.178E+00
124	112.50	2.445	3.407E+01	125	112.50	4.445	1.185E+01	126	112.50	4.445	6.822E+00	127	112.50	5.715	3.490E+00
128	112.50	6.985	2.179E+00	129	135.00	3.175	1.277E+01	130	135.00	4.445	5.868E+00	131	135.00	5.715	3.794E+00
132	135.00	6.985	2.207E+00	133	157.50	2.445	1.675E+01	134	157.50	3.175	1.216E+01	135	157.50	4.445	6.452E+00
136	157.50	5.715	3.433E+00	137	157.50	6.985	2.013E+01	138	180.00	2.445	1.791E+01	139	180.00	3.175	1.181E+01
140	180.00	4.445	7.024E+00	141	180.00	5.715	3.354E+00	142	180.00	6.985	2.002E+00	143	202.50	2.445	1.895E+01
144	202.50	3.175	1.237E+01	145	202.50	4.445	6.620E+00	146	202.50	5.715	3.802E+00	147	202.50	6.985	2.153E+00
148	225.00	3.175	1.256E+01	149	225.00	4.445	6.868E+00	150	225.00	5.715	3.600E+00	151	225.00	6.985	2.074E+00
152	247.50	2.445	1.888E+01	153	247.50	3.175	1.196E+01	154	247.50	4.445	6.418E+00	155	247.50	5.715	3.553E+00
156	247.50	6.985	1.973E+00	157	270.00	4.445	1.798E+01	158	270.00	3.175	1.306E+01	159	270.00	4.445	6.752E+00
160	270.00	4.715	3.407E+01	161	270.00	6.985	1.987E+01	162	292.50	2.445	1.785E+01	163	292.50	3.175	1.179E+01
164	292.50	4.445	6.223E+00	165	292.50	5.715	3.455E+00	166	315.00	6.985	2.032E+00	167	315.00	1.193E+01	1.193E+01
168	315.00	4.445	6.742E+00	169	315.00	5.715	3.444E+00	170	315.00	6.985	2.107E+00	171	337.50	2.445	1.724E+01
172	337.50	3.175	1.171E+01	173	337.50	4.445	6.088E+00	174	337.50	5.715	3.410E+00	175	337.50	6.985	1.890E+00

Table B-8.

RUN DATE.....9/15/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....P22 RUN 52
 PLATE NO.....P22
 PLATE LOCATION..4

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	1.491E+00	1	127.88	2.085	1.475E+00	2	119.06	1.883	1.623E+00	3	108.44	1.735	1.580E+00
4	96.34	1.656	1.555E+00	5	83.66	1.656	1.605E+00	6	71.57	1.735	1.601E+00	7	60.95	1.883	1.591E+00
8	52.13	2.085	1.535E+00	9	41.20	2.328	1.516E+00	10	142.10	2.085	1.410E+00	11	135.00	1.101	1.540E+00
12	125.54	1.573	1.565E+00	13	113.20	1.393	1.787E+00	14	98.13	1.293	1.884E+00	15	81.37	1.293	1.902E+00
16	66.80	1.393	1.733E+00	17	54.46	1.573	1.669E+00	18	45.00	1.810	1.667E+00	19	37.88	2.085	1.559E+00
20	150.95	1.883	1.505E+00	21	144.46	1.573	1.528E+00	22	135.00	1.293	1.708E+00	23	120.96	1.066	1.709E+00
24	101.31	0.933	1.838E+00	25	78.69	0.933	1.923E+00	26	59.04	1.066	2.049E+00	27	45.00	1.293	1.828E+00
28	35.54	1.573	1.633E+00	29	29.06	1.883	1.589E+00	30	161.57	1.735	1.511E+00	31	156.80	1.393	1.593E+00
32	149.04	1.066	1.817E+00	33	135.00	0.776	1.877E+00	34	108.44	0.578	2.178E+00	35	71.57	0.578	2.380E+00
36	45.00	0.776	2.359E+00	37	30.96	1.066	2.120E+00	38	23.20	1.393	1.876E+00	39	18.44	1.735	1.678E+00
40	173.66	1.656	1.508E+00	41	171.87	1.293	1.602E+00	42	168.69	0.933	1.703E+00	43	161.57	0.578	1.879E+00
44	135.00	0.259	2.394E+00	45	45.00	0.259	2.702E+00	46	18.44	0.578	2.539E+00	47	11.31	0.933	2.056E+00
48	8.13	1.293	1.899E+00	49	6.34	1.656	1.730E+00	50	186.34	1.656	1.626E+00	51	188.13	1.293	1.669E+00
52	191.31	0.933	1.953E+00	53	198.44	0.578	2.140E+00	54	225.00	0.259	2.521E+00	55	315.00	0.259	2.792E+00
56	341.57	0.578	2.528E+00	57	348.69	0.933	2.093E+00	58	351.87	1.293	2.011E+00	59	353.66	1.656	1.804E+00
60	196.44	1.393	1.499E+00	61	203.20	1.393	1.603E+00	62	210.96	1.066	1.928E+00	63	225.00	0.776	2.019E+00
64	251.57	0.578	2.159E+00	65	288.44	0.578	2.420E+00	66	315.00	0.776	2.140E+00	67	329.00	1.066	1.951E+00
68	336.80	1.393	1.849E+00	69	341.57	1.735	1.646E+00	70	209.05	1.883	1.620E+00	71	215.54	1.573	1.569E+00
72	223.00	1.293	1.733E+00	73	239.04	1.066	1.848E+00	74	258.69	0.933	2.038E+00	75	281.31	0.933	1.903E+00
76	300.96	1.066	1.966E+00	77	315.00	1.293	1.822E+00	78	324.46	1.573	1.771E+00	79	330.95	1.883	1.639E+00
80	217.88	1.293	1.511E+00	81	225.00	1.810	1.545E+00	82	234.46	1.573	1.630E+00	83	246.80	1.393	1.685E+00
84	261.87	1.293	1.794E+00	85	278.13	1.293	1.777E+00	86	293.20	1.393	1.836E+00	87	305.54	1.573	1.649E+00
88	315.00	1.810	1.605E+00	89	322.13	2.085	1.735E+00	90	225.00	2.328	1.476E+00	91	232.13	2.085	1.534E+00
92	240.95	1.883	1.600E+00	93	251.57	1.735	1.538E+00	94	263.66	1.656	1.581E+00	95	276.34	1.656	1.647E+00
96	288.44	1.735	1.625E+00	97	298.06	1.883	1.601E+00	98	307.88	2.085	1.501E+00	99	315.00	2.328	1.625E+00
100	0	0	0	101	0	0	0	102	0	0	0	103	0	0	0
104	0	6.985	1.078E+00	105	22.50	2.445	1.501E+00	106	22.50	3.175	1.383E+00	107	22.50	4.445	1.188E+00
108	22.50	5.715	1.190E+00	109	22.50	6.985	1.109E+00	110	45.00	3.175	1.368E+00	111	45.00	4.445	1.195E+00
112	45.00	5.715	1.114E+00	113	45.00	6.985	1.080E+00	114	67.50	2.445	1.428E+00	115	67.50	3.175	1.326E+00
116	67.50	4.445	1.233E+00	117	67.50	5.715	1.183E+00	118	67.50	5.985	1.058E+00	119	90.00	2.445	1.395E+00
120	90.00	3.175	1.340E+00	121	90.00	4.445	1.254E+00	122	90.00	5.715	1.102E+00	123	90.00	6.985	1.074E+00
124	112.50	2.445	1.437E+00	125	112.50	3.175	1.276E+00	126	112.50	4.445	1.212E+00	127	112.50	5.715	1.062E+00
128	112.50	6.985	1.034E+00	129	135.00	3.175	1.346E+00	130	135.00	4.445	1.133E+00	131	135.00	5.715	1.087E+00
132	135.00	6.985	1.040E+00	133	157.50	2.445	1.369E+00	134	157.50	3.175	1.331E+00	135	157.50	1.445	1.289E+00
136	157.50	5.715	1.290E+00	137	170.00	6.985	1.080E+00	138	180.00	2.445	1.429E+00	139	180.00	3.175	1.293E+00
140	180.00	4.445	1.157E+00	141	180.00	5.715	1.067E+00	142	180.00	6.985	1.012E+00	143	202.50	2.445	1.035E+00
144	202.50	3.175	1.423E+00	145	202.50	4.445	1.173E+00	146	202.50	5.715	1.163E+00	147	202.50	5.985	1.022E+00
148	225.00	3.175	1.329E+00	149	225.00	4.445	1.200E+00	150	225.00	5.715	1.114E+00	151	225.00	6.985	1.000E+00
152	247.50	2.445	1.476E+00	153	247.50	3.175	1.304E+00	154	247.50	4.445	1.173E+00	155	247.50	5.715	1.161E+00
156	247.50	6.985	1.055E+00	157	270.00	2.445	1.447E+00	158	270.00	3.175	1.429E+00	159	270.00	4.445	1.246E+00
160	270.00	5.715	1.204E+00	161	270.00	6.985	1.065E+00	162	292.50	2.445	1.459E+00	163	292.50	3.175	1.446E+00
164	292.50	4.445	1.226E+00	165	292.50	5.715	1.129E+00	166	292.50	6.985	1.042E+00	167	315.00	3.175	1.438E+00
168	315.00	4.445	1.248E+00	169	315.00	5.715	1.239E+00	170	315.00	6.985	1.096E+00	171	337.50	2.445	1.512E+00
172	337.50	3.175	1.462E+00	173	337.50	4.445	1.218E+00	174	337.50	5.715	1.142E+00	175	337.50	6.985	9.970E-01

Table B-9.

RUN DATE.....9/15/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN 52
 PLATE NO.....P23
 PLATE LOCATION..5

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE		
0	135.00	2.328	1.135E+00	1	127.88	2.085	1.225E+00	2	119.06	1.883	1.200E+00	3	108.44	1.735	1.208E+00	4	98.34	1.656	1.285E+00		
4	98.34	1.656	1.279E+00	5	83.66	1.656	1.270E+00	6	71.57	1.735	1.328E+00	7	60.95	1.883	1.213E+00	8	52.13	2.085	1.213E+00		
10	52.13	2.085	1.187E+00	9	45.00	2.328	1.143E+00	10	42.10	2.085	1.263E+00	11	35.00	1.883	1.406E+00	12	28.54	1.573	1.406E+00		
14	28.54	1.573	1.243E+00	13	113.20	1.393	1.399E+00	14	98.19	1.293	1.400E+00	15	81.87	1.293	1.406E+00	16	66.80	1.393	1.199E+00		
18	66.80	1.393	1.364E+00	17	54.46	1.573	1.343E+00	18	45.00	1.810	1.225E+00	19	37.88	2.085	1.199E+00	20	30.95	1.883	1.448E+00		
22	30.95	1.883	1.226E+00	21	14.46	1.573	1.333E+00	22	135.00	1.293	1.448E+00	23	120.98	1.066	1.448E+00	24	101.31	0.933	1.293E+00		
26	101.31	0.933	1.590E+00	25	78.69	0.933	1.555E+00	26	59.07	1.066	1.530E+00	27	45.00	1.293	1.449E+00	28	35.54	1.573	1.413E+00		
30	35.54	1.573	1.413E+00	29	29.06	1.883	1.212E+00	30	161.57	1.735	1.278E+00	31	156.80	1.393	1.401E+00	32	149.04	1.066	1.457E+00		
34	149.04	1.066	1.457E+00	33	135.00	0.776	1.738E+00	34	108.44	0.578	1.752E+00	35	71.57	0.578	1.916E+00	36	45.00	0.776	1.695E+00		
38	45.00	0.776	1.695E+00	37	30.96	1.056	1.533E+00	38	23.20	1.393	1.479E+00	39	18.44	1.735	1.394E+00	40	173.65	1.656	1.253E+00		
42	173.65	1.656	1.253E+00	41	171.87	1.253	1.371E+00	42	168.69	0.933	1.478E+00	43	161.57	0.578	1.725E+00	44	135.00	0.259	2.046E+00		
46	135.00	0.259	2.046E+00	45	45.00	0.259	2.236E+00	46	18.44	0.578	1.977E+00	47	11.31	0.933	1.678E+00	48	9.13	1.293	1.507E+00		
50	9.13	1.293	1.507E+00	49	6.34	1.656	1.412E+00	50	186.34	1.656	1.219E+00	51	188.13	1.293	1.509E+00	52	191.31	0.933	1.504E+00		
54	191.31	0.933	1.504E+00	53	188.44	0.578	1.722E+00	54	225.00	0.259	2.046E+00	55	315.00	0.259	2.304E+00	56	341.57	0.578	1.917E+00		
58	341.57	0.578	1.917E+00	57	348.69	0.933	1.630E+00	58	351.87	1.293	1.500E+00	59	339.66	1.656	1.294E+00	60	198.44	1.735	1.293E+00		
62	198.44	1.735	1.293E+00	61	203.20	1.393	1.372E+00	62	210.96	1.066	1.607E+00	63	225.00	0.776	1.631E+00	64	251.57	0.578	1.699E+00		
66	251.57	0.578	1.699E+00	65	268.44	0.578	2.040E+00	66	315.00	0.776	1.879E+00	67	329.00	1.066	1.574E+00	68	336.80	1.393	1.438E+00		
70	336.80	1.393	1.438E+00	69	341.57	1.735	1.362E+00	70	209.05	1.883	1.192E+00	71	215.54	1.573	1.264E+00	72	225.00	1.810	1.360E+00		
74	225.00	1.810	1.360E+00	73	239.04	1.066	1.639E+00	74	268.69	0.933	1.721E+00	75	281.31	0.933	1.719E+00	76	300.98	1.066	1.684E+00		
78	300.98	1.066	1.684E+00	77	315.00	1.293	1.498E+00	78	324.48	1.573	1.365E+00	79	329.95	1.883	1.236E+00	80	217.88	2.085	1.173E+00		
82	217.88	2.085	1.173E+00	81	225.00	1.810	1.289E+00	82	234.48	1.573	1.337E+00	83	246.80	1.393	1.359E+00	84	281.87	1.293	1.367E+00		
86	281.87	1.293	1.367E+00	85	278.13	1.293	1.437E+00	86	293.20	1.393	1.430E+00	87	305.54	1.573	1.340E+00	88	315.00	1.810	1.316E+00		
90	315.00	1.810	1.316E+00	89	322.13	2.085	1.289E+00	90	225.00	2.328	1.121E+00	91	232.88	2.085	1.265E+00	92	240.95	1.883	1.240E+00		
94	240.95	1.883	1.240E+00	93	281.57	1.735	1.368E+00	94	268.69	1.556	1.362E+00	95	275.34	1.656	1.294E+00	96	288.44	1.735	1.229E+00		
98	288.44	1.735	1.229E+00	97	299.06	1.883	1.322E+00	98	307.88	2.085	1.350E+00	99	315.00	2.328	1.156E+00	100	0.	2.445	1.099E+00		
102	0.	2.445	1.099E+00	101	0.	3.175	9.989E-01	102	0.	4.445	9.417E-01	103	0.	5.715	7.993E-01	104	22.50	6.985	8.110E-01		
106	22.50	6.985	8.110E-01	105	22.50	2.445	1.095E+00	106	22.50	3.175	1.047E+00	107	22.50	4.445	9.293E-01	108	45.00	5.715	8.089E-01		
110	45.00	5.715	8.089E-01	109	22.50	6.985	7.680E-01	110	45.00	8.110	7.100E-01	111	45.00	9.417E-01	112	45.00	10.645E-01	113	67.50	3.175	1.004E+00
116	67.50	3.175	1.004E+00	114	67.50	4.445	8.228E-01	114	67.50	5.715	7.410E-01	115	67.50	6.985	6.537E-01	116	67.50	8.110E-01	117	67.50	9.417E-01
120	67.50	9.417E-01	8.228E-01	117	67.50	10.645E-01	8.089E-01	117	67.50	11.875E-01	7.680E-01	118	67.50	13.110E-01	7.100E-01	119	90.00	2.445	1.072E+00		
122	90.00	2.445	1.072E+00	121	90.00	4.445	9.450E-01	122	90.00	5.715	8.224E-01	123	90.00	6.985	7.098E-01	124	90.00	8.110E-01	6.089E-01		
126	90.00	6.985	6.089E-01	125	112.50	3.175	1.037E+00	126	112.50	4.445	9.217E-01	127	112.50	5.715	8.089E-01	128	112.50	6.985	6.985E-01		
130	112.50	6.985	6.985E-01	129	135.00	3.175	1.154E+00	130	135.00	4.445	9.837E-01	131	135.00	5.715	8.993E-01	132	135.00	6.985	7.774E-01		
134	135.00	6.985	7.774E-01	133	157.50	2.445	1.087E+00	134	157.50	3.175	1.031E+00	135	157.50	4.445	8.993E-01	136	157.50	5.715	8.089E-01		
138	157.50	5.715	8.089E-01	137	157.50	6.985	7.680E-01	138	180.00	2.445	1.090E+00	139	180.00	3.175	1.004E+00	140	180.00	4.445	8.993E-01		
142	180.00	4.445	8.993E-01	141	180.00	5.715	8.102E-01	142	180.00	6.985	7.098E-01	143	202.50	4.445	8.993E-01	144	202.50	5.715	8.089E-01		
146	202.50	5.715	8.089E-01	145	202.50	6.985	6.985E-01	146	202.50	8.110E-01	6.537E-01	147	225.00	6.985	6.537E-01	148	225.00	8.110E-01	6.089E-01		
150	225.00	8.110E-01	6.089E-01	149	225.00	9.417E-01	5.715E-01	150	225.00	10.645E-01	5.715E-01	151	225.00	11.875E-01	5.715E-01	152	247.50	2.445	1.087E+00		
154	247.50	2.445	1.087E+00	153	247.50	3.175	1.020E+00	154	247.50	4.445	8.993E-01	155	247.50	5.715	8.089E-01	156	247.50	6.985	7.098E-01		
158	247.50	6.985	7.098E-01	157	270.00	2.445	1.087E+00	158	270.00	3.175	1.045E+00	159	270.00	4.445	8.993E-01	160	270.00	5.715	8.089E-01		
162	270.00	5.715	8.089E-01	161	270.00	6.985	6.985E-01	162	292.50	2.445	1.087E+00	163	292.50	3.175	1.004E+00	164	292.50	4.445	8.993E-01		
166	292.50	4.445	8.993E-01	165	292.50	5.715	8.102E-01	166	292.50	6.985	7.098E-01	167	315.00	3.175	1.004E+00	168	315.00	4.445	8.993E-01		
170	315.00	4.445	8.993E-01	169	315.00	5.715	8.102E-01	170	315.00	6.985	6.985E-01	171	337.50	2.445	1.087E+00	172	337.50	3.175	1.004E+00		
174	337.50	3.175	1.004E+00	173	337.50	4.445	8.765E-01	174	337.50	5.715	8.123E-01	175	337.50	6.985	7.190E-01						

Table B-10.

RUN DATE.....9/18/75
 PARTICLE.....ELECTRON
 BEAM ENERGY.....50MEV
 TARGET.....FP RUNS3
 PLATE NO.....P12
 PLATE LOCATION..4

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	4.000E+00	1	127.88	2.085	5.000E+00	2	119.06	1.883	6.000E+00	3	108.44	1.735	6.000E+00
4	95.34	1.658	7.000E+00	5	85.66	1.656	7.000E+00	6	71.57	1.758	6.000E+00	7	60.95	1.883	6.000E+00
8	52.13	2.085	5.000E+00	9	45.00	3.328	2.000E+00	10	142.10	2.085	5.000E+00	11	135.00	1.810	1.000E+01
12	125.54	1.573	4.000E+01	13	113.20	1.393	6.077E+01	14	98.13	1.293	3.754E+01	15	81.87	1.293	3.839E+01
16	66.80	1.393	3.752E+01	17	54.46	1.573	7.345E+01	18	45.00	1.810	1.000E+01	19	37.88	2.085	1.000E+01
20	150.95	1.883	7.000E+00	21	144.46	1.573	2.000E+01	22	135.00	1.293	9.039E+01	23	120.95	1.086	4.332E+01
24	101.31	0.933	7.980E+01	25	78.69	0.933	1.007E+02	26	59.04	1.086	7.470E+01	27	45.00	1.293	4.523E+01
28	35.54	1.573	5.384E+01	29	29.05	1.883	1.000E+01	30	161.57	1.735	6.015E+01	31	156.80	1.393	3.000E+01
32	149.04	1.066	4.137E+01	33	135.00	0.776	8.983E+01	34	108.44	0.578	3.079E+02	35	71.57	0.578	7.717E+02
36	45.00	0.776	3.243E+02	37	30.96	1.066	9.201E+01	38	23.20	1.393	4.027E+01	39	18.44	1.735	1.280E+01
40	173.68	1.656	7.617E+00	41	171.87	1.293	4.000E+01	42	168.69	0.933	4.857E+01	43	161.57	0.578	1.833E+02
44	135.00	0.289	2.492E+03	45	45.00	0.259	3.839E+04	46	18.44	0.578	2.972E+03	47	11.31	0.933	1.813E+02
48	8.13	1.293	6.360E+01	49	8.34	1.656	3.554E+01	50	166.34	1.656	6.904E+00	51	168.13	1.293	4.000E+01
52	191.31	0.933	6.413E+01	53	198.44	0.578	1.815E+02	54	225.00	0.259	2.942E+03	55	315.00	0.259	5.938E+04
56	341.57	0.578	3.539E+03	57	348.69	0.933	2.233E+02	58	351.87	1.293	5.132E+01	59	353.68	1.656	1.588E+01
60	198.44	1.735	7.019E+00	61	203.20	1.393	2.000E+01	62	210.96	1.086	3.988E+01	63	225.00	0.776	1.059E+02
64	251.37	0.578	4.827E+02	65	289.44	0.578	3.645E+01	66	315.00	0.776	8.983E+02	67	329.00	1.066	1.181E+02
68	335.80	1.393	4.363E+01	69	341.57	1.735	1.417E+01	70	209.05	1.883	5.722E+00	71	215.54	1.573	1.000E+01
72	225.00	1.293	4.381E+01	73	239.04	1.066	5.159E+01	74	258.69	0.933	1.004E+02	75	281.31	0.933	1.440E+02
76	300.85	1.066	1.059E+02	77	315.00	1.293	6.202E+01	78	324.46	1.573	4.471E+01	79	330.85	1.883	1.084E+01
80	217.87	2.085	6.598E+00	81	225.00	1.810	6.000E+00	82	234.46	1.573	2.000E+01	83	246.80	1.393	5.169E+01
84	261.87	1.293	7.652E+01	85	278.13	1.293	9.000E+01	86	293.20	1.393	3.792E+01	87	308.54	1.573	4.301E+01
88	315.00	1.810	1.000E+01	89	322.13	2.085	7.580E+00	90	225.00	2.328	9.933E+00	91	232.13	2.085	4.529E+00
92	240.95	1.653	6.921E+00	93	251.37	1.735	8.074E+00	94	263.68	1.656	9.954E+00	95	278.34	1.656	1.165E+01
96	288.44	1.735	6.598E+00	97	293.20	1.883	6.598E+00	98	307.85	2.085	9.954E+00	99	315.00	2.445	6.715E+00
100	0	2.445	6.057E+00	101	0	3.175	4.000E+00	102	0	4.445	2.052E+00	103	0	5.715	1.636E+00
104	0	6.985	1.257E+00	105	22.50	2.445	4.756E+00	106	22.50	3.175	2.995E+00	107	22.50	4.445	1.828E+00
108	22.50	5.715	1.441E+00	109	22.50	6.985	1.182E+00	110	45.00	3.175	2.871E+00	111	45.00	4.445	1.761E+00
112	45.00	5.715	1.421E+00	113	45.00	6.985	1.201E+00	114	67.50	2.445	3.790E+00	115	67.50	3.175	2.509E+00
116	67.50	4.445	1.803E+00	117	67.50	5.715	1.400E+00	118	87.50	6.985	1.132E+00	119	90.00	2.445	1.602E+00
120	90.00	3.175	2.683E+00	121	90.00	4.445	1.994E+00	122	90.00	5.715	1.491E+00	123	90.00	6.985	1.222E+00
124	112.50	2.445	3.356E+00	125	112.50	3.175	2.383E+00	126	112.50	4.445	1.666E+00	127	112.50	5.715	1.426E+00
128	112.50	6.985	1.093E+00	129	135.00	3.175	2.239E+00	130	135.00	4.445	1.749E+00	131	135.00	5.715	1.422E+00
132	135.00	1.185	1.155E+00	133	157.50	6.985	1.136E+00	134	167.50	3.175	2.299E+00	135	157.50	4.445	1.448E+00
136	157.50	5.715	1.397E+00	137	157.50	6.985	1.103E+00	138	180.00	2.445	3.42E+00	139	180.00	3.175	2.419E+00
140	180.00	4.445	1.843E+00	141	180.00	5.715	1.405E+00	142	180.00	6.985	1.058E+00	143	202.50	2.445	3.366E+00
144	202.50	3.175	2.384E+00	145	202.50	4.445	1.722E+00	146	202.50	5.715	1.394E+00	147	202.50	6.985	1.058E+00
148	225.00	3.175	1.752E+00	149	225.00	4.445	1.752E+00	150	225.00	5.715	1.366E+00	151	225.00	6.985	1.123E+00
152	247.50	2.445	3.42E+00	153	247.50	3.175	2.548E+00	154	247.50	4.445	1.742E+00	155	247.50	5.715	1.341E+00
156	247.50	6.985	1.086E+00	157	270.00	2.445	3.820E+00	158	270.00	3.175	2.522E+00	159	270.00	4.445	1.850E+00
160	270.00	5.715	1.429E+00	161	270.00	6.985	1.072E+00	162	292.50	2.445	4.009E+00	163	292.50	3.175	2.731E+00
164	292.50	4.445	1.917E+00	165	292.50	5.715	1.400E+00	166	292.50	6.985	1.089E+00	167	315.00	3.175	2.933E+00
168	315.00	4.445	1.843E+00	169	315.00	5.715	1.404E+00	170	315.00	6.985	1.10E+00	171	337.50	2.445	1.103E+00
172	337.50	3.175	2.75E+00	173	337.50	4.445	1.95E+00	174	337.50	5.715	1.516E+00	175	337.50	6.985	1.175E+00

Table E-11.

RUN DATE.....9/16/76
 PARTIC.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN 53
 PLATE NO.....111
 PLATE LOCATION..5

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	1.381E+02	1	127.88	2.385	2.091E+02	2	119.06	1.883	2.951E+02	3	108.44	1.735	3.580E+02
4	96.34	1.656	4.795E+02	5	83.66	1.656	5.516E+02	6	71.57	1.735	6.362E+02	7	60.95	1.893	3.465E+02
8	52.13	2.085	4.180E+02	9	45.00	2.328	3.061E+02	10	142.10	2.085	2.112E+02	11	135.00	1.810	3.304E+02
12	125.54	1.573	5.227E+02	13	113.20	1.393	7.657E+02	14	98.13	1.293	1.145E+03	15	81.87	1.293	1.224E+03
16	66.80	1.393	1.382E+03	17	54.46	1.573	1.192E+03	18	45.00	1.810	7.534E+02	19	37.88	2.085	4.893E+02
20	180.96	1.893	2.755E+02	21	144.46	1.573	4.810E+02	22	135.00	1.293	8.404E+02	23	120.96	1.066	1.574E+03
24	101.31	0.933	2.567E+03	25	78.69	0.933	4.122E+03	26	59.04	1.066	3.254E+03	27	45.00	1.293	2.208E+03
28	35.54	1.573	1.215E+03	29	29.06	1.883	6.652E+02	30	161.57	1.735	3.755E+02	31	156.80	1.393	6.956E+02
32	149.04	1.066	1.495E+03	33	135.00	0.776	3.645E+03	34	108.44	0.578	7.747E+03	35	71.57	0.578	1.344E+04
36	45.00	0.776	9.981E+03	37	30.96	1.066	5.133E+03	38	23.20	1.393	2.117E+03	39	18.44	1.735	1.106E+03
40	173.66	1.656	4.187E+02	41	171.87	1.293	8.240E+02	42	168.69	0.933	1.977E+03	43	161.57	0.578	5.564E+03
44	135.00	0.259	2.289E+04	45	45.00	0.259	7.158E+04	46	18.44	0.578	3.154E+04	47	11.31	0.933	8.817E+03
48	8.13	1.293	2.755E+03	49	6.34	1.656	1.128E+03	50	186.34	1.656	4.162E+02	51	188.13	1.293	8.690E+02
52	181.31	0.933	2.059E+03	53	198.44	0.578	6.700E+03	54	225.00	0.259	3.093E+04	55	315.00	0.259	9.164E+04
56	341.67	0.578	4.460E+04	57	348.69	0.933	8.725E+03	58	351.87	1.293	3.198E+03	59	353.66	1.656	1.322E+03
60	198.44	1.293	3.427E+02	61	203.20	1.393	6.819E+02	62	210.96	1.066	1.656E+03	63	225.00	0.776	4.603E+03
64	251.57	0.578	1.365E+04	65	288.44	0.578	3.225E+04	66	315.00	0.776	2.081E+04	67	329.00	1.066	6.828E+03
68	336.30	1.393	2.543E+03	69	341.57	1.735	1.108E+03	70	209.05	1.883	3.094E+02	71	215.54	1.573	6.204E+02
72	225.00	1.293	1.170E+03	73	239.04	1.066	2.409E+03	74	258.69	0.933	5.068E+03	75	281.31	0.933	7.674E+02
76	300.96	1.066	6.164E+03	77	315.00	1.293	3.596E+03	78	324.46	1.573	1.719E+03	79	330.95	1.883	8.550E+02
80	217.88	2.085	2.624E+02	81	228.00	1.810	4.131E+02	82	234.46	1.573	6.473E+02	83	246.80	1.393	1.135E+03
84	261.87	1.293	1.879E+03	85	278.13	1.293	2.565E+03	86	293.20	1.393	2.261E+03	87	305.54	1.573	1.611E+03
88	316.00	1.810	1.004E+03	89	322.13	2.085	5.700E+02	90	225.00	2.328	1.739E+02	91	232.13	2.085	2.390E+02
92	240.95	1.893	3.796E+02	93	251.57	1.735	5.707E+02	94	263.66	1.656	7.273E+02	95	276.34	2.656	8.248E+02
96	288.44	1.735	8.970E+02	97	298.06	1.883	7.729E+02	98	307.88	2.085	5.612E+02	99	311.00	2.328	3.110E+02
100	0	2.445	2.759E+02	101	0	3.175	1.078E+02	102	0	4.445	5.000E+00	103	0	5.715	5.000E+00
104	0	6.985	5.000E+00	105	22.50	2.445	2.918E+02	106	22.50	3.175	1.188E+02	107	22.50	4.445	5.000E+00
108	22.50	3.715	5.000E+00	109	22.50	6.985	5.000E+00	110	45.00	3.175	1.102E+02	111	45.00	4.445	5.000E+00
112	45.00	3.715	5.000E+00	113	45.00	6.985	5.000E+00	114	67.50	2.445	2.181E+02	115	67.50	3.175	9.092E+01
116	67.50	4.445	5.000E+00	117	67.50	5.715	5.000E+00	118	67.50	6.985	5.000E+00	119	90.00	2.445	1.543E+02
120	90.00	3.175	6.634E+01	121	90.00	4.445	5.000E+00	122	90.00	5.715	5.000E+00	123	90.00	6.985	5.000E+00
124	112.50	2.445	1.363E+02	125	112.50	3.175	8.218E+01	126	112.50	4.445	5.000E+00	127	112.50	5.715	3.100E+00
128	112.50	6.985	5.000E+00	129	135.00	1.175	5.285E+01	130	135.00	1.445	5.000E+00	131	135.00	1.735	1.000E+00
132	135.00	6.985	5.000E+00	133	157.50	2.445	1.340E+02	134	167.50	3.175	5.590E+01	135	157.50	4.445	5.000E+00
136	157.50	5.715	5.000E+00	137	157.50	6.985	5.000E+00	138	180.00	2.445	1.250E+02	139	180.00	3.175	3.484E+01
140	180.00	4.445	5.000E+00	141	180.00	5.715	5.000E+00	142	180.00	6.985	5.000E+00	143	202.50	2.445	1.271E+02
144	202.50	3.175	5.948E+01	145	202.50	4.445	5.000E+00	146	225.00	5.715	5.000E+00	147	202.50	6.985	5.000E+00
148	225.00	1.175	7.082E+01	149	225.00	4.445	5.000E+00	150	225.00	5.715	5.000E+00	151	225.00	6.985	5.000E+00
152	247.50	2.445	1.504E+02	153	247.50	3.175	7.106E+01	154	247.50	4.445	5.000E+00	155	247.50	5.715	5.000E+00
156	247.50	6.985	5.000E+00	157	270.00	2.445	2.072E+02	158	270.00	3.175	8.126E+01	159	270.00	4.445	5.000E+00
160	270.00	5.715	5.000E+00	161	270.00	6.985	5.000E+00	162	292.50	2.445	7.16E+02	163	292.50	3.175	1.084E+02
164	292.50	4.445	5.000E+00	165	292.50	5.715	5.000E+00	166	315.00	6.985	5.000E+00	167	315.00	1.735	1.096E+02
168	315.00	4.445	5.000E+00	169	315.00	5.715	5.000E+00	170	315.00	6.985	5.000E+00	171	337.50	2.445	3.175E+01
172	337.50	3.175	1.131E+02	173	337.50	4.445	5.000E+00	174	337.50	5.715	5.000E+00	175	337.50	6.985	5.000E+00

Table B-12.

RUN DATE.....9/15/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FP RUN 54
 PLATE NO.....P4
 PLATE LOCATION..2

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	3.305E+01	1	127.88	2.085	4.237E+01	2	119.05	1.883	5.689E+01	3	108.44	1.735	6.255E+01
4	96.34	1.655	7.291E+01	5	82.66	1.636	7.090E+01	6	71.57	1.735	7.113E+01	7	60.95	1.883	7.055E+01
8	52.13	2.085	5.245E+01	9	45.00	2.328	3.851E+01	10	142.10	2.085	4.132E+01	11	135.00	1.810	5.922E+01
12	125.54	1.573	7.908E+01	13	113.20	1.393	1.044E+02	14	98.13	1.293	1.347E+02	15	81.87	1.293	1.304E+02
16	66.80	1.393	1.255E+02	17	54.46	1.573	1.009E+02	18	45.00	1.810	7.227E+01	19	37.88	2.085	5.192E+01
20	100.95	1.883	5.110E+01	21	144.46	1.573	7.525E+01	22	135.00	1.293	1.118E+02	23	120.98	1.066	1.803E+02
24	101.31	0.933	2.713E+02	25	78.89	0.933	3.139E+02	26	59.04	1.066	2.437E+02	27	45.00	1.293	1.513E+02
28	35.54	1.573	1.066E+02	29	29.06	1.883	7.335E+01	30	161.57	1.735	6.342E+01	31	156.80	1.393	9.656E+01
32	149.04	1.066	1.628E+02	33	135.00	0.776	3.402E+02	34	108.44	0.578	9.492E+02	35	71.57	0.578	1.683E+03
36	45.00	0.776	5.239E+02	37	30.96	1.066	2.517E+02	38	23.20	1.393	1.253E+02	39	18.44	1.735	8.388E+01
40	173.66	1.655	6.347E+01	41	171.87	1.293	1.268E+02	42	166.89	0.933	2.283E+02	43	161.57	0.578	5.592E+02
44	135.00	0.259	0.599E+04	45	45.00	0.259	3.224E+04	46	18.44	0.578	1.201E+03	47	11.31	0.933	3.443E+02
48	6.13	1.293	1.524E+02	49	6.34	1.655	9.657E+01	50	186.34	1.655	6.818E+01	51	188.13	1.293	1.225E+02
52	191.31	0.933	2.396E+02	53	198.44	0.578	6.176E+02	54	225.00	0.259	1.994E+04	55	315.00	0.259	4.624E+04
56	341.57	0.578	1.341E+03	57	348.69	0.933	3.385E+02	58	351.87	1.293	1.639E+02	59	353.66	1.655	9.824E+01
60	198.44	0.736	6.309E+01	61	203.20	1.393	1.545E+02	62	210.96	1.066	1.782E+02	63	225.00	0.776	4.035E+02
64	251.57	0.578	1.614E+03	65	288.44	0.578	2.190E+03	66	315.00	0.776	8.664E+02	67	329.00	1.066	2.735E+02
68	336.80	1.393	1.434E+02	69	341.57	1.735	9.219E+01	70	209.05	1.883	5.533E+01	71	215.54	1.573	6.691E+01
72	305.00	1.066	2.352E+02	73	239.04	1.066	2.148E+02	74	258.69	0.933	3.193E+02	75	281.31	0.933	3.992E+02
76	30.96	1.066	2.759E+02	77	315.00	1.293	1.713E+02	78	324.46	1.573	1.035E+02	79	330.95	1.883	6.079E+01
80	117.88	2.085	4.777E+01	81	225.00	1.810	6.394E+01	82	234.46	1.573	8.819E+01	83	246.80	1.393	1.235E+02
84	351.87	1.293	1.515E+02	85	278.13	2.085	1.669E+02	86	293.20	1.393	1.484E+02	87	305.54	1.573	1.069E+02
88	61.00	1.810	8.759E+01	89	322.13	2.085	6.042E+01	90	225.00	2.328	3.554E+01	91	232.13	2.085	4.630E+01
92	240.95	1.883	5.701E+01	93	251.57	1.735	7.649E+01	94	363.88	1.655	7.767E+01	95	276.34	1.655	8.496E+01
96	288.44	1.735	8.495E+01	97	299.06	1.883	7.675E+01	98	307.88	2.085	5.826E+01	99	315.00	2.328	4.640E+01
100	0.	2.445	3.561E+01	101	0.	3.175	1.934E+01	102	0.	4.445	7.137E+00	103	0.	5.715	3.289E+00
104	0.	6.985	1.717E+00	105	22.50	2.445	4.133E+01	106	22.50	3.175	1.945E+01	107	22.50	4.445	7.500E+00
108	22.50	5.715	3.370E+00	109	45.00	6.985	1.876E+00	110	45.00	3.175	1.811E+01	111	45.00	4.445	7.666E+00
112	45.00	5.715	3.052E+00	113	45.00	6.985	1.861E+00	114	67.50	4.445	3.385E+01	115	67.50	3.175	6.79E+00
116	67.50	4.445	6.472E+00	117	67.50	5.715	3.023E+00	118	67.50	6.985	1.496E+00	119	90.00	2.445	3.108E+01
120	90.00	3.175	1.819E+01	121	90.00	4.445	7.107E+00	122	90.00	5.715	3.541E+00	123	90.00	6.985	1.986E+00
124	112.50	2.445	2.942E+00	125	112.50	3.175	1.805E+01	126	112.50	4.445	6.876E+00	127	112.50	5.715	2.758E+00
128	132.50	6.985	1.451E+00	129	135.00	3.175	1.548E+01	130	135.00	4.445	6.380E+00	131	135.00	5.715	2.871E+00
132	135.00	6.985	1.327E+00	133	157.50	2.445	2.959E+01	134	157.50	3.175	1.516E+01	135	157.50	4.445	6.064E+00
136	157.50	5.715	2.685E+00	137	157.50	6.985	1.412E+00	138	180.00	2.445	2.954E+01	139	180.00	3.175	1.662E+01
140	180.00	4.445	6.566E+00	141	180.00	5.715	2.793E+00	142	180.00	6.985	1.302E+00	143	202.50	2.445	3.265E+01
144	202.50	3.175	1.579E+01	145	202.50	4.445	5.996E+00	146	202.50	5.715	2.703E+00	147	202.50	6.985	1.502E+00
148	225.00	3.175	1.656E+01	149	225.00	4.445	8.185E+00	150	225.00	5.715	3.104E+00	151	225.00	6.985	1.498E+00
152	247.50	2.445	3.295E+01	153	247.50	3.175	1.668E+01	154	247.50	4.445	6.862E+00	155	247.50	5.715	2.759E+00
156	247.50	6.985	1.435E+00	157	270.00	2.445	3.221E+01	158	270.00	3.175	1.636E+01	159	270.00	4.445	6.413E+00
160	270.00	5.715	2.952E+00	161	270.00	6.985	1.506E+00	162	292.50	2.445	3.997E+01	163	292.50	3.175	1.871E+01
164	292.50	5.715	7.710E+00	165	292.50	6.985	3.575E+00	166	315.00	5.715	7.710E+00	167	315.00	6.985	1.871E+01
168	315.00	4.445	7.473E+00	169	315.00	5.715	5.575E+00	170	315.00	6.985	1.578E+00	171	337.50	2.445	3.750E+01
172	337.50	3.175	1.935E+01	173	337.50	4.445	7.215E+00	174	337.50	5.715	3.224E+00	175	337.50	6.985	1.653E+00

Table B-13.

RUN DATE.....9/16/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....30MEV
 TARGET.....FP RUN 54
 PLATE NO.....P3
 PLATE LOCATION..3

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	4.326E+01	1	127.68	2.085	6.097E+01	2	119.06	1.883	8.040E+01	3	108.44	1.735	1.007E+02
4	96.34	1.656	1.005E+02	5	83.66	1.656	1.126E+02	6	71.57	1.735	1.054E+02	7	60.95	1.883	8.695E+01
8	52.13	2.085	7.534E+01	9	45.00	2.328	5.584E+01	10	142.10	2.085	5.740E+01	11	135.00	1.810	8.070E+01
12	125.54	1.573	1.122E+02	13	113.20	1.393	1.474E+02	14	98.13	1.293	1.750E+02	15	81.87	1.293	2.000E+02
16	66.80	1.393	1.557E+02	17	54.46	1.573	1.350E+02	18	45.00	1.810	1.033E+02	19	37.88	2.085	8.568E+01
20	150.95	1.883	7.057E+01	21	144.46	1.573	1.145E+02	22	135.00	1.293	1.605E+02	23	120.96	1.066	2.136E+02
24	101.31	0.933	2.864E+02	25	78.69	0.933	3.108E+02	26	59.04	1.066	3.064E+02	27	45.00	1.293	3.191E+02
28	35.84	1.573	1.447E+02	29	29.06	1.883	9.925E+01	30	161.57	1.735	9.095E+01	31	156.63	1.393	1.309E+02
32	149.04	1.066	2.103E+02	33	135.00	0.776	3.164E+02	34	108.44	0.578	4.892E+02	35	71.57	0.578	5.544E+02
36	45.00	0.776	4.680E+02	37	30.96	1.066	2.876E+02	38	23.20	1.393	1.685E+02	39	18.44	1.715	1.200E+02
40	173.66	1.656	9.948E+01	41	171.87	1.293	1.472E+02	42	168.69	0.933	2.366E+02	43	161.57	0.578	4.169E+02
44	135.00	0.259	6.737E+02	45	45.00	0.259	8.304E+02	46	18.44	0.578	6.093E+02	47	11.31	0.933	3.875E+02
48	8.13	1.393	2.555E+02	49	6.34	1.656	1.394E+02	50	186.34	1.656	8.752E+01	51	188.13	1.293	1.532E+02
52	191.31	0.933	2.651E+02	53	198.44	0.578	4.015E+02	54	225.00	0.259	7.553E+02	55	315.00	0.259	9.655E+02
56	341.57	0.578	6.137E+02	57	348.89	0.933	4.021E+02	58	351.87	1.293	2.132E+02	59	353.66	1.656	1.379E+02
60	198.44	1.735	9.443E+01	61	203.20	1.393	1.354E+02	62	210.95	1.066	2.414E+02	63	225.00	0.776	3.207E+02
64	251.57	0.578	8.438E+02	65	288.44	0.578	6.182E+02	66	316.00	0.776	4.799E+02	67	329.00	1.066	2.931E+02
68	336.80	1.393	1.871E+02	69	341.57	1.735	1.162E+02	70	209.05	1.883	7.778E+01	71	215.54	1.573	1.044E+02
72	225.00	1.293	1.727E+02	73	239.04	1.066	2.445E+02	74	258.69	0.933	3.010E+02	75	281.31	0.933	3.432E+02
76	300.98	1.066	2.968E+02	77	315.00	1.293	2.389E+02	78	324.46	1.573	1.579E+02	79	330.95	1.883	9.571E+01
80	217.88	2.085	6.173E+01	81	225.00	1.810	8.482E+01	82	234.46	1.573	1.179E+02	83	246.80	1.393	1.520E+02
84	261.67	1.293	1.906E+02	85	278.13	1.293	2.011E+02	86	293.20	1.393	1.773E+02	87	305.54	1.573	1.611E+02
88	315.00	1.810	1.103E+02	89	322.13	2.085	7.216E+01	90	225.00	2.328	4.594E+01	91	232.13	2.085	5.945E+01
92	240.95	1.883	9.031E+01	93	251.57	1.735	1.018E+02	94	263.66	1.656	1.162E+02	95	276.34	1.883	1.225E+02
96	288.44	1.573	1.447E+02	97	299.06	1.883	1.015E+02	98	307.88	2.085	6.080E+01	99	315.00	2.328	5.360E+01
100	0.00	2.445	4.724E+01	101	0.00	3.175	2.220E+01	102	0.00	4.445	6.379E+00	103	0.00	5.715	1.921E+00
104	0.00	6.985	8.278E+01	105	22.50	2.445	4.962E+01	106	22.50	3.175	2.158E+01	107	22.50	4.445	5.386E+00
108	22.50	5.715	1.960E+00	109	22.50	6.985	8.363E+01	110	45.00	3.175	2.063E+01	111	45.00	4.445	5.692E+00
112	45.00	5.715	1.304E+01	113	45.00	6.985	8.084E+01	114	67.50	2.445	4.470E+01	115	67.50	3.175	1.943E+01
116	67.50	4.445	5.342E+00	117	67.50	5.715	1.834E+00	118	67.50	6.985	7.493E+01	119	90.00	2.445	4.405E+01
120	90.00	3.175	1.941E+01	121	90.00	4.445	5.285E+00	122	90.00	5.715	1.831E+00	123	90.00	6.985	8.406E+01
124	112.50	2.445	4.068E+01	125	112.50	3.175	1.821E+01	126	112.50	4.445	5.244E+00	127	112.50	5.715	1.755E+00
128	112.50	6.985	7.186E+01	129	135.00	3.175	1.739E+01	130	135.00	4.445	5.148E+00	131	135.00	5.715	1.743E+00
132	135.00	6.985	8.985E+01	133	157.50	2.445	3.895E+01	134	157.50	3.175	1.822E+01	135	157.50	4.445	4.796E+01
136	157.50	5.715	1.762E+00	137	157.50	6.985	7.136E+01	138	180.00	2.445	3.806E+01	139	180.00	3.175	1.794E+01
140	180.00	4.445	4.720E+00	141	180.00	5.715	1.735E+00	142	180.00	6.985	7.902E+01	143	202.50	2.445	3.950E+01
144	202.50	3.175	1.690E+01	145	202.50	4.445	4.681E+00	146	202.50	5.715	1.849E+00	147	202.50	6.985	7.271E+01
148	225.00	1.735	1.103E+01	149	225.00	3.175	1.895E+01	150	225.00	4.445	5.131E+00	151	225.00	5.715	1.795E+01
152	247.50	2.445	4.238E+01	153	247.50	3.175	1.814E+01	154	247.50	4.445	5.131E+00	155	247.50	5.715	1.695E+00
156	247.50	6.985	7.699E+01	157	270.00	2.445	4.607E+01	158	270.00	3.175	2.000E+01	159	270.00	4.445	5.337E+00
160	270.00	5.715	1.899E+00	161	270.00	6.985	8.202E+01	162	292.50	2.445	5.012E+01	163	292.50	3.175	2.013E+01
164	292.50	4.445	5.328E+00	165	292.50	5.715	1.961E+00	166	292.50	6.985	8.139E+01	167	315.00	3.175	2.150E+01
168	315.00	4.445	5.000E+00	169	315.00	5.715	1.718E+01	170	315.00	6.985	8.171E+01	171	315.00	7.985	8.244E+01
172	337.50	3.175	2.086E+01	173	337.50	4.445	6.500E+00	174	337.50	5.715	1.968E+00	175	337.50	6.985	8.293E+01

Table B-14.

RUN DATE.....5/16/76
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500MEV
 TARGET.....FR
 PLATE NO.....P7
 PLATE LOCATION..4

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	3.839E+00	1	127.88	2.085	4.273E+00	2	119.06	1.883	4.361E+00	3	108.44	1.735	4.688E+00
4	96.34	1.656	4.561E+00	5	83.66	1.656	4.973E+00	6	71.57	1.735	4.614E+00	7	60.95	1.883	4.480E+00
8	52.13	2.085	4.270E+00	9	45.00	2.328	4.058E+00	10	142.10	2.085	4.095E+00	11	135.00	1.810	4.480E+00
12	125.54	1.735	4.655E+00	13	113.20	1.393	5.034E+00	14	98.13	1.293	5.773E+00	15	81.87	1.293	5.457E+00
16	66.80	1.393	5.583E+00	17	54.46	1.573	5.088E+00	18	45.00	1.810	4.985E+00	19	37.88	2.085	4.335E+00
20	150.95	1.883	4.407E+00	21	144.46	1.573	5.086E+00	22	135.00	1.293	5.037E+00	23	120.96	1.066	5.571E+00
24	101.31	0.933	6.209E+00	25	78.69	0.933	6.785E+00	26	59.04	1.066	5.952E+00	27	45.00	1.293	6.125E+00
28	35.54	1.573	5.151E+00	29	29.06	1.883	4.596E+00	30	161.57	1.735	4.911E+00	31	156.80	1.393	5.019E+00
32	149.04	1.066	5.859E+00	33	135.00	0.776	6.590E+00	34	108.44	0.578	7.457E+00	35	71.57	0.578	7.710E+00
36	45.00	0.776	7.183E+00	37	30.96	1.066	6.137E+00	38	23.20	1.393	5.353E+00	39	18.44	1.735	4.685E+00
40	173.66	1.656	4.805E+00	41	171.87	1.293	5.103E+00	42	168.69	0.933	5.687E+00	43	161.57	0.578	7.498E+00
44	135.00	0.259	9.414E+00	45	45.00	0.259	1.057E+01	46	18.44	0.578	6.158E+00	47	11.31	0.933	6.674E+00
48	8.13	1.293	5.457E+00	49	6.34	1.656	4.255E+00	50	186.34	1.656	6.211E+00	51	186.13	1.293	5.460E+00
52	181.31	0.533	8.154E+00	53	198.44	0.578	6.960E+00	54	225.00	0.259	9.876E+00	55	315.00	0.259	1.063E+01
56	341.57	0.578	6.712E+00	57	348.69	0.933	6.933E+00	58	351.67	1.293	5.909E+00	59	353.66	1.656	4.813E+00
60	198.44	1.735	4.695E+00	61	203.20	1.393	4.984E+00	62	210.96	1.066	5.632E+00	63	225.00	0.776	6.463E+00
64	181.87	0.578	7.891E+00	65	288.44	0.578	8.787E+00	66	315.00	0.776	7.345E+00	67	329.00	1.066	6.335E+00
68	336.80	1.393	6.021E+00	69	341.57	1.735	4.665E+00	70	209.05	1.883	4.554E+00	71	215.54	1.573	4.591E+00
72	225.00	1.293	5.144E+00	73	232.04	1.066	5.936E+00	74	258.69	0.933	6.348E+00	75	281.31	0.933	6.597E+00
76	300.96	1.066	6.322E+00	77	315.00	1.293	6.038E+00	78	324.46	1.573	5.084E+00	79	330.95	1.883	4.688E+00
80	217.88	2.085	4.238E+00	81	225.00	1.810	4.579E+00	82	234.46	1.573	4.749E+00	83	246.80	1.393	5.003E+00
84	281.87	1.293	5.700E+00	85	278.13	1.293	6.111E+00	86	233.20	1.393	5.447E+00	87	305.54	1.393	5.239E+00
88	315.00	1.810	4.591E+00	89	322.13	2.085	4.385E+00	90	225.00	2.328	4.476E+00	91	232.13	2.085	4.805E+00
92	240.95	1.883	4.937E+00	93	251.57	1.735	4.987E+00	94	263.66	1.656	4.812E+00	95	276.34	1.656	4.878E+00
96	288.44	1.735	4.665E+00	97	299.06	1.883	4.502E+00	98	307.88	2.085	4.403E+00	99	315.00	2.328	4.142E+00
100	0.	2.445	3.963E+00	101	0.	3.173	3.667E+00	102	0.	4.445	2.925E+00	103	0.	5.715	2.574E+00
104	0.	6.985	2.308E+00	105	22.50	4.445	4.317E+00	106	22.50	3.173	3.659E+00	107	22.50	4.445	2.911E+00
108	22.50	5.715	2.513E+00	109	22.50	6.985	2.249E+00	110	45.00	3.173	3.503E+00	111	45.00	4.445	2.910E+00
112	45.00	5.715	2.513E+00	113	45.00	6.985	2.255E+00	114	67.50	3.445	4.170E+00	115	67.50	3.173	3.403E+00
116	67.50	4.445	2.819E+00	117	67.50	5.715	2.673E+00	118	67.50	6.985	2.226E+00	119	90.00	2.445	4.115E+00
120	90.00	3.173	3.403E+00	121	90.00	4.445	3.861E+00	122	90.00	5.715	3.478E+00	123	90.00	6.985	2.819E+00
124	112.50	3.445	4.170E+00	125	112.50	4.445	3.271E+00	126	112.50	4.445	3.095E+00	127	112.50	5.715	2.530E+00
128	112.50	6.985	2.819E+00	129	135.00	3.173	3.445E+00	130	135.00	4.445	3.955E+00	131	135.00	5.715	2.491E+00
132	135.00	6.985	2.819E+00	133	157.50	2.445	3.878E+00	134	157.50	3.173	3.624E+00	135	157.50	4.445	3.037E+00
136	157.50	5.715	3.675E+00	137	157.50	6.985	2.598E+00	138	180.00	2.445	4.090E+00	139	180.00	3.173	3.675E+00
140	180.00	4.445	3.037E+00	141	180.00	5.715	2.804E+00	142	180.00	6.985	2.598E+00	143	202.50	4.445	4.038E+00
144	202.50	3.173	3.403E+00	145	202.50	4.445	2.966E+00	146	202.50	5.715	3.701E+00	147	202.50	6.985	2.777E+00
148	225.00	3.173	3.403E+00	149	225.00	4.445	3.224E+00	150	225.00	5.715	3.701E+00	151	225.00	6.985	2.389E+00
152	247.50	2.445	3.893E+00	153	247.50	3.173	3.543E+00	154	247.50	4.445	3.015E+00	155	247.50	5.715	2.683E+00
156	247.50	6.985	2.351E+00	157	270.00	2.445	3.853E+00	158	270.00	3.173	3.459E+00	159	270.00	4.445	2.939E+00
160	270.00	5.715	2.806E+00	161	270.00	6.985	2.804E+00	162	292.50	2.445	3.977E+00	163	292.50	3.173	3.266E+00
164	292.50	4.445	3.245E+00	165	292.50	5.715	3.611E+00	166	292.50	6.985	2.382E+00	167	315.00	3.173	3.422E+00
168	315.00	4.445	2.925E+00	169	315.00	5.715	3.711E+00	170	315.00	6.985	2.382E+00	171	337.50	2.445	4.115E+00
172	337.50	3.173	3.610E+00	173	337.50	4.445	2.986E+00	174	337.50	5.715	2.651E+00	175	337.50	6.985	2.369E+00

Table B-15.

RUN DATE.....5/16/76
 PARTICLES.....ELECTRON
 BEAM ENERGY.....EOMMEV
 TARGET.....PP RUN 54
 PLATE NO.....P9
 PLATE LOCATION..5

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	136.00	2.328	6.582E+00	1	127.88	1.656	5.954E+00	2	119.06	1.883	7.101E+00	3	108.44	1.735	6.879E+00
4	96.34	1.636	6.978E+00	5	83.46	1.566	7.388E+00	6	71.87	1.735	7.102E+00	7	60.95	1.883	6.879E+00
8	62.13	2.085	6.368E+00	9	45.00	2.328	5.943E+00	10	142.10	2.085	5.906E+00	11	135.00	1.883	6.879E+00
12	125.54	1.573	7.314E+00	13	113.20	1.393	7.766E+00	14	98.13	1.293	7.993E+00	15	81.87	1.293	8.243E+00
16	66.80	1.393	8.168E+00	17	54.46	1.573	7.469E+00	18	45.00	1.810	7.162E+00	19	37.88	2.085	6.895E+00
20	180.98	1.883	6.878E+00	21	144.46	1.573	7.528E+00	22	138.00	1.293	8.276E+00	23	120.96	1.066	9.137E+00
24	101.31	0.933	1.000E+01	25	78.89	0.933	1.017E+01	26	59.04	1.066	9.720E+00	27	45.00	1.293	9.000E+00
28	35.54	1.573	8.368E+00	29	29.06	1.883	6.791E+00	30	161.57	1.735	7.423E+00	31	156.80	1.393	7.855E+00
32	149.04	1.066	8.422E+00	33	135.00	0.776	1.048E+01	34	108.44	0.578	1.154E+01	35	71.57	0.578	1.341E+01
36	45.00	0.776	1.237E+01	37	30.96	1.066	1.033E+01	38	23.20	1.393	8.521E+00	39	18.44	1.735	7.235E+00
40	173.88	1.656	6.980E+00	41	171.87	1.293	8.180E+00	42	168.69	0.933	9.474E+00	43	161.57	0.578	1.130E+01
44	135.00	0.259	1.400E+01	45	45.00	0.259	1.866E+01	46	18.44	0.578	1.488E+01	47	11.31	0.933	1.061E+01
48	8.13	1.293	9.071E+00	49	6.34	1.656	7.422E+00	50	186.34	1.656	7.135E+00	51	188.13	1.293	7.855E+00
52	191.31	0.933	9.888E+00	53	188.44	0.578	1.154E+01	54	225.00	0.259	1.436E+01	55	315.00	0.259	1.659E+01
56	341.37	0.578	1.392E+01	57	148.69	0.933	1.043E+01	58	351.87	1.293	8.650E+00	59	353.86	1.066	7.613E+00
60	198.44	1.656	6.801E+00	61	203.20	1.393	7.815E+00	62	210.96	1.066	9.381E+00	63	225.00	0.776	1.143E+01
64	251.37	0.578	1.407E+01	65	288.44	0.578	1.282E+01	66	215.00	0.776	1.195E+01	67	325.00	1.066	9.626E+00
68	336.80	1.393	8.450E+00	69	341.37	1.735	7.440E+00	70	209.05	1.883	6.558E+00	71	215.54	1.573	7.006E+00
72	225.00	1.293	8.134E+00	73	239.04	1.066	9.021E+00	74	258.69	0.933	9.981E+00	75	281.31	0.933	1.042E+01
76	300.98	1.066	9.763E+00	77	315.00	1.293	8.827E+00	78	324.46	1.573	7.978E+00	79	330.95	1.883	7.167E+00
80	217.88	0.933	8.893E+00	81	225.00	1.810	6.347E+00	82	234.46	1.573	6.618E+00	83	246.80	1.393	8.117E+00
84	261.87	1.293	8.573E+00	85	278.13	1.293	8.430E+00	86	293.20	1.393	8.558E+00	87	305.54	1.573	7.640E+00
88	315.00	1.810	6.959E+00	89	322.13	2.085	6.473E+00	90	225.00	2.328	5.656E+00	91	232.13	2.085	6.420E+00
92	240.95	1.883	6.864E+00	93	251.57	1.735	7.454E+00	94	263.66	1.656	7.387E+00	95	276.34	1.656	7.653E+00
96	288.44	2.795	5.257E+00	97	291.80	1.883	7.142E+00	98	307.88	2.085	6.184E+00	99	315.00	2.328	6.099E+00
100	0.00	2.985	5.257E+00	101	0.00	3.175	5.038E+00	102	0.00	3.445	4.722E+00	103	0.00	3.715	2.727E+00
104	0.00	3.985	2.159E+00	105	22.50	2.445	5.459E+00	106	22.50	3.175	4.719E+00	107	22.50	4.445	3.420E+00
108	22.50	5.715	2.818E+00	109	22.50	6.985	2.132E+00	110	45.00	3.175	4.725E+00	111	45.00	4.445	3.302E+00
112	45.00	5.715	2.650E+00	113	45.00	6.985	2.182E+00	114	67.50	2.445	5.461E+00	115	67.50	3.175	5.068E+00
116	67.50	4.445	3.700E+00	117	67.50	5.715	3.599E+00	118	67.50	6.985	2.066E+00	119	90.00	2.445	5.740E+00
120	90.00	3.175	4.482E+00	121	90.00	4.445	3.354E+00	122	90.00	5.715	2.527E+00	123	90.00	6.985	2.173E+00
124	112.50	2.445	5.237E+00	125	112.50	3.175	4.181E+00	126	112.50	4.445	3.168E+00	127	112.50	5.715	2.687E+00
128	112.50	6.985	2.231E+00	129	135.00	3.175	4.350E+00	130	135.00	4.445	3.100E+00	131	135.00	5.715	2.844E+00
132	135.00	5.715	2.181E+00	133	157.50	3.175	5.465E+00	134	157.50	4.445	4.075E+00	135	157.50	4.445	3.360E+00
136	157.50	5.715	2.824E+00	137	157.50	6.985	2.753E+00	138	180.00	3.175	4.627E+00	139	180.00	4.445	3.175E+00
140	180.00	4.445	3.497E+00	141	180.00	5.715	2.516E+00	142	180.00	6.985	2.295E+00	143	202.50	2.445	5.924E+00
144	202.50	3.175	4.870E+00	145	202.50	4.445	3.542E+00	146	202.50	5.715	2.539E+00	147	202.50	6.985	2.049E+00
148	225.00	3.175	4.358E+00	149	225.00	4.445	3.395E+00	150	225.00	5.715	2.581E+00	151	225.00	6.985	2.135E+00
152	247.50	2.445	5.848E+00	153	247.50	3.175	4.761E+00	154	247.50	4.445	3.184E+00	155	247.50	5.715	2.513E+00
156	247.50	6.985	2.180E+00	157	270.00	2.445	5.648E+00	158	270.00	3.175	4.388E+00	159	270.00	4.445	3.175E+00
160	270.00	5.715	2.637E+00	161	270.00	6.985	2.178E+00	162	292.50	2.445	5.625E+00	163	292.50	3.175	4.902E+00
164	292.50	4.445	3.473E+00	165	292.50	5.715	2.846E+00	166	292.50	6.985	2.154E+00	167	315.00	3.175	4.822E+00
168	315.00	5.715	2.711E+00	169	315.00	6.985	2.360E+00	170	315.00	8.985	0.877E+01	171	317.50	2.445	5.808E+00
172	337.50	3.175	4.000E+00	173	337.50	4.445	3.240E+00	174	337.50	5.715	2.686E+00	175	337.50	6.985	2.162E+00

Table B-16.

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RUN DATE.....5/16/76
PARTICLE.....ELECTRON
BEAM ENERGY....300MEV
TARGET.....FP RUN 55*
PLATE NO.....P3
PLATE LOCATION..1

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NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	2.844E+00	1	127.88	2.085	3.862E+00	2	119.06	1.883	6.047E+00	3	108.44	1.735	1.043E+01
4	96.34	1.856	1.193E+01	5	83.66	1.656	1.327E+01	6	71.57	1.735	1.103E+01	7	60.95	1.883	9.002E+00
8	52.13	2.085	5.568E+00	9	45.00	2.328	3.106E+00	10	142.10	2.085	3.792E+00	11	135.00	1.883	6.701E+00
12	125.84	1.503	3.053E+01	13	113.46	1.393	5.949E+00	14	98.00	1.883	1.158E+01	15	87.97	1.883	3.000E+00
16	105.95	1.883	3.053E+01	17	113.46	1.393	5.939E+00	18	45.00	1.883	8.770E+00	19	37.88	2.085	9.003E+00
20	150.95	1.883	5.484E+00	21	144.26	1.573	3.000E+01	22	135.00	1.293	3.904E+01	23	120.96	1.066	7.525E+01
24	101.31	0.933	1.239E+02	25	78.69	0.933	1.502E+02	26	59.04	1.066	1.015E+02	27	45.00	1.293	4.789E+01
28	35.54	1.573	5.384E+01	29	29.06	1.883	8.927E+00	30	161.57	1.735	7.490E+00	31	156.80	0.393	3.951E+01
32	15.04	0.776	0.076E+01	33	0.776	0.076	0.076E+01	34	156.80	0.393	3.951E+01	35	71.57	0.393	3.951E+01
36	45.00	0.776	3.482E+02	37	30.96	1.066	9.565E+01	38	23.20	1.393	3.951E+01	39	18.44	1.735	1.070E+01
40	173.66	1.656	8.752E+00	41	171.87	1.293	3.786E+01	42	168.69	0.933	9.401E+01	43	161.57	0.578	4.347E+02
44	135.00	0.259	1.665E+04	45	45.00	0.259	3.787E+04	46	18.44	0.578	1.136E+03	47	11.31	0.933	1.637E+02
48	9.13	0.293	5.165E+01	49	6.34	0.656	1.322E+01	50	186.34	0.656	9.531E+01	51	188.13	0.293	3.916E+01
52	19.13	0.293	1.947E+02	53	19.13	0.776	9.547E+01	54	186.34	0.656	9.531E+01	55	30.96	0.293	3.916E+01
56	341.57	0.578	1.235E+03	57	348.69	0.933	1.625E+02	58	351.87	1.293	3.290E+01	59	393.66	1.656	1.302E+01
60	198.44	1.735	7.353E+00	61	203.20	1.393	3.985E+01	62	210.96	1.066	6.634E+01	63	225.00	0.776	2.288E+02
64	251.57	0.578	1.848E+03	65	288.44	0.578	2.404E+03	66	315.00	0.776	3.621E+02	67	329.00	1.066	9.482E+01
68	336.80	1.393	3.916E+01	69	341.87	1.735	1.065E+01	70	209.09	0.883	5.745E+01	71	215.54	1.573	3.000E+02
72	300.95	1.066	9.947E+01	73	315.00	1.293	4.721E+01	74	324.46	1.573	4.000E+01	75	330.95	1.883	8.080E+00
76	300.95	1.066	9.947E+01	77	315.00	1.293	4.721E+01	78	324.46	1.573	4.000E+01	79	330.95	1.883	8.080E+00
80	217.88	2.085	3.757E+00	81	225.00	1.883	6.442E+00	82	234.46	1.573	3.000E+01	83	246.80	1.393	3.791E+01
84	261.87	1.293	4.556E+01	85	272.13	2.085	4.638E+01	86	293.20	1.393	4.027E+01	87	305.54	1.573	4.000E+01
88	341.57	1.883	6.686E+00	89	328.44	1.293	4.693E+00	90	225.00	2.228	2.449E+00	91	232.13	2.085	4.087E+01
92	240.95	1.883	3.053E+01	93	239.06	1.883	7.584E+00	94	307.88	2.085	4.957E+00	95	315.00	2.328	3.253E+00
96	268.44	1.735	2.842E+00	100	0	3.175	1.356E+00	102	0	4.445	5.264E+01	103	0	5.715	3.842E+01
100	0	2.445	3.131E+01	105	22.50	2.445	3.150E+00	106	22.50	3.175	1.210E+00	107	22.50	4.445	4.707E+01
104	22.50	6.985	1.032E+01	108	45.00	6.985	1.922E+01	110	45.00	6.985	2.336E+01	111	45.00	6.985	2.752E+01
108	45.00	5.715	8.09E+01	113	67.50	5.715	8.09E+01	114	67.50	6.985	2.336E+01	115	67.50	6.985	2.752E+01
112	67.50	4.445	4.962E+01	117	67.50	5.715	8.09E+01	118	67.50	6.985	2.331E+01	119	90.00	2.445	3.175E+00
116	67.50	4.445	4.962E+01	121	90.00	4.445	5.000E+01	122	90.00	5.715	2.02E+01	123	90.00	6.985	9.204E+01
120	90.00	3.175	1.000E+00	125	112.50	3.175	9.391E+01	126	112.50	4.445	4.699E+01	127	112.50	5.715	3.866E+01
124	112.50	2.445	2.248E+00	128	135.00	3.175	9.391E+01	129	135.00	4.445	4.699E+01	130	135.00	5.715	4.781E+01
128	135.00	6.985	2.283E+01	133	157.50	2.445	2.234E+00	134	157.50	3.175	8.589E+01	135	157.50	4.445	4.781E+01
132	135.00	6.985	2.283E+01	137	157.50	6.985	3.181E+01	138	180.00	2.445	1.864E+00	139	180.00	3.175	7.993E+01
136	157.50	5.715	3.568E+01	141	180.00	5.715	3.576E+01	142	180.00	6.985	3.200E+01	143	202.50	2.445	2.115E+00
140	180.00	4.445	6.121E+01	145	202.50	4.445	4.771E+01	146	202.50	5.715	3.620E+01	147	202.50	6.985	3.185E+01
144	225.00	3.175	8.09E+01	149	247.50	2.445	2.674E+00	150	247.50	3.175	8.589E+01	151	247.50	4.445	4.781E+01
148	225.00	3.175	8.09E+01	153	247.50	3.175	6.682E+01	154	247.50	4.445	4.725E+01	155	247.50	5.715	3.433E+01
152	247.50	2.445	2.108E+00	157	270.00	2.445	2.174E+00	158	270.00	3.175	9.620E+01	159	270.00	4.445	4.709E+01
156	247.50	6.985	2.846E+01	161	270.00	6.985	2.655E+01	162	292.50	2.445	2.621E+00	163	292.50	3.175	9.631E+01
160	270.00	5.715	3.259E+01	165	292.50	5.715	3.242E+01	166	292.50	6.985	3.094E+01	167	315.00	2.445	2.066E+00
164	270.00	6.985	3.094E+01	169	315.00	5.715	3.242E+01	170	315.00	6.985	3.094E+01	171	315.00	8.080	4.445E+00
168	315.00	4.445	1.081E+01	173	337.50	4.445	4.692E+01	174	337.50	5.715	3.874E+01	175	337.50	6.985	3.722E+01
172	337.50	3.175													

*Run 55 was an exposure of a single TLD plate. Beam parameters were the same as run 54.

Table B-17.

12/9/76	PROTON	20	50EV	FP RUN	61	P3	1	
D(00)	1.76	++	D(68)	6.26	++	D(141)	2.84	++
D(01)	1.82	++	D(71)	3.02	++	D(142)	1.88	++
D(02)	2.08	++	D(74)	8.63	++	D(143)	1.51	++
D(03)	3.39	++	D(75)	6.62	++	D(144)	1.03	++
D(04)	2.18	++	D(76)	7.00	++	D(145)	4.72	++
D(05)	2.24	++	D(77)	5.58	++	D(146)	2.80	++
D(06)	2.18	++	D(78)	4.02	++	D(147)	1.87	++
D(07)	1.98	++	D(80)	1.98	++	D(148)	8.98	++
D(08)	1.82	++	D(83)	3.73	++	D(149)	5.01	++
D(09)	1.54	++	D(85)	4.30	++	D(150)	2.93	++
D(10)	1.91	++	D(86)	3.56	++	D(151)	2.09	++
D(11)	2.34	++	D(87)	3.25	++	D(152)	1.46	++
D(12)	3.30	++	D(89)	1.83	++	D(153)	9.92	++
D(13)	3.19	++	D(90)	1.52	++	D(154)	4.84	++
D(14)	3.47	++	D(91)	2.04	++	D(155)	2.74	++
D(15)	3.33	++	D(92)	1.13	++	D(156)	1.87	++
D(16)	3.68	++	D(97)	2.31	++	D(157)	1.41	++
D(17)	2.68	++	D(98)	1.88	++	D(158)	8.55	++
D(18)	2.22	++	D(99)	1.53	++	D(159)	4.71	++
D(19)	1.86	++	D(100)	1.43	++	D(160)	2.74	++
D(20)	2.38	++	D(101)	8.76	++	D(161)	2.00	++
D(21)	4.61	++	D(102)	4.66	++	D(162)	1.32	++
D(22)	6.06	++	D(103)	2.82	++	D(163)	8.73	++
D(23)	3.06	++	D(104)	1.84	++	D(164)	4.66	++
D(24)	3.33	++	D(105)	1.42	++	D(165)	3.01	++
D(25)	3.33	++	D(106)	9.39	++	D(166)	1.80	++
D(26)	3.99	++	D(107)	4.45	++	D(167)	8.65	++
D(27)	2.69	++	D(108)	2.80	++	D(168)	4.65	++
D(28)	2.69	++	D(109)	1.97	++	D(169)	2.90	++
D(29)	4.90	++	D(110)	9.23	++	D(170)	1.98	++
D(30)	1.10	++	D(111)	4.79	++	D(171)	1.44	++
D(31)	1.10	++	D(112)	3.03	++	D(172)	8.81	++
D(32)	1.48	++	D(113)	1.96	++	D(173)	4.44	++
D(33)	1.12	++	D(114)	1.31	++	D(174)	2.84	++
D(34)	1.69	++	D(115)	7.96	++	D(175)	1.93	++
D(35)	1.50	++	D(116)	4.42	++			
D(36)	1.12	++	D(117)	2.68	++			
D(37)	7.72	++	D(118)	1.89	++			
D(38)	4.84	++	D(119)	8.29	++			
D(41)	6.65	++	D(120)	1.29	++			
D(42)	1.81	++	D(121)	4.35	++			
D(43)	3.06	++	D(122)	2.65	++			
D(44)	3.22	++	D(123)	1.77	++			
D(45)	2.89	++	D(124)	1.42	++			
D(46)	1.98	++	D(125)	8.62	++			
D(47)	1.27	++	D(126)	4.71	++			
D(48)	7.10	++	D(127)	2.77	++			
D(51)	6.69	++	D(128)	1.82	++			
D(52)	1.84	++	D(129)	9.86	++			
D(53)	2.99	++	D(130)	4.78	++			
D(54)	3.45	++	D(131)	2.89	++			
D(55)	3.13	++	D(132)	1.88	++			
D(56)	2.20	++	D(133)	1.82	++			
D(57)	1.37	++	D(134)	9.94	++			
D(58)	8.03	++	D(135)	5.03	++			
D(61)	4.41	++	D(136)	2.84	++			
D(64)	2.13	++	D(137)	2.05	++			
D(65)	2.11	++	D(138)	1.62	++			
D(66)	1.39	++	D(139)	9.60	++			
D(67)	9.52	++	D(140)	4.84	++			

Table B-18.

12/9/76 PROTON 28.5GEV FP RUN 61 P4 2							
D(00)	=	1.36	E+3	D(59)	=	3.31	E+3
D(01)	=	1.69	E+3	D(60)	=	2.95	E+3
D(02)	=	2.00	E+3	D(61)	=	4.61	E+3
D(03)	=	2.22	E+3	D(62)	=	7.63	E+3
D(04)	=	2.30	E+3	D(63)	=	1.03	E+4
D(05)	=	2.26	E+3	D(64)	=	1.22	E+4
D(06)	=	2.31	E+3	D(65)	=	1.14	E+4
D(07)	=	1.81	E+3	D(66)	=	9.72	E+3
D(08)	=	1.65	E+3	D(67)	=	6.97	E+3
D(09)	=	1.21	E+3	D(68)	=	4.78	E+3
D(10)	=	1.77	E+3	D(69)	=	2.97	E+3
D(11)	=	2.36	E+3	D(70)	=	2.41	E+3
D(12)	=	2.97	E+3	D(71)	=	3.53	E+3
D(13)	=	3.37	E+3	D(72)	=	5.22	E+3
D(14)	=	3.56	E+3	D(73)	=	6.79	E+3
D(15)	=	3.53	E+3	D(74)	=	7.42	E+3
D(16)	=	3.11	E+3	D(75)	=	7.51	E+3
D(17)	=	2.67	E+3	D(76)	=	6.22	E+3
D(18)	=	2.30	E+3	D(77)	=	5.16	E+3
D(19)	=	1.60	E+3	D(78)	=	3.85	E+3
D(20)	=	2.50	E+3	D(79)	=	2.53	E+3
D(21)	=	2.34	E+3	D(80)	=	2.02	E+3
D(22)	=	4.62	E+3	D(81)	=	2.61	E+3
D(23)	=	3.66	E+3	D(82)	=	3.48	E+3
D(24)	=	1.16	E+3	D(83)	=	4.03	E+3
D(25)	=	3.53	E+3	D(84)	=	4.76	E+3
D(26)	=	1.16	E+3	D(85)	=	4.54	E+3
D(27)	=	4.09	E+3	D(86)	=	3.95	E+3
D(28)	=	2.88	E+3	D(87)	=	3.29	E+3
D(29)	=	2.30	E+3	D(88)	=	2.62	E+3
D(30)	=	3.21	E+3	D(89)	=	1.82	E+3
D(31)	=	4.49	E+3	D(90)	=	1.50	E+3
D(32)	=	6.76	E+3	D(91)	=	1.84	E+3
D(33)	=	8.87	E+3	D(92)	=	2.27	E+3
D(34)	=	8.80	E+3	D(93)	=	2.63	E+3
D(35)	=	9.80	E+3	D(94)	=	2.80	E+3
D(36)	=	7.67	E+3	D(95)	=	3.02	E+3
D(37)	=	5.63	E+3	D(96)	=	2.62	E+3
D(38)	=	4.08	E+3	D(97)	=	2.22	E+3
D(39)	=	2.81	E+3	D(98)	=	1.85	E+3
D(40)	=	3.56	E+3	D(99)	=	1.48	E+3
D(41)	=	6.15	E+3	D(100)	=	1.36	E+3
D(42)	=	9.72	E+3	D(101)	=	6.75	E+3
D(43)	=	1.34	E+4	D(102)	=	2.92	E+3
D(44)	=	1.10	E+4	D(103)	=	1.36	E+3
D(45)	=	1.33	E+4	D(104)	=	7.75	E+3
D(46)	=	1.02	E+4	D(105)	=	1.27	E+3
D(47)	=	1.91	E+3	D(106)	=	6.37	E+3
D(48)	=	5.01	E+3	D(107)	=	2.91	E+3
D(49)	=	3.24	E+3	D(108)	=	1.30	E+3
D(50)	=	3.31	E+3	D(109)	=	7.70	E+3
D(51)	=	5.76	E+3	D(110)	=	6.54	E+3
D(52)	=	9.43	E+3	D(111)	=	2.65	E+3
D(53)	=	1.33	E+4	D(112)	=	1.28	E+3
D(54)	=	1.63	E+4	D(113)	=	7.75	E+3
D(55)	=	1.49	E+4	D(114)	=	1.05	E+3
D(56)	=	1.17	E+4	D(115)	=	5.74	E+3
D(57)	=	8.24	E+3	D(116)	=	2.47	E+3
D(58)	=	5.44	E+3	D(117)	=	1.35	E+3
				D(118)	=	7.58	E+3
				D(119)	=	1.19	E+3
				D(120)	=	1.92	E+3
				D(121)	=	5.50	E+3
				D(122)	=	7.73	E+3
				D(123)	=	1.39	E+3
				D(124)	=	1.20	E+3
				D(125)	=	6.25	E+3
				D(126)	=	2.56	E+3
				D(127)	=	1.39	E+3
				D(128)	=	7.97	E+3
				D(129)	=	6.89	E+3
				D(130)	=	3.03	E+3
				D(131)	=	1.47	E+3
				D(132)	=	8.70	E+3
				D(133)	=	1.43	E+3
				D(134)	=	7.54	E+3
				D(135)	=	3.09	E+3
				D(136)	=	1.57	E+3
				D(137)	=	8.50	E+3
				D(138)	=	1.36	E+3
				D(139)	=	7.47	E+3
				D(140)	=	3.32	E+3
				D(141)	=	1.53	E+3
				D(142)	=	8.76	E+3
				D(143)	=	1.37	E+3
				D(144)	=	7.02	E+3
				D(145)	=	2.94	E+3
				D(146)	=	1.46	E+3
				D(147)	=	7.96	E+3
				D(148)	=	6.75	E+3
				D(149)	=	3.08	E+3
				D(150)	=	1.46	E+3
				D(151)	=	9.45	E+3
				D(152)	=	1.27	E+3
				D(153)	=	6.65	E+3
				D(154)	=	2.86	E+3
				D(155)	=	1.41	E+3
				D(156)	=	8.77	E+3
				D(157)	=	1.24	E+3
				D(158)	=	6.58	E+3
				D(159)	=	2.99	E+3
				D(160)	=	1.50	E+3
				D(161)	=	8.42	E+3
				D(162)	=	1.18	E+3
				D(163)	=	6.40	E+3
				D(164)	=	2.87	E+3
				D(165)	=	1.46	E+3
				D(166)	=	8.25	E+3
				D(167)	=	7.13	E+3
				D(168)	=	2.76	E+3
				D(169)	=	1.43	E+3
				D(170)	=	8.72	E+3
				D(171)	=	1.38	E+3
				D(172)	=	6.63	E+3
				D(173)	=	2.81	E+3
				D(174)	=	1.44	E+3
				D(175)	=	7.73	E+3

Table B-19.

12/9/76	PROTON	28.50EV	FP	RUN	61	P5	3	
D(00)	1.16	+3	D(59)	2.59	+3	D(120)	5.10	+2
D(01)	1.37	+3	D(60)	2.10	+3	D(121)	2.58	+2
D(02)	1.48	+3	D(61)	3.10	+3	D(122)	7.20	+2
D(03)	1.64	+3	D(62)	4.89	+3	D(123)	9.81	+1
D(04)	1.82	+3	D(63)	7.09	+3	D(124)	5.40	+2
D(05)	1.81	+3	D(64)	8.45	+3	D(125)	2.59	+2
D(06)	1.67	+3	D(65)	8.45	+3	D(126)	1.30	+2
D(07)	1.49	+3	D(66)	6.68	+3	D(127)	7.88	+2
D(08)	1.33	+3	D(67)	5.47	+3	D(128)	5.39	+2
D(09)	1.03	+3	D(68)	3.94	+3	D(129)	2.44	+2
D(10)	1.41	+3	D(69)	2.38	+3	D(130)	1.33	+2
D(11)	1.73	+3	D(70)	1.81	+3	D(131)	7.32	+1
D(12)	2.18	+3	D(71)	2.62	+3	D(132)	1.04	+3
D(13)	2.56	+3	D(72)	3.48	+3	D(133)	6.23	+2
D(14)	2.72	+3	D(73)	4.77	+3	D(134)	2.88	+2
D(15)	2.75	+3	D(74)	5.27	+3	D(135)	1.36	+2
D(16)	2.52	+3	D(75)	5.46	+3	D(136)	8.19	+1
D(17)	2.14	+3	D(76)	4.52	+3	D(137)	1.14	+3
D(18)	1.68	+3	D(77)	3.90	+3	D(138)	6.21	+2
D(19)	1.30	+3	D(78)	2.80	+3	D(139)	1.33	+2
D(20)	1.85	+3	D(79)	2.11	+3	D(141)	8.11	+1
D(21)	2.32	+3	D(80)	1.40	+3	D(142)	1.01	+3
D(22)	3.19	+3	D(81)	1.85	+3	D(143)	5.81	+2
D(23)	3.66	+3	D(82)	3.41	+3	D(144)	2.67	+2
D(24)	4.31	+3	D(83)	3.07	+3	D(145)	1.36	+2
D(25)	4.19	+3	D(84)	3.45	+3	D(146)	7.72	+1
D(26)	3.97	+3	D(85)	3.44	+3	D(147)	5.47	+2
D(27)	3.09	+3	D(86)	2.93	+3	D(148)	2.42	+2
D(28)	2.34	+3	D(87)	2.50	+3	D(149)	1.29	+2
D(29)	1.72	+3	D(88)	2.12	+3	D(150)	7.29	+1
D(30)	2.08	+3	D(89)	1.60	+3	D(151)	9.89	+2
D(31)	3.23	+3	D(90)	1.15	+3	D(152)	5.67	+2
D(32)	4.77	+3	D(91)	1.53	+3	D(153)	2.63	+2
D(33)	6.24	+3	D(92)	1.71	+3	D(154)	1.41	+2
D(34)	7.00	+3	D(93)	2.02	+3	D(155)	7.53	+1
D(35)	7.27	+3	D(94)	2.08	+3	D(156)	1.02	+3
D(36)	5.81	+3	D(95)	2.19	+3	D(157)	5.47	+2
D(37)	4.84	+3	D(96)	2.03	+3	D(158)	2.52	+2
D(38)	3.13	+3	D(97)	1.72	+3	D(159)	1.26	+2
D(39)	2.33	+3	D(98)	1.46	+3	D(160)	7.60	+1
D(40)	2.31	+3	D(99)	1.19	+3	D(161)	1.07	+3
D(41)	2.79	+3	D(100)	1.11	+3	D(162)	6.01	+2
D(42)	6.21	+3	D(101)	6.35	+2	D(163)	2.64	+2
D(43)	8.74	+3	D(102)	2.76	+2	D(164)	2.23	+2
D(44)	1.01	+4	D(103)	1.41	+2	D(165)	7.66	+1
D(45)	9.42	+3	D(104)	7.59	+1	D(166)	5.69	+2
D(46)	26.11	+3	D(105)	1.10	+3	D(167)	2.48	+2
D(47)	9.11	+3	D(106)	6.09	+2	D(168)	1.29	+2
D(48)	9.96	+3	D(107)	2.43	+2	D(169)	7.27	+1
D(49)	2.80	+3	D(108)	1.27	+2	D(170)	1.13	+3
D(50)	2.52	+3	D(109)	7.32	+1	D(171)	6.09	+2
D(51)	3.75	+3	D(110)	5.22	+2	D(172)	2.47	+2
D(52)	3.54	+3	D(111)	2.48	+2	D(173)	1.34	+2
D(53)	9.06	+3	D(113)	7.46	+1	D(174)	7.54	+1
D(54)	1.04	+4	D(114)	9.03	+2			
D(55)	1.04	+4	D(115)	4.91	+2			
D(56)	8.28	+3	D(116)	2.26	+2			
D(57)	6.10	+3	D(117)	1.32	+2			
D(58)	4.33	+3	D(118)	7.65	+1			
			D(119)	9.07	+2			

Table B-20.

12/9/76	PROTON	28.56EV	FP	RUN	61	P6	4
00	1.17	67	4.95				
01	1.34	69	2.055				
02	1.32	70	1.59				
03	1.40	71	1.67				
04	1.52	73	3.56				
05	1.36	74	4.42				
06	1.32	75	4.87				
07	1.34	76	3.87				
08	1.20	79	1.65				
09	1.12	80	1.39				
10	1.31	81	1.56				
11	1.43	82	1.78				
12	1.70	83	2.16				
13	1.74	84	2.40				
14	1.55	86	2.21				
15	1.70	87	1.88				
16	1.44	88	1.66				
17	1.38	89	1.48				
18	1.52	90	1.17				
19	1.52	91	1.32				
20	1.60	92	1.42				
21	1.18	93	1.62				
22	1.44	94	1.60				
23	1.83	95	1.69				
24	1.79	96	1.70				
25	1.78	97	1.61				
26	1.79	98	1.30				
27	1.54	99	1.37				
28	1.51	100	1.28				
29	1.99	101	1.78				
30	1.51	102	1.28				
31	1.05	103	1.33				
32	1.05	104	1.55				
33	1.72	106	1.29				
34	1.72	107	1.33				
35	1.29	108	1.21				
36	1.79	109	1.06				
37	1.29	110	1.25				
38	1.22	111	1.52				
39	1.09	112	1.32				
40	1.10	114	1.13				
41	1.10	115	1.70				
42	1.65	116	1.21				
43	1.48	117	1.94				
44	1.33	118	1.98				
45	1.21	119	1.17				
46	1.62	120	1.83				
47	1.02	121	1.46				
48	1.64	122	1.73				
49	1.23	123	1.83				
50	1.20	125	1.02				
51	1.58	126	1.39				
52	1.13	128	1.07				
53	1.53	129	1.59				
54	1.48	130	1.43				
55	1.77	131	1.13				
56	1.99	132	1.04				
57	1.48	134	1.81				
58	1.00	135	1.22				
59	1.00	138	1.20				
60							
61							
62							
63							
64							
65							
66							

Table B-21.

12/9/76	PROTON	28.50EV	FP	RUN	61	P8	5
00	3.44	60			5.50		
01	4.16	61			7.65		
02	4.44	62			1.23		
03	5.03	63			2.12		
04	5.55	64			2.38		
05	5.99	65			2.39		
06	6.13	66			2.24		
07	6.25	67			1.68		
08	6.44	68			1.21		
09	6.70	69			7.77		
10	6.97	70			4.69		
11	7.35	71			6.35		
12	7.80	72			9.43		
13	8.97	73			1.19		
14	9.33	74			1.43		
15	9.73	75			1.55		
16	9.39	76			1.38		
17	6.76	77			1.06		
18	5.38	78			8.20		
19	4.65	79			6.51		
20	5.03	80			4.17		
21	8.10	81			5.63		
22	1.11	82			8.10		
23	1.13	83			9.32		
24	1.22	84			9.13		
25	1.07	85			8.72		
26	9.10	86			7.56		
27	6.93	87			6.55		
28	5.25	88			4.87		
29	5.33	89			3.61		
30	7.95	90			4.40		
31	1.26	91			5.36		
32	1.62	92			5.76		
33	1.90	93			5.94		
34	1.86	94			5.99		
35	1.63	95			4.49		
36	1.37	96			3.96		
37	9.44	97			3.93		
38	7.25	98			1.53		
39	6.03	99			1.08		
40	8.73	100			3.52		
41	1.56	101			2.47		
42	2.47	102			1.47		
43	2.80	103			1.12		
44	2.98	104			7.75		
45	2.36	105			2.55		
46	1.79	106			1.05		
47	1.23	107			1.05		
48	7.78	108			2.33		
49	5.76	109			1.13		
50	5.96	110			8.42		
51	5.57	111			3.39		
52	5.50	112			1.52		
53	5.55	113			1.11		
54	5.57	114			7.59		
55	5.88	115			1.55		
56	5.26	116			1.02		
57	9.25	117					
58		118					
59		119					
		120					
		121					
		122					
		123					
		124					
		125					
		126					
		127					

Table B-22.

12/9/76	PROTON	28.50EV	FP	RUN	62	P224	
D(00)	= 1.70	E+1	D(105)	= 2.19	E+1	D(174)	= 7.01 E+0
D(01)	= 2.10	E+1	D(106)	= 1.27	E+1		
D(02)	= 2.36	E+1	D(107)	= 8.30	E+0		
D(03)	= 2.79	E+1	D(108)	= 6.77	E+0		
D(04)	= 2.63	E+1	D(109)	= 5.09	E+0		
D(05)	= 2.55	E+1	D(110)	= 1.15	E+1		
D(06)	= 2.40	E+1	D(111)	= 7.72	E+0		
D(07)	= 2.35	E+1	D(112)	= 5.82	E+0		
D(08)	= 1.99	E+1	D(113)	= 4.38	E+0		
D(09)	= 1.76	E+1	D(115)	= 1.07	E+1		
D(10)	= 2.30	E+1	D(116)	= 7.70	E+0		
D(11)	= 2.77	E+1	D(117)	= 5.43	E+0		
D(12)	= 3.45	E+1	D(118)	= 4.34	E+0		
D(15)	= 4.67	E+1	D(119)	= 1.51	E+1		
D(18)	= 2.66	E+1	D(120)	= 1.11	E+1		
D(19)	= 2.25	E+1	D(121)	= 7.86	E+0		
D(20)	= 3.56	E+1	D(122)	= 5.59	E+0		
D(22)	= 5.68	E+1	D(123)	= 4.29	E+0		
D(27)	= 7.06	E+1	D(124)	= 1.47	E+1		
D(29)	= 4.07	E+1	D(125)	= 1.07	E+1		
D(30)	= 4.20	E+1	D(126)	= 7.75	E+0		
D(31)	= 6.25	E+1	D(127)	= 5.43	E+0		
D(34)	= 2.73	E+2	D(128)	= 4.05	E+0		
D(35)	= 2.82	E+2	D(129)	= 1.19	E+1		
D(36)	= 2.82	E+2	D(130)	= 7.40	E+0		
D(39)	= 9.30	E+1	D(131)	= 5.28	E+0		
D(40)	= 4.67	E+1	D(132)	= 4.28	E+0		
D(41)	= 8.89	E+1	D(133)	= 2.73	E+1		
D(43)	= 7.10	E+2	D(134)	= 1.73	E+1		
D(44)	= 9.35	E+2	D(135)	= 8.42	E+0		
D(45)	= 9.81	E+2	D(136)	= 5.58	E+0		
D(46)	= 8.96	E+2	D(138)	= 2.71	E+1		
D(53)	= 1.69	E+3	D(139)	= 1.76	E+1		
D(54)	= 2.36	E+3	D(140)	= 8.91	E+0		
D(55)	= 2.28	E+3	D(141)	= 5.88	E+0		
D(56)	= 2.27	E+3	D(143)	= 2.51	E+1		
D(60)	= 4.78	E+1	D(144)	= 1.38	E+1		
D(61)	= 1.20	E+2	D(145)	= 8.90	E+0		
D(64)	= 2.73	E+3	D(146)	= 5.16	E+0		
D(65)	= 2.86	E+3	D(148)	= 1.49	E+1		
D(66)	= 2.48	E+3	D(149)	= 8.93	E+0		
D(70)	= 3.83	E+1	D(150)	= 6.22	E+0		
D(71)	= 8.23	E+1	D(152)	= 2.30	E+1		
D(81)	= 4.99	E+1	D(153)	= 1.53	E+1		
D(89)	= 1.90	E+2	D(154)	= 9.05	E+0		
D(90)	= 2.55	E+1	D(155)	= 6.32	E+0		
D(91)	= 3.48	E+1	D(157)	= 2.51	E+1		
D(92)	= 5.09	E+1	D(158)	= 1.53	E+1		
D(93)	= 8.24	E+1	D(159)	= 9.35	E+0		
D(94)	= 1.11	E+2	D(160)	= 6.74	E+0		
D(95)	= 1.35	E+2	D(162)	= 2.85	E+1		
D(96)	= 1.37	E+2	D(163)	= 1.55	E+1		
D(97)	= 1.10	E+2	D(164)	= 9.95	E+0		
D(99)	= 6.56	E+1	D(165)	= 6.54	E+0		
D(100)	= 6.25	E+1	D(167)	= 1.62	E+1		
D(101)	= 1.59	E+1	D(168)	= 9.52	E+0		
D(102)	= 9.49	E+0	D(169)	= 6.83	E+0		
D(103)	= 6.19	E+0	D(171)	= 1.03	E+2		
D(104)	= 4.92	E+0	D(172)	= 1.53	E+1		
			D(173)	= 9.32	E+0		

[illegible]

Table B-23.

Table B-24.

12/9/76	PROTON	28.50EV	FP	RUN	63	P9	1
(00)	9.91	(59)	1	31	(119)	6.	(20)
(01)	9.23	(60)	1	12	(120)	-4.4.	(21)
(02)	1.17	(61)	4	93	(121)	-8.05	(22)
(03)	1.23	(62)	4	93	(122)	1.1.	(23)
(04)	1.36	(63)	6	23	(123)	1.8.	(24)
(05)	1.25	(64)	5	45	(124)	1.9.	(25)
(06)	1.27	(65)	4	50	(125)	1.7.	(26)
(07)	1.17	(66)	4	07	(126)	-4.4.	(27)
(08)	9.00	(67)	3	07	(127)	-8.05	(28)
(09)	9.99	(68)	2	27	(128)	1.1.	(29)
(10)	9.58	(69)	1	13	(129)	1.1.	(30)
(11)	1.27	(70)	1	98	(130)	-8.05	(31)
(12)	1.23	(71)	4	43	(131)	1.1.	(32)
(13)	1.77	(72)	5	06	(132)	9.83	(33)
(14)	1.74	(73)	5	36	(133)	7.89	(34)
(15)	1.83	(74)	4	37	(134)	4.72	(35)
(16)	1.81	(75)	3	94	(135)	-8.05	(36)
(17)	1.55	(76)	3	40	(136)	1.62	(37)
(18)	1.24	(77)	2	64	(137)	9.27	(38)
(19)	7.98	(78)	1	73	(138)	8.56	(39)
(20)	1.10	(79)	1	10	(139)	4.80	(40)
(21)	1.95	(80)	1	54	(140)	-8.05	(41)
(22)	7.50	(81)	3	18	(141)	1.62	(42)
(23)	7.76	(82)	4	27	(142)	1.08	(43)
(24)	7.78	(83)	3	67	(143)	8.60	(44)
(25)	7.54	(84)	3	46	(144)	6.08	(45)
(26)	7.54	(85)	2	97	(145)	-8.05	(46)
(27)	7.20	(86)	2	55	(146)	1.79	(47)
(28)	7.66	(87)	1	65	(147)	1.16	(48)
(29)	7.44	(88)	1	29	(148)	-6.83	(49)
(30)	8.83	(89)	8	39	(149)	-8.05	(50)
(31)	8.83	(90)	2	29	(150)	2.04	(51)
(32)	8.82	(91)	2	29	(151)	1.50	(52)
(33)	8.82	(92)	2	78	(152)	1.49	(53)
(34)	8.93	(93)	2	59	(153)	7.81	(54)
(35)	8.63	(94)	2	30	(154)	-8.05	(55)
(36)	8.60	(95)	2	17	(155)	-8.05	(56)
(37)	8.02	(96)	1	81	(156)	1.57	(57)
(38)	2.23	(97)	1	39	(157)	1.12	(58)
(39)	2.26	(98)	1	15	(158)	7.47	(59)
(40)	1.86	(99)	7	80	(159)	-8.05	(60)
(41)	1.86	100	5	39	(160)	2.29	(61)
(42)	6.08	101	3	74	(161)	1.49	(62)
(43)	5.55	102	1	92	(162)	9.13	(63)
(44)	4.07	103	1	30	(163)	5.61	(64)
(45)	4.76	104	7	7	(164)	-8.05	(65)
(46)	4.35	105	5	88	(165)	1.67	(66)
(47)	3.55	106	3	44	(166)	1.17	(67)
(48)	3.62	107	3	87	(167)	4.52	(68)
(49)	3.38	108	1	27	(168)	2.30	(69)
(50)	1.89	109	7	82	(169)	1.48	(70)
(51)	1.4.	110	3	70	(170)	5.31	(71)
(52)	7.41	111	1	99	(171)	9.81	(72)
(53)	5.56	112	1	33	(172)	3.54	(73)
(54)	5.76	113	8	46	(173)	2.34	(74)
(55)	2.25	114	6	87	(174)	1.29	(75)
(56)	2.25	115	4	34	(175)	8.70	
(57)	6.53	116	-8.05				
(58)	6.53	117	1.40				
(59)	6.53	118	8.18				

Table B-25.

12/9/76	PROTON	28.5GEV	FP RUN 63	P102
D(00)	7.14	D(54)	1.11	+4
D(01)	9.49	D(60)	1.65	+4
D(02)	1.04	D(61)	2.66	+4
D(03)	1.17	D(62)	3.45	+4
D(04)	1.17	D(63)	3.93	+4
D(05)	1.19	D(64)	3.93	+4
D(06)	1.55	D(65)	4.22	+4
D(07)	1.90	D(66)	4.94	+4
D(08)	2.21	D(67)	5.50	+4
D(09)	2.21	D(68)	6.11	+4
D(10)	2.21	D(69)	6.92	+3
D(11)	2.21	D(70)	7.11	+4
D(12)	4.48	D(71)	7.28	+4
D(13)	7.55	D(72)	8.15	+4
D(14)	7.55	D(73)	9.09	+4
D(15)	7.55	D(74)	9.64	+4
D(16)	7.55	D(75)	10.47	+4
D(17)	7.55	D(76)	12.07	+4
D(18)	7.55	D(77)	1.86	+4
D(19)	7.49	D(78)	1.24	+4
D(20)	7.12	D(79)	9.06	+3
D(21)	6.77	D(80)	1.27	+4
D(22)	6.18	D(81)	1.83	+4
D(23)	6.30	D(82)	2.25	+4
D(24)	6.21	D(83)	2.22	+4
D(25)	6.13	D(84)	2.22	+4
D(26)	6.13	D(85)	2.22	+4
D(27)	6.13	D(86)	2.22	+4
D(28)	6.13	D(87)	2.22	+4
D(29)	6.13	D(88)	2.22	+4
D(30)	6.13	D(89)	2.22	+4
D(31)	6.13	D(90)	2.22	+4
D(32)	6.13	D(91)	2.22	+4
D(33)	6.13	D(92)	2.22	+4
D(34)	6.13	D(93)	2.22	+4
D(35)	6.13	D(94)	2.22	+4
D(36)	6.13	D(95)	2.22	+4
D(37)	6.13	D(96)	2.22	+4
D(38)	6.13	D(97)	2.22	+4
D(39)	6.13	D(98)	2.22	+4
D(40)	6.13	D(99)	2.22	+4
D(41)	6.13	D(100)	2.22	+4
D(42)	6.13	D(101)	2.22	+4
D(43)	6.13	D(102)	2.22	+4
D(44)	6.13	D(103)	2.22	+4
D(45)	6.13	D(104)	2.22	+4
D(46)	6.13	D(105)	2.22	+4
D(47)	6.13	D(106)	2.22	+4
D(48)	6.13	D(107)	2.22	+4
D(49)	6.13	D(108)	2.22	+4
D(50)	6.13	D(109)	2.22	+4
D(51)	6.13	D(110)	2.22	+4
D(52)	6.13	D(111)	2.22	+4
D(53)	6.13	D(112)	2.22	+4
D(54)	6.13	D(113)	2.22	+4
D(55)	6.13	D(114)	2.22	+4
D(56)	6.13	D(115)	2.22	+4
D(57)	6.13	D(116)	2.22	+4
D(58)	6.13	D(117)	2.22	+4
D(59)	6.13	D(118)	2.22	+4

Table B-26.

12/9/76	PROTON	28.56EV	FP RUN	63	P113
00	5.30	00	58	8.87	+3
01	6.76	00	60	1.14	+4
02	7.27	00	61	1.73	+4
03	8.14	00	62	2.38	+4
04	8.94	00	63	2.53	+4
05	9.16	00	64	2.26	+4
06	9.30	00	65	2.05	+4
07	9.67	00	66	1.91	+4
08	9.07	00	67	1.88	+4
09	7.66	00	68	1.20	+3
10	6.49	00	69	8.38	+3
11	8.25	00	70	1.06	+4
12	9.96	00	71	1.54	+4
13	1.08	00	72	2.05	+4
14	1.14	00	73	2.18	+4
15	1.11	00	74	1.92	+4
16	1.10	00	75	1.78	+4
17	9.81	00	76	1.60	+4
18	9.05	00	77	1.27	+4
19	6.39	00	78	1.09	+4
20	8.16	00	79	7.21	+3
21	1.04	00	80	9.87	+3
22	1.42	00	81	1.95	+4
23	1.45	00	82	1.71	+4
24	1.50	00	83	1.67	+4
25	1.49	00	84	1.56	+4
26	1.41	00	85	1.52	+4
27	1.19	00	86	1.27	+4
28	0.03	00	87	1.06	+4
29	7.34	00	88	9.43	+3
30	1.02	00	89	7.58	+3
31	1.37	00	90	1.58	+3
32	1.77	00	91	1.01	+4
33	1.87	00	92	1.22	+4
34	1.95	00	93	1.21	+4
35	1.83	00	94	1.24	+4
36	1.79	00	95	1.12	+4
37	1.41	00	96	1.01	+4
38	1.15	00	97	8.17	+3
39	6.56	00	98	6.55	+3
40	1.15	00	99	5.24	+3
41	1.60	00	100	4.21	+3
42	2.16	00	101	2.26	+3
43	2.27	00	102	3.03	+3
44	2.24	00	103	5.40	+2
45	1.15	00	104	3.05	+2
46	2.03	00	105	4.21	+3
47	7.74	00	106	2.32	+3
48	1.29	00	107	9.99	+3
49	8.84	00	108	5.59	+2
50	1.14	00	109	3.30	+2
51	1.82	00	110	2.40	+2
52	4.47	00	111	1.08	+3
53	1.53	00	112	5.81	+3
54	2.55	00	113	3.28	+3
55	1.92	00	114	4.67	+3
56	2.62	00	115	2.73	+3
57	1.31	00	116	1.31	+2
58	6.10	00	117	6.10	+2
		00	118	3.47	+2
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Table B-27.

12/9/76	PROTON	28.50EV	FP RUN	63 P134
00	5.47	60	8.49	122
01	6.14	61	1.36	124
02	7.04	62	2.24	125
03	7.34	63	2.41	126
04	7.34	64	1.17	127
05	7.41	65	1.92	128
06	7.90	66	1.72	129
07	7.77	67	1.61	130
08	6.94	68	1.34	131
09	5.94	69	9.88	133
10	7.08	70	7.76	134
11	8.91	71	1.25	135
12	9.37	72	1.93	136
13	9.58	73	2.01	138
14	1.02	74	1.79	139
15	1.04	75	1.63	140
16	1.02	76	1.43	141
17	8.86	77	1.24	143
18	6.97	78	1.04	144
19	6.75	79	8.16	145
20	8.86	80	7.03	146
21	1.20	81	1.05	148
22	1.29	82	1.43	149
23	1.34	83	1.36	150
24	1.25	84	1.32	152
25	1.25	85	1.44	153
26	1.08	86	1.10	154
27	8.71	87	8.73	155
28	7.04	88	7.33	157
29	1.07	89	6.64	158
30	1.56	90	8.40	159
31	1.74	91	1.11	160
32	1.61	92	1.18	163
33	1.64	93	1.06	164
34	1.70	94	9.55	165
35	1.49	95	9.24	167
36	1.32	96	8.44	168
37	1.07	97	7.07	169
38	7.79	98	6.33	171
39	1.27	99	5.85	172
40	2.38	100	4.71	173
41	2.07	101	3.57	174
42	1.92	102	3.10	
43	1.80	103	5.35	
44	1.66	104	5.79	
45	1.37	105	4.48	
46	1.14	106	3.50	
47	7.78	107	2.82	
48	1.44	108	4.47	
49	2.25	109	3.53	
50	2.29	110	3.15	
51	2.13	111	2.40	
52	1.81	112	5.61	
53	1.75	113	4.53	
54	1.97	114	3.53	
55	1.07	115	2.85	
56		116	5.11	
57		117	4.70	
58		118	3.58	
59		119		
		120		
		121		

Table B-28.

12/3/76	PROTON	28.5GEV	FP	RUN	63	P175
00)	1.63	6.48	62)	6.48	122)	5.00
01)	0.00	6.84	63)	6.84	123)	3.72
02)	0.18	6.71	64)	6.71	124)	1.11
03)	0.34	6.07	65)	6.07	125)	1.20
04)	0.49	5.51	66)	5.51	126)	0.64
05)	0.53	4.95	67)	4.95	127)	7.19
06)	0.44	4.36	68)	4.36	128)	3.73
07)	0.28	3.98	69)	3.98	129)	1.11
08)	0.22	3.07	70)	3.07	130)	1.18
09)	1.11	4.69	71)	4.69	131)	5.29
10)	0.05	5.97	72)	5.97	132)	3.83
11)	0.48	6.17	73)	6.17	133)	1.56
12)	0.90	5.74	74)	5.74	134)	1.20
13)	0.18	5.38	75)	5.38	135)	7.12
14)	0.22	4.78	76)	4.78	136)	5.14
15)	0.11	3.95	77)	3.95	137)	3.80
16)	0.14	3.64	78)	3.64	138)	1.11
17)	0.05	2.66	79)	2.66	139)	1.15
18)	0.84	2.62	80)	2.62	140)	7.58
19)	0.26	3.77	81)	3.77	141)	5.30
20)	0.30	4.66	82)	4.66	142)	3.76
21)	0.93	5.27	83)	5.27	143)	1.98
22)	0.92	4.68	84)	4.68	144)	1.36
23)	0.11	4.45	85)	4.45	145)	8.65
24)	0.21	3.83	86)	3.83	146)	5.75
25)	0.31	3.57	87)	3.57	147)	4.29
26)	0.96	3.06	88)	3.06	148)	1.38
27)	0.64	2.39	89)	2.39	149)	8.75
28)	0.19	2.34	90)	2.34	150)	5.72
29)	0.67	2.95	91)	2.95	151)	4.71
30)	0.66	3.58	92)	3.58	152)	2.31
31)	0.73	4.12	93)	4.12	153)	1.51
32)	0.72	3.70	94)	3.70	154)	9.37
33)	0.11	3.36	95)	3.36	155)	6.53
34)	0.29	3.08	96)	3.08	156)	4.95
35)	0.23	2.91	97)	2.91	157)	2.22
36)	0.91	2.26	98)	2.26	158)	1.60
37)	0.48	1.97	99)	1.97	159)	9.89
38)	0.90	1.65	100)	1.65	160)	6.51
39)	0.05	1.06	101)	1.06	161)	4.80
40)	0.94	7.39	102)	7.39	162)	2.00
41)	0.29	5.10	103)	5.10	163)	1.40
42)	0.75	3.84	104)	3.84	164)	9.08
43)	0.28	1.62	105)	1.62	165)	5.84
46)	0.67	1.19	106)	1.19	166)	4.16
47)	0.15	6.75	107)	6.75	167)	1.26
48)	0.33	4.77	108)	4.77	168)	7.45
49)	0.62	3.82	109)	3.82	169)	5.18
50)	0.16	1.07	110)	1.07	170)	3.96
51)	0.01	6.83	111)	6.83	171)	6.60
52)	0.77	5.21	112)	5.21	172)	1.20
53)	0.08	3.43	113)	3.43	173)	7.20
54)	0.28	3.59	114)	3.59	174)	4.91
55)	0.27	1.12	115)	1.12	175)	3.97
56)	0.31	7.41	116)	7.41		
57)	0.11	3.55	117)	3.55		
58)	0.21	1.62	118)	1.62		
59)	0.27	1.11	119)	1.11		
60)	0.30	6.93	120)	6.93		
61)	5.30		121)			

Table B-29.

12/9/76	PROTON	28.5GEV	FP	RUN	64	P7	4			
00	2.61	+	0	59	2.01	+	119	3.09	E+2	
01	3.26	+	0	60	5.08	+	120	9.93	E+2	
02	4.82	+	0	61	1.10	+	121	1.19	E+2	
03	7.04	+	0	62	4.64	+	122	6.00	E+2	
04	8.34	+	0	63	7.82	+	123	3.95	E+2	
05	8.99	+	0	64	6.31	+	124	2.92	E+2	
06	8.67	+	0	65	5.16	+	125	2.16	E+2	
07	8.93	+	0	66	4.53	+	126	1.20	E+2	
08	8.40	+	0	67	3.59	+	127	6.34	E+2	
09	5.14	+	0	68	2.38	+	128	3.73	E+2	
10	2.83	+	0	69	1.51	+	129	1.61	E+2	
11	4.38	+	0	70	4.33	+	130	8.62	E+2	
12	9.04	+	0	71	1.07	+	131	6.06	E+1	
13	1.28	+	0	72	3.46	+	132	3.65	E+1	
14	1.11	+	0	73	5.66	+	133	2.06	E+2	
15	1.57	+	0	74	5.22	+	134	1.39	E+2	
16	1.54	+	0	75	4.12	+	135	8.00	E+1	
17	1.49	+	0	76	3.39	+	136	4.93	E+1	
18	1.21	+	0	77	2.82	+	137	3.35	E+1	
19	3.39	+	0	78	1.05	+	138	2.02	E+2	
20	6.66	+	0	79	8.84	+	139	1.47	E+1	
21	1.11	+	0	80	3.99	+	140	8.35	E+1	
22	6.92	+	0	81	8.31	+	141	4.88	E+1	
23	7.95	+	0	82	3.38	+	142	3.80	E+1	
24	2.89	+	0	83	2.78	+	143	2.55	E+2	
25	1.11	+	0	84	3.26	+	144	1.61	E+1	
26	4.20	+	0	85	2.53	+	145	9.30	E+1	
27	2.41	+	0	86	2.28	+	146	3.28	E+1	
28	2.01	+	0	87	1.78	+	147	3.72	E+1	
29	1.28	+	0	88	1.17	+	148	2.21	E+2	
30	3.66	+	0	89	6.75	+	149	1.21	E+2	
31	2.22	+	0	90	3.63	+	150	7.49	E+1	
32	2.58	+	0	91	6.20	+	151	5.33	E+1	
33	4.37	+	0	92	1.57	+	152	6.51	E+2	
34	4.48	+	0	93	2.36	+	154	1.60	E+2	
35	4.02	+	0	94	1.98	+	155	9.37	E+1	
36	3.82	+	0	95	1.49	+	156	7.88	E+2	
37	3.39	+	0	96	1.16	+	157	6.83	E+2	
38	2.69	+	0	97	1.16	+	159	1.69	E+2	
39	1.76	+	0	98	7.63	+	160	9.55	E+1	
40	4.35	+	0	99	4.40	+	161	7.50	E+1	
41	1.06	+	0	100	1.91	+	162	5.88	E+2	
42	3.90	+	0	101	1.05	+	164	1.09	E+2	
43	6.25	+	0	102	7.34	+	165	6.79	E+1	
44	8.85	+	0	103	2.44	+	166	4.80	E+1	
45	3.38	+	0	104	3.79	+	167	1.36	E+2	
46	5.03	+	0	105	2.59	+	168	2.22	E+2	
47	4.13	+	0	106	1.11	+	169	7.70	E+1	
48	3.03	+	0	107	7.02	+	170	4.28	E+1	
49	2.04	+	0	108	5.12	+	171	2.37	E+2	
50	4.37	+	0	109	3.85	+	172	1.12	E+2	
51	1.19	+	0	110	1.19	+	173	7.31	E+1	
52	4.47	+	0	111	6.94	+	174	5.51	E+1	
53	8.13	+	0	112	4.96	+	175	0.01	E+1	
54	6.67	+	0	113	3.92	+				
55	1.11	+	0	114	4.31	+				
56	5.34	+	0	115	2.34	+				
57	4.14	+	0	116	5.60	+				
58	2.94	+	0	117	5.09	+				
			0	118	3.59	+				

Table B-30.

12/9/76	PROTON	28.50EV	FP RUN	64 P195					
D(00)	1.90	+	D(59)	7.84	+	D(119)	2.02	+	
D(01)	3.49	+	D(60)	4.00	+	D(120)	1.20	+	
D(02)	3.35	+	D(61)	7.68	+	D(121)	5.11	+	
D(03)	3.89	+	D(62)	1.57	+	D(123)	1.26	+	
D(04)	4.63	+	D(63)	2.28	+	D(124)	2.03	+	
D(05)	4.74	+	D(64)	2.15	+	D(125)	1.20	+	
D(06)	4.80	+	D(65)	1.82	+	D(126)	5.45	+	
D(07)	4.57	+	D(66)	1.65	+	D(128)	1.28	+	
D(08)	4.15	+	D(67)	1.44	+	D(129)	9.90	+	
D(09)	3.03	+	D(68)	1.00	+	D(130)	4.18	+	
D(10)	2.26	+	D(69)	6.88	+	D(131)	2.28	+	
D(11)	3.34	+	D(70)	4.13	+	D(132)	1.22	+	
D(12)	4.59	+	D(71)	6.75	+	D(133)	1.73	+	
D(13)	5.95	+	D(72)	1.29	+	D(134)	9.21	+	
D(14)	7.03	+	D(73)	1.83	+	D(135)	3.85	+	
D(15)	7.16	+	D(74)	1.74	+	D(136)	1.92	+	
D(16)	7.21	+	D(75)	1.50	+	D(137)	1.00	+	
D(17)	6.50	+	D(76)	1.40	+	D(138)	1.67	+	
D(18)	5.61	+	D(77)	1.11	+	D(139)	8.98	+	
D(19)	4.12	+	D(78)	8.71	+	D(140)	3.96	+	
D(20)	2.91	+	D(79)	5.86	+	D(141)	2.07	+	
D(21)	4.41	+	D(80)	3.56	+	D(142)	9.69	+	
D(22)	7.12	+	D(81)	5.54	+	D(143)	1.96	+	
D(23)	9.69	+	D(82)	1.02	+	D(144)	1.09	+	
D(24)	1.03	+	D(83)	1.31	+	D(145)	4.79	+	
D(25)	1.14	+	D(84)	1.38	+	D(147)	1.09	+	
D(26)	1.03	+	D(85)	1.16	+	D(148)	1.41	+	
D(27)	9.24	+	D(86)	9.69	+	D(149)	5.80	+	
D(28)	8.23	+	D(87)	8.61	+	D(151)	1.85	+	
D(29)	6.14	+	D(88)	6.15	+	D(152)	3.68	+	
D(30)	3.39	+	D(89)	4.09	+	D(153)	1.85	+	
D(31)	5.56	+	D(90)	2.86	+	D(154)	8.30	+	
D(32)	9.87	+	D(91)	4.25	+	D(157)	3.59	+	
D(33)	1.43	+	D(92)	6.74	+	D(158)	1.94	+	
D(34)	1.52	+	D(93)	9.03	+	D(159)	8.29	+	
D(35)	1.58	+	D(94)	8.77	+	D(162)	3.30	+	
D(36)	1.37	+	D(95)	7.85	+	D(163)	1.75	+	
D(37)	1.22	+	D(96)	7.39	+	D(164)	6.61	+	
D(38)	9.83	+	D(97)	5.96	+	D(166)	1.64	+	
D(39)	7.50	+	D(98)	4.78	+	D(167)	1.20	+	
D(40)	3.84	+	D(99)	3.28	+	D(168)	4.13	+	
D(41)	7.09	+	D(100)	2.26	+	D(169)	2.24	+	
D(42)	1.24	+	D(101)	9.44	+	D(170)	2.27	+	
D(43)	1.88	+	D(102)	3.81	+	D(171)	2.68	+	
D(44)	1.84	+	D(103)	2.11	+	D(172)	2.13	+	
D(45)	1.86	+	D(104)	1.19	+	D(173)	2.27	+	
D(46)	1.68	+	D(105)	9.50	+	D(174)	4.13	+	
D(47)	1.48	+	D(106)	3.76	+	D(175)	2.23	+	
D(48)	1.15	+	D(107)	2.02	+		1.30	+	
D(49)	8.91	+	D(108)	1.05	+			+	
D(50)	4.11	+	D(109)	1.02	+			+	
D(51)	7.30	+	D(110)	3.87	+			+	
D(52)	1.53	+	D(111)	1.88	+			+	
D(53)	2.26	+	D(112)	1.03	+			+	
D(54)	2.29	+	D(113)	2.41	+			+	
D(55)	1.94	+	D(114)	1.26	+			+	
D(56)	1.76	+	D(115)	5.22	+			+	
D(57)	1.47	+	D(116)	2.24	+			+	
D(58)	1.13	+	D(117)	1.03	+			+	
			D(118)		+			+	

Table B-32.

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....FP RUN 71
 PLATE NO.....P1
 PLATE LOCATION..1

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	2.390E+02	1	127.88	2.085	4.170E+02	2	119.06	1.889	3.580E+02	3	108.44	1.705	3.770E+02
4	95.34	1.693	3.520E+02	5	93.66	1.855	2.760E+02	6	71.57	1.735	2.310E+02	7	60.95	1.683	1.820E+02
8	52.13	2.085	1.410E+02	9	45.00	2.328	1.130E+02	10	142.10	2.085	4.280E+02	11	135.00	1.610	6.020E+02
12	125.54	1.573	5.860E+02	13	113.20	1.393	5.840E+02	14	98.13	1.293	5.750E+02	15	81.87	1.293	4.520E+02
16	66.80	1.393	3.310E+02	17	54.46	1.573	2.370E+02	18	45.00	1.810	2.640E+02	19	37.88	2.085	1.510E+02
20	150.95	1.983	6.410E+02	21	144.46	1.573	7.280E+02	22	135.00	1.293	9.780E+02	23	120.96	1.066	1.030E+03
24	101.31	0.933	8.320E+02	25	78.69	0.933	6.450E+02	26	59.04	1.066	4.400E+02	27	45.00	1.293	2.990E+02
28	35.54	1.573	2.180E+02	29	29.06	1.833	1.810E+02	30	161.57	1.735	6.670E+02	31	156.80	1.393	1.040E+03
32	149.04	1.066	1.280E+03	33	135.00	0.776	1.330E+03	34	108.44	0.578	1.160E+03	35	71.57	0.578	8.420E+02
36	45.00	0.776	6.150E+02	37	30.96	1.066	3.900E+02	38	23.20	1.393	2.530E+02	39	18.44	1.735	2.020E+02
40	173.66	1.686	7.300E+02	41	171.87	1.293	1.310E+03	42	168.69	0.933	1.460E+03	43	161.57	0.578	1.550E+03
44	135.00	0.259	1.400E+03	45	45.00	0.259	1.060E+03	46	18.44	0.578	7.000E+02	47	11.31	0.933	4.780E+02
48	8.13	1.293	2.970E+02	49	6.34	1.656	2.200E+02	50	186.34	1.656	7.400E+02	51	188.13	1.293	1.000E+03
52	191.31	0.933	1.680E+02	53	198.44	0.578	1.740E+03	54	225.00	0.259	1.520E+03	55	315.00	0.259	1.150E+03
56	341.57	0.578	7.870E+02	57	348.69	0.933	4.870E+02	58	351.87	1.293	3.300E+02	59	353.66	1.656	3.060E+02
60	198.44	1.735	7.260E+02	61	203.20	1.393	1.000E+03	62	210.96	1.066	1.580E+03	63	225.00	0.776	1.630E+03
64	251.57	0.578	1.430E+03	65	268.44	0.578	1.080E+03	66	315.00	0.776	7.320E+02	67	329.00	1.066	4.850E+02
68	336.80	1.393	3.030E+02	69	341.57	1.735	2.320E+02	70	209.05	1.883	6.970E+02	71	215.54	1.573	7.450E+02
72	225.00	0.933	1.410E+03	73	239.04	1.066	1.410E+03	74	258.69	0.933	1.220E+03	75	281.31	0.933	9.160E+02
76	300.96	1.066	6.400E+02	77	315.00	1.293	4.080E+02	78	324.46	1.573	4.170E+02	79	330.95	1.883	2.130E+02
80	217.88	2.085	6.520E+02	81	225.00	1.610	8.020E+02	82	234.46	1.573	7.390E+02	83	246.80	1.393	7.360E+02
84	261.87	1.293	7.430E+02	85	278.13	2.093	6.880E+02	86	293.20	1.393	6.420E+02	87	305.54	1.573	3.310E+02
88	315.00	1.810	2.470E+02	89	322.13	2.093	1.370E+02	90	225.00	2.328	4.560E+02	91	232.13	2.085	6.200E+02
92	240.95	1.883	6.540E+02	93	251.57	1.735	6.640E+02	94	265.66	1.656	6.500E+02	95	276.34	1.656	5.910E+02
96	288.44	1.735	3.810E+02	97	299.06	1.883	2.670E+02	98	307.88	2.085	1.950E+02	99	315.00	2.328	1.650E+02
100	0.	2.445	1.350E+02	101	0.	3.175	9.020E+01	102	0.	4.445	5.180E+01	103	0.	5.715	2.400E+01
104	0.	6.985	1.430E+01	105	22.50	2.445	1.150E+02	106	22.50	3.175	7.710E+01	107	22.50	4.445	4.170E+01
108	22.50	7.15	3.000E+01	109	22.50	6.985	1.380E+01	110	46.00	3.175	6.860E+01	111	46.00	4.445	3.000E+01
112	45.00	5.715	2.120E+01	113	45.00	6.985	1.400E+01	114	67.50	2.445	1.150E+02	115	67.50	3.175	6.990E+01
116	67.50	4.445	3.610E+01	117	67.50	5.715	2.120E+01	118	67.50	6.985	1.300E+01	119	90.00	2.445	1.360E+02
120	90.00	3.175	7.250E+01	121	90.00	4.445	3.800E+01	122	90.00	5.715	2.130E+01	123	90.00	6.985	1.400E+01
124	112.50	2.445	1.720E+02	125	112.50	3.175	8.950E+01	126	112.50	4.445	4.170E+01	127	112.50	5.715	2.450E+01
128	112.50	4.985	1.500E+01	129	135.00	3.175	2.980E+01	130	135.00	4.445	4.720E+01	131	135.00	5.715	2.490E+01
132	150.00	6.985	6.530E+01	133	157.50	2.445	2.660E+02	134	157.50	3.175	1.500E+02	135	157.50	4.445	1.250E+02
136	157.50	5.715	2.850E+01	137	157.50	6.985	1.600E+01	138	180.00	2.445	3.130E+02	139	180.00	3.175	1.310E+02
140	180.00	4.445	5.710E+01	141	160.00	5.715	2.940E+01	142	180.00	6.985	1.750E+01	143	202.50	2.445	3.400E+02
144	202.50	3.175	1.530E+02	145	202.50	4.445	1.360E+02	146	202.50	5.715	3.000E+01	147	202.50	6.985	1.780E+01
148	225.00	4.985	1.200E+01	149	225.00	4.445	5.370E+01	150	225.00	5.715	3.190E+01	151	225.00	6.985	1.960E+01
152	247.50	2.445	2.690E+02	153	247.50	3.175	1.300E+02	154	247.50	4.445	5.530E+01	155	247.50	5.715	3.000E+01
156	247.50	6.985	2.000E+01	157	270.00	2.445	2.020E+02	158	270.00	3.175	1.070E+02	159	270.00	4.445	4.970E+01
160	270.00	5.715	2.760E+01	161	270.00	6.985	1.750E+01	162	292.50	2.445	1.560E+02	163	292.50	3.175	9.110E+01
164	292.50	4.985	1.600E+01	165	292.50	5.715	1.600E+01	166	315.00	6.985	1.600E+01	167	315.00	8.420E+01	1.440E+02
168	315.00	4.445	4.190E+01	169	315.00	5.715	2.360E+01	170	315.00	6.985	1.550E+01	171	337.50	2.445	1.440E+02
172	337.50	3.175	8.930E+01	173	337.50	4.445	4.650E+01	174	337.50	5.715	2.430E+01	175	337.50	6.985	1.400E+01

Table B-33.

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....120E9
 TARGET.....FP RUN 71
 PLATE NO.....P4
 PLATE LOCATION..2

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE			
0	135.00	2.328	1.200E+03	1	127.88	2.085	1.420E+03	2	119.06	1.883	1.540E+03	3	108.44	1.735	1.600E+03			
4	96.34	1.656	1.560E+03	5	83.66	1.656	1.460E+03	6	71.57	1.735	1.230E+03	7	60.95	1.883	1.050E+03			
8	52.13	2.085	8.530E+02	9	45.00	2.328	6.730E+02	10	142.10	2.085	1.520E+03	11	135.00	1.810	1.810E+03			
12	125.54	1.573	2.060E+03	13	113.20	1.393	2.220E+03	14	98.13	1.293	2.080E+03	15	81.87	1.293	2.210E+03			
16	66.80	1.393	2.530E+03	17	54.46	1.573	2.220E+03	18	45.00	1.810	1.070E+03	19	37.88	2.085	1.000E+03			
20	150.95	1.893	1.910E+03	21	144.46	1.573	2.390E+03	22	125.54	1.293	2.640E+03	23	120.96	1.066	2.820E+03			
24	101.31	0.933	2.850E+03	25	78.69	0.933	2.370E+03	26	59.04	1.066	1.800E+03	27	45.00	1.293	1.480E+03			
28	35.54	1.573	1.480E+03	29	29.06	1.893	3.330E+02	30	161.57	1.735	2.270E+03	31	156.80	1.393	2.860E+03			
32	149.04	1.066	3.560E+03	33	135.00	0.776	3.530E+03	34	108.44	0.578	4.200E+03	35	71.57	0.578	2.720E+03			
36	45.00	0.776	2.220E+03	37	136.34	1.656	2.510E+03	38	188.13	1.293	3.330E+03	39	191.31	0.933	4.180E+03			
40	173.66	1.656	2.460E+03	41	171.87	1.293	3.230E+03	42	168.69	0.933	3.960E+03	43	161.57	0.578	4.100E+03			
44	135.00	0.259	3.650E+03	45	45.00	0.259	3.080E+03	46	18.44	0.578	2.560E+03	47	11.31	0.933	1.860E+03			
48	8.13	1.293	1.420E+03	49	6.34	1.656	1.130E+03	50	136.34	1.656	2.510E+03	51	188.13	1.293	3.330E+03			
52	191.31	0.933	4.180E+03	53	190.44	0.578	4.370E+03	54	235.10	0.259	4.040E+03	55	315.00	0.259	3.310E+03			
56	341.57	0.578	2.470E+03	57	348.69	0.933	1.930E+03	58	331.87	1.293	1.450E+03	59	353.66	1.656	1.140E+03			
60	199.44	1.735	2.480E+03	61	203.20	1.393	3.290E+03	62	210.96	1.066	3.870E+03	63	225.00	0.776	3.930E+03			
64	251.57	0.578	3.710E+03	65	288.44	0.578	3.050E+03	66	315.00	0.776	2.400E+03	67	329.00	1.066	1.850E+03			
68	336.80	1.393	1.410E+03	69	341.57	1.735	1.120E+03	70	209.05	1.893	2.130E+03	71	215.54	1.573	2.780E+03			
72	225.00	1.293	3.100E+03	73	239.04	1.066	3.240E+03	74	225.69	0.933	3.140E+03	75	281.31	0.933	2.750E+03			
76	300.96	1.656	2.190E+03	77	315.00	2.035	1.67E+03	78	22.45	5.73	1.260E+03	79	330.95	1.883	3.100E+03			
80	217.88	2.085	2.230E+03	81	225.00	1.810	2.260E+03	82	231.46	1.573	2.380E+03	83	246.80	1.393	2.510E+03			
84	261.67	1.293	2.430E+03	85	278.13	2.035	2.070E+03	86	293.20	1.393	1.730E+03	87	305.54	1.573	1.440E+03			
88	315.00	1.810	1.120E+03	89	322.13	2.293	0.770E+03	90	225.00	2.328	1.710E+03	91	232.13	2.085	1.790E+03			
92	240.95	1.893	1.930E+03	93	251.57	1.735	1.360E+03	94	263.66	1.656	2.230E+03	95	276.34	1.656	1.650E+03			
96	268.44	2.445	1.930E+03	97	259.06	1.893	1.200E+03	98	307.88	2.085	9.640E+02	99	315.00	2.328	8.000E+02			
100	0.	2.445	6.340E+02	101	0.	3.175	4.470E+02	102	0.	4.445	2.370E+02	103	0.	5.715	1.090E+02			
104	0.	6.985	6.210E+01	105	22.50	4.445	6.470E+01	106	22.50	3.175	4.300E+02	107	22.50	4.445	4.230E+02			
108	22.50	3.175	4.020E+02	109	22.50	6.985	5.920E+01	110	45.00	3.175	3.720E+02	111	45.00	4.445	1.890E+02			
112	45.00	5.715	1.000E+02	113	67.50	2.985	9.800E+02	114	67.50	4.445	1.890E+02	115	67.50	5.715	1.000E+02			
116	67.50	4.445	1.000E+02	117	67.50	5.715	1.040E+02	118	67.50	6.985	5.950E+01	119	90.00	2.445	8.170E+02			
120	90.00	3.175	4.890E+02	121	90.00	4.445	2.110E+02	122	90.00	5.715	1.000E+02	123	90.00	6.985	6.170E+01			
124	112.50	2.445	9.800E+02	125	112.50	3.175	5.810E+02	126	112.50	4.445	2.420E+02	127	112.50	5.715	1.250E+02			
128	135.00	6.985	2.360E+02	129	135.00	4.445	3.160E+02	130	135.00	5.715	1.800E+02	131	135.00	6.985	8.290E+01			
132	135.00	6.985	2.360E+02	133	157.50	2.445	1.690E+03	134	157.50	3.175	7.700E+02	135	157.50	4.445	3.000E+02			
136	157.50	5.715	1.750E+02	137	157.50	6.985	8.050E+01	138	180.00	2.445	1.690E+03	139	180.00	3.175	7.700E+02			
140	180.00	4.445	3.110E+02	141	180.00	5.715	1.130E+02	142	180.00	6.985	8.130E+01	143	202.50	2.445	1.430E+03			
144	202.50	3.175	7.740E+02	145	202.50	4.445	3.160E+02	146	202.50	5.715	1.800E+02	147	202.50	6.985	8.290E+01			
148	225.00	4.445	2.130E+03	149	225.00	5.715	1.150E+02	150	225.00	6.985	8.800E+01	151	247.50	3.175	4.430E+02			
152	247.50	2.445	1.160E+03	153	247.50	3.175	5.730E+02	154	247.50	4.445	2.690E+02	155	247.50	5.715	1.570E+02			
156	247.50	6.985	2.520E+02	157	270.00	2.445	9.720E+02	158	270.00	3.175	5.560E+02	159	270.00	4.445	2.360E+02			
160	270.00	5.715	1.250E+02	161	270.00	6.985	2.80E+02	162	292.50	2.445	8.410E+02	163	292.50	3.175	4.360E+02			
164	292.50	3.175	4.430E+02	165	292.50	4.445	3.160E+02	166	292.50	5.715	1.800E+02	167	315.00	3.175	4.820E+02			
168	315.00	4.445	2.130E+03	169	315.00	5.715	1.150E+02	170	315.00	6.985	8.800E+01	171	315.00	8.170E+01	172	337.50	3.175	4.430E+02
172	337.50	3.175	4.430E+02	173	337.50	4.445	5.000E+02	174	337.50	5.715	1.070E+02	175	337.50	6.985	5.990E+01			

Table B-34.

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....FP RUN 71
 PLATE NO.....P3
 PLATE LOCATION..3

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE		
0	135.00	2.328	8.640E+02	1	127.88	2.085	9.830E+02	2	119.05	1.883	1.090E+03	3	108.44	1.735	1.060E+03		
4	95.34	1.656	1.010E+03	5	83.66	1.556	9.170E+02	6	71.57	1.735	7.790E+02	7	60.95	1.883	7.120E+02		
8	52.13	2.085	5.700E+02	9	43.06	2.328	4.770E+02	10	32.10	2.085	1.070E+03	11	23.00	1.810	1.320E+03		
12	155.54	1.573	1.420E+03	13	113.20	1.393	1.420E+03	14	98.13	1.293	1.310E+03	15	81.87	1.293	1.150E+03		
16	66.80	1.393	1.030E+03	17	54.46	1.573	9.450E+02	18	45.00	1.810	6.570E+02	19	37.88	2.085	5.580E+02		
20	150.95	1.883	1.410E+03	21	144.46	1.573	1.650E+03	22	135.00	1.293	1.500E+03	23	120.96	1.066	1.780E+03		
24	101.31	0.933	1.680E+03	25	78.59	0.933	1.520E+03	26	59.04	1.066	1.250E+03	27	45.00	1.293	1.000E+03		
28	35.54	1.573	7.800E+02	29	29.06	1.883	6.650E+02	30	161.57	1.735	1.820E+03	31	156.80	1.393	2.270E+03		
32	149.04	1.066	2.200E+03	33	135.00	0.776	2.440E+03	34	109.44	0.578	2.100E+03	35	71.57	0.578	1.720E+03		
36	45.00	0.776	1.420E+03	37	30.96	1.066	1.260E+03	38	23.20	1.393	8.560E+02	39	18.44	1.735	7.000E+02		
40	173.66	1.656	1.870E+03	41	171.87	1.293	2.320E+03	42	168.59	0.933	3.190E+03	43	161.57	0.578	3.200E+03		
44	135.00	0.239	2.350E+03	45	45.00	0.239	2.030E+03	46	18.44	0.578	1.830E+03	47	11.31	0.933	1.260E+03		
48	8.13	1.293	9.450E+02	49	6.34	1.656	7.150E+02	50	186.34	1.656	1.960E+03	51	188.13	1.293	2.470E+03		
52	191.31	0.933	2.930E+03	53	198.44	0.578	2.650E+03	54	225.00	0.239	2.550E+03	55	315.00	0.239	2.170E+03		
56	341.57	0.578	1.680E+03	57	348.59	0.933	1.320E+03	58	351.87	1.293	1.180E+03	59	353.66	1.656	8.030E+02		
60	199.44	1.735	1.880E+03	61	203.20	1.97	2.190E+03	62	210.96	1.066	2.820E+03	63	225.00	0.776	2.660E+03		
64	251.57	0.578	2.550E+03	65	288.44	0.578	2.380E+03	66	315.00	0.776	1.680E+03	67	329.00	1.066	1.290E+03		
68	336.80	1.393	9.520E+02	69	341.57	1.735	7.740E+02	70	209.05	1.883	1.690E+03	71	215.54	1.573	2.080E+03		
72	225.00	1.293	2.400E+03	73	239.04	1.066	2.600E+03	74	238.69	0.933	2.170E+03	75	281.31	0.933	1.810E+03		
76	300.96	1.066	1.510E+03	77	315.00	1.293	1.370E+03	78	324.46	1.573	8.98E+02	79	330.95	1.883	7.140E+02		
80	217.88	2.085	1.470E+03	81	225.00	1.810	1.600E+03	82	234.46	1.573	1.870E+03	83	246.80	1.393	1.980E+03		
84	261.67	1.293	1.810E+03	85	278.13	1.293	1.450E+03	86	293.20	1.393	1.470E+03	87	305.54	1.573	1.010E+03		
88	315.00	1.810	9.100E+02	89	322.13	2.085	6.570E+02	90	225.00	2.328	1.210E+03	91	232.13	2.085	1.360E+03		
92	280.95	1.883	1.470E+03	93	251.57	1.735	1.450E+03	94	263.66	1.656	1.420E+03	95	276.34	1.656	1.420E+03		
96	288.44	1.735	1.060E+03	97	299.06	1.883	8.470E+02	98	307.88	2.085	7.020E+02	99	315.00	2.328	6.060E+02		
100	0	2.445	4.600E+02	101	0	3.175	2.970E+02	102	0	4.445	1.600E+02	103	0	5.715	8.360E+01		
104	0	6.985	9.590E+01	105	22.50	2.445	4.320E+02	106	22.50	3.175	2.770E+02	107	22.50	4.445	1.420E+02		
108	22.50	5.715	7.500E+01	109	22.50	6.985	4.110E+01	110	45.00	3.175	2.660E+02	111	45.00	4.445	1.270E+02		
112	45.00	5.715	1.470E+02	113	45.00	6.985	4.370E+01	114	67.50	2.445	4.680E+02	115	67.50	3.175	2.890E+02		
116	67.50	4.445	1.390E+02	117	67.50	5.715	1.470E+02	118	90.00	6.985	4.420E+01	119	90.00	8.360E+01	120	90.00	9.590E+01
120	90.00	3.175	3.110E+02	121	90.00	4.445	1.500E+02	122	90.00	5.715	8.080E+01	123	90.00	6.985	4.860E+01		
124	112.50	2.445	6.510E+02	125	112.50	3.175	3.720E+02	126	112.50	4.445	1.870E+02	127	112.50	5.715	8.730E+01		
128	112.50	6.985	5.160E+01	129	135.00	3.175	4.310E+02	130	135.00	4.445	1.980E+02	131	135.00	5.715	1.730E+02		
132	135.00	6.985	1.900E+01	133	157.50	4.445	9.090E+02	134	157.50	5.715	6.300E+02	135	157.50	6.985	4.445E+02		
136	157.50	5.715	1.110E+02	137	157.50	6.985	6.280E+01	138	180.00	2.445	1.050E+03	139	180.00	3.175	7.140E+02		
140	180.00	4.445	2.330E+02	141	180.00	5.715	1.190E+02	142	180.00	6.985	6.600E+01	143	202.50	2.445	1.110E+03		
144	202.50	3.175	7.220E+02	145	202.50	4.445	3.440E+02	146	202.50	5.715	1.950E+02	147	202.50	6.985	6.850E+01		
148	225.00	8.360E+01	8.360E+01	149	225.00	9.590E+01	9.590E+01	150	225.00	1.110E+02	1.110E+02	151	225.00	1.393E+02	1.393E+02		
152	247.50	2.445	8.780E+02	153	247.50	3.175	5.090E+02	154	247.50	4.445	2.070E+02	155	247.50	5.715	1.120E+02		
156	247.50	6.985	6.480E+01	157	270.00	2.445	7.520E+02	158	270.00	3.175	4.320E+02	159	270.00	4.445	1.850E+02		
160	270.00	5.715	9.710E+01	161	270.00	6.985	5.430E+01	162	292.50	2.445	6.980E+02	163	292.50	3.175	3.600E+03		
164	292.50	4.445	1.780E+02	165	315.00	5.715	9.190E+01	166	292.50	6.985	5.130E+01	167	315.00	8.360E+01	8.360E+01		
168	315.00	6.985	1.500E+02	169	315.00	8.360E+01	8.360E+01	170	315.00	9.590E+01	9.590E+01	171	315.00	1.110E+02	1.110E+02		
172	337.50	3.175	3.350E+02	173	337.50	4.445	1.600E+02	174	337.50	5.715	8.110E+01	175	337.50	6.985	4.850E+01		

Table B-35.

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RUN DATE.....1/12/77
PARTICLE.....PROTON
BEAM ENERGY....12GEV
TARGET.....FP RUN 71
PLATE NO.....P5
PLATE LOCATION..4

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NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	9.280E+01	1	127.88	2.085	2.020E+02	2	119.06	1.883	1.330E+02	3	108.44	1.735	1.430E+02
4	95.34	1.656	1.430E+02	5	83.66	1.676	5.750E+02	6	71.57	1.735	9.930E+01	7	60.95	1.813	8.400E+01
8	52.14	1.087	7.500E+01	9	45.00	2.328	5.140E+02	10	42.12	2.085	1.930E+02	11	135.00	1.810	1.750E+02
12	127.88	2.085	2.020E+02	13	119.06	1.883	1.330E+02	14	95.34	1.656	1.430E+02	15	83.66	1.676	5.750E+02
16	66.80	1.393	1.420E+02	17	54.46	1.573	1.070E+02	18	45.00	1.610	6.210E+01	19	37.88	2.085	6.690E+01
20	150.95	1.883	1.700E+02	21	144.46	1.573	2.340E+02	22	135.00	1.293	4.590E+02	23	120.96	1.066	3.220E+02
24	101.31	0.933	3.140E+02	25	78.69	0.933	2.620E+02	26	69.41	1.066	1.990E+02	27	45.00	1.293	1.300E+02
28	35.54	1.573	2.340E+02	29	33.05	0.883	7.400E+01	30	181.57	7.739	2.110E+03	31	156.80	3.383	3.030E+02
32	14.66	0.933	0.66E+02	33	33.05	0.883	7.400E+01	34	18.44	0.933	1.220E+02	35	18.44	1.735	8.720E+01
36	45.00	0.776	2.560E+02	37	30.96	1.066	1.770E+02	38	23.20	1.393	1.220E+02	39	18.44	0.776	5.330E+02
40	173.66	1.656	2.510E+02	41	171.87	1.233	4.130E+02	42	163.69	0.933	6.510E+02	43	161.57	0.578	5.330E+02
44	135.00	0.259	6.200E+02	45	45.00	0.239	4.170E+02	46	18.44	0.578	2.800E+02	47	11.31	0.933	2.020E+02
48	9.13	0.293	1.300E+02	49	6.34	1.656	1.000E+02	50	188.34	1.656	2.540E+02	51	188.13	0.293	4.250E+02
52	191.31	0.0	0.00E+00	53	191.78	0.0	0.00E+00	54	191.78	0.0	0.00E+00	55	191.78	0.0	0.00E+00
56	341.57	0.578	3.100E+02	57	348.69	0.933	1.920E+02	58	351.87	1.293	1.280E+02	59	353.66	1.656	9.890E+01
60	193.44	1.735	2.400E+02	61	203.20	1.393	5.360E+02	62	210.96	1.066	5.430E+02	63	225.00	0.776	5.150E+02
64	251.57	0.578	4.710E+02	65	258.44	0.578	3.810E+02	66	315.00	0.776	2.860E+02	67	329.00	1.066	1.530E+02
68	235.80	1.393	2.510E+02	69	235.80	1.393	2.510E+02	70	193.44	0.883	1.390E+02	71	175.54	0.776	1.530E+02
72	300.96	1.066	3.900E+02	73	249.04	0.776	4.470E+02	74	259.69	0.883	1.400E+02	75	251.57	0.933	3.020E+02
76	300.96	1.066	2.330E+02	77	315.00	1.293	1.640E+02	78	324.46	1.573	1.160E+02	79	330.95	1.883	8.800E+01
80	217.88	2.085	1.530E+02	81	225.00	1.810	2.030E+02	82	234.45	1.573	2.380E+02	83	246.80	1.393	2.740E+02
84	281.07	1.293	2.570E+02	85	278.13	1.293	2.120E+02	86	298.20	1.393	1.640E+02	87	305.54	1.573	1.230E+02
88	281.00	0.883	0.88E+02	89	281.00	0.883	0.88E+02	90	281.00	0.883	0.88E+02	91	281.00	0.883	0.88E+02
92	240.95	1.883	0.88E+02	93	251.57	1.735	1.790E+02	94	263.65	1.656	1.650E+02	95	276.84	1.656	2.870E+02
96	263.44	1.735	2.100E+02	97	299.06	1.863	9.640E+01	98	307.88	2.085	8.070E+01	99	315.00	2.328	6.400E+01
100	0.	2.445	8.000E+01	101	0.	3.175	5.090E+01	102	0.	4.445	3.750E+01	103	0.	5.715	2.900E+01
104	0.	6.985	2.490E+01	105	22.50	6.985	8.000E+01	106	22.50	3.175	4.710E+01	107	22.50	4.445	3.340E+01
108	22.50	6.985	2.490E+01	109	45.00	6.985	2.490E+01	110	45.00	3.175	4.359E+01	111	45.00	4.445	3.350E+01
112	45.00	5.715	2.900E+01	113	45.00	6.985	2.300E+01	114	67.50	6.985	2.400E+01	115	67.50	3.175	4.445E+01
116	67.50	4.445	3.210E+01	117	67.50	5.715	3.140E+01	118	67.50	6.985	2.410E+01	119	90.00	2.445	6.410E+01
120	90.00	3.175	4.600E+01	121	90.00	4.445	3.380E+01	122	90.00	5.715	2.800E+01	123	90.00	6.985	2.440E+01
124	112.50	2.445	7.310E+01	125	112.50	3.175	4.500E+01	126	112.50	4.445	4.000E+01	127	112.50	5.715	2.900E+01
128	112.50	985	2.350E+01	129	135.00	3.175	4.500E+01	130	135.00	4.445	3.530E+01	131	135.00	5.715	4.710E+01
132	135.00	5.715	2.350E+01	133	150.00	6.985	4.45E+01	134	150.00	6.985	3.210E+01	135	150.00	9.885	3.980E+01
136	157.50	5.715	3.020E+01	137	157.50	6.985	2.640E+01	138	180.00	2.445	9.880E+01	139	180.00	3.175	5.420E+01
140	180.00	4.445	3.860E+01	141	180.00	5.715	3.110E+01	142	180.00	6.985	2.480E+01	143	202.50	2.445	2.000E+02
144	202.50	3.175	5.420E+01	145	202.50	4.445	3.830E+01	146	202.50	5.715	3.070E+01	147	202.50	6.985	2.720E+01
148	225.00	2.445	8.800E+01	149	225.00	3.175	4.000E+01	150	227.00	4.445	3.210E+01	151	225.00	5.715	3.030E+02
152	225.00	2.445	8.800E+01	153	247.50	3.175	5.010E+01	154	247.50	4.445	3.210E+01	155	270.00	7.739	2.15E+02
156	247.50	6.985	2.770E+01	157	270.00	2.445	6.770E+01	158	270.00	3.175	4.800E+01	159	270.00	4.445	3.820E+01
160	270.00	5.715	2.840E+01	161	270.00	6.985	2.780E+01	162	292.50	2.445	6.230E+01	163	292.50	3.175	4.440E+01
164	292.50	4.445	3.500E+01	165	292.50	5.715	3.000E+01	166	292.50	6.985	2.680E+01	167	315.00	3.175	4.530E+01
168	315.00	6.985	2.680E+01	169	315.00	9.885	3.00E+01	170	315.00	12.785	3.00E+01	171	337.50	6.985	3.370E+01
172	337.50	3.175	5.000E+01	173	337.50	4.445	5.590E+01	174	337.50	5.715	2.930E+01	175	337.50	6.985	3.370E+01

Table B-36.

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....FP RUN 71
 FILE NO.....5
 PLATE LOCATION..5

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.323	3.340E+02	1	127.88	2.085	3.450E+02	2	119.06	1.883	4.340E+02	3	108.44	1.735	4.430E+02
4	96.34	1.656	4.090E+02	5	83.66	1.656	3.590E+02	6	71.57	1.735	3.050E+02	7	60.95	1.883	2.460E+02
8	52.13	2.005	1.960E+02	9	45.00	2.323	1.750E+02	10	142.10	2.005	5.550E+02	11	135.00	1.810	5.300E+02
12	125.54	1.573	5.950E+02	13	113.20	1.393	6.500E+02	14	90.13	1.293	5.850E+02	15	81.07	1.293	4.320E+02
16	66.80	1.393	3.870E+02	17	54.46	1.573	3.750E+02	18	45.00	1.810	2.780E+02	19	37.68	2.085	1.890E+02
20	150.95	1.883	6.060E+02	21	144.46	1.573	6.830E+02	22	135.00	1.293	7.600E+02	23	120.96	1.066	6.040E+02
24	101.31	0.933	7.540E+02	25	78.69	0.933	6.460E+02	26	59.04	1.066	5.400E+02	27	45.00	1.293	3.820E+02
28	35.54	1.573	2.950E+02	29	29.06	1.883	2.340E+02	30	161.57	1.735	6.570E+02	31	156.80	1.393	8.360E+02
32	149.04	1.066	9.470E+02	33	135.00	0.775	9.320E+02	34	103.44	0.573	9.170E+02	35	71.57	0.578	7.930E+02
36	45.00	0.775	6.240E+02	37	30.96	1.066	4.550E+02	38	23.20	1.393	3.450E+02	39	18.44	1.735	2.650E+02
40	173.66	1.656	6.890E+02	41	171.87	1.293	5.510E+02	42	168.69	0.933	1.090E+03	43	161.57	0.578	1.110E+03
44	135.00	0.259	1.050E+03	45	45.00	0.259	8.930E+02	46	18.44	0.578	6.710E+02	47	11.31	0.933	5.410E+02
48	8.13	1.293	3.740E+02	49	6.34	1.656	2.930E+02	50	186.34	1.656	5.930E+02	51	188.13	1.293	9.470E+02
52	191.31	0.933	1.090E+03	53	198.44	0.578	1.170E+03	54	220.00	0.259	1.060E+03	55	315.00	0.259	9.420E+02
56	341.57	0.775	6.430E+02	57	348.69	0.933	5.280E+02	58	351.87	1.293	3.650E+02	59	353.66	1.656	2.990E+02
60	193.44	1.573	6.750E+02	61	203.20	1.393	8.930E+02	62	210.95	1.066	1.130E+03	63	225.00	0.776	1.090E+03
64	251.57	0.578	1.020E+03	65	288.44	0.578	8.170E+02	66	315.00	0.776	6.450E+02	67	329.00	1.066	4.810E+02
68	335.80	0.393	6.50E+02	69	341.57	1.735	6.50E+02	70	203.05	1.883	6.570E+02	71	215.34	1.573	7.570E+02
72	225.00	1.293	8.370E+02	73	239.04	1.066	8.750E+02	74	351.87	0.933	9.050E+02	75	281.31	0.933	7.530E+02
76	300.96	1.066	5.690E+02	77	315.00	1.293	4.260E+02	78	324.46	1.573	3.170E+02	79	330.95	1.883	2.620E+02
80	217.88	2.085	5.490E+02	81	225.00	1.810	5.900E+02	82	234.46	1.573	6.810E+02	83	246.80	1.393	6.920E+02
84	261.57	1.293	6.230E+02	85	278.13	1.293	5.480E+02	86	293.20	1.393	4.540E+02	87	305.54	1.573	3.290E+02
88	315.00	1.810	2.740E+02	89	322.13	2.085	2.130E+02	90	235.00	2.323	3.020E+02	91	232.13	2.085	5.770E+02
92	240.95	1.883	5.810E+02	93	251.57	1.735	5.520E+02	94	260.66	1.656	5.60E+02	95	276.34	1.656	4.530E+02
96	288.44	1.735	3.420E+02	97	299.06	1.883	2.700E+02	98	307.88	2.085	2.340E+02	99	315.00	2.323	1.850E+02
100	0.	2.445	1.620E+02	101	0.	3.175	1.180E+02	102	0.	4.445	6.960E+01	103	0.	5.715	4.430E+01
104	0.	6.985	3.50E+01	105	22.50	2.445	1.890E+02	106	22.50	3.175	1.130E+02	107	26.50	4.445	6.800E+01
108	22.50	5.715	4.30E+01	109	22.50	6.985	3.45E+01	110	45.00	3.175	1.000E+02	111	45.00	4.445	6.270E+01
112	45.00	5.715	4.40E+01	113	45.00	6.985	3.45E+01	114	67.50	2.445	1.890E+02	115	67.50	3.175	1.080E+02
116	67.50	4.445	6.290E+01	117	67.50	5.715	4.470E+01	118	67.50	6.985	3.370E+01	119	90.00	2.445	2.080E+02
120	90.00	3.175	1.210E+02	121	90.00	4.445	6.730E+01	122	90.00	5.715	4.760E+01	123	90.00	6.985	3.440E+01
124	112.50	2.445	4.620E+02	125	112.50	3.175	1.380E+02	126	112.50	4.445	1.190E+02	127	112.50	5.715	4.870E+01
128	112.50	6.985	7.150E+01	129	135.00	3.175	1.650E+02	130	135.00	4.445	1.250E+02	131	135.00	5.715	5.390E+01
132	135.00	6.985	3.730E+01	133	157.50	2.445	4.270E+02	134	157.50	3.175	1.740E+02	135	157.50	4.445	8.360E+01
136	157.50	5.715	5.390E+01	137	157.50	6.985	7.560E+01	138	180.00	2.445	3.490E+02	139	180.00	3.175	2.190E+02
140	180.00	4.445	8.710E+01	141	180.00	5.715	5.80E+01	142	180.00	6.985	3.980E+01	143	202.50	2.445	3.60E+02
144	202.50	3.175	1.790E+02	145	202.50	4.445	8.380E+01	146	202.50	5.715	5.480E+01	147	202.50	6.985	4.050E+01
148	225.00	3.175	1.660E+02	149	225.00	4.445	7.530E+01	150	225.00	5.715	5.060E+01	151	225.00	6.985	7.620E+01
152	247.50	2.445	2.980E+02	153	247.50	3.175	1.13E+02	154	217.50	4.445	7.440E+01	155	247.50	5.715	5.190E+01
156	247.50	6.985	3.980E+01	157	270.00	2.445	2.070E+02	158	270.00	3.175	1.240E+02	159	270.00	4.445	6.780E+01
160	270.00	5.715	4.800E+01	161	270.00	6.985	3.710E+01	162	292.50	2.445	1.720E+02	163	292.50	3.175	1.110E+02
164	292.50	4.445	6.620E+01	165	292.50	5.715	5.010E+01	166	244.50	6.985	3.370E+01	167	315.00	3.175	1.150E+02
168	315.00	4.445	6.470E+01	169	315.00	5.715	4.60E+01	170	315.00	6.985	7.520E+01	171	337.50	2.445	1.970E+02
172	337.50	3.175	1.130E+02	173	337.50	4.445	1.10E+02	174	337.50	5.715	4.510E+01	175	337.50	6.985	3.250E+01

Table B-37.

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....129EV
 TARGET.....FP RUN 72
 PLATE NO.....P8
 PLATE LOCATION..4

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	135.00	2.328	1.280E+02	1	127.88	2.003	1.340E+02	2	119.06	1.893	2.270E+02	3	108.44	1.735	2.590E+02
4	95.34	1.656	2.260E+02	5	83.66	1.656	1.940E+02	6	71.57	1.735	1.230E+02	7	60.35	1.883	7.610E+01
8	52.13	2.085	5.040E+01	9	45.00	2.328	4.500E+01	10	142.10	2.065	1.610E+02	11	135.00	1.810	2.510E+02
12	125.54	1.573	3.850E+02	13	113.20	1.393	4.650E+02	14	98.13	1.293	4.880E+02	15	81.87	1.293	4.220E+02
16	66.80	1.393	2.300E+02	17	54.46	1.573	1.730E+02	18	43.00	1.810	1.110E+02	19	37.88	2.085	5.170E+01
20	150.95	1.893	2.400E+02	21	144.46	1.573	5.070E+02	22	135.00	1.293	6.470E+02	23	120.96	1.065	7.770E+02
24	101.31	0.933	7.240E+02	25	78.69	0.933	5.710E+02	26	59.04	1.065	3.690E+02	27	45.00	1.293	2.110E+02
28	35.54	1.573	1.190E+02	29	29.06	1.853	1.110E+02	30	161.57	1.735	4.470E+02	31	156.80	1.393	6.560E+02
32	145.04	1.066	9.230E+02	33	135.00	0.776	1.070E+03	34	108.44	0.578	1.040E+03	35	71.57	0.578	8.440E+02
36	45.00	0.776	5.460E+02	37	30.96	1.066	2.910E+02	38	23.20	1.393	2.000E+02	39	18.44	1.735	8.990E+01
40	173.66	1.656	5.740E+02	41	171.87	1.293	7.110E+02	42	168.90	0.933	1.150E+03	43	161.57	0.578	1.400E+03
44	135.00	0.259	1.290E+03	45	45.00	0.259	1.040E+03	46	18.44	0.578	7.360E+02	47	11.31	0.933	4.110E+02
48	8.13	1.293	1.850E+02	49	6.34	1.656	1.190E+02	50	186.34	1.656	5.970E+02	51	188.13	1.293	7.380E+02
52	191.31	0.933	1.260E+03	53	198.44	0.578	1.450E+03	54	225.00	0.578	1.380E+03	55	315.00	0.259	1.090E+03
56	341.57	0.578	7.110E+02	57	348.69	0.933	4.040E+02	58	351.87	1.293	2.010E+02	59	353.66	1.656	1.180E+02
60	198.44	1.735	5.470E+02	61	203.20	1.393	7.000E+02	62	210.06	1.066	1.150E+03	63	225.00	0.776	1.450E+03
64	251.57	0.578	1.310E+03	65	288.44	0.578	1.010E+03	66	315.00	0.776	6.610E+02	67	329.00	1.066	3.720E+02
68	336.80	1.393	1.910E+02	69	341.57	1.735	1.140E+02	70	209.05	1.893	3.650E+02	71	215.54	1.573	6.580E+02
72	225.00	1.293	8.590E+02	73	239.04	1.066	9.880E+02	74	258.69	0.933	9.610E+02	75	281.31	0.933	7.960E+02
76	300.96	1.066	5.190E+02	77	315.00	1.293	2.690E+02	78	324.46	1.573	1.950E+02	79	330.95	1.883	1.020E+02
80	217.38	2.085	2.240E+02	81	225.00	1.810	4.300E+02	82	234.46	1.573	6.550E+02	83	246.80	1.393	6.480E+02
84	261.87	1.293	6.660E+02	85	278.13	2.593	5.310E+02	86	293.20	1.393	3.510E+02	87	305.54	1.573	1.900E+02
88	318.00	1.810	1.130E+02	89	322.13	2.085	7.460E+01	90	235.00	2.378	1.310E+02	91	232.13	2.005	2.200E+02
92	240.95	1.883	2.940E+02	93	251.57	1.735	3.890E+02	94	283.66	1.656	3.630E+02	95	276.44	1.656	2.680E+02
96	288.44	1.735	1.850E+02	97	299.06	1.303	1.130E+02	98	307.88	2.005	7.870E+01	99	315.00	2.328	5.430E+01
100	0.	2.445	9.890E+01	101	0.	3.175	3.880E+01	102	0.	4.445	2.220E+01	103	0.	5.715	1.000E+01
104	0.	6.985	4.190E+00	105	22.50	2.445	4.200E+01	106	22.50	3.175	2.510E+01	107	22.50	4.445	1.240E+01
108	22.50	5.715	5.790E+00	109	45.00	6.985	6.985E+00	110	45.00	6.985	3.960E+01	111	45.00	4.445	7.840E+00
112	45.00	5.715	5.390E+00	113	45.00	6.985	3.930E+00	114	67.50	2.445	3.120E+01	115	67.50	3.175	1.410E+01
116	67.50	4.445	7.550E+00	117	67.50	5.715	5.290E+00	118	67.50	6.985	4.130E+00	119	90.00	2.445	8.560E+01
120	90.00	3.175	1.550E+01	121	90.00	4.445	7.760E+00	122	90.00	5.715	5.640E+00	123	90.00	6.985	4.210E+00
124	112.50	2.445	5.490E+00	125	112.50	3.175	1.700E+01	126	112.50	4.445	8.850E+00	127	112.50	5.715	5.960E+00
128	112.50	6.985	4.220E+00	129	135.00	3.175	2.010E+01	130	135.00	4.445	6.290E+00	131	135.00	5.715	6.190E+00
132	135.00	6.985	4.450E+00	133	157.50	2.445	1.220E+02	134	157.50	3.175	2.370E+01	135	157.50	4.445	9.020E+00
136	157.50	5.715	5.910E+00	137	157.50	6.985	4.430E+00	138	180.00	2.445	9.930E+00	139	180.00	3.175	2.560E+01
140	180.00	4.445	9.870E+00	141	180.00	5.715	6.030E+00	142	180.00	6.985	4.700E+00	143	202.50	2.445	1.050E+02
144	202.50	3.175	6.990E+01	145	202.50	4.445	1.010E+01	146	202.50	5.715	6.290E+00	147	202.50	6.985	4.760E+00
148	225.00	3.175	2.530E+01	149	225.00	4.445	1.040E+01	150	225.00	5.715	6.220E+00	151	225.00	6.985	4.000E+00
152	247.50	2.445	6.450E+01	153	247.50	3.175	2.280E+01	154	247.50	4.445	9.590E+00	155	247.50	5.715	6.150E+00
156	247.50	6.985	4.000E+00	157	270.00	2.445	5.670E+01	158	270.00	3.175	1.690E+01	159	270.00	4.445	8.840E+00
160	270.00	5.715	5.900E+00	161	270.00	6.985	4.410E+00	162	292.50	2.445	4.310E+01	163	292.50	3.175	1.630E+01
164	292.50	4.445	8.370E+00	165	292.50	5.715	6.500E+00	166	315.00	6.985	4.980E+00	167	315.00	8.131	6.150E+01
168	315.00	4.445	8.860E+00	169	315.00	5.715	6.230E+00	170	315.00	6.985	4.140E+00	171	337.50	2.445	5.860E+01
172	337.50	3.175	3.200E+01	173	337.50	4.445	1.430E+01	174	337.50	5.715	6.030E+00	175	337.50	6.985	4.130E+00

Table B-38.

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....120E6
 TARGET.....FP RUN 72
 PLATE NO.....P9
 PLATE LOCATION..S

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	135.00	2.1656	5.390E+02	5	135.35	2.0987	7.030E+02	2	119.06	1.885	8.110E+02	3	108.44	1.735	8.760E+02
4	96.34	1.656	8.390E+02	5	83.66	2.656	7.630E+02	6	71.57	1.735	6.160E+02	7	60.95	1.883	4.560E+02
8	52.13	2.085	3.280E+02	9	45.00	2.328	2.420E+02	10	142.10	2.085	8.320E+02	11	135.00	1.810	1.130E+03
12	125.54	1.573	1.330E+03	13	113.20	1.393	1.360E+03	14	98.13	1.293	1.430E+03	15	81.87	1.293	8.160E+02
16	66.80	1.393	6.190E+02	17	54.46	1.573	1.120E+03	18	45.00	1.810	4.050E+02	19	37.88	2.005	3.480E+02
20	150.95	1.883	1.180E+03	21	144.46	1.573	1.700E+03	22	135.00	1.293	1.980E+03	23	120.96	1.066	1.930E+03
24	101.31	0.933	1.760E+03	25	78.69	0.933	1.600E+03	26	59.04	1.066	1.160E+03	27	45.00	1.293	8.070E+02
28	35.54	1.573	5.750E+02	29	29.06	1.883	3.840E+02	30	161.57	1.735	1.330E+03	31	156.80	1.393	1.750E+03
32	149.04	1.066	2.250E+03	33	135.00	0.776	2.590E+03	34	108.44	0.578	2.440E+03	35	71.57	0.578	1.950E+03
36	45.00	0.776	1.400E+03	37	30.96	1.066	9.900E+02	38	23.20	1.393	6.540E+02	39	18.44	1.735	4.420E+02
40	173.66	1.656	1.510E+03	41	171.87	1.293	2.090E+03	42	168.69	0.933	2.810E+03	43	161.57	0.578	3.050E+03
44	135.00	0.259	2.870E+03	45	45.00	0.259	2.330E+03	46	18.44	0.578	1.720E+03	47	11.31	0.933	1.110E+03
48	8.13	1.293	8.140E+02	49	6.34	1.656	5.340E+02	50	186.34	1.656	1.670E+03	51	188.13	1.293	2.190E+03
52	191.31	0.933	3.070E+03	53	198.44	0.578	3.200E+03	54	225.00	0.259	3.040E+03	55	315.00	0.259	2.790E+03
56	341.57	0.578	1.700E+03	57	346.69	0.933	1.090E+03	58	351.87	1.293	7.760E+02	59	353.66	1.656	5.320E+02
60	198.44	1.735	1.650E+03	61	203.20	1.393	2.120E+03	62	210.96	1.066	2.620E+03	63	225.00	0.776	2.800E+03
64	251.57	0.578	2.730E+03	65	288.44	0.578	2.040E+03	66	315.00	0.776	1.540E+03	67	329.00	1.066	1.070E+03
68	336.80	1.393	7.450E+02	69	341.57	1.735	4.940E+02	70	209.05	1.883	1.260E+03	71	215.54	1.573	1.730E+03
72	225.00	2.293	2.110E+03	73	239.04	1.066	2.430E+03	74	258.59	0.933	2.140E+03	75	281.31	0.933	1.750E+03
76	300.96	1.066	1.330E+03	77	315.00	2.293	9.200E+02	78	324.46	1.573	6.230E+02	79	330.95	1.883	4.570E+02
80	217.88	2.085	9.540E+02	81	225.00	1.810	1.200E+03	82	234.46	1.573	1.630E+03	83	246.80	1.393	1.510E+03
84	261.87	1.293	1.520E+03	85	278.13	1.293	1.340E+03	86	293.20	1.393	9.830E+02	87	305.54	1.573	7.270E+02
88	315.00	1.810	5.060E+02	89	322.13	2.085	3.850E+02	90	225.00	2.328	6.450E+02	91	232.13	2.085	8.850E+02
92	240.95	1.883	1.020E+03	93	251.57	1.735	1.070E+03	94	283.63	1.573	1.050E+03	95	276.34	1.656	8.610E+02
96	288.44	1.735	7.170E+02	97	299.06	1.883	5.350E+02	98	307.89	2.085	3.940E+02	99	315.00	2.328	2.900E+02
100	0.	2.445	2.540E+02	101	0.	3.175	1.570E+02	102	0.	4.445	7.940E+01	103	0.	5.715	4.250E+01
104	0.	6.985	1.000E+01	105	22.50	2.985	2.390E+02	106	22.50	3.175	1.360E+02	107	22.50	4.445	5.360E+01
108	22.50	5.715	1.950E+01	109	22.50	6.985	2.060E+01	110	45.00	3.175	1.030E+02	111	45.00	4.445	3.610E+01
112	45.00	1.715	1.800E+01	113	45.00	6.985	9.500E+01	114	67.50	2.985	2.410E+02	115	67.50	3.175	1.190E+02
116	67.50	4.445	4.010E+01	117	67.50	5.715	1.840E+01	118	67.50	6.985	9.710E+01	119	90.00	2.445	2.930E+02
120	90.00	3.175	1.330E+02	121	90.00	4.445	6.870E+01	122	90.00	5.715	1.880E+01	123	90.00	6.985	1.030E+01
124	112.50	2.445	3.760E+02	125	112.50	3.175	1.640E+02	126	112.50	4.445	4.940E+01	127	112.50	5.715	2.020E+01
128	112.50	1.066	1.060E+01	129	135.00	1.735	1.750E+02	130	135.00	4.445	5.520E+01	131	135.00	5.715	2.460E+01
132	135.00	6.985	1.170E+01	133	157.50	2.445	5.350E+02	134	157.50	3.175	2.050E+02	135	157.50	4.445	6.120E+01
136	157.50	5.715	2.400E+01	137	157.50	6.985	2.890E+01	138	180.00	2.445	6.000E+02	139	180.00	3.175	2.340E+02
140	180.00	4.445	6.510E+01	141	180.00	5.715	2.480E+01	142	180.00	6.985	1.230E+02	143	202.50	2.445	5.950E+02
144	202.50	3.175	2.320E+02	145	202.50	4.445	6.390E+01	146	202.50	5.715	2.560E+01	147	202.50	6.985	1.270E+01
148	225.00	1.735	2.040E+02	149	225.00	4.445	6.080E+01	150	225.00	5.715	2.540E+01	151	247.50	6.985	1.400E+01
152	247.50	2.445	4.450E+02	153	247.50	3.175	1.700E+02	154	247.50	4.445	5.760E+01	155	247.50	5.715	2.240E+01
156	247.50	6.985	1.170E+01	157	270.00	2.445	3.310E+02	158	270.00	3.175	1.440E+02	159	270.00	4.445	4.870E+01
160	270.00	5.715	2.080E+01	161	270.00	6.985	1.140E+01	162	292.50	2.445	2.580E+02	163	292.50	3.175	1.230E+02
164	292.50	4.445	1.110E+01	165	292.50	5.715	1.980E+01	166	292.50	6.985	2.300E+01	167	315.00	3.175	1.230E+02
168	315.00	4.445	4.400E+01	169	315.00	5.715	1.910E+01	170	315.00	6.985	2.600E+01	171	337.50	2.445	2.560E+02
172	337.50	3.175	1.410E+02	173	337.50	4.445	5.900E+01	174	337.50	5.715	4.070E+01	175	337.50	6.985	9.920E+00

Table B-39.

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....120EV
 TARGET.....FR RUN 73
 PLATE NO.....P13
 PLATE LOCATION..1

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	135.00	2.328	1.950E+02	1	127.88	2.085	3.880E+02	2	119.06	1.883	3.870E+02	3	108.44	1.735	4.790E+02
4	96.34	1.656	5.740E+02	5	83.66	1.656	5.910E+02	6	71.57	1.735	5.210E+02	7	60.95	1.883	5.310E+02
8	52.13	2.085	2.980E+02	9	45.00	2.328	2.430E+02	10	42.10	2.085	3.630E+02	11	35.00	1.883	4.980E+02
12	125.54	1.573	5.750E+02	13	113.20	1.393	7.840E+02	14	96.13	1.293	6.670E+02	15	81.87	1.293	8.990E+02
16	66.80	1.393	6.690E+02	17	54.46	1.573	5.750E+02	18	45.00	1.610	4.540E+02	19	37.88	2.085	3.170E+02
20	150.95	1.883	3.180E+02	21	144.46	1.573	5.180E+02	22	135.00	1.293	7.650E+02	23	120.96	1.066	1.120E+03
24	101.31	0.933	1.440E+03	25	78.69	0.933	1.240E+03	26	59.04	1.066	1.050E+03	27	45.00	1.293	8.060E+02
28	35.54	1.573	5.780E+02	29	29.06	1.883	4.010E+02	30	161.57	1.735	3.900E+02	31	156.80	1.393	6.310E+02
32	149.04	1.066	1.030E+03	33	135.00	0.776	1.320E+03	34	108.44	0.578	1.620E+03	35	71.57	0.578	1.650E+03
36	45.00	0.776	1.590E+03	37	30.95	1.066	9.770E+02	38	21.20	1.393	6.720E+02	39	18.44	1.735	4.540E+02
40	173.66	1.656	4.370E+02	41	171.87	1.293	7.250E+02	42	168.69	0.933	1.140E+03	43	161.57	0.578	1.550E+03
44	135.00	0.259	1.810E+03	45	45.00	0.259	1.790E+03	46	18.44	0.378	1.550E+03	47	11.31	0.933	1.140E+03
48	8.13	1.293	6.670E+02	49	6.34	1.656	6.470E+02	50	186.34	1.656	4.480E+02	51	186.13	1.293	9.000E+02
52	191.31	0.933	1.140E+03	53	198.44	0.578	1.560E+03	54	225.00	0.259	1.900E+03	55	315.00	0.259	1.990E+03
56	341.57	0.578	1.590E+03	57	348.69	0.933	1.190E+03	58	351.87	1.293	8.920E+02	59	353.66	1.656	5.090E+02
60	198.44	1.735	4.290E+02	61	203.20	1.393	7.020E+02	62	210.96	1.066	1.290E+03	63	225.00	0.776	1.460E+03
64	251.57	0.578	1.760E+03	65	286.44	0.378	1.750E+03	66	315.00	0.776	1.450E+03	67	329.00	1.066	1.080E+03
68	336.80	1.393	1.450E+02	69	341.57	1.735	4.960E+02	70	209.05	0.883	3.860E+02	71	215.34	1.573	5.880E+02
72	225.00	1.293	8.840E+02	73	239.04	1.066	1.190E+03	74	258.69	0.933	1.420E+03	75	281.31	0.933	1.380E+03
76	300.96	1.066	1.170E+03	77	315.00	1.293	8.690E+02	78	324.46	1.610	6.060E+02	79	330.95	1.883	4.080E+02
80	217.88	2.085	2.850E+02	81	225.00	1.610	4.210E+02	82	234.46	1.573	6.490E+02	83	246.80	1.393	8.950E+02
84	261.87	1.293	1.000E+03	85	278.13	1.293	1.030E+03	86	293.20	0.933	8.620E+02	87	305.54	1.573	6.900E+02
88	315.00	1.610	4.830E+02	89	322.13	2.085	4.540E+02	90	225.00	2.328	2.220E+02	91	232.13	2.085	3.230E+02
92	240.95	1.883	4.440E+02	93	251.57	1.735	5.940E+02	94	263.66	1.656	6.920E+02	95	276.34	1.656	7.860E+02
96	268.44	1.735	6.210E+02	97	299.06	1.883	4.750E+02	98	307.88	2.085	3.550E+02	99	315.00	2.328	2.250E+02
100	0	2.445	2.260E+02	101	0	3.178	1.440E+02	102	0	4.445	1.700E+01	103	0	5.715	3.420E+01
104	0	6.985	1.800E+01	105	22.50	2.445	3.320E+02	106	22.50	3.175	1.280E+02	107	22.50	4.445	1.550E+02
108	22.50	5.715	2.990E+01	109	22.50	6.985	1.830E+01	110	45.00	3.175	1.150E+02	111	45.00	4.445	5.300E+01
112	45.00	5.715	2.720E+01	113	45.00	6.985	1.710E+01	114	67.50	2.445	2.130E+02	115	67.50	3.175	1.040E+02
116	67.50	4.445	4.760E+01	117	67.50	5.715	2.760E+01	118	67.50	6.985	1.780E+01	119	90.00	2.445	2.030E+02
120	90.00	1.175	1.040E+02	121	90.00	4.445	4.540E+01	122	90.00	7.15	2.740E+01	123	90.00	6.985	1.670E+01
124	112.50	2.445	1.950E+02	125	112.50	3.175	2.080E+02	126	112.50	4.445	4.370E+01	127	112.50	5.715	3.000E+01
128	112.50	6.985	1.610E+01	129	135.00	3.175	9.520E+01	130	135.00	4.445	4.480E+01	131	135.00	5.715	2.490E+01
132	135.00	6.985	1.590E+01	133	137.50	2.445	2.650E+02	134	157.50	3.175	1.880E+02	135	157.50	4.445	4.500E+01
136	157.50	5.715	2.810E+01	137	157.50	6.985	2.000E+01	138	180.00	2.445	1.850E+02	139	180.00	3.175	9.340E+01
140	180.00	4.445	4.560E+01	141	180.00	5.715	2.440E+01	142	180.00	6.985	2.000E+01	143	202.50	2.445	1.720E+02
142	202.50	3.175	9.430E+01	143	202.50	4.445	4.690E+01	144	202.50	5.715	3.000E+01	145	202.50	6.985	1.560E+01
146	225.00	3.175	9.350E+01	147	225.00	4.445	4.790E+01	148	225.00	5.715	3.000E+01	149	225.00	6.985	1.610E+01
150	247.50	2.445	1.040E+02	151	247.50	3.175	9.820E+01	152	247.50	4.445	4.810E+01	153	247.50	5.715	3.000E+01
154	267.50	6.985	1.720E+01	155	270.00	3.175	2.270E+02	156	270.00	4.445	1.100E+02	157	270.00	4.445	5.040E+01
158	270.00	5.715	2.840E+01	161	270.00	6.985	1.780E+01	162	292.50	2.445	3.610E+02	163	292.50	3.175	1.140E+02
164	292.50	4.445	5.220E+01	165	292.50	5.715	2.870E+01	166	292.50	6.985	1.820E+01	167	315.00	3.175	1.300E+02
168	315.00	4.445	5.410E+01	169	315.00	5.715	3.110E+01	170	315.00	6.985	1.870E+01	171	337.50	2.445	2.240E+02
172	337.50	3.175	1.420E+02	173	337.50	4.445	6.820E+01	174	337.50	5.715	3.260E+01	175	337.50	6.985	1.930E+01

Table B-40.

RUN DATE 1/12/77
 PARTICLE PROTON
 BEAM ENERGY 120EV
 TARGET FP RUN 73
 PLATE NO. P16
 PLATE LOCATION. 2

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	1.255	1.200E+03	1	137.85	2.085	1.290E+03	2	118.06	1.883	1.870E+03	3	108.44	1.735	1.810E+03
4	95.34	1.656	1.900E+03	5	83.66	1.656	1.970E+03	6	71.57	1.735	1.870E+03	7	60.95	1.683	1.550E+03
8	52.12	2.085	1.800E+03	9	45.00	2.328	1.160E+03	10	142.10	2.085	1.220E+03	11	135.00	1.810	1.570E+03
12	125.54	1.573	1.900E+03	13	113.20	1.393	2.340E+03	14	98.13	1.293	2.580E+03	15	81.87	1.293	2.630E+03
16	66.80	1.393	3.200E+03	17	54.46	1.573	2.100E+03	18	45.00	1.810	1.740E+03	19	37.88	2.085	1.410E+03
20	150.85	1.883	1.400E+03	21	144.46	1.573	1.910E+03	22	135.00	1.293	2.560E+03	23	120.96	1.066	3.140E+03
24	101.31	0.933	3.460E+03	25	78.69	0.933	3.590E+03	26	59.04	1.066	3.220E+03	27	45.00	1.293	2.640E+03
28	35.54	1.573	2.140E+03	29	29.06	1.883	1.590E+03	30	161.57	1.735	1.670E+03	31	156.80	1.393	2.320E+03
32	149.04	0.066	3.030E+03	33	135.00	0.776	3.890E+03	34	108.44	0.578	4.520E+03	35	71.57	0.578	5.790E+03
36	45.00	0.776	4.060E+03	37	30.96	1.066	3.190E+03	38	23.20	1.393	2.480E+03	39	18.44	1.735	1.780E+03
40	173.66	1.656	1.850E+03	41	171.87	1.293	3.140E+03	42	168.69	0.933	3.410E+03	43	161.57	0.578	4.370E+03
44	135.00	0.259	4.960E+03	45	45.00	0.259	5.130E+03	46	18.44	0.578	5.760E+03	47	11.31	0.933	3.770E+03
48	8.13	1.293	2.590E+03	49	6.34	1.656	1.930E+03	50	186.34	1.656	1.790E+03	51	188.13	1.293	2.510E+03
52	191.31	0.933	3.600E+03	53	198.44	0.578	5.660E+03	54	225.00	0.259	5.500E+03	55	315.00	0.259	5.420E+03
56	341.57	0.578	4.830E+03	57	348.69	0.933	3.580E+03	58	351.87	1.293	2.850E+03	59	353.66	1.656	1.980E+03
60	198.44	1.735	1.740E+03	61	203.20	1.393	2.450E+03	62	210.96	1.066	3.340E+03	63	225.00	0.776	4.120E+03
64	251.57	0.578	4.760E+03	65	288.44	0.578	5.130E+03	66	315.00	0.776	4.300E+03	67	329.00	1.066	3.320E+03
68	395.80	1.393	2.460E+03	69	341.57	1.735	1.880E+03	70	209.05	1.883	1.530E+03	71	215.54	1.573	2.080E+03
72	285.00	0.293	3.820E+03	73	239.04	1.066	3.610E+03	74	258.69	0.933	3.940E+03	75	281.31	0.933	4.030E+03
76	300.96	1.066	3.770E+03	77	315.00	1.293	2.920E+03	78	324.46	1.573	2.370E+03	79	330.95	1.883	1.700E+03
80	217.88	2.085	1.400E+03	81	225.00	1.810	1.820E+03	82	234.46	1.573	2.360E+03	83	246.80	1.393	2.780E+03
84	261.87	1.293	3.180E+03	85	278.13	1.293	3.070E+03	86	293.20	1.393	2.800E+03	87	305.54	1.573	2.480E+03
88	315.00	0.293	1.890E+03	89	32.13	2.085	1.490E+03	90	225.00	1.393	1.180E+03	91	232.13	2.085	1.450E+03
92	240.95	1.883	1.760E+03	93	25.57	1.735	2.110E+03	94	263.66	1.656	2.320E+03	95	276.34	1.656	2.490E+03
96	288.44	1.735	2.240E+03	97	299.36	1.883	1.790E+03	98	307.88	2.085	1.560E+03	99	315.00	2.328	1.270E+03
100	0.	2.445	1.100E+03	101	0.	3.175	7.040E+02	102	0.	4.445	3.660E+02	103	0.	5.715	1.760E+02
104	0.	0.985	8.820E+01	105	22.50	6.985	8.560E+01	106	22.50	3.175	6.700E+02	107	22.50	4.445	2.100E+02
108	22.50	0.715	1.800E+02	109	22.50	6.985	8.560E+01	110	45.00	3.175	8.00E+02	111	45.00	4.445	2.700E+02
112	45.00	0.715	1.390E+02	113	45.00	6.985	7.960E+01	114	67.50	2.445	1.010E+03	115	67.50	3.175	5.770E+02
116	67.50	4.445	2.500E+02	117	67.50	5.715	1.270E+02	118	67.50	6.985	7.480E+01	119	90.00	2.445	1.000E+03
120	90.00	3.175	5.420E+02	121	90.00	4.445	1.330E+02	122	90.00	5.715	1.180E+02	123	90.00	6.985	7.110E+01
124	112.50	2.445	1.010E+02	125	112.50	3.175	5.410E+02	126	112.50	4.445	2.410E+02	127	112.50	5.715	1.200E+02
128	112.50	6.985	6.480E+01	129	135.00	3.175	5.410E+02	130	135.00	4.445	2.280E+02	131	135.00	5.715	1.280E+02
132	135.00	6.985	6.970E+01	133	157.50	2.445	9.400E+02	134	157.50	3.175	5.160E+02	135	157.50	4.445	2.290E+02
136	157.50	5.715	1.220E+02	137	157.50	6.985	6.800E+01	138	180.00	2.445	9.140E+02	139	180.00	3.175	5.640E+02
140	180.00	4.445	2.370E+02	141	180.00	5.715	1.230E+02	142	180.00	6.985	6.600E+01	143	202.50	2.445	9.770E+01
144	202.50	3.175	5.390E+02	145	202.50	4.445	2.370E+02	146	202.50	5.715	1.260E+02	147	202.50	6.985	7.320E+01
148	225.00	3.175	5.710E+02	149	225.00	4.445	2.470E+02	150	225.00	5.715	1.260E+02	151	225.00	6.985	3.360E+02
152	247.50	2.445	1.120E+02	153	247.50	3.175	6.150E+02	154	247.50	4.445	6.820E+02	155	247.50	5.715	1.250E+02
156	247.50	6.985	7.760E+01	157	270.00	2.445	1.180E+03	158	270.00	3.175	1.050E+03	159	270.00	4.445	6.780E+02
160	270.00	4.445	1.360E+02	161	270.00	6.985	3.480E+02	162	292.50	2.445	1.190E+03	163	292.50	3.175	6.790E+02
164	292.50	4.445	2.750E+02	165	292.50	5.715	1.350E+02	166	315.00	6.985	7.970E+01	167	315.00	3.175	6.720E+02
168	315.00	4.445	2.960E+02	169	315.00	5.715	1.490E+02	170	315.00	6.985	8.510E+01	171	337.50	2.445	1.200E+03
172	337.50	3.175	7.200E+02	173	337.50	4.445	7.390E+02	174	337.50	5.715	1.640E+02	175	337.50	6.985	8.190E+01

Table B-41.

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....PF RUN 73
 PLATE NO.....17
 PLATE LOCATION..3

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	7.590E+02	1	127.88	2.085	9.110E+02	2	119.06	1.883	1.120E+03	3	108.44	1.735	1.340E+03
4	96.34	1.656	2.850E+03	5	83.66	1.656	1.460E+03	6	71.57	1.735	1.400E+03	7	60.95	1.883	1.240E+03
8	52.13	2.085	1.010E+03	9	45.00	2.328	7.500E+02	10	142.10	2.085	8.490E+02	11	135.00	1.810	1.210E+03
12	125.54	1.573	2.950E+03	13	113.20	1.393	1.690E+03	14	98.13	1.293	1.820E+03	15	81.87	1.293	1.980E+03
16	66.80	1.393	1.770E+03	17	54.46	1.573	1.490E+03	18	45.00	1.810	1.350E+03	19	37.88	2.085	9.910E+02
20	150.95	1.883	9.370E+02	21	144.46	1.573	1.380E+03	22	135.00	1.293	1.720E+03	23	120.96	1.066	2.060E+03
24	101.31	0.933	2.470E+03	25	78.69	0.933	2.530E+03	26	59.04	1.066	2.280E+03	27	45.00	1.293	1.980E+03
28	35.54	1.573	1.530E+03	29	29.06	1.883	1.170E+03	30	161.57	1.735	1.040E+03	31	156.80	1.393	3.120E+03
32	149.04	1.066	2.130E+03	33	135.00	0.776	2.510E+03	34	108.44	0.578	2.820E+03	35	71.57	0.578	5.060E+03
36	45.00	0.776	4.350E+03	37	30.95	1.066	2.150E+03	38	23.20	1.393	1.730E+03	39	16.44	1.735	1.330E+03
40	173.66	1.656	1.210E+03	41	171.87	1.293	1.760E+03	42	166.69	0.933	2.280E+03	43	161.57	0.578	2.830E+03
44	135.00	0.259	3.270E+03	45	45.00	0.259	3.510E+03	46	18.44	0.578	4.710E+03	47	11.31	0.933	2.540E+03
48	8.13	1.293	1.910E+03	49	6.34	1.656	1.470E+03	50	186.34	1.656	1.280E+03	51	188.13	1.293	1.820E+03
52	191.21	0.933	2.330E+03	53	198.44	0.578	5.090E+03	54	225.00	0.259	3.570E+03	55	315.00	0.259	3.580E+03
56	341.57	0.578	3.190E+03	57	348.69	0.933	2.570E+03	58	351.87	1.293	1.920E+03	59	353.66	1.656	1.550E+03
60	198.44	1.735	1.360E+03	61	203.20	1.393	1.720E+03	62	210.96	1.066	2.290E+03	63	225.00	0.776	2.830E+03
64	251.57	0.578	3.190E+03	65	288.44	0.578	3.330E+03	66	315.00	0.776	2.980E+03	67	329.00	1.066	2.390E+03
68	336.80	1.393	1.850E+03	69	341.57	1.735	1.410E+03	70	209.05	1.883	1.270E+03	71	215.54	1.873	1.880E+03
72	228.00	1.293	2.000E+03	73	239.04	1.066	2.510E+03	74	258.69	0.933	2.770E+03	75	281.31	0.933	2.900E+03
76	300.96	1.066	4.470E+03	77	315.00	1.293	2.090E+03	78	324.46	1.573	1.630E+03	79	330.95	1.883	1.000E+03
80	217.88	2.085	2.730E+03	81	225.00	1.810	1.400E+03	82	234.46	1.573	3.090E+03	83	246.80	1.393	1.940E+03
84	261.87	1.293	2.280E+03	85	278.13	1.293	1.400E+03	86	293.20	1.393	2.030E+03	87	305.54	1.573	1.780E+03
88	315.00	1.810	1.460E+03	89	322.13	2.085	1.000E+03	90	225.00	2.328	2.070E+02	91	232.13	0.805	6.300E+03
92	240.95	1.983	1.330E+03	93	251.57	1.735	1.520E+03	94	263.66	1.656	1.680E+03	95	276.34	1.656	1.660E+03
96	288.44	1.735	1.560E+03	97	299.06	1.883	1.360E+03	98	307.88	2.085	1.190E+03	99	315.00	2.328	1.000E+03
100	0	2.445	7.080E+02	101	0	3.175	5.350E+02	102	0	4.445	2.500E+02	103	0	5.715	1.460E+02
104	0	6.985	8.450E+01	105	22.50	2.445	5.650E+02	106	22.50	3.175	5.150E+02	107	22.50	4.445	2.470E+02
108	22.50	3.715	1.330E+02	109	22.50	6.985	6.160E+01	110	45.00	3.175	4.620E+02	111	45.00	4.445	2.280E+02
112	45.00	5.715	1.260E+02	113	45.00	6.985	7.910E+01	114	67.50	2.445	7.640E+02	115	67.50	3.175	4.620E+02
116	67.50	4.445	2.040E+02	117	67.50	5.715	1.250E+02	118	67.50	6.985	7.280E+01	119	90.00	2.445	2.140E+03
120	90.00	3.175	4.58E+02	121	90.00	4.445	2.120E+02	122	90.00	5.715	1.170E+02	123	90.00	6.985	7.730E+01
124	112.50	2.445	2.060E+02	125	112.50	3.175	1.600E+02	126	112.50	4.445	1.220E+02	127	112.50	5.715	1.250E+02
128	112.50	6.985	7.380E+01	129	135.00	3.175	4.060E+02	130	135.00	4.445	2.020E+02	131	135.00	5.715	1.170E+02
132	135.00	6.985	7.210E+01	133	157.50	2.445	7.030E+02	134	157.50	3.175	3.960E+02	135	157.50	4.445	2.020E+02
136	157.50	5.715	1.160E+02	137	157.50	6.985	7.340E+01	138	180.00	2.445	6.910E+02	139	180.00	3.175	4.190E+02
140	180.00	4.445	2.110E+02	141	180.00	5.715	1.160E+02	142	180.00	6.985	7.330E+01	143	202.50	2.445	7.130E+02
144	202.50	3.175	4.540E+02	145	202.50	4.445	2.040E+02	146	202.50	5.715	1.220E+02	147	202.50	6.985	7.700E+01
148	227.00	3.175	4.690E+02	149	225.00	4.445	2.170E+02	150	225.00	5.715	1.190E+02	151	225.00	6.985	7.760E+01
152	247.50	2.445	8.030E+02	153	247.50	3.175	5.110E+02	154	247.50	4.445	2.230E+02	155	247.50	5.715	1.250E+02
156	247.50	6.985	8.000E+01	157	270.00	2.445	2.260E+03	158	270.00	3.175	4.740E+02	159	270.00	4.445	2.140E+02
160	270.00	3.715	1.310E+02	161	270.00	6.985	7.400E+01	162	292.50	2.445	8.780E+02	163	292.50	3.175	5.030E+02
164	292.50	4.445	2.000E+02	165	292.50	5.715	1.250E+02	166	292.50	6.985	8.940E+01	167	315.00	3.175	8.320E+02
168	315.00	4.445	2.370E+02	169	315.00	5.715	1.400E+02	170	315.00	6.985	8.540E+01	171	337.50	2.445	8.000E+02
172	337.50	3.175	5.000E+02	173	337.50	4.445	2.740E+02	174	337.50	5.715	9.770E+01	175	337.50	6.985	8.620E+01

Table B-42.

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....126EV
 TARGET.....FP RUN 73
 PLATE NO.....19
 PLATE LOCATION..5

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	5.490E+02	1	127.88	2.005	6.570E+02	2	119.06	1.883	7.630E+02	3	108.44	1.735	8.400E+02
4	96.34	1.656	9.170E+02	5	89.66	1.656	9.110E+02	6	71.57	1.735	1.120E+03	7	60.95	1.883	8.220E+02
8	52.13	2.085	6.870E+02	9	45.00	2.328	6.120E+02	10	142.10	2.085	6.310E+02	11	135.00	1.810	7.670E+02
12	125.54	1.573	9.140E+02	13	113.20	1.993	1.060E+03	14	98.13	1.293	1.200E+03	15	81.87	1.293	1.260E+03
16	66.80	1.393	1.170E+03	17	54.46	1.573	1.010E+03	18	45.00	1.810	8.490E+02	19	37.88	2.085	7.180E+02
20	150.95	1.883	7.220E+02	21	144.45	1.573	9.070E+02	22	135.00	1.293	1.370E+03	23	120.96	1.066	1.380E+03
24	101.31	0.933	1.490E+03	25	78.69	0.933	1.520E+03	26	59.04	1.066	8.410E+03	27	45.00	1.293	1.230E+03
28	35.54	1.573	1.010E+03	29	29.06	1.883	8.070E+02	30	161.57	1.735	7.920E+02	31	156.80	1.393	1.010E+03
32	149.04	1.066	1.330E+03	33	135.00	0.776	1.580E+03	34	108.44	0.578	1.820E+03	35	71.57	0.578	1.820E+03
36	45.00	0.776	1.660E+03	37	30.96	1.066	1.390E+03	38	23.20	1.393	1.460E+03	39	18.44	1.735	8.650E+02
40	173.65	1.656	8.250E+02	41	171.87	1.293	1.100E+03	42	168.69	0.933	1.410E+03	43	161.57	0.578	1.680E+03
44	135.00	0.259	1.950E+03	45	45.00	0.259	2.000E+03	46	18.44	0.578	1.750E+03	47	11.31	0.933	1.490E+03
48	8.13	1.293	1.260E+03	49	6.34	1.656	9.390E+02	50	185.34	1.656	8.410E+02	51	188.13	1.293	1.130E+03
52	191.31	0.933	1.420E+03	53	198.44	0.578	1.870E+03	54	225.00	0.259	1.970E+03	55	315.00	0.259	1.990E+03
56	341.57	0.578	1.860E+03	57	348.69	0.933	1.600E+03	58	351.67	1.293	1.340E+03	59	353.66	1.656	9.020E+02
60	199.44	1.735	8.180E+02	61	203.20	1.393	1.070E+03	62	210.96	1.066	1.370E+03	63	225.00	0.776	1.720E+03
64	251.57	0.578	1.840E+03	65	288.44	0.578	1.830E+03	66	315.00	0.776	1.740E+03	67	329.00	1.066	1.460E+03
68	336.80	1.393	1.120E+03	69	341.57	1.735	9.180E+02	70	209.05	1.883	7.670E+02	71	215.54	1.573	9.700E+02
72	229.00	1.293	1.220E+03	73	239.04	1.066	1.480E+03	74	258.69	0.933	1.690E+03	75	281.31	0.933	1.700E+03
76	300.96	1.066	1.560E+03	77	315.00	1.293	1.510E+03	78	324.46	1.573	1.100E+03	79	330.95	1.883	1.120E+03
80	217.88	2.085	6.620E+02	81	225.00	1.810	8.220E+02	82	234.46	1.573	1.030E+03	83	246.80	1.393	1.220E+03
84	261.87	1.293	1.340E+03	85	278.13	1.293	1.310E+03	86	293.20	1.393	1.290E+03	87	305.54	1.573	1.050E+03
88	315.00	1.810	9.190E+02	89	322.13	2.085	7.620E+02	90	225.00	2.328	6.140E+02	91	232.13	2.085	6.900E+02
92	240.95	1.883	8.060E+02	93	251.57	1.735	9.200E+02	94	261.66	1.656	1.000E+03	95	276.34	1.656	9.820E+02
96	288.44	1.735	9.760E+02	97	299.06	1.683	8.840E+02	98	307.88	2.085	7.470E+02	99	315.00	2.328	6.250E+02
100	0.	2.445	5.690E+02	101	0.	3.175	4.110E+02	102	0.	4.445	2.440E+02	103	0.	5.715	1.440E+02
104	22.50	5.715	1.40E+01	105	22.50	6.445	5.920E+02	106	22.50	3.175	3.950E+02	107	22.50	4.445	2.380E+02
108	45.00	5.715	1.410E+02	109	22.50	6.985	9.650E+01	110	45.00	3.175	3.690E+02	111	45.00	4.445	2.110E+02
112	67.50	5.715	1.330E+02	113	45.00	6.985	8.900E+01	114	67.50	2.445	5.240E+02	115	67.50	3.175	3.480E+02
116	67.50	4.445	1.970E+02	117	67.50	5.715	1.300E+02	118	67.50	6.985	8.680E+01	119	90.00	2.445	5.130E+02
120	90.00	3.175	3.580E+02	121	90.00	4.445	1.930E+02	122	90.00	5.715	1.260E+02	123	90.00	6.985	8.560E+01
124	112.50	2.445	5.200E+02	125	112.50	3.175	3.520E+02	126	112.50	4.445	2.000E+02	127	112.50	5.715	1.250E+02
128	112.50	6.985	8.570E+01	129	135.00	3.175	3.260E+02	130	135.00	4.445	1.950E+02	131	135.00	5.715	1.270E+02
132	135.00	6.985	8.530E+01	133	157.50	2.445	7.910E+02	134	157.50	3.175	3.430E+02	135	157.50	4.445	1.840E+02
136	157.50	5.715	1.190E+02	137	157.50	6.985	8.140E+01	138	180.00	2.445	4.850E+02	139	180.00	3.175	3.370E+02
140	180.00	4.445	1.85E+02	141	180.00	5.715	1.290E+01	142	180.00	6.985	9.100E+01	143	202.50	4.445	5.080E+02
144	202.50	3.175	3.480E+02	145	202.50	4.445	1.900E+02	146	202.50	5.715	1.900E+02	147	202.50	6.985	8.940E+01
148	225.00	3.175	4.000E+02	149	225.00	4.445	9.100E+01	150	225.00	5.715	1.320E+02	151	225.00	6.985	3.330E+02
152	247.50	2.445	5.840E+02	153	247.50	3.175	3.610E+02	154	247.50	4.445	2.040E+02	155	247.50	5.715	1.330E+02
156	247.50	6.985	1.250E+02	157	270.00	2.445	5.810E+02	158	270.00	3.175	3.950E+02	159	270.00	4.445	2.000E+02
160	270.00	5.715	1.350E+02	161	270.00	6.985	8.570E+01	162	292.50	2.445	5.850E+02	163	292.50	3.175	3.850E+02
164	292.50	4.445	2.110E+02	165	292.50	5.715	1.340E+02	166	292.50	6.985	8.560E+01	167	315.00	3.175	3.720E+02
168	315.00	4.445	2.200E+02	169	315.00	5.715	1.360E+02	170	315.00	6.985	8.960E+01	171	337.50	2.445	5.870E+02
172	337.50	3.175	4.060E+02	173	337.50	4.445	2.260E+02	174	337.50	5.715	1.450E+02	175	337.50	6.985	9.200E+01

Table B-43.

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....136EV
 TARGET.....FP RUN 74
 PLATE NO.....P22
 PLATE LOCATION..1

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	1.540E+02	1	127.88	2.085	2.250E+02	2	119.06	1.883	2.680E+02	3	108.44	1.735	3.420E+02
4	96.34	1.656	3.480E+02	5	83.66	1.656	3.960E+02	6	71.57	1.735	3.730E+02	7	60.95	1.863	3.020E+02
8	55.13	2.085	2.860E+02	9	45.00	2.328	1.910E+02	10	142.10	2.085	2.190E+02	11	135.00	1.810	3.050E+02
12	125.54	1.573	4.300E+02	13	113.20	1.393	5.390E+02	14	90.13	1.293	6.770E+02	15	81.87	1.293	7.440E+02
16	66.80	1.393	6.810E+02	17	54.46	1.573	4.690E+02	18	45.00	1.810	4.130E+02	19	37.88	2.085	2.450E+02
20	150.95	1.863	2.810E+02	21	144.46	1.573	4.110E+02	22	135.00	1.293	6.430E+02	23	120.95	1.066	8.480E+02
24	101.31	0.933	9.670E+02	25	78.69	0.933	9.820E+02	26	59.01	1.066	8.850E+02	27	45.00	1.293	6.690E+02
28	35.04	1.573	4.790E+02	29	29.06	1.883	3.300E+02	30	161.57	1.735	3.290E+02	31	156.80	1.393	5.590E+02
32	149.54	1.066	8.410E+02	33	138.00	0.776	1.120E+03	34	108.44	0.578	1.530E+02	35	71.57	0.578	1.370E+03
36	45.00	0.776	1.380E+02	37	30.86	1.066	8.790E+02	38	23.20	1.393	6.550E+02	39	19.44	1.735	4.070E+02
40	173.66	1.656	4.000E+02	41	171.87	1.293	6.630E+02	42	168.69	0.933	1.060E+03	43	161.57	0.578	1.420E+03
44	135.00	0.259	1.820E+03	45	45.00	0.259	1.690E+03	46	18.44	0.578	1.450E+03	47	11.31	0.933	1.090E+03
48	8.13	1.293	7.170E+02	49	6.34	1.656	4.490E+02	50	186.34	1.656	4.260E+02	51	188.13	1.293	7.470E+02
52	191.31	0.933	1.150E+03	53	198.44	0.578	1.480E+03	54	225.00	0.259	1.780E+02	55	215.00	0.259	1.820E+03
56	341.57	0.578	1.520E+03	57	348.69	0.933	1.130E+03	58	351.87	1.293	7.510E+02	59	385.66	1.656	5.030E+02
60	199.44	1.735	4.390E+02	61	203.20	1.393	7.910E+02	62	210.95	1.066	1.260E+03	63	225.00	0.776	1.44E+03
64	251.57	0.578	1.690E+03	65	268.44	0.578	1.780E+03	66	315.00	0.776	1.490E+03	67	329.00	1.066	1.12C+03
68	336.80	1.393	7.500E+02	69	341.57	1.735	4.990E+02	70	209.05	1.883	4.140E+02	71	215.34	1.573	6.760E+02
72	225.00	1.293	9.330E+02	73	235.04	1.066	1.230E+03	74	258.69	0.933	1.380E+03	75	281.31	0.933	1.420E+03
76	300.95	1.066	1.250E+02	77	315.00	1.293	9.680E+02	78	324.46	1.573	6.500E+02	79	330.95	1.883	4.090E+02
80	217.88	2.085	2.910E+02	81	225.00	1.810	4.740E+02	82	234.46	1.573	6.990E+02	83	246.80	1.393	9.370E+02
84	261.87	1.293	1.040E+03	85	278.13	1.293	1.090E+03	86	293.20	1.393	1.010E+03	87	305.54	1.573	7.140E+02
88	315.00	1.810	5.650E+02	89	322.13	2.085	3.670E+02	90	225.00	2.328	2.340E+02	91	232.13	2.085	3.480E+02
92	240.95	1.983	5.170E+02	93	251.57	1.735	6.160E+02	94	263.66	1.656	6.990E+02	95	276.34	1.656	6.840E+02
96	283.44	1.735	6.170E+02	97	299.06	1.883	5.680E+02	98	307.86	2.085	3.780E+02	99	315.00	2.085	2.810E+02
100	0.	2.445	2.610E+02	101	0.	3.175	1.470E+02	102	0.	4.445	7.250E+01	103	0.	5.715	6.090E+01
104	0.	6.985	3.730E+01	105	22.50	2.445	2.040E+02	106	22.50	3.175	1.180E+02	107	22.50	4.445	5.430E+01
108	22.50	7.15	2.610E+01	109	22.50	6.985	1.440E+01	110	45.00	3.175	1.330E+02	111	45.00	4.445	4.220E+01
112	45.00	7.15	6.490E+01	113	45.00	6.985	3.920E+01	114	67.50	2.445	1.540E+02	115	67.50	3.175	1.280E+02
116	67.50	4.445	3.950E+01	117	67.50	5.715	1.960E+01	118	67.50	6.985	1.320E+01	119	90.00	4.445	1.440E+02
120	90.00	3.175	1.250E+02	121	90.00	4.445	7.250E+01	122	90.00	5.715	4.820E+01	123	90.00	6.985	1.220E+01
124	1.2.50	2.445	1.420E+02	125	112.50	3.175	7.550E+01	126	112.50	4.445	3.570E+01	127	112.50	5.715	2.100E+01
128	112.50	6.985	1.230E+01	129	135.00	3.175	7.670E+01	130	135.00	4.445	3.580E+01	131	135.00	5.715	2.010E+01
132	135.00	6.985	3.300E+01	133	157.50	2.445	1.410E+02	134	157.50	3.175	8.160E+01	135	157.50	4.445	3.690E+01
136	157.50	5.715	2.000E+01	137	157.50	6.985	1.250E+01	138	180.00	2.445	2.130E+02	139	180.00	3.175	8.300E+01
140	180.00	4.445	7.300E+01	141	180.00	5.715	5.130E+01	142	180.00	6.985	1.230E+01	143	202.50	2.445	2.320E+02
144	202.50	3.175	8.580E+01	145	202.50	4.445	3.990E+01	146	202.50	5.715	2.310E+01	147	202.50	6.985	1.300E+01
148	225.00	3.175	9.340E+01	149	225.00	4.445	4.320E+01	150	225.00	5.715	2.340E+01	151	225.00	6.985	1.400E+01
152	247.50	6.985	2.220E+02	153	247.50	3.175	1.500E+02	154	247.50	4.445	4.480E+01	155	247.50	5.715	2.420E+01
156	247.50	6.985	1.400E+01	157	270.00	2.445	2.260E+02	158	270.00	3.175	1.020E+02	159	270.00	4.445	4.500E+01
160	270.00	5.715	2.310E+01	161	270.00	6.985	1.470E+01	162	292.50	2.445	2.810E+02	163	292.50	3.175	1.140E+02
164	292.50	4.445	4.870E+01	165	292.50	5.715	2.560E+01	166	292.50	6.985	1.550E+01	167	315.00	3.175	1.170E+02
168	315.00	4.445	5.130E+01	169	315.00	5.715	2.790E+01	170	315.00	6.985	4.360E+01	171	337.50	2.445	2.690E+02
172	337.50	5.715	1.400E+02	173	337.50	4.445	6.570E+01	174	337.50	5.715	2.910E+01	175	337.50	6.985	1.520E+01

Table B-44.

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....120E9V
 TARGET.....FP RUN 74
 PLATE NO.....P23
 PLATE LOCATION..2

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	6.810E+02	1	127.88	2.085	8.620E+02	2	119.06	1.883	1.070E+03	3	108.44	1.735	1.250E+03
4	96.34	1.656	1.480E+03	5	83.66	1.656	1.510E+03	6	71.57	1.735	1.480E+03	7	60.95	1.883	1.350E+03
8	125.13	2.085	1.200E+03	9	45.00	2.328	9.570E+02	10	142.10	2.085	9.580E+02	11	135.00	1.810	1.680E+03
12	125.84	1.735	1.520E+03	13	113.20	1.393	1.870E+03	14	98.13	1.293	1.940E+03	15	81.67	1.293	2.050E+03
16	66.80	1.393	1.990E+03	17	54.46	1.573	1.750E+03	18	45.00	1.810	1.050E+03	19	37.88	2.085	1.210E+03
20	150.95	1.883	9.860E+02	21	144.46	1.573	1.340E+03	22	135.00	1.293	1.940E+03	23	120.96	1.066	2.190E+03
24	101.31	0.933	2.550E+03	25	78.69	0.933	2.740E+03	26	59.04	1.066	2.660E+03	27	45.00	1.293	2.260E+03
28	35.84	1.573	2.150E+03	29	29.06	1.883	1.440E+03	30	161.57	1.735	1.100E+03	31	156.80	1.393	1.730E+03
32	149.04	1.066	2.030E+03	33	135.00	0.776	2.720E+03	34	108.44	0.578	3.230E+03	35	171.57	0.578	3.740E+03
36	45.00	0.776	4.100E+03	37	30.96	1.066	3.400E+03	38	23.20	1.393	2.140E+03	39	18.44	1.735	1.660E+03
40	173.66	1.656	1.330E+03	41	171.87	1.293	1.660E+03	42	168.69	0.933	2.330E+03	43	161.57	0.578	2.990E+03
44	135.00	0.259	3.850E+03	45	45.00	0.259	4.050E+03	46	18.44	0.578	3.940E+03	47	11.31	0.933	3.990E+03
48	8.13	1.293	2.480E+03	49	6.34	1.656	1.820E+03	50	186.34	1.656	1.390E+03	51	188.13	1.293	1.710E+03
52	191.31	0.933	2.430E+03	53	198.44	0.578	3.230E+03	54	225.00	0.259	4.020E+03	55	315.00	0.259	4.390E+03
56	341.57	0.578	4.060E+03	57	348.69	0.933	3.370E+03	58	351.87	1.293	2.610E+03	59	353.66	1.656	1.880E+03
60	198.44	1.735	1.220E+03	61	203.20	1.393	1.670E+03	62	210.96	1.066	2.310E+03	63	225.00	0.776	3.630E+03
64	251.57	0.578	3.820E+03	65	288.44	0.578	4.170E+03	66	315.00	0.776	3.960E+03	67	329.00	1.066	3.310E+03
68	336.80	1.393	2.390E+03	69	341.57	1.735	1.760E+03	70	209.05	1.883	1.040E+03	71	215.84	1.573	1.660E+03
72	225.00	1.293	1.950E+03	73	239.04	1.066	2.620E+03	74	258.69	0.933	3.080E+03	75	281.31	0.933	3.330E+03
76	300.96	1.066	3.320E+03	77	315.00	1.293	3.080E+03	78	324.46	1.573	2.140E+03	79	330.95	1.883	1.650E+03
80	217.88	0.933	3.030E+02	81	225.00	1.810	1.450E+03	82	234.46	1.573	1.630E+03	83	246.80	1.393	1.980E+03
84	261.87	1.293	2.440E+03	85	278.13	1.293	2.520E+03	86	293.20	1.393	2.460E+03	87	305.54	1.573	2.150E+03
88	315.00	1.810	1.780E+03	89	322.13	2.085	1.370E+03	90	225.00	2.328	7.810E+02	91	232.13	2.085	9.860E+02
92	240.95	1.883	1.260E+03	93	251.57	1.735	1.510E+03	94	269.66	1.656	1.720E+03	95	276.13	1.656	1.600E+03
96	288.44	1.735	1.790E+03	97	299.06	1.883	1.540E+03	98	307.88	2.085	1.350E+03	99	31.00	2.328	1.200E+02
100	0.	6.985	5.800E+01	101	0.	3.175	6.110E+02	102	0.	4.445	2.840E+02	103	0.	5.715	2.000E+02
104	0.	6.985	5.800E+01	105	22.50	2.445	9.300E+02	106	22.50	3.175	5.520E+02	107	22.50	4.445	2.330E+02
108	22.50	5.715	9.910E+01	109	22.50	6.985	5.070E+01	110	45.00	3.175	4.610E+02	111	45.00	4.445	1.910E+02
112	45.00	5.715	6.880E+01	113	45.00	6.985	4.710E+01	114	67.50	2.445	7.770E+02	115	67.50	3.175	4.120E+02
116	67.50	4.445	1.670E+02	117	67.50	5.715	7.670E+01	118	67.50	6.985	4.010E+01	119	90.00	2.445	2.250E+02
120	90.00	3.175	3.860E+02	121	90.00	4.445	1.550E+02	122	90.00	5.715	7.120E+01	123	90.00	6.985	3.610E+01
124	112.50	2.445	6.460E+02	125	112.50	3.175	3.410E+02	126	112.50	4.445	1.400E+02	127	112.50	5.715	6.850E+01
128	112.50	6.985	3.330E+01	129	135.00	3.175	3.410E+02	130	135.00	4.445	1.340E+02	131	135.00	5.715	6.960E+01
132	135.00	6.985	3.860E+01	133	157.50	2.445	5.740E+02	134	157.50	3.175	3.150E+02	135	157.50	4.445	1.210E+02
136	157.50	5.715	6.310E+01	137	157.50	6.985	3.600E+01	138	180.00	4.445	6.040E+02	139	180.00	3.175	3.250E+02
140	180.00	4.445	1.820E+02	141	180.00	5.715	6.570E+01	142	180.00	6.985	3.470E+01	143	202.50	2.445	6.140E+02
144	202.50	3.175	3.530E+02	145	202.50	4.445	1.510E+02	146	202.50	5.715	6.360E+01	147	202.50	6.985	3.530E+01
148	225.00	3.175	3.830E+02	149	225.00	4.445	1.510E+02	150	225.00	5.715	7.170E+01	151	225.00	6.985	8.310E+01
152	247.50	4.445	7.200E+02	153	247.50	5.715	1.580E+02	154	247.50	6.985	1.580E+02	155	247.50	5.715	1.770E+01
156	247.50	6.985	4.120E+01	157	270.00	2.445	6.850E+02	158	270.00	3.175	4.490E+02	159	270.00	4.445	1.700E+02
160	270.00	5.715	8.270E+01	161	270.00	6.985	4.210E+01	162	292.50	2.445	1.030E+03	163	292.50	3.175	4.600E+02
164	292.50	4.445	1.920E+02	165	292.50	5.715	8.590E+01	166	292.50	6.985	8.700E+01	167	315.00	3.175	5.339E+02
168	315.00	4.445	2.000E+02	169	315.00	5.715	9.750E+01	170	315.00	6.985	5.070E+01	171	337.50	2.445	1.070E+02
172	337.50	3.175	5.770E+02	173	337.50	4.445	2.540E+02	174	337.50	5.715	1.130E+02	175	337.50	6.985	5.670E+01

Table B-45.

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....FP RUN 74
 PLATE NO.....P24
 PLATE LOCATION..4

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	3.270E+02	1	127.88	2.085	1.780E+02	2	119.06	1.983	2.070E+02	3	108.44	1.735	2.470E+02
4	96.34	1.656	2.730E+02	5	83.66	1.656	5.450E+02	6	71.57	1.735	2.630E+02	7	60.95	1.883	2.320E+02
8	52.13	2.085	1.910E+02	9	45.00	2.328	1.690E+02	10	142.10	2.085	1.760E+02	11	135.00	1.810	2.240E+02
12	125.54	1.573	2.860E+02	13	113.20	1.393	3.640E+02	14	98.13	1.293	4.480E+02	15	81.87	1.293	4.670E+02
16	66.80	1.393	4.020E+02	17	54.46	1.573	3.250E+02	18	45.00	1.810	2.550E+02	19	37.88	2.085	1.980E+02
20	150.95	1.883	3.870E+02	21	144.46	1.573	2.710E+02	22	135.00	1.293	4.010E+02	23	120.96	1.066	5.020E+02
24	101.31	0.933	6.170E+02	25	78.69	0.933	6.640E+02	26	59.04	1.066	5.860E+02	27	45.00	1.293	4.580E+02
28	35.54	1.573	3.420E+02	29	29.06	1.883	2.430E+02	30	161.57	1.735	3.760E+02	31	156.80	1.393	3.610E+02
32	149.04	1.066	5.100E+02	33	135.00	0.776	7.140E+02	34	108.44	0.578	8.590E+02	35	71.57	0.578	8.420E+02
36	45.00	0.776	7.710E+02	37	30.96	1.066	6.250E+02	38	23.20	1.393	4.270E+02	39	18.44	1.735	2.850E+02
40	173.66	1.656	2.590E+02	41	171.87	1.293	3.920E+02	42	168.69	0.933	5.860E+02	43	161.57	0.578	8.110E+02
44	135.00	0.259	9.690E+02	45	45.00	0.259	1.210E+03	46	18.44	0.578	9.060E+02	47	11.31	0.933	6.830E+02
48	8.13	1.293	4.600E+02	49	6.34	1.656	3.100E+02	50	186.34	1.656	4.540E+02	51	188.13	1.293	4.120E+02
52	191.31	0.933	6.060E+02	53	198.44	0.578	8.930E+02	54	225.00	0.259	1.040E+03	55	315.00	0.259	1.060E+03
56	341.57	0.578	1.100E+03	57	348.69	0.933	7.100E+02	58	351.87	1.293	6.420E+02	59	353.66	1.656	3.080E+02
60	198.44	1.735	2.370E+02	61	203.20	1.393	3.800E+02	62	210.96	1.066	5.840E+02	63	225.00	0.776	7.960E+02
64	251.57	0.578	9.790E+02	65	288.44	0.578	9.780E+02	66	315.00	0.776	8.510E+02	67	329.00	1.066	6.590E+02
68	336.80	1.393	4.400E+02	69	341.57	1.735	2.950E+02	70	209.05	1.883	2.280E+02	71	215.54	1.573	3.230E+02
72	225.00	1.810	3.160E+02	73	239.04	1.066	6.320E+02	74	258.69	0.933	7.710E+02	75	281.31	0.933	7.710E+02
76	300.96	1.066	6.720E+02	77	315.00	1.293	5.370E+02	78	324.46	1.573	3.840E+02	79	330.95	1.883	2.680E+02
80	217.88	2.085	1.900E+02	81	225.00	1.810	2.540E+02	82	234.46	1.573	3.590E+02	83	246.80	1.393	4.560E+02
84	261.87	1.293	5.480E+02	85	278.13	1.293	5.460E+02	86	293.20	1.393	4.500E+02	87	305.54	1.573	3.980E+02
88	315.00	1.810	3.160E+02	89	322.13	2.085	2.170E+02	90	225.00	1.735	2.700E+02	91	232.13	2.085	2.000E+02
92	240.95	1.883	2.340E+02	93	251.57	1.735	3.080E+02	94	263.66	1.656	3.310E+02	95	276.34	1.656	3.440E+02
96	283.44	1.735	3.250E+02	97	299.06	1.883	2.660E+02	98	307.88	2.085	2.210E+02	99	315.00	2.328	1.760E+02
100	0	2.445	1.850E+02	101	0	3.175	1.440E+02	102	0	4.445	1.050E+02	103	0	5.715	1.970E+02
104	22.50	6.985	6.230E+01	105	22.50	2.445	1.720E+02	106	22.50	3.175	1.310E+02	107	22.50	4.445	1.110E+01
108	45.00	5.715	2.060E+02	109	45.00	6.985	6.250E+01	110	45.00	3.175	1.690E+02	111	45.00	2.445	8.870E+01
112	67.50	4.445	2.260E+02	113	67.50	6.985	1.670E+02	114	67.50	2.445	1.520E+02	115	67.50	3.175	1.150E+02
116	90.00	4.445	2.440E+02	117	67.50	5.715	7.110E+01	118	67.50	6.985	6.190E+01	119	90.00	2.445	1.500E+02
120	90.00	3.175	1.120E+02	121	90.00	4.445	2.280E+02	122	90.00	5.715	7.370E+01	123	90.00	6.985	5.880E+01
124	112.50	2.445	1.450E+02	125	112.50	3.175	1.070E+02	126	112.50	4.445	8.690E+01	127	112.50	5.715	2.040E+02
128	112.50	6.985	5.940E+01	129	135.00	3.175	2.810E+02	130	135.00	4.445	8.270E+01	131	135.00	5.715	6.900E+01
132	135.00	6.985	5.920E+01	133	157.50	2.445	1.360E+02	134	157.50	3.175	2.670E+02	135	157.50	4.445	8.530E+01
136	157.50	5.715	6.870E+01	137	157.50	6.985	5.970E+01	138	180.00	2.445	1.430E+02	139	180.00	3.175	1.130E+02
140	180.00	4.445	8.590E+01	141	180.00	5.715	6.940E+01	142	180.00	6.985	7.670E+01	143	202.50	2.445	1.440E+02
144	202.50	3.175	1.120E+02	145	202.50	4.445	8.620E+01	146	202.50	5.715	7.030E+01	147	202.50	6.985	5.830E+01
148	225.00	3.175	1.130E+02	149	225.00	4.445	8.940E+01	150	225.00	5.715	7.460E+01	151	225.00	6.985	5.820E+01
152	247.50	2.445	1.530E+02	153	247.50	3.175	1.150E+02	154	247.50	4.445	8.570E+01	155	247.50	5.715	7.450E+01
156	247.50	6.985	1.980E+02	157	270.00	2.445	1.630E+02	158	270.00	3.175	1.210E+02	159	270.00	4.445	9.240E+01
160	270.00	5.715	1.160E+02	161	270.00	6.985	5.970E+01	162	292.50	2.445	1.720E+02	163	292.50	3.175	1.230E+02
164	292.50	4.445	8.650E+01	165	292.50	5.715	7.560E+01	166	292.50	6.985	6.230E+01	167	315.00	3.175	1.240E+02
168	315.00	4.445	2.440E+02	169	315.00	5.715	7.350E+01	170	315.00	6.985	1.890E+02	171	337.50	2.445	1.910E+02
172	337.50	3.175	1.390E+02	173	337.50	4.445	1.040E+02	174	337.50	5.715	7.850E+01	175	337.50	6.985	6.180E+01

Table B-46.

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....120EV
 TARGET.....FP RUN 74
 PLATE NO.....P11
 PLATE LOCATION..5

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	3.720E+02	1	127.88	2.085	4.840E+02	2	119.05	1.883	5.500E+02	3	108.44	1.395	6.720E+02
4	95.34	1.856	7.180E+02	5	83.66	1.856	7.150E+02	6	71.57	1.735	6.390E+02	7	60.38	1.883	5.620E+02
8	52.13	2.085	4.630E+02	9	45.00	2.328	3.780E+02	10	142.10	2.085	4.700E+02	11	135.00	1.810	5.680E+02
12	125.54	1.573	7.510E+02	13	113.20	1.393	9.210E+02	14	98.13	1.293	9.900E+02	15	81.87	1.293	1.110E+03
16	58.80	1.393	8.760E+02	17	54.46	1.573	7.800E+02	18	45.00	1.810	6.010E+02	19	37.88	2.085	4.740E+02
20	150.95	1.883	5.470E+02	21	144.46	1.573	7.430E+02	22	135.00	1.293	1.020E+03	23	120.96	1.066	1.150E+03
24	101.31	0.933	1.290E+03	25	78.69	0.933	1.460E+03	26	59.04	0.666	1.140E+03	27	45.00	1.293	9.380E+02
28	35.54	1.573	7.630E+02	29	29.06	1.883	5.590E+02	30	161.57	1.735	6.750E+02	31	156.80	1.393	9.020E+02
32	149.04	1.066	1.180E+03	33	135.00	0.776	1.510E+03	34	108.44	0.578	1.850E+03	35	71.57	0.578	1.860E+03
36	45.00	0.776	1.460E+03	37	30.95	1.066	1.200E+03	38	23.20	1.393	1.040E+03	39	18.44	1.735	6.890E+02
40	173.68	1.856	7.380E+02	41	171.87	1.293	1.010E+03	42	168.69	0.933	1.410E+03	43	161.57	0.578	1.360E+03
44	135.00	0.259	2.130E+03	45	45.00	0.259	1.950E+03	46	18.44	0.578	1.660E+03	47	11.31	0.933	1.360E+03
48	8.13	1.293	1.050E+03	49	6.34	1.656	7.430E+02	50	186.34	1.856	7.970E+02	51	188.13	1.293	1.090E+03
52	191.31	0.933	1.450E+03	53	198.44	0.578	1.600E+03	54	225.00	0.259	1.960E+03	55	315.00	0.259	1.980E+03
56	341.87	0.578	1.780E+03	57	348.69	0.933	1.390E+03	58	351.87	1.293	1.190E+03	59	353.66	1.656	7.620E+02
60	194.44	1.735	7.330E+02	61	203.20	1.393	1.050E+03	62	210.96	1.066	1.400E+03	63	225.00	0.776	1.690E+03
64	251.57	0.578	1.930E+03	65	288.44	0.578	1.950E+03	66	315.00	0.776	1.670E+03	67	329.00	1.066	1.400E+03
68	336.80	1.393	1.010E+03	69	341.57	1.735	8.070E+02	70	209.05	1.883	6.540E+02	71	215.54	1.573	9.090E+02
72	225.00	1.293	1.240E+03	73	239.04	1.066	1.490E+03	74	258.69	0.933	1.630E+03	75	281.31	0.933	1.600E+03
76	300.96	1.883	5.470E+02	77	315.00	1.293	1.200E+03	78	324.46	1.573	9.070E+02	79	330.95	1.883	6.390E+02
80	271.88	2.085	6.120E+02	81	225.00	1.810	7.450E+02	82	234.46	1.573	9.620E+02	83	246.80	1.393	1.180E+03
84	261.87	1.293	1.260E+03	85	278.13	1.293	1.230E+03	86	293.20	1.393	1.120E+03	87	305.54	1.573	9.400E+02
88	315.00	1.810	7.350E+02	89	322.13	2.085	5.440E+02	90	225.00	2.328	4.380E+02	91	232.13	2.085	5.540E+02
92	240.95	1.883	6.67C+02	93	251.57	1.735	8.190E+02	94	261.66	1.656	9.250E+02	95	276.34	1.656	9.230E+02
96	269.44	1.735	7.880E+02	97	299.06	1.883	7.270E+02	98	307.88	2.085	6.340E+02	99	315.00	2.328	4.380E+02
100	0.	2.445	4.300E+02	101	0.	3.175	3.450E+02	102	0.	4.445	1.580E+02	103	0.	5.715	9.290E+01
104	0.	6.985	5.970E+01	105	22.50	2.445	3.840E+02	106	22.50	3.175	2.390E+02	107	22.50	4.445	1.430E+02
108	22.50	6.985	5.970E+01	109	22.50	6.985	5.010E+01	110	45.00	3.175	2.050E+02	111	45.00	4.445	1.820E+02
112	45.00	5.715	7.700E+01	113	45.00	6.985	5.940E+01	114	67.50	2.445	4.070E+02	115	67.50	3.175	2.070E+02
116	67.50	4.445	1.160E+02	117	67.50	5.715	7.950E+01	118	67.50	6.985	5.790E+01	119	80.00	2.445	3.520E+02
120	90.00	3.175	2.010E+02	121	90.00	4.445	1.180E+02	122	90.00	5.715	7.800E+01	123	90.00	6.985	1.010E+02
124	112.50	2.445	3.390E+02	125	112.50	3.175	1.840E+02	126	112.50	4.445	1.190E+02	127	112.50	5.715	7.220E+01
128	112.50	6.985	5.850E+01	129	138.00	2.445	1.170E+02	130	138.00	3.175	8.300E+01	131	138.00	4.445	4.950E+01
132	135.00	6.985	5.670E+01	133	157.50	2.445	3.570E+02	134	157.50	3.175	2.060E+02	135	157.50	4.445	1.140E+02
136	157.50	5.715	7.890E+01	137	157.50	6.985	1.080E+02	138	180.00	2.445	3.580E+02	139	180.00	3.175	2.090E+02
140	180.00	4.445	1.260E+02	141	180.00	5.715	8.140E+01	142	180.00	6.985	1.040E+02	143	202.50	2.445	3.820E+02
144	202.50	3.175	2.250E+02	145	202.50	4.445	1.280E+02	146	202.50	5.715	7.720E+01	147	202.50	6.985	5.810E+01
148	225.00	6.985	2.200E+02	149	225.00	4.445	1.290E+02	150	225.00	3.175	8.300E+01	151	225.00	2.445	3.10E+01
152	247.50	2.445	4.150E+02	153	247.50	3.175	2.280E+02	154	247.50	4.445	1.320E+02	155	247.50	5.715	8.110E+01
156	247.50	6.985	5.960E+01	157	270.00	2.445	4.140E+02	158	270.00	3.175	2.400E+02	159	270.00	4.445	1.270E+02
160	270.00	5.715	7.900E+01	161	270.00	6.985	6.220E+01	162	292.50	2.445	4.650E+02	163	292.50	3.175	3.060E+02
164	292.50	4.445	1.180E+02	165	292.50	5.715	8.10E+01	166	292.50	6.985	6.040E+01	167	315.00	4.445	2.450E+02
168	315.00	4.445	1.250E+02	169	315.00	5.715	8.30E+01	170	315.00	6.985	5.800E+01	171	337.50	2.445	1.050E+02
172	337.50	3.175	2.200E+02	173	337.50	4.445	1.480E+02	174	337.50	5.715	8.810E+01	175	337.50	6.985	1.180E+02

Table B-47.

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....125EV
 TARGET.....FP RUN 75
 PLATE NO.....P18
 PLATE LOCATION..1

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	3.110E+01	1	127.88	2.085	5.390E+01	2	119.06	1.883	8.200E+01	3	108.44	1.735	1.060E+02
4	95.34	1.656	1.260E+02	5	85.66	1.656	1.230E+02	6	71.57	1.735	9.880E+01	7	60.95	1.883	7.410E+01
8	52.13	2.085	4.110E+01	9	45.00	2.328	2.600E+01	10	142.10	2.085	5.510E+01	11	135.00	1.810	9.590E+01
12	125.54	1.573	1.470E+02	13	113.20	1.393	2.050E+02	14	98.13	1.293	2.510E+02	15	81.87	1.293	2.370E+02
16	66.60	1.393	1.940E+02	17	54.46	1.573	1.330E+02	18	45.00	1.810	2.320E+01	19	37.88	2.085	4.420E+01
20	150.95	1.883	7.920E+01	21	144.46	1.573	1.530E+02	22	135.00	1.293	2.470E+02	23	120.96	1.066	3.480E+02
24	101.31	0.933	4.200E+02	25	78.69	0.933	4.090E+02	26	59.04	1.066	3.190E+02	27	45.00	1.293	2.030E+02
28	35.54	1.573	1.170E+02	29	29.06	1.883	6.880E+01	30	161.57	1.735	1.110E+02	31	156.80	1.393	2.120E+02
32	149.04	1.066	3.610E+02	33	135.00	0.776	5.250E+02	34	108.44	0.578	5.910E+02	35	71.57	0.578	5.830E+02
36	45.00	0.776	4.410E+02	37	30.96	1.066	3.010E+02	38	23.20	1.393	1.600E+02	39	18.44	1.735	8.530E+01
40	173.66	1.656	1.370E+02	41	171.87	1.293	2.560E+02	42	168.69	0.933	4.610E+02	43	161.57	0.578	6.520E+02
44	145.00	0.259	1.460E+02	45	45.00	0.259	3.400E+02	46	18.44	0.578	3.360E+02	47	11.31	0.933	3.650E+02
48	8.13	1.293	1.940E+02	49	6.34	1.656	1.070E+02	50	186.34	1.656	1.490E+02	51	188.13	1.293	2.800E+02
52	191.31	0.933	4.940E+02	53	198.44	0.578	6.820E+02	54	225.00	0.259	2.000E+02	55	353.66	0.259	7.840E+02
56	341.57	0.578	6.190E+02	57	348.69	0.933	3.980E+02	58	351.87	1.293	2.000E+02	59	353.66	1.656	1.120E+02
60	198.44	1.735	4.400E+02	61	203.20	1.393	2.630E+02	62	210.96	1.066	4.570E+02	63	225.00	0.776	6.510E+02
64	251.57	0.578	7.500E+02	65	288.44	0.578	6.890E+02	66	315.00	0.776	5.390E+02	67	329.00	1.066	3.530E+02
68	336.80	1.393	1.920E+02	69	341.57	1.735	1.030E+02	70	209.05	1.883	1.120E+02	71	215.54	1.573	2.210E+02
72	250.00	1.293	3.490E+02	73	239.04	1.066	5.190E+02	74	258.69	0.933	6.200E+02	75	281.31	0.933	5.750E+02
76	300.98	1.066	4.300E+02	77	315.00	1.293	2.760E+02	78	324.48	1.573	1.410E+02	79	330.95	1.883	9.010E+01
80	217.88	2.085	8.140E+01	81	225.00	1.810	1.520E+02	82	234.46	1.573	2.400E+02	83	246.80	1.393	3.450E+02
84	261.87	1.293	4.140E+02	85	278.13	1.293	3.860E+02	86	293.20	1.393	2.910E+02	87	305.54	1.573	1.850E+02
88	315.00	1.810	1.070E+02	89	322.13	2.085	7.100E+01	90	225.00	2.328	4.850E+01	91	232.13	2.085	9.200E+01
92	240.95	1.883	1.470E+02	93	251.87	1.735	1.990E+02	94	263.69	1.656	2.150E+02	95	275.00	1.656	1.280E+02
96	288.44	1.735	1.660E+02	97	299.06	1.883	2.110E+02	98	307.88	2.085	7.540E+01	99	315.00	2.328	4.590E+01
100	0.	2.445	3.730E+01	101	0.	3.175	2.030E+01	102	0.	4.445	1.010E+01	103	0.	5.715	1.750E+00
104	0.	6.985	7.330E+01	105	22.50	2.445	3.200E+01	106	22.50	3.175	1.320E+01	107	22.50	4.445	4.710E+00
108	22.50	5.715	1.460E+00	109	22.50	6.985	7.660E+01	110	45.00	6.985	8.470E+00	111	45.00	4.445	6.620E+00
112	45.00	5.715	1.300E+00	113	45.00	6.985	7.000E+01	114	67.50	2.445	2.460E+01	115	67.50	3.175	7.780E+00
116	67.50	4.445	2.490E+00	117	67.50	5.715	1.260E+00	118	67.50	6.985	7.610E+01	119	90.00	2.445	2.630E+01
120	90.00	3.175	7.420E+00	121	90.00	4.445	2.540E+00	122	90.00	5.715	1.310E+00	123	90.00	6.985	7.230E+01
124	112.50	2.445	2.680E+00	125	112.50	3.175	7.440E+00	126	132.50	4.445	2.450E+00	127	112.50	5.715	1.260E+00
128	112.50	4.445	7.720E+01	129	136.00	3.175	7.490E+00	130	157.00	2.445	2.500E+00	131	115.00	1.656	1.280E+02
132	135.00	6.985	2.700E+01	133	157.50	2.445	2.700E+01	134	157.00	3.175	8.510E+00	135	157.50	4.445	2.980E+00
136	157.50	5.715	1.240E+00	137	157.50	6.985	6.980E+01	138	180.00	2.445	2.780E+01	139	180.00	3.175	6.950E+00
140	180.00	4.445	2.600E+00	141	180.00	5.715	1.270E+00	142	180.00	6.985	7.100E+01	143	202.50	2.445	3.350E+01
144	202.50	3.175	8.990E+00	145	202.50	4.445	2.810E+00	146	202.50	5.715	1.700E+00	147	202.50	6.985	7.360E+01
148	225.00	6.985	3.730E+00	149	225.00	4.445	2.700E+00	150	225.00	5.715	1.340E+00	151	225.00	6.985	7.650E+01
152	247.50	2.445	4.050E+01	153	247.50	3.175	1.020E+01	154	247.50	4.445	2.760E+00	155	247.50	5.715	1.340E+00
156	247.50	6.985	7.320E+01	157	270.00	2.445	4.300E+01	158	270.00	3.175	9.670E+00	159	270.00	4.445	2.770E+00
160	270.00	5.715	1.310E+00	161	270.00	6.985	7.260E+01	162	292.50	2.445	3.820E+01	163	292.50	3.175	1.010E+01
164	292.50	4.445	2.220E+00	165	292.50	5.715	1.370E+00	166	315.00	6.985	7.310E+01	167	315.00	5.715	1.230E+01
168	315.00	4.445	1.190E+00	169	315.00	5.715	1.370E+00	170	315.00	6.985	7.310E+01	171	337.50	2.445	3.920E+01
172	337.50	3.175	1.740E+01	173	337.50	4.445	6.510E+00	174	337.50	5.715	1.600E+00	175	337.50	6.985	7.130E+01

Table B-48.

RUN DATE.....1/12/77
 PARTICLE.....PROTON
 BEAM ENERGY.....120E6V
 TARGET.....FP RUN 76
 PLATE NO.....P10
 PLATE LOCATION..1

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	1.810E+02	1	127.88	2.085	2.920E+02	2	119.76	1.883	4.700E+02	3	108.44	1.735	5.930E+02	4	96.34	1.656	6.930E+02
4	85.34	1.656	6.930E+02	5	83.66	1.598	9.010E+02	6	71.47	1.735	5.970E+02	7	60.35	1.883	5.160E+02	8	52.13	2.085	5.430E+02
8	45.00	2.328	2.030E+02	9	35.00	2.328	2.030E+02	10	24.11	2.085	2.750E+02	11	135.00	1.810	2.290E+02	12	125.54	1.573	8.530E+02
12	125.54	1.573	8.530E+02	13	113.20	1.393	1.160E+03	14	98.13	1.293	1.430E+03	15	81.87	1.293	1.510E+03	16	66.80	1.393	1.210E+03
16	66.80	1.393	1.210E+03	17	54.46	1.573	9.370E+02	18	45.00	1.810	5.600E+02	19	37.88	2.085	3.600E+02	20	30.95	1.883	4.190E+02
20	30.95	1.883	4.190E+02	21	144.45	1.573	8.160E+02	22	135.00	1.293	1.350E+03	23	120.96	1.066	1.820E+03	24	101.31	0.933	2.290E+03
24	101.31	0.933	2.290E+03	25	78.69	0.933	2.620E+03	26	59.04	1.066	2.290E+03	27	45.00	1.293	1.460E+03	28	35.54	1.573	9.000E+02
28	35.54	1.573	9.000E+02	29	29.06	1.883	5.080E+02	30	161.57	1.735	6.260E+02	31	156.80	1.393	1.100E+03	32	149.04	1.066	1.800E+03
32	149.04	1.066	1.800E+03	33	135.00	0.776	2.700E+03	34	108.44	0.578	3.620E+03	35	71.57	0.578	3.560E+03	36	45.00	0.776	2.880E+03
36	45.00	0.776	2.880E+03	37	30.96	1.066	2.020E+03	38	23.20	1.393	1.200E+03	39	18.44	1.735	7.310E+02	40	173.66	1.856	6.390E+02
40	173.66	1.856	6.390E+02	41	171.87	1.293	1.320E+03	42	168.69	0.933	2.240E+03	43	161.57	0.578	3.660E+03	44	135.00	0.259	4.660E+03
44	135.00	0.259	4.660E+03	45	45.00	0.259	5.340E+03	46	18.44	0.578	3.750E+03	47	11.31	0.933	2.460E+03	48	8.13	1.293	1.500E+03
48	8.13	1.293	1.500E+03	49	6.34	1.656	8.090E+02	50	186.34	1.656	7.620E+02	51	188.13	1.293	1.510E+03	52	191.31	0.933	2.400E+03
52	191.31	0.933	2.400E+03	53	198.44	0.578	3.780E+03	54	225.00	0.259	5.100E+03	55	315.00	0.259	6.110E+03	56	341.57	0.578	4.670E+03
56	341.57	0.578	4.670E+03	57	348.69	0.933	2.480E+03	58	351.87	1.293	1.490E+03	59	353.66	1.656	8.260E+02	60	198.44	1.393	7.420E+02
60	198.44	1.393	7.420E+02	61	203.20	1.393	1.280E+03	62	210.96	1.066	2.190E+03	63	225.00	0.776	3.250E+03	64	251.57	0.578	4.350E+03
64	251.57	0.578	4.350E+03	65	288.44	0.578	4.180E+03	66	315.00	0.776	3.550E+03	67	329.00	1.066	2.170E+03	68	336.80	1.393	1.450E+03
68	336.80	1.393	1.450E+03	69	341.57	1.735	7.650E+02	70	209.05	1.883	5.730E+02	71	215.54	1.573	1.090E+03	72	225.00	1.293	6.700E+02
72	225.00	1.293	6.700E+02	73	239.04	1.066	2.570E+03	74	258.69	0.933	3.670E+03	75	281.31	0.933	3.130E+03	76	300.96	1.883	6.970E+02
76	300.96	1.883	6.970E+02	77	315.00	2.293	1.750E+03	78	324.46	1.573	1.110E+03	79	330.95	1.883	6.500E+02	80	217.88	2.085	3.950E+02
80	217.88	2.085	3.950E+02	81	223.00	1.810	7.470E+02	82	234.46	1.573	1.190E+03	83	246.80	1.393	1.670E+03	84	261.87	1.293	2.060E+03
84	261.87	1.293	2.060E+03	85	278.13	1.293	2.080E+03	86	293.20	1.393	1.700E+03	87	305.54	1.573	1.320E+03	88	315.00	1.810	7.740E+02
88	315.00	1.810	7.740E+02	89	322.13	2.085	4.600E+02	90	225.00	2.328	2.550E+02	91	232.13	2.085	4.470E+02	92	240.95	1.883	6.970E+02
92	240.95	1.883	6.970E+02	93	251.57	1.735	9.570E+02	94	263.66	1.656	1.140E+03	95	276.34	1.656	1.190E+03	96	288.44	1.735	9.620E+02
96	288.44	1.735	9.620E+02	97	299.06	1.883	7.310E+02	98	337.50	2.085	5.160E+02	99	315.00	2.328	2.370E+02	100	0.	2.445	2.760E+02
100	0.	2.445	2.760E+02	101	0.	3.175	1.580E+02	102	0.	4.445	6.840E+01	103	0.	5.715	1.030E+01	104	22.50	6.985	4.390E+00
104	22.50	6.985	4.390E+00	105	22.50	2.445	2.170E+02	106	22.50	3.175	1.040E+02	107	22.50	4.445	3.850E+01	108	45.00	5.715	8.800E+00
108	45.00	5.715	8.800E+00	109	22.50	6.985	4.380E+00	110	45.00	3.175	6.800E+01	111	45.00	4.445	8.840E+01	112	45.00	1.735	8.380E+01
112	45.00	1.735	8.380E+01	113	45.00	6.985	4.510E+00	114	67.50	2.445	1.810E+02	115	67.50	3.175	5.580E+01	116	67.50	4.445	1.670E+01
116	67.50	4.445	1.670E+01	117	67.50	5.715	8.400E+00	118	67.50	6.985	4.170E+00	119	90.00	2.445	1.710E+01	120	90.00	3.175	5.290E+01
120	90.00	3.175	5.290E+01	121	90.00	4.445	1.780E+01	122	90.00	5.715	8.430E+00	123	90.00	6.985	4.350E+00	124	112.50	2.445	1.500E+02
124	112.50	2.445	1.500E+02	125	112.50	3.175	5.180E+01	126	112.50	4.445	1.690E+01	127	112.50	5.715	8.540E+00	128	112.50	6.985	4.300E+00
128	112.50	6.985	4.300E+00	129	135.00	3.175	5.150E+01	130	135.00	4.445	1.640E+01	131	135.00	5.715	8.150E+00	132	135.00	6.985	4.450E+00
132	135.00	6.985	4.450E+00	133	157.50	2.445	1.510E+02	134	157.50	3.175	5.330E+01	135	157.50	4.445	1.730E+01	136	157.50	5.715	7.770E+00
136	157.50	5.715	7.770E+00	137	157.50	6.985	3.870E+00	138	180.00	2.445	1.640E+02	139	180.00	3.175	5.720E+01	140	180.00	4.445	1.730E+01
140	180.00	4.445	1.730E+01	141	180.00	5.715	7.940E+00	142	180.00	6.985	4.220E+00	143	202.50	2.445	1.730E+02	144	202.50	3.175	5.380E+01
144	202.50	3.175	5.380E+01	145	202.50	4.445	1.720E+01	146	202.50	5.715	7.480E+00	147	202.50	6.985	3.930E+00	148	225.00	2.445	1.730E+01
148	225.00	2.445	1.730E+01	149	247.50	4.445	1.510E+02	150	225.00	3.175	7.570E+00	151	225.00	4.445	1.730E+01	152	247.50	2.445	2.060E+02
152	247.50	2.445	2.060E+02	153	247.50	3.175	6.330E+01	154	247.50	4.445	1.740E+01	155	247.50	5.715	8.320E+00	156	247.50	6.985	4.230E+00
156	247.50	6.985	4.230E+00	157	270.00	2.445	2.200E+02	158	270.00	3.175	6.730E+01	159	270.00	4.445	1.730E+01	160	270.00	5.715	7.560E+00
160	270.00	5.715	7.560E+00	161	270.00	6.985	4.140E+00	162	292.50	2.445	2.320E+02	163	292.50	3.175	6.760E+01	164	292.50	4.445	1.730E+01
164	292.50	4.445	1.730E+01	165	292.50	5.715	7.500E+00	166	292.50	6.985	4.150E+00	167	315.00	3.175	8.520E+01	168	315.00	4.445	1.730E+01
168	315.00	4.445	1.730E+01	169	315.00	5.715	7.380E+00	170	315.00	6.985	4.150E+00	171	315.00	7.715	8.490E+00	172	337.50	3.175	1.300E+02
172	337.50	3.175	1.300E+02	173	337.50	4.445	4.330E+01	174	337.50	5.715	8.940E+00	175	337.50	6.985	4.090E+00				

Table B-49.

RUN DATE.....6/14/77
 PARTICLE.....PROTON
 BEAM ENERGY.....120EV
 TARGET.....RUN 60
 PLATE NO.....P10
 PLATE LOCATION..1

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	136.00	2.326	2.527E+03	1	127.88	2.085	3.246E+03	2	119.06	1.883	3.953E+03	3	108.44	1.735	3.709E+03
4	96.34	1.656	5.198E+03	5	83.66	1.656	5.221E+03	6	71.57	1.735	5.011E+03	7	60.95	1.883	4.492E+03
8	52.13	2.085	3.246E+03	9	45.00	2.326	2.509E+03	10	142.10	2.085	3.082E+03	11	135.00	1.810	4.117E+03
12	126.54	1.573	5.401E+03	13	113.20	1.393	6.098E+03	14	98.13	1.293	6.876E+03	15	81.87	1.293	6.598E+03
16	66.80	1.393	6.456E+03	17	64.46	1.573	5.391E+03	18	45.00	1.810	3.994E+03	19	37.88	2.085	3.004E+03
20	150.95	1.883	4.035E+03	21	144.46	1.573	5.122E+03	22	135.00	1.293	4.966E+03	23	120.96	1.066	7.781E+03
24	101.31	0.933	8.460E+03	25	78.69	0.933	8.468E+03	26	59.04	1.066	8.008E+03	27	45.00	1.293	6.221E+03
28	35.54	1.873	4.975E+03	29	29.06	1.883	3.503E+03	30	181.57	1.735	4.846E+03	31	156.80	1.393	6.263E+03
32	149.04	1.066	8.304E+03	33	135.00	0.776	9.871E+03	34	108.44	0.578	1.005E+04	35	71.57	0.578	8.302E+03
36	45.00	0.776	8.803E+03	37	30.96	1.066	7.570E+03	38	23.20	1.393	5.933E+03	39	18.44	1.735	3.890E+03
40	173.66	1.656	5.610E+03	41	171.67	1.293	8.138E+03	42	168.69	0.933	9.935E+03	43	161.57	0.578	1.073E+04
44	135.00	0.259	1.094E+04	45	45.00	0.259	1.107E+04	46	18.44	0.578	9.995E+03	47	11.31	0.933	7.965E+03
48	8.13	1.293	5.714E+03	49	6.34	1.656	4.482E+03	50	186.34	1.656	6.814E+03	51	188.13	1.293	8.010E+03
52	181.31	0.933	1.049E+04	53	186.44	0.578	1.061E+04	54	225.00	0.259	1.223E+04	55	315.00	0.259	1.094E+04
56	341.57	0.578	9.664E+03	57	348.69	0.933	8.034E+03	58	331.67	1.293	6.188E+03	59	353.66	1.656	4.205E+03
60	198.44	1.735	6.501E+03	61	203.20	1.393	8.647E+03	62	210.96	1.066	1.022E+04	63	225.00	0.776	9.709E+03
64	251.57	0.578	1.123E+04	65	268.44	0.578	1.085E+04	66	315.00	0.776	9.497E+03	67	329.00	1.066	7.530E+03
68	398.80	1.393	5.681E+03	69	341.87	1.735	4.120E+03	70	209.05	1.883	5.592E+03	71	215.54	1.573	7.659E+03
72	225.00	1.293	6.831E+03	73	239.04	1.066	9.977E+03	74	258.69	0.933	1.000E+04	75	281.31	0.933	9.372E+03
76	300.36	1.066	8.479E+03	77	315.00	1.293	6.931E+03	78	324.46	1.573	5.267E+03	79	330.95	1.883	3.596E+03
80	217.86	2.085	5.103E+03	81	225.00	1.810	6.420E+03	82	234.46	1.573	7.298E+03	83	246.80	1.393	8.204E+03
84	281.87	1.293	7.813E+03	85	278.13	1.293	7.640E+03	86	293.20	1.393	6.989E+03	87	305.54	1.735	3.399E+03
88	315.00	1.810	4.406E+03	89	322.13	2.085	3.098E+03	90	325.00	1.320	7.295E+03	91	292.13	2.085	3.686E+03
92	240.35	1.883	5.087E+03	93	251.57	1.735	5.187E+03	94	263.66	1.656	5.348E+03	95	276.34	1.656	4.774E+03
96	268.44	1.735	4.402E+03	97	299.06	1.883	3.692E+03	98	307.68	2.085	3.068E+03	99	315.00	2.326	2.260E+03
100	0	2.445	1.775E+03	101	0	3.175	9.655E+02	102	0	4.445	4.707E+02	103	0	5.715	2.753E+02
104	0	6.985	1.693E+02	105	22.50	2.445	1.891E+03	106	22.50	3.175	9.301E+02	107	22.50	4.445	4.881E+02
108	22.50	5.715	2.495E+02	109	22.50	6.985	1.581E+02	110	22.50	7.715	1.142E+03	111	45.00	4.445	4.460E+02
112	46.00	5.715	2.622E+02	113	45.00	6.985	1.667E+02	114	67.50	2.445	2.325E+03	115	67.50	3.175	1.087E+03
116	67.50	4.445	4.003E+02	117	67.50	5.715	2.593E+02	118	67.50	6.985	1.659E+02	119	90.00	2.445	2.307E+03
120	90.00	3.175	1.087E+03	121	90.00	4.445	4.503E+02	122	90.00	5.715	2.689E+02	123	90.00	6.985	1.606E+02
124	112.50	2.445	2.446E+03	125	112.50	3.175	1.088E+03	126	112.50	4.445	3.775E+02	127	112.50	5.715	2.895E+02
128	112.50	6.985	1.891E+02	129	135.00	3.175	1.076E+03	130	135.00	4.445	4.778E+02	131	135.00	5.715	2.995E+02
132	135.00	6.985	1.732E+02	133	157.50	2.445	2.191E+03	134	157.50	3.175	1.182E+03	135	157.50	4.445	4.865E+02
136	157.50	5.715	2.857E+02	137	157.50	6.985	1.863E+02	138	180.00	2.445	2.727E+03	139	180.00	3.175	1.196E+03
140	160.00	4.445	5.318E+02	141	180.00	5.715	2.884E+02	142	180.00	6.985	1.846E+02	143	202.50	2.445	3.303E+02
144	202.50	3.175	1.287E+03	145	202.50	4.445	3.404E+02	146	202.50	5.715	3.118E+02	147	202.50	6.985	1.782E+02
148	225.00	3.175	1.287E+03	149	225.00	4.445	3.447E+02	150	225.00	5.715	2.872E+02	151	225.00	6.985	2.130E+02
152	247.50	2.445	2.082E+03	153	247.50	3.175	1.072E+03	154	247.50	4.445	5.487E+02	155	247.50	5.715	2.990E+02
156	247.50	6.985	2.716E+02	157	270.00	2.445	1.751E+03	158	270.00	3.175	9.216E+02	159	270.00	4.445	4.794E+02
160	270.00	5.715	2.585E+02	161	270.00	5.995	2.114E+02	162	292.50	2.445	1.780E+03	163	292.50	3.175	9.197E+02
164	292.50	4.445	4.514E+02	165	292.50	5.715	2.529E+02	166	292.50	6.985	1.783E+02	167	315.00	3.175	8.973E+02
168	315.00	4.445	4.399E+02	169	315.00	5.715	2.884E+02	170	315.00	6.985	1.601E+02	171	337.50	2.445	2.000E+03
172	337.50	3.175	9.309E+02	173	337.50	4.445	4.541E+02	174	337.50	5.715	2.148E+02	175	337.50	6.985	1.764E+02

Table B-50.

RUN DATE.....6/14/77
 PARTICLE.....PROTON
 BEAM ENERGY.....120EV
 TARGET.....RUN 80
 PLATE NO.....19
 PLATE LOCATION..2

N0	ANGLE	RADIUS	D0SE	N0	ANGLE	RADIUS	D0SE	N0	ANGLE	RADIUS	D0SE	N0	ANGLE	RADIUS	D0SE	N0	ANGLE	RADIUS	D0SE
0	135.00	2.933	1.202E+04	1	127.85	2.085	1.253E+04	2	119.06	1.883	1.270E+04	3	108.44	1.735	1.584E+04	4	100.00	1.583	2.275E+04
4	95.34	1.656	1.924E+04	5	83.66	1.656	1.077E+04	6	71.57	1.735	2.567E+04	7	60.95	1.883	2.275E+04	8	52.13	2.085	1.000E+00
12	125.54	1.573	1.000E+00	13	113.20	1.393	1.434E+04	10	142.10	2.085	1.000E+00	11	135.00	1.810	1.000E+00	12	125.54	1.573	1.000E+00
16	66.80	1.393	1.227E+04	17	54.46	1.573	1.950E+04	18	45.00	1.810	1.000E+00	19	37.88	2.085	1.298E+04	20	150.95	1.883	1.000E+00
24	101.31	0.933	2.910E+04	25	76.69	0.933	2.794E+04	26	59.04	1.066	2.804E+04	27	45.00	1.293	3.168E+04	28	35.54	1.573	2.034E+04
36	149.04	1.066	2.685E+04	37	135.00	0.776	2.872E+04	34	108.44	0.578	2.400E+04	35	71.57	0.378	3.228E+04	36	45.00	0.776	3.162E+04
40	173.66	1.656	2.162E+04	41	171.87	1.293	2.624E+04	42	168.69	0.933	3.055E+04	43	161.57	0.578	3.619E+04	44	135.00	0.259	3.825E+04
46	8.13	1.293	2.038E+04	49	6.34	1.656	1.567E+04	50	186.34	1.656	2.308E+04	51	188.13	1.293	2.795E+04	52	191.31	0.933	3.162E+04
56	341.57	0.578	2.872E+04	57	348.69	0.933	2.811E+04	58	351.87	1.293	2.177E+04	59	335.66	1.656	1.743E+04	60	196.44	1.735	2.334E+04
64	251.37	0.578	1.000E+00	65	288.44	0.578	3.286E+04	66	315.00	0.776	3.405E+04	67	325.00	1.066	3.322E+04	68	336.80	1.393	2.849E+04
72	300.96	1.393	2.849E+04	73	341.57	1.735	1.642E+04	70	209.05	1.883	1.000E+00	71	215.54	1.573	1.000E+00	72	300.96	1.393	2.849E+04
76	212.88	1.066	1.000E+00	77	315.00	1.293	1.000E+00	74	258.69	0.933	1.000E+00	75	281.31	0.933	1.000E+00	76	212.88	1.066	1.000E+00
80	217.88	2.085	1.000E+00	81	225.00	1.810	1.000E+00	82	234.46	1.573	1.000E+00	83	246.80	1.393	1.000E+00	84	261.87	1.293	1.000E+00
88	315.00	1.810	2.427E+04	89	322.13	2.085	1.000E+00	90	225.00	2.328	1.000E+00	91	232.13	2.085	1.000E+00	88	315.00	1.810	2.427E+04
92	240.95	1.883	1.000E+00	93	251.37	1.735	1.000E+00	94	263.66	1.656	1.000E+00	95	276.34	1.656	1.000E+00	92	240.95	1.883	1.000E+00
96	286.44	1.735	1.000E+00	97	299.06	1.883	1.000E+00	98	307.88	2.085	8.293E+03	99	315.00	2.328	1.001E+04	96	286.44	1.735	1.000E+00
100	0.	2.445	1.000E+00	101	0.	3.175	1.000E+00	102	0.	4.445	1.983E+03	103	0.	5.715	1.028E+03	100	0.	2.445	1.000E+00
104	22.50	6.985	6.039E+02	105	22.50	2.445	1.627E+04	106	22.50	3.175	4.962E+03	107	22.50	4.445	1.640E+03	104	22.50	6.985	6.039E+02
108	45.00	3.715	1.081E+03	109	45.00	6.985	6.786E+02	110	45.00	3.175	5.460E+03	111	45.00	4.445	2.131E+03	108	45.00	3.715	1.081E+03
112	67.50	4.445	1.121E+03	113	67.50	6.985	6.243E+02	114	67.50	2.445	1.176E+04	115	67.50	3.175	6.434E+03	112	67.50	4.445	1.121E+03
116	90.00	3.175	2.340E+03	117	90.00	4.445	1.206E+03	118	90.00	6.985	5.485E+02	119	90.00	2.445	1.798E+04	116	90.00	3.175	2.340E+03
120	112.50	6.985	6.316E+03	121	112.50	3.175	2.498E+03	122	90.00	5.715	1.179E+03	123	90.00	6.985	6.762E+02	120	112.50	6.985	6.316E+03
124	135.00	2.445	2.122E+04	125	135.00	3.175	6.414E+03	126	112.50	4.445	2.440E+03	127	112.50	5.715	1.092E+03	124	135.00	2.445	2.122E+04
128	150.95	6.985	6.483E+02	129	135.00	4.445	6.637E+03	130	135.00	4.445	2.844E+03	131	135.00	3.715	1.092E+03	128	150.95	6.985	6.483E+02
132	135.00	6.985	7.056E+02	133	157.50	2.445	1.113E+04	134	157.50	3.175	6.219E+03	135	157.50	4.445	2.562E+03	132	135.00	6.985	7.056E+02
136	157.50	5.715	1.371E+03	137	157.50	6.985	7.634E+02	138	180.00	2.445	1.335E+04	139	180.00	3.175	6.685E+03	136	157.50	5.715	1.371E+03
140	180.00	4.445	2.664E+03	141	180.00	5.715	1.258E+03	142	180.00	6.985	8.014E+02	143	202.50	2.445	1.940E+04	140	180.00	4.445	2.664E+03
144	202.50	3.175	7.840E+03	145	202.50	4.445	2.820E+03	146	202.50	5.715	9.535E+02	147	202.50	6.985	7.361E+02	144	202.50	3.175	7.840E+03
148	225.00	3.175	6.540E+03	149	225.00	4.445	2.695E+03	150	225.00	5.715	1.266E+03	151	225.00	6.985	6.924E+02	148	225.00	3.175	6.540E+03
152	247.50	2.445	1.000E+00	153	247.50	3.175	1.000E+00	154	247.50	4.445	2.447E+03	155	247.50	5.715	1.270E+03	152	247.50	2.445	1.000E+00
156	247.50	6.985	6.973E+02	157	270.00	2.445	1.112E+04	158	270.00	3.175	1.460E+04	159	270.00	4.445	2.246E+03	156	247.50	6.985	6.973E+02
160	270.00	5.715	1.440E+03	161	270.00	6.985	6.893E+03	162	292.50	4.445	4.762E+03	163	292.50	5.715	1.741E+04	160	270.00	5.715	1.440E+03
164	292.50	4.445	1.996E+03	165	292.50	5.715	1.048E+03	166	292.50	6.985	6.158E+02	167	315.00	3.175	2.593E+04	164	292.50	4.445	1.996E+03
168	315.00	4.445	1.961E+03	169	315.00	5.715	1.027E+03	170	315.00	6.985	6.332E+02	171	337.50	2.445	1.000E+00	168	315.00	4.445	1.961E+03
172	337.50	3.175	9.046E+03	173	337.50	4.445	2.039E+03	174	337.50	5.715	1.027E+03	175	337.50	6.985	6.382E+02	172	337.50	3.175	9.046E+03

Table B-51.

RUN DATE... 6/14/77
 PARTICLE... PROTON
 BEAM ENERGY... 120EV
 TARGET... RUN 80
 PLATE LOCATION... 3

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	7.893E+03	1	127.88	2.085	9.844E+03	2	119.06	1.883	1.112E+04	3	108.44	1.735	1.217E+04
4	96.34	1.656	9.948E+03	5	83.66	1.656	1.267E+04	6	71.57	1.735	1.206E+04	7	60.95	1.883	1.062E+04
8	52.13	2.085	9.948E+04	9	45.00	2.328	7.455E+03	10	142.10	2.085	9.754E+03	11	135.00	1.810	1.198E+04
12	125.34	1.573	1.344E+04	13	113.20	1.393	1.531E+04	14	98.10	1.293	1.279E+04	15	81.87	1.293	1.813E+04
16	66.60	1.393	1.479E+04	17	54.46	1.573	1.372E+04	18	45.00	1.810	1.100E+04	19	37.88	2.085	8.839E+03
20	150.95	1.883	1.145E+04	21	144.46	1.573	1.423E+04	22	135.00	1.293	1.944E+04	23	120.98	1.066	1.721E+04
24	101.31	0.933	2.003E+04	25	78.69	0.933	1.907E+04	26	59.04	1.066	1.755E+04	27	45.00	1.293	1.568E+04
28	35.34	1.573	1.278E+04	29	29.06	1.883	9.721E+03	30	161.57	1.735	1.289E+04	31	156.80	1.393	1.694E+04
32	149.04	1.066	1.583E+04	33	135.00	0.776	2.219E+04	34	108.44	0.578	2.040E+04	35	71.57	0.578	2.043E+04
36	45.00	0.776	1.972E+04	37	30.96	1.066	1.652E+04	38	23.20	1.393	1.320E+04	39	18.44	1.735	1.089E+04
40	173.66	1.656	1.465E+04	41	171.87	1.293	1.784E+04	42	168.69	0.933	1.966E+04	43	161.57	0.578	2.092E+04
44	135.00	0.259	2.155E+04	45	45.00	0.259	1.647E+04	46	18.44	0.578	2.002E+04	47	11.31	0.933	1.695E+04
48	8.13	1.293	1.451E+04	49	5.34	1.656	1.152E+04	50	186.34	0.656	1.484E+04	51	185.13	1.293	1.813E+04
52	181.31	0.933	2.190E+04	53	188.44	0.578	2.123E+04	54	225.00	0.259	2.205E+04	55	315.00	0.259	2.307E+04
56	341.57	0.578	2.057E+04	57	348.69	0.933	1.787E+04	58	351.87	1.293	1.449E+04	59	353.66	1.656	1.147E+04
60	198.44	1.735	1.444E+04	61	203.20	1.393	1.732E+04	62	210.96	1.066	2.003E+04	63	225.00	0.776	2.078E+04
64	231.57	0.578	2.171E+04	65	238.44	0.578	2.103E+04	66	315.00	0.776	2.158E+04	67	329.00	1.066	1.718E+04
68	338.80	1.293	1.342E+04	69	341.57	1.735	1.028E+04	70	209.05	1.883	1.374E+04	71	215.34	1.573	1.710E+04
72	225.00	1.293	1.868E+04	73	239.04	1.066	1.995E+04	74	258.69	0.933	1.964E+04	75	281.31	0.933	2.039E+04
76	300.95	1.066	1.699E+04	77	315.00	1.293	1.577E+04	78	324.46	1.573	9.666E+03	79	330.95	1.883	9.327E+03
80	217.88	2.085	1.218E+04	81	225.00	1.810	1.400E+04	82	234.46	1.573	1.632E+04	83	246.80	1.393	1.796E+04
84	281.57	1.293	1.779E+04	85	278.13	1.293	1.534E+04	86	293.20	0.393	1.548E+04	87	305.34	1.573	1.273E+04
88	315.00	1.066	1.160E+04	89	322.13	2.085	9.019E+03	90	225.00	2.328	9.408E+03	91	232.13	2.085	1.168E+04
92	240.95	1.883	1.160E+04	93	251.57	1.735	1.320E+04	94	263.66	1.656	1.303E+04	95	276.34	1.656	1.322E+04
96	268.44	1.735	1.181E+04	97	299.06	1.883	9.787E+03	98	307.88	2.085	8.832E+03	99	315.00	2.328	7.185E+03
100	0.	2.445	6.053E+03	101	0.	3.173	3.665E+03	102	0.	4.445	1.686E+03	103	0.	5.715	9.222E+02
104	0.	8.985	5.175E+02	105	22.50	2.445	6.475E+03	106	22.50	3.173	3.808E+03	107	22.50	4.445	1.703E+03
108	22.50	5.715	9.136E+02	109	22.50	6.985	5.206E+02	110	45.00	3.173	1.077E+03	111	45.00	4.445	1.646E+03
112	45.00	5.715	9.215E+02	113	45.00	6.985	5.420E+02	114	67.50	2.445	7.509E+03	115	67.50	3.173	4.260E+03
116	87.50	4.445	1.808E+03	117	67.50	5.715	9.417E+02	118	67.50	6.985	5.507E+02	119	90.00	2.445	7.761E+03
120	90.00	3.173	4.391E+03	121	90.00	4.445	1.990E+03	122	90.00	5.715	9.682E+02	123	90.00	6.985	5.788E+02
124	112.50	4.445	7.448E+03	125	112.50	3.173	4.411E+03	126	112.50	4.445	1.918E+03	127	112.50	5.715	9.978E+02
128	112.50	6.985	5.790E+02	129	135.00	3.173	4.497E+03	130	135.00	4.445	1.857E+03	131	135.00	5.715	1.026E+03
132	135.00	6.985	5.716E+02	133	157.50	2.445	7.831E+03	134	157.50	3.173	4.337E+03	135	157.50	4.445	1.698E+03
136	157.50	5.715	1.057E+03	137	157.50	6.985	5.310E+02	138	180.00	2.445	8.236E+03	139	180.00	3.173	4.915E+03
140	180.00	4.445	2.036E+03	141	180.00	5.715	8.818E+02	142	180.00	6.985	5.952E+02	143	202.50	2.445	1.833E+03
144	202.50	5.715	5.200E+03	145	202.50	4.445	2.008E+03	146	202.50	5.715	1.157E+03	147	202.50	6.985	8.318E+02
148	225.00	3.173	4.961E+03	149	225.00	4.445	2.057E+03	150	225.00	5.715	1.050E+03	151	225.00	6.985	6.237E+02
152	247.50	2.445	7.793E+03	153	247.50	3.173	4.526E+03	154	247.50	4.445	2.026E+03	155	247.50	5.715	1.008E+03
156	247.50	6.985	5.964E+02	157	270.00	2.445	8.810E+03	158	270.00	3.173	3.867E+03	159	270.00	4.445	1.805E+03
160	270.00	5.715	1.006E+03	161	270.00	6.985	5.344E+02	162	292.50	2.445	6.311E+03	163	292.50	3.173	3.698E+03
164	292.50	4.445	1.804E+03	165	292.50	5.715	8.792E+02	166	315.00	6.985	5.202E+02	167	315.00	3.173	3.529E+03
168	315.00	4.445	1.667E+03	169	315.00	5.715	8.845E+02	170	315.00	6.985	5.243E+02	171	337.50	2.445	6.622E+03
172	337.50	3.173	3.517E+03	173	337.50	4.445	1.693E+03	174	337.50	5.715	8.775E+02	175	337.50	6.985	4.993E+02

APPENDIX C **DOSE PLOTS FOR** **TLD DETECTORS EMBEDDED IN ^{238}U PLATES**

Fig. C-1.

Fig. C-2.

Fig. C-3.

Fig. C-4,

Fig. C-5.

Fig. C-6.

Fig. C-7.

Fig. C-8.

Fig. C-9.

Fig. C-10.

Fig. C-11.

Fig. C-12.

Fig. C-13.

Fig. C-14.

Fig. C-15.

Fig. C-16.

Fig. C-17.

Fig. C-18.

Fig. C-19.

Fig. C-20.

Fig. C-31.

Fig. C-22.

Fig. C-23.

Fig. C-24.

Fig. C-25.

Fig. C-26.

Fig. C-27.

Fig. C-28.

Fig. C-29.

DOSE - RADS
 B - 2.500E+02
 C - 5.000E+02
 D - 7.000E+02
 E - 1.000E+03
 F - 2.000E+03
 G - 4.000E+03
 H - 6.000E+03
 I - 1.000E+04
 J - 2.000E+04
 K - 2.500E+04

RUN DATE.....6/14/77
 PARTICLE.....PROTON
 BEAM ENERGY.....1PGEV
 TARGET.....RUN BD
 PLATE NO.....DB
 PLATE LOCATION..1

Fig. C-30.

DOSE - RADS
 B - 6.000E+02
 C - 7.000E+02
 D - 1.000E+03
 E - 2.000E+03
 F - 3.500E+03
 G - 6.000E+03
 H - 1.000E+04
 I - 2.000E+04
 J - 3.000E+04
 K - 4.000E+04

RUN DATE.....6/14/77
 PARTICLE.....PROTON
 BEAM ENERGY.....1PGEV
 TARGET.....RUN 80
 PLATE NO.....D9
 PLATE LOCATION..2

Fig. C-31.

DOSE - RADS
 B - 2.500E+02
 C - 5.000E+02
 D - 7.000E+02
 E - 1.000E+03
 F - 2.000E+03
 G - 4.000E+03
 H - 6.000E+03
 I - 1.000E+04
 J - 2.000E+04
 K - 3.000E+04

RUN DATE.....6/14/77
 PARTICLE.....PROTON
 BEAM ENERGY.....12GEV
 TARGET.....RUN 80
 PLATE NO.....D10
 PLATE LOCATION..3

Fig. C-32.

APPENDIX D
TLD DETECTORS IN ^{238}U PLATES
FISSION DATA FROM INTEGRAL GAMMA COUNTING

Figures D-1 through D-32 are the numerical dose data (in $\text{rad} \times 10^{-3}$) for TLD detectors in ^{238}U plates (top half of the circle). Fission data (in $\text{rad} \times 10^{-3}$) from integral gamma counting measurements are included in the bottom half of the circle for comparison (where available).

Beam energy 500 MeV
 Run date 9/15/76
 Run No. 51
 Particle Electron
 Plate No. D1 (FB)
 Plate location 1

Fig. D-1.

Beam energy 500 MeV
 Run date 9/15/76
 Run No. 51
 Particle Electron
 Plate No. D2 (AFB)
 Plate location 2

Fig. D-2.

Plate location 3

190

Beam energy 500 MeV
 Run date 9/16/76
 Run No. 52
 Particle Electron
 Plate No. D4 (FB)
 Plate location 1

Fig. D-4.

Beam energy 500 MeV
 Run date 9/16/76
 Run No. 52
 Particle Electron
 Plate No. D5 (AFB)
 Plate location 2

Fig. D-5.

Beam energy 500 MeV
 Run date 9/16/76
 Run No. 52
 Particle Electron
 Plate No. D6 (AFB)
 Plate location 3

Fig. D-6.

Beam energy 500 MeV
 Run date 9/16/76
 Run No. 53
 Particle Electron
 Plate No. D8 (AFB)
 Plate location 5

Fig. D-8.

Beam energy	500 MeV
Run date	9/16/76
Run No.	54
Particle	Electron
Plate No.	09 (FB)
Plate location	2

Fig. D-9.

Beam energy 500 MeV
 Run date 9/16/76
 Run No. 54
 Particle Electron
 Plate No. D10 (AFB)
 Plate location 3

Fig. D-10.

Beam energy 28.5 GeV
 Run date 12/10/76
 Run No. 61
 Particle Proton
 Plate No. D6 (FB)
 Plate location 1

Fig. D-11.

Beam energy 28.5 GeV
 Run date 12/10/76
 Run No. 61
 Particle Proton
 Plate No. D7 (AFB)
 Plate location 2

Fig. D-12.

Beam energy	28.5 GeV
Run date	12/10/76
Run No.	61
Particle	Proton
Plate No.	D8 (AFB)
Plate location	3

Fig. D-13.

Plate location 5

201

Beam energy	28.5 GeV
Pun date	12/10/76
Run No.	62
Particle	Proton
Plate No.	D10 (FB)
Plate location	5

Fig. D-15.

Beam energy 28.5 GeV
 Run date 12/9/76
 Run No. 63
 Particle Proton
 Plate No. D; (FB)
 Plate location 1

Fig. A-16.

Beam energy 28.6 GeV
 Run date 12/9/76
 Run No. 63
 Particle Proton
 Plate No. D2 (AFB)
 Plate location 2

Fig. D-17.

Beam energy 28.5 GeV
 Run date 12/9/76
 Run No. 63
 Particle Proton
 Plate No. D3 (AFB)
 Plate location 3

Fig. D-18.

Beam energy 28.5 GeV
 Run date 12/9/76
 Run No. 63
 Particle Proton
 Plate No. D4 (FB)
 Plate location 5

Fig. D-19.

Beam energy 28.5 GeV
 Run date 12/9/76
 Run No. 6^A
 Particle Proton
 Plate No. D5 (FB)
 Plate location 5

Fig. D-20.

Beam energy 11.4
 Run date 1/12/77
 Run No. 71
 Particle Proton
 Plate No. D1 (FB)
 Plate location 1

Fig. D-21.

Beam energy	11.4
Run date	1/12/77
Run No.	71
Particle	Proton
Plate No.	D2 (AFB)
Plate location	2

Fig. D-22.

Beam energy 11.4
 Run date 1/12/77
 Run No. 71
 Particle Proton
 Plate No. D3 (AFB)
 Plate location 3

Fig. D-23.

Beam energy	11.4
Run date	1/12/77
Run No.	71
Particle	Proton
Plate No.	D4 (FB)
Plate location	5

Fig. D-24.

Beam energy 12.3 GeV
Run date 1/12/77
Run No. 72
Particle Proton
Plate No. D5 (FB)
Plate location 5

Fig. D-25.

Beam energy 11.4 GeV
 Run date 1/12/77
 Run No. 73
 Particle Proton
 Plate No. D6 (AFB)
 Plate location 2

Fig. D-26.

Beam energy 11.4
 Run date 1/12/77
 Run No. 73
 Particle Proton
 Plate No. D7 (FB)
 Plate location 5

Fig. D-27.

Beam energy 11.4
 Run date 1/12/77
 Run No. 74
 Particle Proton
 Plate No. D8 (FB)
 Plate location 1

Fig. D-28.

Beam energy 11.4
 Run date 1/12/77
 Run No. 74
 Particle Proton
 Plate No. D9 (AFB)
 Plate location 2

Fig. D-29.

Beam energy 11.4
 Run date 1/12/77
 Run No. Proton
 Particle 74
 Plate No. D10 (FB)
 Plate location 5

Fig. D-30.

Beam energy 11.4
 Run date 6/14/77
 Run No. 80
 Particle Proton
 Plate No. D8 (FB)
 Plate location 1

Beam energy 11.4 GeV
 Run date 6/14/77
 Run No. 80
 Particle Proton
 Plate No. D9 (AFB)
 Plate location 2

Fig. D-32.

Beam energy 11.4
Run date 6/14/77
Run No. 80
Particle Proton
Plate No. D10 (AFB)
Plate location 3

Fig. D-33.

APPENDIX E **FISSION-DOSE DATA ALONG TWO AXES OF PLATES VS** **DISTANCE FROM THE CENTER OF EACH PLATE**

Fig. E-1.

Fig. E-2.

Fig. E-3.

Fig. E-4.

Fig. E-5.

Fig. E-6.

Fig. E-7.

Fig. E-8.

Fig. E-9.

Fig. E-10.

Fig. E-11.

Fig. E-12.

Fig. E-13.

Note: Radiochemistry results are ~ 30 X higher than fission dose shown here.

Fig. E-14.

Note: Radiochemistry results are $\sim 30 \times$ higher than fission dose shown here.

Fig. E-15.

Note: Radiochemistry results of fission dose are one order of magnitude higher (~ 30 – 80 rad).

Fig. E-16.

Fig. E-17.

Fig. E-18.

Fig. E-19.

Fig. E-20.

Fig. E-21.

Fig. E-22.

Fig. E-23.

Fig. E-24.

Fig. E-25.

Fig. E-26.

Fig. E-27.

Fig. E-28.

Fig. E-29.

Fig. E-30.

Fig. E-31.

Fig. E-32.

Fig. E-33.

Fig. E-34.

Fig. E-35.

Fig. E-36.

Fig. E-37.

Fig. E-38.

Fig. E-39.

Fig. E-40.

Fig. E-41.

Fig. E-42.

Fig. E-43.

Note: Foil 71Z was in contact with 1 - cm diam ^{238}U , and between foils 71C and D. The maximum fission dose was 4760 rad (Lexan) and ^{140}Ba count averaged 1.06×10^4 rad. ^{140}Ba from ^{235}U foil, whose Lexan data are plotted above, gave 2.1×10^3 rad.

Fig. E-44.

Fig. E-45.

Fig. E-46.

Fig. E-47.

Fig. E-48.

Fig. E-49.

Fig. E-50.

Fig. E-51.

Note: Foil 73Z indicated 2400 rad of fission in ^{238}U , but ^{140}Ba count was 1.26×10^4 rad in ^{238}U , ^{140}Ba measured nothing in ^{235}U .

Fig. E-52.

Fig. E-53.

Fig. E-54.

Fig. E-55.

Fig. E-56.

Note: ^{140}Ba count gave 5600 rad for ^{235}U .

Fig. E-57.

Fig. E-58.

Fig. E-59.

Fig. E-60.

APPENDIX F

SAMPLE DATA REDUCTION FOR THERMOCOUPLE INSTRUMENTED ANL STACK RUN 78

In this appendix, we present sample calculations and results for the thermocouple instrumented stack run performed at ANL (run 78). This experiment consisted of six alternating disks of Ta and ^{238}U separated by small air gaps on the same axis. All the disks were the same radius and thickness. Thermal contact with the environment and each other was minimized by suspending each disk from strings of low thermal conductivity. A thermocouple was attached to the outer edge of the first five disks. As the beam passed through them, they were exposed in line in the following order: Ta, ^{238}U , Ta, ^{238}U , and Ta. An uninstrumented Ta disk allowed the last instrumented disk to provide with a similar temperature environment as the inner samples. The temperature isolation achieved was adequate because the temperature decrease between beam pulses was small as was shown in Fig. 4.

In table F-1, we present physical data on the disks, while in Table F-2 we give the experimental data.

Table F-1. Physical data for disks in ANL stack run.

Physical parameter	Disk material	
	Ta	^{238}U
Radius, cm	0.5	0.5
Thickness, cm	0.0889	0.0889
Mass, cm	1.16	1.35
Heat capacity, cal/g $^{\circ}\text{C}$ at 25°C	0.033	0.028
Density, g/cm ³	16.6	18.9
Fission cross section (mb) ^{2,3}	~ 0	870 ± 140
^{140}Ba production cross section (mb) ⁴	~ 0	7.7 ± 0.3

Table F-2. Experimental data ANL stack run
(20 beam pulses).

Disk	Quantity measured	
	$\Delta T, ^{\circ}\text{C}$	^{140}Ba produced, atoms
1st Ta	$9.8 (\pm .1)^{\circ}\text{C}$	0
1st ^{238}U	$16.3 (\pm .1)^{\circ}\text{C}$	$3.48 \times 10 (\pm 3.1\%)$
2nd Ta	$11.6 (\pm .1)^{\circ}\text{C}$	0
2nd ^{238}U	$17.4 (\pm .1)^{\circ}\text{C}$	$3.0 \times 10 (\pm 3.1\%)$
3rd Ta	$12.2 (\pm .1)^{\circ}\text{C}$	0

In this simplified analysis, we have neglected such matters as secondary production and their influence on the data even though the data are clearly influenced by them (compare the Ta data as the beam passes through successive disks).

The purpose of this experiment was to demonstrate a technique by which one could estimate the energy deposited per fission induced by high-energy protons. One therefore needs to know the energy deposited by fission and the number of fission events. The energy deposited by fission can be estimated from this experiment by comparing the temperature rise in the Ta with that found in the ^{238}U . For example, if we average the temperatures of the second and third Ta disks, we would find a temperature rise of $\sim 11.9^{\circ}\text{C}$ for a Ta disk that would occupy the same position as the second ^{238}U disk; this approximately compensates for secondary product deposition for everything but fission. The excess of energy (presumably from fission) deposited in the uranium is then:

$$\Delta H = (17.4)(0.028) - (11.9)(0.033) = 0.095 \text{ cal/g}$$

or

$$\Delta H = 2.5 \times 10^{12} \text{ MeV/g}$$

The number or energy of fissions can be estimated from the available data by four methods.

1. Estimate proton flux using gold-activation data and ratio of sample area to total beam area. The fission cross section is then used to calculate the number of fissions.
2. The method is the same as the first except that the incident proton flux is calculated from the temperature rise of the first Ta disk by dividing it by the energy deposited per incident proton.
3. Estimate the number of fissions from the number of ^{140}Ba atoms produced in the sample.
4. The ratio of energy deposited in the ^{238}U to Ta is:

$$\frac{E_U}{E_{Ta}} = \frac{I_U + F_U \rho f}{I_{Ta}}$$

where I_U and I_{Ta} are the energies deposited in the ^{238}U and Ta by all processes other than fission, F_U is the

energy deposited per fission, and p_i is the probability of fission. (The proton flux cancels out when the ratio is taken.) If the samples were thin, I_1 and I_2 would be the ionization losses. One would then solve for F_1 .

We shall use the third method as an example. This depends on the ^{140}Ba production to estimate the number of fissions. The ^{140}Ba production cross sections are nearly independent of proton energy from 2 to 11.5 GeV.⁴ The number of fissions per gram can then be calculated.

$$\text{fissions} = \frac{870}{7.7} (3 \times 10^8) = 3.4 \times 10^{10} \text{ fissions/g}$$

or

$$\text{energy per fission} = \frac{2.5 \times 10^{12}}{3.4 \times 10^{10}} = 74 \text{ MeV/fission}$$

The value of 74 MeV/fission is much lower than expected. This is not a thin sample (relative to those used in typical cross-section measurements) and therefore other processes must be producing ^{140}Ba . In comparing ^{140}Ba calculated fission levels with those measured by the Lexan and total gamma-ray counting methods, we find that the ^{140}Ba is consistently high. In one such comparison between ^{140}Ba and integral gamma-ray counting, we found the ratio to have a mean of 3.14 with σ equal to 0.30. The geometry of this experiment was considerably

different, so this ratio cannot be applied directly. However, it does confirm our suspicions that ^{140}Ba is being produced by other processes than merely fission.

Although there is a discrepancy between our results and the expected energy released per fission from the residual nuclei after a high-energy proton interaction, the method is promising and capable of greater accuracy with more effort. The measurement of temperature is reliable. Our error is apparently in the ^{140}Ba measurement. Our two other methods of measuring fission density, i.e., with Lexan foils and the total residual fission gamma counts have shown results which are reasonably consistent with each other. With some exceptions, these results gave lower fission densities by twofold or more than the ^{140}Ba method. Considering this correction, we would interpret the energy released per fission to be 150-220 MeV, and not 74 MeV/fission. Unfortunately, we lost the opportunity to make the total residual gamma measurement on these disks following the run, and fission densities were too high for Lexan use.

In conclusion, this method of obtaining energy released per fission gave results consistent with our expectations. The accuracy of our results is not good enough to be reliable, but if the experiment were to be repeated, we would achieve more accurate results.

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