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Measurement of energy deposited by charged-particle beams in composite targets

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MEASUREMENT OF ENERGY
DEPOSITED BY CHARGED PARTICLE
BEAMS IN COMPOSITE TARGETS

ABSTRACT

We have measured the energy deposited in two types of composite targets by a number of charged-particle beams: targets made of ^{238}U , Lucite, and polyethylene were exposed to 0.26-GeV protons and 0.33-GeV deuterons, and aluminum-Lucite composites were exposed to 0.5-GeV electrons. In addition, we measured neutrons and gamma rays emitted from solid targets of various materials (including ^{238}U and iron) exposed to 0.26-GeV protons and 0.33-GeV deuterons. We used passive detectors (thermoluminescence dosimeters, Lexan fission track recorders, and photographic emulsions) to measure the non-fission dose and the fission-fragment dose from the primary beam and its shower of products. Measurements were made at various depths and radial positions in the targets. Plots and numerical values of the measured doses are presented. The emission of neutrons and gamma rays was measured with a liquid-deuterated-benzene detector. In general, the dose profile with depth is similar for 0.26-GeV protons and 0.33-GeV deuterons. The ratio of return neutrons to gamma rays increases with increasing target mass number. Deuterons, however, produce from 1.7 to 5.8 times as many neutrons and gamma rays per particle as do protons.

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 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 and the subsequent transport of particle showers. One can calculate the energy deposited by such charged particles with charged-particle transport codes such as nucleon-meson codes (NMTC,¹ HETC,^{2,3} and CASIM⁴) or the

coupled electron-photon code SANDYL.⁵ However, incomplete knowledge of the interactions and the approximations and compromises made in the codes mean that their results may be unreliable. Thus, direct measurements of the energies deposited at various depths in a simple target are necessary for comparing with code calculations. Once its performance and reliability are established, a code can 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 positions in selected targets) by incident beams of high-energy protons and electrons. Previous measurements made with incident protons of kinetic energy 0.8, 2.1, 4.8, 11.4 and 28.5 GeV and with 500-MeV electrons were reported in UCRL-52459.⁶ This report describes the extension of this work to include beams of 330-MeV deuterons; a spatially spread "wide" beam of 260-MeV protons; measurements of the return radiation produced by these beams; and a new 500-MeV electron experiment that used smaller thermoluminescence dosimeters (TLD's) in a more tightly packed configuration.*

EXPERIMENTAL METHOD

The previous experiments discussed in Ref. 6 all used variations of the target plate arrangement shown in Fig. 1. It consisted of 7-in.- (17.8-cm-) square variable-thickness shower plates of uranium-238[†] (²³⁸U) located in front of (and separated from) a 2-in. thick polyethylene block and a thin ²³⁸U plate, with variable spacing between the two portions. The purpose of the spacing was 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 then moderates the shower neutrons, which are detected in the thin ²³⁸U plate and a 10-mil-thick ²³⁵U foil.** The ²³⁵U foil

* These experiments along with comparison calculations have been documented in more detail in Ref. 7.

[†] Actual composition in atom %: 99.774% ²³⁸U; 0.201% ²³⁵U, 0.01% ²³⁴U; 0.01% ²³⁶U; 0.005% ²³³U.

** Actual composition in atom %: 93% ²³⁵U; 0.2% each ²³³U, ²³⁴U, ²³⁶U; remainder ²³⁸U.

FIG. 1. Standard shower plate and detector assembly.

was shielded with 0.1 g/cm^2 of ^{10}B to protect it from highly thermalized shower or background neutrons. Because the ^{238}U detector is sensitive to neutrons with energy in excess of 1 MeV, and the ^{10}B -shielded, ^{235}U detector is sensitive to neutron energies above a few eV, a measure of the neutron spectrum can be obtained by comparing the data from the two detectors.

This target plate arrangement worked well for protons whose kinetic energy was 0.8 GeV or higher. However, the shower plate was too thick to allow through any primary particles whose initial energy was less than several hundred MeV. Therefore, for the proton and deuteron measurements described in this report, the target was restructured to one portion with thinner ^{238}U plates. A new target configuration using 50.8-cm by 50.8-cm square aluminum

Run 91

Run 92

Key:

- Thermoluminescent dosimeter assemblies
- Film
- Aluminum (2-in.)
- Lucite (2-in.)

FIG. 2. Target setup for Stanford 500-MeV electron runs.

plates was used for the electron experiments also. Figures 2 through 4 illustrate the target geometries used. The planer dimensions of materials and detectors, e.g., Lucite TLD holder, photographic film (with the exception of the electron experiments), Lexan plastic foil, etc., were nearly the same as those of the aluminum or ^{238}U plates. For a typical run, passive energy-dose integrating detectors were located at different positions in the flat plate target assembly. At selected depths along the beam transport path we were therefore able to measure the radial distribution of dose deposited by the primary beam (protons, deuterons, or electrons) and by secondary beta, gamma, and x rays using these TLD's. The TLD's were nominally 3-by-3-by-1-mm

FIG. 3. Target setup for Lawrence Berkeley Lab proton runs.

for the proton and deuteron runs and 1-by-1-by-3-mm for the electron experiments. They were packaged in Lucite holders for the proton and deuteron runs (pattern shown in Fig. 5) and for the electron runs (pattern shown in Fig. 6). TLD's were also embedded in cylindrical holes in the ^{238}U plates and the remainder of each hole was filled with a cylindrical plug of ^{238}U (sometimes called D38) or ^{235}U (sometimes called or alloy or oy). 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. Photographic emulsion films were also used to measure the non-fission dose. This technique provides spatially continuous data and a gross visual check of the energy-deposition pattern. The film and TLD's were calibrated with a gamma-ray source of known intensity.

The fission-fragment contribution to dose was estimated by counting the tracks in etched 10-mil Lexan foils that were in contact with the ^{238}U and ^{235}U surfaces. (The number of tracks is related to the number of fissions

FIG. 4. Target setup for Lawrence Berkeley Lab deuteron runs.

by a constant.) The dose was then calculated, based on the number of fissions, by assuming 180 MeV deposited per fission event. The calibration constant, relating the fission/g in uranium to the number of tracks per unit area (track density) in the Lexan foil was measured in calibration runs with a 14-MeV neutron source. The result was 2.08×10^4 fissions/g per track/mm² with one standard deviation of better than 20% for a standard track-shape criterion.

The neutrons and gamma rays emitted by various targets were also measured during both of the July 257-MeV proton and 330-MeV deuteron exposures. The targets were chosen from a wide range of the periodic table and the thickness was roughly equivalent to the particle range. Two detectors were fielded, one to measure the number of neutrons (n) and gamma rays (γ) emitted per incident particle and another to obtain γ -ray spectral information. The n/γ detector was deuterated benzene contained in a cylinder 12.5 cm in diameter and 7.5 cm

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. 5. Pattern of TLD's packaged in a Lucite holder for measuring radial dose distribution in plates at specified depths in the target assembly for quateron and proton experiments.

FIG. 6. Experimental thermoluminescent dosimeter array for electron experiments.

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) = 135.0
R(2) = 2.10 T(2) = 90.0	R(20) = 0.70 T(20) = 0.0	R(37) = 2.214 T(37) = 288.43	R(54) = 3.0 T(54) = 180.0
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) = 180.0
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) = 180.0
R(5) = 1.565 T(5) = 116.57	R(23) = 2.214 T(23) = 198.43	R(40) = 6.0 T(40) = 0.0	R(57) = 7.5 T(57) = 180.0
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) = 225.0
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) = 225.0
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) = 225.0
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) = 225.0
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) = 270.0
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) = 270.0
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) = 270.0
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) = 270.0
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) = 315.0
R(15) = 2.214 T(15) = 18.43	R(33) = 1.565 T(33) = 296.57	R(50) = 3.0 T(50) = 135.0	R(67) = 4.5 T(67) = 315.0
R(16) = 2.10 T(16) = 180.0	R(34) = 1.980 T(34) = 315.0	R(51) = 4.5 T(51) = 135.0	R(68) = 6.0 T(68) = 315.0
R(17) = 1.40 T(17) = 180.0	R(35) = 2.214 T(35) = 251.57	R(52) = 6.0 T(52) = 135.0	R(69) = 7.5 T(69) = 315.0
R(18) = 0.70 T(18) = 180.0			

FIG. 7. Pattern of TLD's embedded in the surfaces of ^{238}U plates.

long. The spectrometer utilized pulse-shape discrimination to separate the neutron-produced signals from those due to gamma rays. A NaI (Tl) detector was used for the γ -ray spectral measurement. Both detectors were located within a lead and boric acid house at an angle of 80° with respect to the incoming beam line. This was as close to 0° as existing physical constraints would allow. The detectors were separated from each other by a 5-cm-thick lead sheet to minimize detector cross-talk. In addition, the n/γ detector had a 1.2-cm-thick lead sheet between it and the target to absorb scattered protons (the range of a 90-MeV proton in lead is 1.24 cm) and low energy γ rays. Figure 8 presents a layout of the geometry. The beam macrostructure was nominally 0.5 s in duration with a 4-s period. The microstructure had a nominal frequency of 1.5 MHz while the beam packets were 40-50 ns wide. The beam packets were also modulated so that the instantaneous current might well reach 10^{10} to 10^{11} particles per packet. The detectors were triggered by the radio frequency (rf) microstructure. The neutron energy spectrum was then measured using time-of-flight technique with the beam-on-pulse as zero time. Standard delays were used to time-calibrate the system. Stray background counts were also thus reduced by reducing the counting time.

A 5.125-in. aluminum degrader* was in the beam 97 inches upstream of the target during the proton runs and removed from the beam line during the deuteron runs. The targets were all solid plates with a 7-by-7-in. cross section. The target physical data are presented in Table 1.

The detector efficiency for a fission spectrum was measured in the experimental geometry using a ^{252}Cf source at the target position. The ^{252}Cf source was contained in an ionization chamber. To obtain the time-of-flight spectrum, start pulses were taken from the ionization chamber rather than from the accelerator rf.

Data were obtained for approximately 15 minutes of bombardment time for each target. An ionization chamber placed upstream in the beam path monitored beam currents.

The proton and deuteron experiments were carried out at the Lawrence Berkeley Laboratory (LBL) Bevatron while the electron beam work was done at the Stanford Mk III accelerator. In a typical run, the appropriate beam characteristics were first established. Then the intensity was reduced and a Polaroid or x-ray film was exposed by the beam to check alignment and size.

*This degrader will be discussed later.

FIG. 8. Layout of n/γ detector geometry for Berkeley runs.

TABLE 1. Neutron and gamma-ray return measurement targets.

Material	Thickness (in.)	Bombarding particle ^a
Lucite	13	d
Aluminum	7	d
Fe	3	p,d
²³⁸ U	2	p,d

^ap = 257-MeV protons, beam size $\approx$ 11 cm (FWHM),
d = 330-MeV deuterons, beam size $\approx$ 8 cm (FWHM)

In the case of a very high intensity beam, such as the 500-MeV-electron exposures, the alignment was checked by exposing glass slides and examining the resultant radiation browning. We then followed this procedure:

1. the beam was blocked by a massive beam plug;
2. the real target was aligned;
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 target. The appropriate particle fluence was usually obtained during a running time of 0.2 to 2 hours. After the exposure, the photographic emulsions and the TLD packages were removed from the target assembly. The TLD's embedded in the uranium plates were not removed for two to three days after the exposure.

Particle currents during the runs were monitored by secondary emission chambers which counted electrons emitted from aluminum foils in the beam or by gas-filled ion chambers. To obtain the absolute number of particles, the ion chambers were calibrated by the amount of ¹¹C (20-min half-life) produced in a thin polystyrene sheet placed in the beam. The secondary emission monitors vs Faraday cup calibration for the 500-MeV electron beam was done two months after the experiment and was found to have changed from 6% efficiency (as assumed in Ref. 4) to $4.9 \pm 0.4\%$.

The Stanford experiments were performed on January 17, 1978 while the Faraday cup vs. secondary emission monitor calibration runs were made on March 7, 1978. The plates loaded with the TLD's were stored near the beam dump while the machine was being tuned. The TLD's were exposed to doses of

TABLE 2. Ion chamber data.

Fill gas:	pure nitrogen
Fill gas pressure:	few mm above atmospheric pressure
Chamber annuli:	0-1, 1-3, 3-5, 5-9, 9-13, 13-17 cm diameters
Chamber foil spacing:	1 cm
Number of protons per ion-chamber count:	
Upstream chamber (350 MeV)	$= 6.78 \times 10^5$ protons/IC count
Downstream chamber (257 MeV)	$= 5.40 \times 10^5$ protons/IC count
Ion chamber counts in 0-1 cm segment:	
Run 1101: Upstream	$= 206699$ implies 1.40×10^{11} protons
Downstream	$= 11328$ implies 6.11×10^9 protons
Run 1102: Upstream	$= 201976$ implies 1.37×10^{11} protons
Downstream	$= 11306$ implies 6.11×10^9 protons
Attenuation due to degrader and spacing	is 95.6% in center segment

from 0 to 0.2 rads, depending on where they were located in the plate and where the plate was in the stack. No backgrounds have been subtracted from any of the dose data (e, p, or d) since they are usually small compared to the beam-related dose.

The March 16-17, 1978, 257-MeV proton runs were performed in one of the Biomed caves at the LBL Bevatron. The lowest proton energy available was 350 MeV, so a 5.125-in. aluminum degrader was used to both reduce the energy and spread the beam. The Biomed facility has two computer-monitored, radially segmented ionization chambers. The characteristics of the chambers are given in Table 2. (Their segmentation assumes beam symmetry.) Between the chambers is a computer-controlled, remotely filled water column. The Bragg curve of particle ionization vs water column thickness can be measured automatically by the downstream ion chamber as the thickness of the water column is increased. The 5.125-in. aluminum block was placed between the upstream ion chamber and the water column and a 11.12-cm-thick piece of Lucite was placed next to the water column; the column alone was not enough to produce maximum ionization in the downstream ion chamber. The ionization peaked with a total thickness of 26 cm of water plus the 11.12-cm-thick Lucite. The density of Lucite is 1.2 g/cm^3 while the stopping power is 97.1% that of water, in the range from

380 to 240 MeV. The Lucite is therefore equivalent to an additional thickness of water of 12.96 cm, for a total water column thickness of 38.96 cm or approximately 39 g/cm^2 . The energy of a proton with this range in water is 257 MeV. A 10% error in density or thickness yields a 2% error in energy ($\sim 5 \text{ MeV}$).

The degrader was left in position between the upstream ion chamber and the water column (with the water and Lucite removed) while the downstream chamber was moved near the front of the targets. The distance from the center of the degrader to the face of the targets was maintained at 2.52 m ($\sim 100 \text{ in.}$).

The target exposures were stopped when the computer inserted a beam plug after the downstream ion chamber reached a predetermined number of counts. It was estimated that the target return signal induced in the downstream ion chamber (placed $\sim 2 \text{ in.}$ in front of the target) was about 7%. Since the beam was large ($\sim 17 \text{ cm FWHM}$) and the fluence fairly uniform over the central TLD's, the fluence derived from the central segment of the ion chamber was used to calculate the specific energy deposited.

An attempt was made to measure the return radiation (neutrons and gamma rays) resulting from protons bombarding several thick target materials. An electronics malfunction, which we subsequently discovered, invalidated the data. Return radiation was successfully measured in the July runs.

The July LBL runs were performed in a different cave and the 330-MeV-deuteron beam was undegraded, while the proton return radiation was measured with the same degrader and spacing as the March runs. The ^{11}C measurements described earlier were used to calibrate these ion chambers. Restricted space and equipment meant we were able to use only one chamber located upstream of the degrader block position (see Fig. 8). Polystyrene foils were positioned just downstream of the ion chamber and at the front and rear of the target stand for the ^{11}C calibration with the proton beam. Two foils were used for the deuteron calibration, one next to the ion chamber and one at the front of our target stand.

An unresolved inconsistency between the ^{11}C proton fluence measurements and some TLD dose measurements exists. Using the ^{11}C -measured deuteron ion-chamber calibration (corrected for the proton's lower stopping power), one estimates 3×10^5 protons per ion-chamber pulse at the front of the target stand. The actual ^{11}C measurement for the proton run was 2.6×10^5 protons per ion-chamber pulse. These numbers are crudely consistent. However, a Lucite TLD plate was exposed during one n/ γ measurement run. This plate

shows a peak dose of 0.27 rads with a beam FWHM of ≈ 8.5 cm for a total ion chamber count of 901. Assuming a stopping power of $3.2 \text{ (MeV) (cm}^2\text{)/g}$ in the TLD and knowing the beam profile, we calculated that the calibration is more nearly 1.0×10^5 protons per ion-chamber pulse, after correcting for dose enhancement from room and target return. These TLD measurements (with the assumed stopping power) yield fluence results consistent with those measured by the ion chambers used during the March exposures. The ^{11}C deuteron experiment ion-chamber calibration and the TLD data from the deuteron measurements are also consistent.

DATA ANALYSIS

The exposed photographic films were developed, in the same way as the calibration films, for the expected dose level. 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 plots 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.

The fission density was measured with the Lexan track recorders. Large 5-by-7-in. foils were placed next to each uranium plate, and two small 0.25-in.-diameter foils were located on either side of the TLD's placed inside each of the 69 holes in every uranium plate. The bottom foil in this Lexan/TLD/Lexan plug stack was always in contact with a ^{238}U surface. The top foil was contacting either ^{238}U (D38) or ^{235}U (oy), depending on the plug material. After the exposures the foils were removed and the Lexan was etched for 90 min in an NaOH solution (240 g of NaOH/liter H_2O at 60°C). The etching process enlarges the damage produced by the fragments, rendering them visible through a 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. Shape factors, such as the ratio of the projected area of a feature to the square of its perimeter, were used to discriminate against dust and other artifacts. The 5-by-7-in. foils were read along the vertical and horizontal directions in 1-mm increments. Averages were then taken of five adjacent readings. Each of the 0.25-in.-diam foils was read three times and an average was used. With the proper calibration constant for the specific shape factors, the tracks/mm were converted to fissions/g at the specific location from which the foil was removed. The fissions/g for the ¹⁰B-shielded ²³⁵U detector foils were similarly calculated. We have assumed a deposited energy of 180 MeV/fission and converted to rad to compare directly with the TLD data.

For the n/γ emission measurements, the pulse-shape discriminator associates every event above threshold in the liquid scintillator with either a neutron or gamma ray incident on the detector. Thus, by using two halves of a multichannel analyzer in combination with their identifying signal, neutron and gamma-ray data were obtained simultaneously for each target listed in Table 1. The neutron time-of-flight spectra are characterized by an evaporation-type distribution with a maximum near 3 to 4 MeV (together with a peak due to misidentified gamma rays). Room-return neutrons appear as low energy neutrons. Background runs were performed so that the influence of room-return neutrons and gamma rays could be evaluated.

The neutron and gamma-ray yields for each target were extracted from the data as follows. The yield of neutrons or gamma rays plus background was obtained by integrating over a specific time region where the data were clearly above background. The background was estimated from the late-time region of the spectrum. The new yield was then obtained by subtraction. The high-energy neutron integration limit was chosen to include the contribution of high-energy neutrons to yield; it therefore includes some misidentified prompt gamma rays. This procedure, therefore, overestimates the yield from the lighter targets, which had higher misidentified gamma-ray contributions. The error is not significant, however, although data exist to make further corrections.

Unfortunately, the NaI (Tl) detector was saturated when the targets were exposed so that no usable gamma-ray spectral data were obtained.

RESULTS

In Appendices A-D we present the detailed experimental data. The most reliable and complete of these are the TLD dose data. In Appendix A, the TLD dose contours are shown (one to a page). On each contour is indicated the energy deposited (in rad) in the plane perpendicular to the beam, at the depth indicated by the location number and the detector designation (plate no.). Reference to the specific target drawing (Figs. 2 through 4) for the run number of interest should resolve any ambiguity. These contour plots refer to both the Lucite-held TLD's (plate no. begins with a P) and those embedded in the D38 plates (plate no. begins with a D). For each plane we have also plotted the dose along lines at 0° , 45° , 90° , and 135° to the horizontal axis of each plane. All data are arranged chronologically. Comparison of "D" and "P" plate data for the same location show that the TLD dose is very nearly the same whether the TLD is in Lucite or uranium. This was not the case for the higher-energy proton runs reported in UCRL-52459,⁶ in which those TLD's embedded in ^{238}U had doses consistently higher (by a factor of approximately two) than those in Lucite.

The numerical data corresponding to the contour plots of Appendix A are included as Appendix B. The data are listed with their corresponding position coordinates: dose in rad, angle in degrees, radius in cm.

Appendix C is the reduced fission data, presented in terms of dose and plotted as a function of radius. Only the data for deuterons are shown graphically, since the proton beam was so large there was little radial structure ($\sigma \approx 20\%$) and there were no fission measurements in the current electron beam experiments. The foils on the top of the Lx/TLD/Lx/pellet stack are the only ones that could come in contact with a ^{235}U (oy) pellet. Those on the bottom were all next to ^{238}U (D38). The beam was somewhat off the geometric center of the target. An approximate center was chosen and the radii from all angles transformed to the new center so that all the available D-plate data could be plotted. Plate D6 was read twice and plots of both sets of data are included. There is reasonable agreement for the D38 data but the oy data is lower by roughly $1/3$ in the peak dose region. This is a demonstration of the errors one can expect in this type of measurement. Even so, the oy shows a consistently higher fission density, by at least three-fold, than does the D38.

It is interesting to note the influence of the ^{10}B on the ^{235}U fission density measured in plate D10 (Fig. 7, Appendix C). These pellets were

separated from the incident beam by the ^{10}B -shielded 2-in.-diam ^{235}U foil. The effect on the low energy (<1 MeV) neutron flux can be clearly seen. Contrast this with the unshadowed ^{235}U data of plate D9 in Fig. C6.

In contrast to the higher energy proton runs reported in Ref. 6, there is little difference between the fission densities measured on the surface of a uranium plate and those measured inside.

The fission data for the proton runs are given in Table 3. Most of the ^{235}U foils could not be read because of a mottling of the Lexan surface.

The room and uranium background doses given to the detectors were generally small compared with peak doses. No background corrections have been made to any of the data reported in the Appendices.*

The quantity frequently used 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 at each detector position for the various runs; the results are presented in Table 3. These data have been corrected for background. The maximum specific dose is usually derived from the highest dose at each depth. The beam area was measured at the FWHM value of the dose contour for the first TLD plate in each experiment.

From the data in Table 3, we have plotted in Fig. 9 (for visual comparison) the TLD-specific dose as a function of depth for one measurement at each energy and particle. The specific doses from fission are plotted separately in Fig. 10 because the fission detectors were not located at all TLD depth positions.

The specific dose data in Table 3 and Figs. 9 and 10 summarize the results for rough comparison of effects from incident particles of different types.

Figure 11 shows the results of the electron experiments with the aluminum plates.

The neutron time-of-flight spectra are shown in Appendix D, Figs. D1-D7, while the corresponding gamma-ray time distributions are illustrated in Figs. D8-D14.

*The estimated background from intrinsic radiation of the uranium plates (for TLD's embedded in them) is 40 rad for the deuteron experiments with 0.5 rad from room return and 20 rad for the proton exposures.

TABLE 3. Measured doses along beam axes in flat plate target assemblies.

Particle type		Detector designation	TLD dose (rad)	Fission dose		Specific dose cal/g per kJ/cm ²		
Energy				(rad)		TLD	Fissions	
Run No.	Particle No. Beam size (FWHM)			²³⁸ U	²³⁵ U		²³⁸ U	²³⁵ U
91	e	1	5.4 × 10 ⁴	--	--	3.0 × 10 ⁻¹	--	
	500 MeV	2	6.5 × 10 ⁴	--	--	3.6 × 10 ⁻¹	--	
	6.73 × 10 ¹¹	4	1.7 × 10 ⁴	--	--	9.5 × 10 ⁻²	--	
	0.4 cm	5	9.3 × 10 ³	--	--	5.2 × 10 ⁻²	--	
		6	3.7 × 10 ³	--	--	2.1 × 10 ⁻²	--	
92	e	1	7.9 × 10 ⁴	--	--	3.7 × 10 ⁻¹	--	
	500 MeV	3	3.9 × 10 ⁴	--	--	2.3 × 10 ⁻¹	--	
	7.2 × 10 ¹¹	5	9.4 × 10 ³	--	--	5.4 × 10 ⁻²	--	
	0.42 cm	6	3.0 × 10 ¹	--	--	1.7 × 10 ⁻⁴	--	
		7	9.5 × 10 ¹	--	--	5.5 × 10 ⁻⁴	--	
101	P	P1	3.6 × 10 ²	--	--	2.9 ^a	--	
	257 MeV	D1	3.7 × 10 ²	5.3 × 10 ¹	--	3.0	0.42	
	1.2 × 10 ¹²	P2	4.0 × 10 ²	--	--	3.2	--	
	17.0 cm	D2	3.8 × 10 ²	6.0 × 10 ¹	--	3.0	0.48	
		P3	4.1 × 10 ²	--	--	3.3	--	
		D3	4.0 × 10 ²	6.5 × 10 ¹	--	3.2	0.52	
		P4	4.1 × 10 ²	--	--	3.3	--	
		D4	4.6 × 10 ²	4.9 × 10 ¹	--	3.7	0.39	
		P5	5.2 × 10 ²	--	--	4.1	--	
102	P	P6	3.6 × 10 ²	--	--	2.8	--	
	257 MeV	D5	4.0 × 10 ²	5.8 × 10 ¹	--	3.2	0.46	
	1.2 × 10 ¹²	D6	4.2 × 10 ²	6.5 × 10 ¹	--	3.4	0.52	
	17.0 cm	P7	4.2 × 10 ²	--	--	3.4	--	
		D7	4.3 × 10 ²	7.9 × 10 ¹	3.1 × 10 ²	3.4	0.63	2.5
		D8	4.7 × 10 ²	7.2 × 10 ¹	3.5 × 10 ²	3.8	0.57	2.8
		D9	5.2 × 10 ²	9.3 × 10 ¹	3.7 × 10 ²	4.1	0.74	3.0
		P8	5.5 × 10 ²	--	--	4.4	--	

TABLE 3. Continued.

Particle type			Specific dose					
Energy			Fission dose		cal/g per kJ/cm ²			
Run	Particle No.	Detector	TLD dose	(rad)		TLD	Fissions	
No.	Beam size (FWHM)	designation	(rad)	²³⁸ U	²³⁵ U		²³⁸ U	²³⁵ U
		D10	9.5 × 10 ¹	3.9 × 10 ¹	2.9 × 10 ²	0.76	0.31	2.3
		P9	1.4 × 10 ¹	--	--	0.11	--	--
110	d	P1	1.3 × 10 ²	--	--	2.4	--	--
	330 MeV	E1	1.5 × 10 ²	8.0 × 10 ¹	2.0 × 10 ²	2.7	1.5	3.7
	1.4 × 10 ¹¹	P2	1.5 × 10 ²	--	--	2.8	--	--
	8.5 cm	D2	1.5 × 10 ²	5.0 × 10 ¹	2.1 × 10 ²	2.8	0.92	3.9
		P3	1.6 × 10 ²	--	--	2.9	--	--
		D3	1.6 × 10 ²	4.5 × 10 ¹	2.4 × 10 ²	2.9	0.83	4.4
		P14	1.9 × 10 ²	--	--	3.5	--	--
		D4	1.9 × 10 ²	(3.0 × 10 ¹) ^b	(36) ^c	3.5	0.55 ^b	(0.66) ^c
		P5	2.0 × 10 ²	--	--	3.7	--	--
111	d	P11	1.4 × 10 ²	--	--	2.5	--	--
	330 MeV	D5	1.5 × 10 ²	4.0 × 10 ¹	1.50 × 10 ²	2.7	0.74	2.8
	1.4 × 10 ¹¹	D6	1.5 × 10 ²	5.5 × 10 ¹	1.50 × 10 ²	2.8	1.0	2.8
	8.5 cm	P13	1.6 × 10 ²	--	(2.20 × 10 ²) ^d	2.9	--	(4.1) ^d
		D7	1.6 × 10 ²	4.0 × 10 ¹	2.20 × 10 ²	2.9	0.74	4.1
		D8	1.7 × 10 ²	3.0 × 10 ¹	1.50 × 10 ²	3.1	0.55	2.8
		D9	2.0 × 10 ²	4.0 × 10 ¹	2.20 × 10 ²	3.6	0.74	4.1
		P16	2.1 × 10 ²	--	--	3.9	--	--
		D10	1.3 × 10 ¹	1.0 × 10 ¹	2.00 × 10 ²	0.24	0.18	3.7
					(22) ^c			(0.40) ^e
		P17	2.0 × 10 ⁰	--	--	0.04	--	--

^aAssumes 7.3×10^9 p/cm² over central beam region (from segmented ion-chamber data).

^bUnshielded ²³⁵U foils unreadable.

^cUranium-235 foil shielded with ¹⁰B.

^dResults of two readings.

^eUranium-235 disk shielded with ¹⁰B.

FIG. 9. Maximum TLD specific dose versus depth.

The neutron time-of-flight spectra (Figs. D1-D7) are characterized by an evaporation-type distribution with a maximum near $E_n = 3-4$ MeV, together with a peak from misidentified prompt gamma rays (near channel 322 in Fig. D2) and identified on the upper abscissa scale as " γ ." At the low-energy end of the spectrum, a contribution from room-scattered neutrons is evident as well as another contribution from misidentified gamma radiation. This later contribution is time-independent and originates in delayed gamma-ray activity. When these spectra are examined it must be remembered that, due to the beam microstructure, the time resolution is ~ 40 ns (FWHM). Thus, events in the spectrum from high-energy neutrons and prompt gamma rays overlap. In Figs. D1-D7, the upper abscissa scale labels the neutron energy, deduced from the time calibration (1.41 ns/channel) and the length of the flight path.

FIG. 10. Fission dose versus depth.

Gamma-ray time distribution spectra are shown in Figs. D8-D14. The gamma-ray spectra exhibit a "prompt" gamma-ray peak superimposed on a long-term time-independent background, representing for the most part beam-induced delayed activity. This is illustrated in Fig. D9, the spectrum associated with deuteron bombardment of Al. The FWHM of the time distribution is found from these data to be 42 ns (30 channels).

Table 4 lists:

1. the integrated counts of both neutrons and prompt γ rays obtained in this fashion;
2. these yields normalized with negligible error to the ionization chamber current;
3. the ratio of the two yields; and
4. an estimate of the detected source strength at the target.

A detailed examination of the shape of the neutron time-of-flight spectra reveals some interesting features. For ^{238}U , the spectral shape is independent of the bombarding particle type (p or d). The same statement applies to the spectra obtained with the Fe target, although with less certainty. This

FIG. 11. 500-MeV electron specific dose versus depth. All TLD's were mounted in Lucite holders (mass of holders is included). Error bar on first datum for Run 92 is due to malfunction of TLD reader on this chip.

is because the neutron time-of-flight spectrum associated with the proton bombardment of Fe has poor statistics. Also, it was obtained with intermittent beam conditions and so the gamma-ray time-independent background is high.

When the spectrum resulting from bombarding Al with deuterons (Fig. D2) is compared with the spectrum resulting from deuteron bombardment of ^{238}U (Fig. D4), the only shape difference is the pronounced peak in the Al spectrum from misidentified gamma rays. When the spectrum resulting from bombarding an Fe target (Fig. D3) is compared with that resulting from bombarding ^{238}U , a slightly different slope for $E_n > 8$ MeV is suggested, such that the spectrum associated with the Fe target is slightly harder than that associated with the ^{238}U target. However, this difference becomes insignificant when a small amount of misidentified gamma radiation is mixed in and when statistics

TABLE 4. Prompt return neutron and gamma-ray data.^a

Target	Particle	Energy (MeV)	Ion- chamber pulses	Number of ^b incident particles	Detected ^c		Ratio n/γ	Detected 4π source strength at target	
					Total n	Yield γ		n/particle	γ/particle
Blank	d	330	717	3.8×10^8	886	479	1.23	(0.015)	(0.0081)
13-in. Lucite	d	330	685	3.6×10^8	4168	2521	1.62	0.073	0.045
7-in. aluminum	d	330	1163	6.2×10^8	14052	8119	1.73	0.15	0.084
3-in. iron	d	330	745	3.9×10^8	9691	6456	1.50	0.16	0.10
	p	257	1184	$0.36-1.2 \times 10^9$	4309	3320	1.29	0.023-0.077	0.018-0.060
2-in. ²³⁸ U	d	330	619	3.3×10^8	29524	7222	4.08	0.58	0.14
	p	257	1367	$0.41-1.4 \times 10^9$	21603	5098	4.23	0.10-0.34	0.024-0.08
²⁵² Cf	-	--	--	--	240603	238155	1.01	--	--

^aStatistical errors are estimated to be 10% in yield and 14% in the ratio n/γ.

^bRange for proton data based on conflicting ¹¹C and TLD data (3×10^5 vs 1×10^6 p/IC counts).

^cMeasured by this detector at its location. No efficiency has been included.

are considered. The same statement may be made when the spectrum produced by the Lucite target (Fig. D1) is compared with the spectrum associated with the ^{238}U target. These data, therefore, exhibit no evidence of a change in the neutron energy spectrum as a function of target atomic number or incident particle.

The yield of neutrons is sensitive to both the target atomic number and the type of bombarding particle (p or d). During data collection, the incident beam was monitored through the charge collected in an ionization chamber located in the beam line. The ionization-chamber output counter was calibrated separately and (in terms of the entries in Table 4, column 4) one ionization-chamber count represents either 0.3 to 1.0×10^6 protons* or 5.3×10^5 deuterons, appropriately. Columns 9 and 10 of Table 4 present the neutron and gamma-ray counts per incident particle. It is clear that the neutron yield in particular, and also the gamma-ray yield, increase with increasing target atomic number. In Table 5, the neutron yields, the gamma yields, and the ratio of the two are compared to the corresponding entries when ^{238}U is the target.

The absolute cross section may be estimated if one knows the calibration of the ionization chamber that monitors the incident beam and the counter

TABLE 5. Neutron yields, γ -ray yields, and their ratio for various targets normalized to the respective quantities for a ^{238}U target.

Incident particle	Target	Neutron yield	γ -ray yield	Ratio
d	Lucite	0.13	0.32	0.40
d	Al	0.25	0.60	0.42
d	Fe	0.27	0.74	0.37
d	^{238}U	1	1	1
p	Fe	0.23	0.75	0.30
p	^{238}U	1	1	1

* The reader is reminded of the inconsistency between the TLD and ^{11}C calibration data discussed earlier.

efficiency as a function of neutron energy. The efficiency of the counter may be measured by counting a ^{252}Cf source placed at the sample site for a known time interval. Figures D15 and D16 illustrate the neutron and gamma-ray time-of-flight spectra, respectively, for the ^{252}Cf source. The source was counted in the experimental geometry with the same electronic arrangement. For the ^{252}Cf fission neutron spectrum, we found that the detector had a counting efficiency per fission of $(6.61 \pm 0.66) \times 10^{-3}\%$. An arbitrary error of 10% is assigned to the source strength. The absolute calibration of the ionization chamber is given above. Assuming that the neutron emission spectrum is similar for spallation reactions and fission, one can estimate the absolute cross section using this efficiency. However, it is clear that the ^{252}Cf spectral shape is quite different from the spectral shape measured with, e.g., a ^{238}U target: the spallation spectrum exhibits a great many more high-energy neutrons than the ^{252}Cf spontaneous fission spectrum. Thus this procedure of obtaining an absolute measurement is only a rough one (suitable, however, for field use).

Very little information was obtained on the prompt gamma-ray pulse height distribution with the experimental arrangement described, because of pulse pile-up during the beam pulse. A visual inspection of the pulse height suggested that the heavier targets had some gamma rays with energy greater than 2 MeV. Another source of evidence for differences in the gamma-ray spectra is contained in the neutron time-of-flight spectra. Because of the nature of the pulse-shape discrimination processes, gamma-ray pulses corresponding to low-energy gamma-ray events may be mistakenly identified as neutron events, and thus appear in the neutron spectra. Prompt events appear in the neutron time-of-flight spectra corresponding to the velocity c . Examination of the neutron time-of-flight spectra indicates that the ratio of low-energy gamma rays to neutrons varies from target to target, suggesting a change in the gamma-ray pulse-height distribution with target.

DISCUSSION AND CONCLUSIONS

The data presented provide detailed information on charged-particle beam-induced dose at different locations in selected targets from a variety of particles. Not all of the information contained in the raw data has yet been

extracted. Many photographic films have not been developed or digitized and some of the Lexan has not been read.

The uncertainty of the TLD doses is about $\pm 15\%$ while the Lexan-track counting is more like $\pm 50\%$. With these uncertainties the following conclusions may be drawn:

1. Even if not measured in detail, there is some buildup for all particles at all energies measured, including those reported in Ref. 6, i.e., initially the density of energy deposited increases as a function of target depth.

2. There is less than a 15% difference (in terms of energy deposited in the TLD's per unit of energy delivered) between the 260-MeV proton beam and the 330-MeV deuteron beam. The fission dose has a similar difference.

3. Both the 260-MeV proton and the 330-MeV deuteron beam deposit significantly more energy in the first 70 g/cm^2 of the target than any other energy or beam measured. Then the energy deposited rapidly drops off past the Bragg peak.

4. Specific dose results vary with 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 must be identical from one incident beam to the next.

5. The ^{238}U fission dose is usually about two to tenfold lower than the TLD dose for both protons and deuterons. The dose from fissions in ^{235}U unshielded from low energy neutrons is roughly comparable to the TLD dose.

6. The ^{235}U foil shielded from the low energy neutrons has a fission density nearly ten times lower than the unshielded ^{235}U pellets, demonstrating the significant population of low-energy (eV) neutrons.

7. Fission and TLD doses were higher when measured on the interior of the uranium plates compared with those measured on the exterior (but physically near) for the high-energy beams reported previously. These appear now to be essentially equal at these energies.

8. Return radiation measurements from proton and deuteron beams indicate significant numbers of both neutrons and gamma rays escape from thick targets. Those targets (^{238}U and Fe) exposed to both particles have about the same n/ γ ratio. However, the total number of particles from deuteron bombardment is 1.7 to 5.8 times that from protons.

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REFERENCES

1. RSIC Computer Code Collection, *NMTC, Monte Carlo Nucleon-Meson Transport Code System*, Oak Ridge National Laboratory, Oak Ridge, TN, CCC-161C (1974).
2. RSIC Computer Code Collection, *HETC, Monte Carlo Nucleon-Meson Transport Code System*, Oak Ridge National Laboratory, Oak Ridge, TN, CCC-178 (1974).
3. T. W. Armstrong and B. L. Colborn, *LHI Code Development Study*, Science Applications, Inc., La Jolla, CA, SAI-78-709-LJ (1979).
4. A. van Ginneken, *CASIM, A Program to Simulate Transport of Hadronic Cascades in Bulk Matter*, Fermi National Accelerator, Batavia, IL, FN-272 (1974).
5. H. M. Colbert, *SANDYL, A Computer Program for Calculating Combined Photon-Electron Transport in Complex Systems*, Sandia Laboratories, Albuquerque, NM, SLL-74-0012 (1974).
6. K. Crase, W. E. Farley, H. Kruger, D. Selway, G. S. Sidhu, *Measurement of Energy Deposited by Charged Particle Beams In Composite Targets*, Lawrence Livermore Laboratory, Livermore, CA, UCRL-52459 (1977).
7. W. E. Farley, *500 MeV Electron Beam Bench Mark Experiments and Calculations*, Lawrence Livermore Laboratory, Livermore, CA, D-79-10 (1979).

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

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 91
 PLATE NO.....P1
 PLATE LOCATION..1

DOSE - RADS
 B - 6.000E-01
 C - 7.000E-01
 D - 8.000E-01
 E - 1.300E+00
 F - 2.000E+00
 G - 3.000E+00
 H - 5.000E+00
 I - 5.000E+01
 J - 5.000E+02
 K - 2.500E+04

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 91
 PLATE NO.....P1
 PLATE LOCATION..1

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

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 91
 PLATE NO.....P2
 PLATE LOCATION..2

DOSE - RADS
 B - 2.000E+00
 C - 5.000E+00
 D - 1.000E+01
 E - 2.000E+01
 F - 5.000E+01
 G - 1.000E+02
 H - 5.000E+02
 I - 1.000E+03
 J - 1.000E+04
 K - 3.400E+04

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY....500 MEV
 TARGET.....FP RUN 91
 PLATE NO.....P2
 PLATE LOCATION..2

DOSE - RADS
 D - 3.500E-01
 C - 5.000E-01
 D - 2.000E+00
 E - 5.000E+00
 F - 1.000E+01
 G - 2.000E+01
 H - 5.000E+01
 I - 1.000E+02
 J - 1.000E+03
 K - 1.250E+04

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 91
 PLATE NO.....P3
 PLATE LOCATION..4

DOSE - RADS
 B - 1.000E+01
 C - 2.000E+01
 D - 5.000E+01
 E - 1.000E+02
 F - 2.000E+02
 G - 5.000E+02
 H - 1.000E+03
 I - 2.000E+03
 J - 1.250E+04
 K - 2.400E+04

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 91
 PLATE NO.....P3
 PLATE LOCATION..4

DOSE - RADS
 B - 3.000E-01
 C - 5.000E-01
 D - 2.000E+00
 E - 5.000E+00
 F - 1.000E+01
 G - 2.000E+01
 H - 5.000E+01
 I - 1.000E+02
 J - 1.000E+03
 K - 4.700E+03^x

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 91
 PLATE NO.....P4
 PLATE LOCATION..5

DOSE - RADS

B - 3.000E+01

C - 5.000E+01

D - 1.000E+02

E - 2.000E+02

F - 5.000E+02

G - 1.000E+03

H - 2.000E+03

I - 3.000E+03

J - 4.700E+03

K - 9.200E+03

RUN DATE.....1/17/78

PARTICLE.....ELECTRON

BEAM ENERGY.....500 MEV

TARGET.....FP RUN 91

PLATE NO.....P4

PLATE LOCATION..5

DOSE - RADS
 B - 5.000E-01
 C - 7.000E-01
 D - 2.000E+00
 E - 5.000E+00
 F - 1.000E+01
 G - 2.000E+01
 H - 5.000E+01
 I - 1.000E+02
 J - 1.000E+03
 K - 1.500E+03

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 91
 PLATE NO.....P5
 PLATE LOCATION..6

DOSE - RADS
 B - 5.000E+01
 C - 1.000E+02
 D - 2.000E+02
 E - 5.000E+02
 F - 7.000E+02
 G - 1.000E+03
 H - 1.750E+03
 I - 2.000E+03
 J - 2.500E+03
 K - 4.750E+03

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 91
 PLATE NO.....P5
 PLATE LOCATION..6

DOSE - RADS
 B - 1.000E-01
 C - 2.000E-01
 D - 5.000E-01
 E - 2.000E+00
 F - 5.000E+00
 G - 7.000E+00
 H - 1.000E+01
 I - 2.000E+01
 J - 5.000E+01
 K - 4.300E+04

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 92
 PLATE NO.....P6
 PLATE LOCATION..1

DOSE - RADS
 B - 7.000E-01
 C - 8.000E-01
 D - 2.000E+00
 E - 5.000E+00
 F - 1.000E+01
 G - 1.000E+02
 H - 5.000E+02
 I - 1.000E+03
 J - 4.300E+04
 K - 8.000E+04

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP. RUN 92
 PLATE NO.....P6
 PLATE LOCATION...1

DOSE - RADS
 B - 4.000E-01
 C - 7.000E-01
 D - 2.000E+00
 E - 5.000E+00
 F - 1.000E+01
 G - 5.000E+01
 H - 1.000E+02
 I - 5.000E+02
 J - 1.000E+03
 K - 2.400E+04

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 92
 PLATE NO.....P7
 PLATE LOCATION..3

DOSE - RADS
 B - 6.000E+00
 C - 1.000E+01
 D - 2.000E+01
 E - 5.000E+01
 F - 1.000E+02
 G - 5.000E+02
 H - 1.000E+03
 I - 5.000E+03
 J - 2.400E+04
 K - 4.700E+04

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 92
 PLATE NO.....P7
 PLATE LOCATION..3

DOSE - RADS

B - 2.000E+01

C - 5.000E+01

D - 1.000E+02

E - 2.000E+02

F - 5.000E+02

G - 1.000E+03

H - 2.000E+03

I - 3.000E+03

J - 5.600E+03

K - 1.000E+04

RUN DATE.....1/17/78

PARTICLE.....ELECTRON

BEAM ENERGY.....500 MEV

TARGET.....FP RUN 92

PLATE NO.....P8

PLATE LOCATION..5

DOSE - RADS
 B - 6.000E-01
 C - 1.000E+00
 D - 2.000E+00
 E - 5.000E+00
 F - 1.000E+01
 G - 5.000E+01
 H - 1.000E+02
 I - 5.000E+02
 J - 1.000E+03
 K - 5.600E+03

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 92
 PLATE NO.....P8
 PLATE LOCATION..5

DOSE - RADS
 B - 4.000E+00
 C - 5.000E+00
 D - 6.000E+00
 E - 8.000E+00
 F - 9.000E+00
 G - 1.000E+01
 H - 1.200E+01
 I - 1.500E+01
 J - 2.000E+01
 K - 2.500E+01

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 92
 PLATE NO.....P9
 PLATE LOCATION..6

DOSE - RADS
 B - 1.100E+01
 C - 1.200E+01
 D - 1.300E+01
 E - 1.500E+01
 F - 1.700E+01
 G - 1.900E+01
 H - 2.000E+01
 I - 2.500E+01
 J - 3.000E+01
 K - 3.300E+01

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 92
 PLATE NO.....P9
 PLATE LOCATION..6

DOSE - RADS
 B - 4.000E+00
 C - 5.000E+00
 D - 6.000E+00
 E - 7.000E+00
 F - 1.000E+01
 G - 2.000E+01
 H - 3.000E+01
 I - 5.000E+01
 J - 7.500E+01
 K - 9.000E+01

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 92
 PLATE NO.....P10
 PLATE LOCATION..7

DOSE - RADS
 B - 2.500E+01
 C - 3.000E+01
 D - 4.000E+01
 E - 5.000E+01
 F - 6.000E+01
 G - 7.000E+01
 H - 8.000E+01
 I - 9.000E+01
 J - 9.500E+01
 K - 1.000E+02^x

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 92
 PLATE NO.....P16
 PLATE LOCATION..7

DOSE - RADS
 B - 2.277E+02
 C - 2.442E+02
 D - 2.628E+02
 E - 2.814E+02
 F - 3.000E+02
 G - 3.186E+02
 H - 3.372E+02
 I - 3.558E+02
 J - 3.744E+02
 K - 3.723E+02

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 101
 PLATE NO.....P1
 PLATE LOCATION..1

DOSE - RADS
 B - 2.000E+02
 C - 2.500E+02
 D - 3.000E+02
 E - 3.500E+02
 F - 4.000E+02
 G - 4.500E+02
 H - 5.000E+02
 I - 5.500E+02
 J - 6.000E+02
 K - 6.500E+02

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 101
 PLATE NO.....D1
 PLATE LOCATION..I

DOSE - RADS
 B - 2.618E+02
 C - 2.846E+02
 D - 3.079E+02
 E - 3.312E+02
 F - 3.545E+02
 G - 3.778E+02
 H - 4.011E+02
 I - 4.244E+02
 J - 4.477E+02
 K - 4.472E+02

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 101
 PLATE NO.....P2
 PLATE LOCATION..2

DOSE - RADS
 B - 2.794E+02
 C - 2.982E+02
 D - 3.203E+02
 E - 3.424E+02
 F - 3.645E+02
 G - 3.866E+02
 H - 4.087E+02
 I - 4.308E+02
 J - 4.529E+02
 K - 4.496E+02

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 101
 PLATE NO.....02
 PLATE LOCATION..2

DOSE - RADS
 B - 2.000E+02
 C - 2.500E+02
 D - 3.000E+02
 E - 3.500E+02
 F - 4.000E+02
 G - 4.500E+02
 H - 5.000E+02
 I - 5.500E+02
 J - 6.000E+02
 K - 6.500E+02

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 101
 PLATE NO.....P3
 PLATE LOCATION..3

DOSE - RADS
 B - 2.000E+02
 C - 2.500E+02
 D - 3.000E+02
 E - 3.500E+02
 F - 4.000E+02
 G - 4.500E+02
 H - 5.000E+02
 I - 5.500E+02
 J - 6.000E+02
 K - 6.500E+02

RUN DATE.....3/16/79
 PARTICLE.....PROTON
 BEAM ENERGY....250 MEV
 TARGET.....FP RUN 101
 PLATE NO.....03
 PLATE LOCATION..3

DOSE - RADS

B - 2.000E+02

C - 2.500E+02

D - 3.000E+02

E - 3.500E+02

F - 4.000E+02

G - 4.500E+02

H - 5.000E+02

I - 5.500E+02

J - 6.000E+02

K - 6.500E+02

RUN DATE.....3/16/78

PARTICLE.....PROTON

BEAM ENERGY.....250 MEV

TARGET.....FP RUN 101

PLATE NO.....P4

PLATE LOCATION..4

0°

45°

90°

135°

DOSE - RADS
 B - 2.000E+02
 C - 2.500E+02
 D - 3.000E+02
 E - 3.500E+02
 F - 4.000E+02
 G - 4.500E+02
 H - 5.000E+02
 I - 5.500E+02
 J - 6.000E+02
 K - 6.500E+02

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 101
 PLATE NO.....D4
 PLATE LOCATION..4

DOSE - RADS
 B - 6.050E+00
 C - 1.328E+02
 D - 1.964E+02
 E - 2.601E+02
 F - 3.238E+02
 G - 3.874E+02
 H - 4.511E+02
 I - 5.147E+02
 J - 5.783E+02
 K - 6.415E+02

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 101
 PLATE NO.....P5
 PLATE LOCATION..5

DOSE - RADS
 B - 2.354E+02
 C - 2.528E+02
 D - 2.722E+02
 E - 2.916E+02
 F - 3.110E+02
 G - 3.304E+02
 H - 3.498E+02
 I - 3.692E+02
 J - 3.886E+02
 K - 3.866E+02

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP. RUN 102
 PLATE NO.....P6
 PLATE LOCATION..1

DOSE - RADS
 B - 2.000E+02
 C - 2.500E+02
 D - 3.000E+02
 E - 3.500E+02
 F - 4.000E+02
 G - 4.500E+02
 H - 5.000E+02
 I - 5.500E+02
 J - 6.000E+02
 K - 6.500E+02

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 102
 PLATE NO.....D5
 PLATE LOCATION..1

DOSE - RADS
 B - 2.805E+02
 C - 3.066E+02
 D - 3.324E+02
 E - 3.582E+02
 F - 3.840E+02
 G - 4.098E+02
 H - 4.356E+02
 I - 4.614E+02
 J - 4.872E+02
 K - 4.875E+02

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY....250 MEV
 TARGET.....FP RUN 102
 PLATE NO.....06
 PLATE LOCATION..2

DOSE - RADS
 B - 2.000E+02
 C - 2.500E+02
 D - 3.000E+02
 E - 3.500E+02
 F - 4.000E+02
 G - 4.500E+02
 H - 5.000E+02
 I - 5.500E+02
 J - 6.000E+02
 K - 6.500E+02

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 102
 PLATE NO.....P7
 PLATE LOCATION..2

DOSE - RADS
 B - 3.124E+02
 C - 3.350E+02
 D - 3.605E+02
 E - 3.860E+02
 F - 4.115E+02
 G - 4.370E+02
 H - 4.625E+02
 I - 4.880E+02
 J - 5.135E+02
 K - 5.106E+02

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 102
 PLATE NO.....D7
 PLATE LOCATION..3

DOSE - RADS
 B - 3.454E+02
 C - 3.702E+02
 D - 3.983E+02
 E - 4.264E+02
 F - 4.545E+02
 G - 4.825E+02
 H - 5.107E+02
 I - 5.388E+02
 J - 5.669E+02
 K - 5.636E+02

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 102
 PLATE NO.....DB
 PLATE LOCATION..4

DOSE - RADS
 B - 2.000E+02
 C - 2.500E+02
 D - 3.000E+02
 E - 3.500E+02
 F - 4.000E+02
 G - 4.500E+02
 H - 5.000E+02
 I - 5.500E+02
 J - 6.000E+02
 K - 6.500E+02

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 102
 PLATE NO.....D9
 PLATE LOCATION..5

DOSE - RADS
 B - 2.000E+02
 C - 2.500E+02
 D - 3.000E+02
 E - 3.500E+02
 F - 4.000E+02
 G - 4.500E+02
 H - 5.000E+02
 I - 5.500E+02
 J - 6.000E+02
 K - 6.500E+02

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 102
 PLATE NO.....P8
 PLATE LOCATION..3

DOSE - RADS
 B - 3.500E+01
 C - 5.000E+01
 D - 7.500E+01
 E - 1.000E+02
 F - 1.300E+02
 G - 2.000E+02
 H - 2.500E+02
 I - 3.000E+02
 J - 3.500E+02
 K - 4.000E+02

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 102
 PLATE NO.....D10
 PLATE LOCATION..6

DOSE - RADS
 B - 1.000E+01
 C - 2.000E+01
 D - 3.000E+01
 E - 4.000E+01
 F - 5.000E+01
 G - 6.000E+01
 H - 7.000E+01
 I - 8.000E+01
 J - 9.000E+01
 K - 1.000E+02

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 102
 PLATE NO.....P9
 PLATE LOCATION..4

DOSE - RADS

B - 1.738E+01

C - 4.064E+01

D - 5.306E+01

E - 6.548E+01

F - 7.790E+01

G - 9.032E+01

H - 1.027E+02

I - 1.152E+02

J - 1.276E+02

K - 1.384E+02

RUN DATE.....7/15/78

PARTICLE.....DEUTERON

BEAM ENERGY.....330 MEV

TARGET.....FP: RUN 110

PLATE NO.....P1

PLATE LOCATION..I

0°

45°

90°

135°

DOSE - RADS
 B - 5.610E+01
 C - 7.960E+01
 D - 9.390E+01
 E - 1.082E+02
 F - 1.225E+02
 G - 1.368E+02
 H - 1.511E+02
 I - 1.654E+02
 J - 1.797E+02
 K - 1.889E+02

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 110
 PLATE NO.....D1
 PLATE LOCATION..1

DOSE - RADS
 B - 8.217E+00
 C - 3.958E+01
 D - 5.563E+01
 E - 7.168E+01
 F - 8.773E+01
 G - 1.038E+02
 H - 1.198E+02
 I - 1.359E+02
 J - 1.519E+02
 K - 1.673E+02

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 110
 PLATE NO.....P2
 PLATE LOCATION..2

DOSE - RADS

B - 5.599E+01

C - 8.332E+01

D - 9.953E+01

E - 1.157E+02

F - 1.319E+02

G - 1.482E+02

H - 1.644E+02

I - 1.806E+02

J - 1.968E+02

K - 2.079E+02

RUN DATE.....7/15/78

PARTICLE.....DEUTERON

BEAM ENERGY.....330 MEV

TARGET.....FP RUN 110

PLATE NO.....D2

PLATE LOCATION..2

DOSE - RADS
 B - 7.524E+00
 C - 4.367E+01
 D - 6.209E+01
 E - 8.050E+01
 F - 9.892E+01
 G - 1.173E+02
 H - 1.358E+02
 I - 1.542E+02
 J - 1.726E+02
 K - 1.903E+02

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY....330 MEV
 TARGET.....FP RUN 110
 PLATE NO.....P3
 PLATE LOCATION..3

DOSE - RADS
 B - 4.939E+00
 C - 4.679E+01
 D - 6.784E+01
 E - 8.909E+01
 F - 1.102E+02
 G - 1.314E+02
 H - 1.525E+02
 I - 1.737E+02
 J - 1.948E+02
 K - 2.156E+02

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 110
 PLATE NO.....03
 PLATE LOCATION..3

DOSE - RADS
 B - 2.145E+01
 C - 6.100E+01
 D - 8.175E+01
 E - 1.025E+02
 F - 1.233E+02
 G - 1.440E+02
 H - 1.648E+02
 I - 1.855E+02
 J - 2.063E+02
 K - 2.251E+02

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY....330 MEV
 TARGET.....FP RUN#110
 PLATE NO.....P14
 PLATE LOCATION..4

DOSE - RADS
 B - 6.985E+01
 C - 1.006E+02
 D - 1.192E+02
 E - 1.377E+02
 F - 1.563E+02
 G - 1.748E+02
 H - 1.933E+02
 I - 2.119E+02
 J - 2.304E+02
 K - 2.426E+02

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 110
 PLATE NO.....D4
 PLATE LOCATION..5

DOSE - RADS
 B - 1.529E+01
 C - 5.232E+01
 D - 7.153E+01
 E - 9.074E+01
 F - 1.100E+02
 G - 1.292E+02
 H - 1.484E+02
 I - 1.676E+02
 J - 1.868E+02
 K - 2.046E+02

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 110
 PLATE NO.....P5
 PLATE LOCATION..5

DOSE - RADS
 B - 1.727E+01
 C - 4.216E+01
 D - 5.539E+01
 E - 6.862E+01
 F - 8.185E+01
 G - 9.508E+01
 H - 1.083E+02
 I - 1.215E+02
 J - 1.348E+02
 K - 1.464E+02

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 111
 PLATE NO.....P11
 PLATE LOCATION..1

DOSE - RADS
 B - 5.346E+01
 C - 7.628E+01
 D - 9.012E+01
 E - 1.040E+02
 F - 1.178E+02
 G - 1.316E+02
 H - 1.455E+02
 I - 1.593E+02
 J - 1.732E+02
 K - 1.871E+02

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 111
 PLATE NO.....05
 PLATE LOCATION..1

DOSE - RADS
 B - 5.401E+01
 C - 7.828E+01
 D - 9.287E+01
 E - 1.075E+02
 F - 1.221E+02
 G - 1.356E+02
 H - 1.512E+02
 I - 1.658E+02
 J - 1.804E+02
 K - 1.901E+02

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 111
 PLATE NO.....D6
 PLATE LOCATION..2

DOSE - RAD5
 B - 2.112E+01
 C - 5.216E+01
 D - 6.864E+01
 E - 8.512E+01
 F - 1.016E+02
 G - 1.181E+02
 H - 1.346E+02
 I - 1.510E+02
 J - 1.675E+02
 K - 1.821E+02

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 111
 PLATE NO.....P13
 PLATE LOCATION..3

DOSE - RADS
 B - 5.797E+01
 C - 8.776E+01
 D - 1.053E+02
 E - 1.228E+02
 F - 1.404E+02
 G - 1.579E+02
 H - 1.754E+02
 I - 1.929E+02
 J - 2.105E+02
 K - 2.227E+02

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 111
 PLATE NO... ..D7
 PLATE LOCATION..3

DOSE - RADS
 B - 6.820E+01
 C - 9.580E+01
 D - 1.127E+02
 E - 1.296E+02
 F - 1.465E+02
 G - 1.634E+02
 H - 1.803E+02
 I - 1.972E+02
 J - 2.141E+02
 K - 2.248E+02

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 111
 PLATE NO.....DB
 PLATE LOCATION..4

DOSE - RADS
 B - 7.997E+01
 C - 1.064E+02
 D - 1.232E+02
 E - 1.400E+02
 F - 1.569E+02
 G - 1.737E+02
 H - 1.905E+02
 I - 2.073E+02
 J - 2.242E+02
 K - 2.337E+02

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 111
 PLATE NO.....D9
 PLATE LOCATION..5

DOSE - RADS
 B - 1.540E+01
 C - 6.320E+01
 D - 8.780E+01
 E - 1.124E+02
 F - 1.370E+02
 G - 1.616E+02
 H - 1.862E+02
 I - 2.108E+02
 J - 2.354E+02
 K - 2.586E+02

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 111
 PLATE NO.....P16
 PLATE LOCATION..6

DOSE - RADS
 B - 3.729E+01
 C - 3.976E+01
 D - 4.269E+01
 E - 4.562E+01
 F - 4.855E+01
 G - 5.148E+01
 H - 5.441E+01
 I - 5.734E+01
 J - 6.027E+01
 K - 5.981E+01

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 111
 PLATE NO.....D10
 PLATE LOCATION..7

DOSE - RADS
 B - 5.830E-01
 C - 3.164E+00
 D - 4.481E+00
 E - 5.798E+00
 F - 7.115E+00
 G - 8.432E+00
 H - 9.749E+00
 I - 1.107E+01
 J - 1.238E+01
 K - 1.365E+01

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY....330 MEV
 TARGET.....FP RUN 111
 PLATE NO.....P17
 PLATE LOCATION..7

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 91
 PLATE NO.....P1
 PLATE LOCATION..1

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	124.99	1.147	1.390E+01	2	116.57	1.051	1.170E+01	3	106.70	0.981	2.270E+01	4	95.71	0.945	2.600E+01	5	84.29	0.945	2.600E+01
5	84.29	0.945	2.260E+01	6	73.30	0.981	2.320E+01	7	63.44	1.051	1.420E+01	8	55.01	1.147	1.360E+01	9	135.00	1.053	5.830E+01
13	90.00	0.752	6.485E+01	10	126.87	0.940	4.750E+01	11	116.57	0.841	3.670E+01	12	104.04	0.775	6.570E+01	13	90.00	0.752	6.485E+01
17	45.00	1.054	1.720E+01	14	75.96	0.775	6.400E+01	15	63.44	0.841	4.770E+01	16	53.13	0.940	3.300E+01	17	45.00	1.054	1.720E+01
21	45.46	0.572	1.370E+02	18	139.40	0.867	3.550E+01	19	119.81	0.734	5.970E+01	20	116.57	0.631	7.640E+01	21	45.46	0.572	1.370E+02
25	40.60	0.857	1.150E+01	22	60.64	0.572	2.480E+02	23	42.44	0.631	1.800E+02	24	50.19	0.734	9.860E+01	25	40.60	0.857	1.150E+01
29	116.57	0.420	5.890E+02	26	153.43	0.841	3.480E+01	27	146.31	0.678	9.750E+01	28	135.00	0.532	2.190E+02	29	116.57	0.420	5.890E+02
33	33.69	0.678	1.420E+02	30	90.00	0.376	1.490E+03	31	43.44	0.420	1.550E+03	32	45.00	0.532	4.640E+02	33	33.69	0.678	1.420E+02
37	145.31	0.339	1.860E+03	34	26.57	0.841	5.170E+01	35	164.05	0.684	9.040E+01	36	158.20	0.506	2.680E+02	37	145.31	0.339	1.860E+03
41	21.80	0.506	7.440E+02	39	116.57	0.210	1.680E+04	39	63.43	0.210	3.220E+04	40	33.69	0.339	1.040E+04	41	21.80	0.506	7.440E+02
45	180.00	0.376	2.090E+03	42	15.95	0.684	1.420E+02	43	180.00	0.752	6.980E+01	44	160.00	0.564	7.400E+02	45	180.00	0.376	2.090E+03
49	0.00	0.376	4.880E+03	46	180.00	0.188	2.180E+04	47	0.00	0.752	4.990E+04	48	0.00	0.188	3.580E+04	49	0.00	0.376	4.880E+03
53	201.80	0.506	3.060E+02	50	0.00	0.564	4.200E+02	51	0.00	0.752	1.160E+02	52	195.95	0.684	1.220E+02	53	201.80	0.506	3.060E+02
57	325.31	0.339	1.660E+04	54	213.69	0.339	2.190E+04	55	243.43	0.210	4.330E+04	56	296.57	0.210	4.320E+04	57	325.31	0.339	1.660E+04
61	213.69	0.678	4.530E+02	58	338.20	0.506	8.480E+02	59	314.05	0.684	1.920E+02	60	206.57	0.841	3.660E+02	61	213.69	0.678	4.530E+02
65	295.57	0.420	1.350E+04	62	225.00	0.532	5.400E+02	63	243.43	0.420	4.640E+02	64	270.00	0.376	2.780E+04	65	295.57	0.420	1.350E+04
69	220.60	0.867	5.230E+01	66	315.00	0.532	1.030E+03	67	316.31	0.678	2.420E+02	68	333.43	0.841	7.430E+01	69	220.60	0.867	5.230E+01
73	279.46	0.572	1.040E+03	70	230.19	0.734	1.270E+02	71	213.43	0.631	4.340E+02	72	260.54	0.572	8.130E+02	73	279.46	0.572	1.040E+03
77	225.00	1.054	2.220E+01	74	296.57	0.631	4.960E+02	75	319.81	0.734	2.210E+02	76	319.40	0.867	8.120E+01	77	225.00	1.054	2.220E+01
81	279.00	0.752	2.270E+02	78	233.10	0.940	4.810E+01	79	213.40	0.841	7.540E+01	80	255.96	0.775	1.440E+02	81	279.00	0.752	2.270E+02
85	315.00	1.084	3.250E+01	82	284.00	0.775	2.090E+02	83	216.57	0.841	1.260E+02	84	306.57	0.940	6.650E+01	85	315.00	1.084	3.250E+01
89	264.29	0.945	5.520E+01	86	235.00	1.147	2.030E+01	87	213.43	1.051	3.220E+01	88	293.30	0.981	5.590E+01	89	264.29	0.945	5.520E+01
93	304.99	1.147	2.590E+01	90	275.71	2.000	2.620E+00	91	216.70	0.981	5.130E+01	92	296.57	1.051	3.550E+01	93	304.99	1.147	2.590E+01
97	67.50	2.000	2.030E+00	94	0.00	2.000	2.030E+00	95	222.50	2.000	2.460E+00	96	45.00	2.000	2.245E+00	97	67.50	2.000	2.030E+00
101	157.50	2.000	2.400E+00	98	90.00	2.000	2.030E+00	99	112.50	2.000	1.810E+00	100	135.00	2.000	1.960E+00	101	157.50	2.000	2.400E+00
105	247.50	2.000	2.430E+00	102	180.00	2.000	2.120E+00	103	202.50	2.000	2.090E+00	104	225.00	2.000	2.260E+00	105	247.50	2.000	2.430E+00
109	337.50	2.000	2.400E+00	106	270.00	2.000	2.470E+00	107	212.50	2.000	2.470E+00	108	315.00	2.000	2.470E+00	109	337.50	2.000	2.400E+00
113	67.50	3.000	1.000E+00	110	0.00	3.000	1.700E+00	111	112.50	3.000	1.200E+00	112	135.00	3.000	1.040E+00	113	67.50	3.000	1.000E+00
117	157.50	3.000	1.220E+00	114	90.00	3.000	1.380E+00	115	212.50	3.000	1.090E+00	116	223.00	3.000	9.970E-01	117	157.50	3.000	1.220E+00
121	247.50	3.000	1.310E+00	118	180.00	3.000	1.020E+00	119	212.50	3.000	1.220E+00	120	315.00	3.000	1.180E+00	121	247.50	3.000	1.310E+00
125	337.50	3.000	1.410E+00	122	270.00	3.000	1.270E+00	123	212.50	3.000	1.040E+00	124	223.00	3.000	1.225E+00	125	337.50	3.000	1.410E+00
129	67.50	4.000	7.330E-01	126	0.00	4.000	9.000E-01	127	112.50	4.000	8.860E-01	128	135.00	4.000	7.600E-01	129	67.50	4.000	7.330E-01
133	157.50	4.000	7.310E-01	130	90.00	4.000	1.310E+00	131	212.50	4.000	7.730E-01	132	225.00	4.000	7.410E-01	133	157.50	4.000	7.310E-01
137	247.50	4.000	6.370E-01	134	180.00	4.000	8.060E-01	135	212.50	4.000	7.870E-01	136	315.00	4.000	7.970E-01	137	247.50	4.000	6.370E-01
141	337.50	4.000	6.030E-01	138	270.00	4.000	7.340E-01	139	212.50	4.000	7.750E-01	140	225.00	4.000	8.400E-01	141	337.50	4.000	6.030E-01
145	67.50	5.000	6.510E-01	142	0.00	5.000	6.740E-01	143	112.50	5.000	8.490E-01	144	135.00	5.000	6.650E-01	145	67.50	5.000	6.510E-01
149	157.50	5.000	6.700E-01	146	90.00	5.000	8.980E-01	147	212.50	5.000	8.290E-01	148	225.00	5.000	7.130E-01	149	157.50	5.000	6.700E-01
153	247.50	5.000	7.950E-01	150	180.00	5.000	6.350E-01	151	212.50	5.000	7.155E-01	152	315.00	5.000	7.558E-01	153	247.50	5.000	7.950E-01
157	337.50	5.000	6.630E-01	154	270.00	5.000	7.370E-01	155	212.50	5.000	9.980E-01	156	225.00	5.000	6.610E-01	157	337.50	5.000	6.630E-01
161	67.50	6.000	5.115E-01	158	0.00	6.000	5.390E-01	159	112.50	6.000	5.840E-01	160	135.00	6.000	5.030E-01	161	67.50	6.000	5.115E-01
165	157.50	6.000	5.020E-01	162	90.00	6.000	5.203E-01	163	212.50	6.000	5.110E-01	164	225.00	6.000	4.880E-01	165	157.50	6.000	5.020E-01
169	247.50	6.000	5.310E-01	166	180.00	6.000	5.580E-01	167	112.50	6.000	5.180E-01	168	135.00	6.000	5.340E-01	169	247.50	6.000	5.310E-01
173	337.50	6.000	5.180E-01	170	270.00	6.000	5.630E-01	171	212.50	6.000	5.220E-01	172	315.00	6.000	5.390E-01	173	337.50	6.000	5.180E-01
177	67.50	7.000	5.340E-01	174	0.00	6.000	6.360E-01	175	112.50	6.000	5.610E-01	176	135.00	6.000	5.330E-01	177	67.50	7.000	5.340E-01
181	157.50	7.000	5.830E-01	178	90.00	6.000	6.610E-01	179	212.50	6.000	5.101E-01	180	225.00	6.000	6.830E-01	181	157.50	7.000	5.830E-01
185	247.50	7.000	5.420E-01	182	180.00	6.000	5.130E-01	183	315.00	6.000	5.280E-01	184	337.50	6.000	6.230E-01	185	247.50	7.000	5.420E-01
189	337.50	7.000	5.560E-01	186	270.00	7.000	5.610E-01	187	315.00	7.000	4.800E-01	188	337.50	7.000	5.950E-01	189	337.50	7.000	5.560E-01
193	67.50	7.000	4.820E-01	190	0.00	7.000	4.650E-01	191	112.50	7.000	4.780E-01	192	225.00	7.000	5.010E-01	193	67.50	7.000	4.820E-01
197	157.50	7.000	4.440E-01	194	90.00	7.000	4.850E-01	195	212.50	7.000	1.950E-01	196	112.50	7.000	4.530E-01	197	157.50	7.000	4.440E-01
201	247.50	7.000	4.540E-01	198	180.00	7.000	7.570E-01	199	315.00	7.000	4.530E-01	200	337.50	7.000	4.460E-01	201	247.50	7.000	4.540E-01
205	337.50	7.000	4.820E-01	202	270.00	7.000	4.820E-01	203	315.00	7.000	4.530E-01	204	337.50	7.000	5.120E-01	205	337.50	7.000	4.820E-01

RUN DATE 1/17/78
 PARTICLE ELECTRON
 BEAM ENERGY 500 KILV
 TARGET EP RUN 91
 PLATE NO.
 PLATE LOCATION. 2

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	124.99	0.1435	1.30E+03	101	105.39	0.0000	1.30E+03
2	125.00	0.1435	1.30E+03	102	105.40	0.0000	1.30E+03
3	125.01	0.1435	1.30E+03	103	105.41	0.0000	1.30E+03
4	125.02	0.1435	1.30E+03	104	105.42	0.0000	1.30E+03
5	125.03	0.1435	1.30E+03	105	105.43	0.0000	1.30E+03
6	125.04	0.1435	1.30E+03	106	105.44	0.0000	1.30E+03
7	125.05	0.1435	1.30E+03	107	105.45	0.0000	1.30E+03
8	125.06	0.1435	1.30E+03	108	105.46	0.0000	1.30E+03
9	125.07	0.1435	1.30E+03	109	105.47	0.0000	1.30E+03
10	125.08	0.1435	1.30E+03	110	105.48	0.0000	1.30E+03
11	125.09	0.1435	1.30E+03	111	105.49	0.0000	1.30E+03
12	125.10	0.1435	1.30E+03	112	105.50	0.0000	1.30E+03
13	125.11	0.1435	1.30E+03	113	105.51	0.0000	1.30E+03
14	125.12	0.1435	1.30E+03	114	105.52	0.0000	1.30E+03
15	125.13	0.1435	1.30E+03	115	105.53	0.0000	1.30E+03
16	125.14	0.1435	1.30E+03	116	105.54	0.0000	1.30E+03
17	125.15	0.1435	1.30E+03	117	105.55	0.0000	1.30E+03
18	125.16	0.1435	1.30E+03	118	105.56	0.0000	1.30E+03
19	125.17	0.1435	1.30E+03	119	105.57	0.0000	1.30E+03
20	125.18	0.1435	1.30E+03	120	105.58	0.0000	1.30E+03
21	125.19	0.1435	1.30E+03	121	105.59	0.0000	1.30E+03
22	125.20	0.1435	1.30E+03	122	105.60	0.0000	1.30E+03
23	125.21	0.1435	1.30E+03	123	105.61	0.0000	1.30E+03
24	125.22	0.1435	1.30E+03	124	105.62	0.0000	1.30E+03
25	125.23	0.1435	1.30E+03	125	105.63	0.0000	1.30E+03
26	125.24	0.1435	1.30E+03	126	105.64	0.0000	1.30E+03
27	125.25	0.1435	1.30E+03	127	105.65	0.0000	1.30E+03
28	125.26	0.1435	1.30E+03	128	105.66	0.0000	1.30E+03
29	125.27	0.1435	1.30E+03	129	105.67	0.0000	1.30E+03
30	125.28	0.1435	1.30E+03	130	105.68	0.0000	1.30E+03
31	125.29	0.1435	1.30E+03	131	105.69	0.0000	1.30E+03
32	125.30	0.1435	1.30E+03	132	105.70	0.0000	1.30E+03
33	125.31	0.1435	1.30E+03	133	105.71	0.0000	1.30E+03
34	125.32	0.1435	1.30E+03	134	105.72	0.0000	1.30E+03
35	125.33	0.1435	1.30E+03	135	105.73	0.0000	1.30E+03
36	125.34	0.1435	1.30E+03	136	105.74	0.0000	1.30E+03
37	125.35	0.1435	1.30E+03	137	105.75	0.0000	1.30E+03
38	125.36	0.1435	1.30E+03	138	105.76	0.0000	1.30E+03
39	125.37	0.1435	1.30E+03	139	105.77	0.0000	1.30E+03
40	125.38	0.1435	1.30E+03	140	105.78	0.0000	1.30E+03
41	125.39	0.1435	1.30E+03	141	105.79	0.0000	1.30E+03
42	125.40	0.1435	1.30E+03	142	105.80	0.0000	1.30E+03
43	125.41	0.1435	1.30E+03	143	105.81	0.0000	1.30E+03
44	125.42	0.1435	1.30E+03	144	105.82	0.0000	1.30E+03
45	125.43	0.1435	1.30E+03	145	105.83	0.0000	1.30E+03
46	125.44	0.1435	1.30E+03	146	105.84	0.0000	1.30E+03
47	125.45	0.1435	1.30E+03	147	105.85	0.0000	1.30E+03
48	125.46	0.1435	1.30E+03	148	105.86	0.0000	1.30E+03
49	125.47	0.1435	1.30E+03	149	105.87	0.0000	1.30E+03
50	125.48	0.1435	1.30E+03	150	105.88	0.0000	1.30E+03
51	125.49	0.1435	1.30E+03	151	105.89	0.0000	1.30E+03
52	125.50	0.1435	1.30E+03	152	105.90	0.0000	1.30E+03
53	125.51	0.1435	1.30E+03	153	105.91	0.0000	1.30E+03
54	125.52	0.1435	1.30E+03	154	105.92	0.0000	1.30E+03
55	125.53	0.1435	1.30E+03	155	105.93	0.0000	1.30E+03
56	125.54	0.1435	1.30E+03	156	105.94	0.0000	1.30E+03
57	125.55	0.1435	1.30E+03	157	105.95	0.0000	1.30E+03
58	125.56	0.1435	1.30E+03	158	105.96	0.0000	1.30E+03
59	125.57	0.1435	1.30E+03	159	105.97	0.0000	1.30E+03
60	125.58	0.1435	1.30E+03	160	105.98	0.0000	1.30E+03
61	125.59	0.1435	1.30E+03	161	105.99	0.0000	1.30E+03
62	125.60	0.1435	1.30E+03	162	106.00	0.0000	1.30E+03
63	125.61	0.1435	1.30E+03	163	106.01	0.0000	1.30E+03
64	125.62	0.1435	1.30E+03	164	106.02	0.0000	1.30E+03
65	125.63	0.1435	1.30E+03	165	106.03	0.0000	1.30E+03
66	125.64	0.1435	1.30E+03	166	106.04	0.0000	1.30E+03
67	125.65	0.1435	1.30E+03	167	106.05	0.0000	1.30E+03
68	125.66	0.1435	1.30E+03	168	106.06	0.0000	1.30E+03
69	125.67	0.1435	1.30E+03	169	106.07	0.0000	1.30E+03
70	125.68	0.1435	1.30E+03	170	106.08	0.0000	1.30E+03
71	125.69	0.1435	1.30E+03	171	106.09	0.0000	1.30E+03
72	125.70	0.1435	1.30E+03	172	106.10	0.0000	1.30E+03
73	125.71	0.1435	1.30E+03	173	106.11	0.0000	1.30E+03
74	125.72	0.1435	1.30E+03	174	106.12	0.0000	1.30E+03
75	125.73	0.1435	1.30E+03	175	106.13	0.0000	1.30E+03
76	125.74	0.1435	1.30E+03	176	106.14	0.0000	1.30E+03
77	125.75	0.1435	1.30E+03	177	106.15	0.0000	1.30E+03
78	125.76	0.1435	1.30E+03	178	106.16	0.0000	1.30E+03
79	125.77	0.1435	1.30E+03	179	106.17	0.0000	1.30E+03
80	125.78	0.1435	1.30E+03	180	106.18	0.0000	1.30E+03
81	125.79	0.1435	1.30E+03	181	106.19	0.0000	1.30E+03
82	125.80	0.1435	1.30E+03	182	106.20	0.0000	1.30E+03
83	125.81	0.1435	1.30E+03	183	106.21	0.0000	1.30E+03
84	125.82	0.1435	1.30E+03	184	106.22	0.0000	1.30E+03
85	125.83	0.1435	1.30E+03	185	106.23	0.0000	1.30E+03
86	125.84	0.1435	1.30E+03	186	106.24	0.0000	1.30E+03
87	125.85	0.1435	1.30E+03	187	106.25	0.0000	1.30E+03
88	125.86	0.1435	1.30E+03	188	106.26	0.0000	1.30E+03
89	125.87	0.1435	1.30E+03	189	106.27	0.0000	1.30E+03
90	125.88	0.1435	1.30E+03	190	106.28	0.0000	1.30E+03
91	125.89	0.1435	1.30E+03	191	106.29	0.0000	1.30E+03
92	125.90	0.1435	1.30E+03	192	106.30	0.0000	1.30E+03
93	125.91	0.1435	1.30E+03	193	106.31	0.0000	1.30E+03
94	125.92	0.1435	1.30E+03	194	106.32	0.0000	1.30E+03
95	125.93	0.1435	1.30E+03	195	106.33	0.0000	1.30E+03
96	125.94	0.1435	1.30E+03	196	106.34	0.0000	1.30E+03
97	125.95	0.1435	1.30E+03	197	106.35	0.0000	1.30E+03
98	125.96	0.1435	1.30E+03	198	106.36	0.0000	1.30E+03
99	125.97	0.1435	1.30E+03	199	106.37	0.0000	1.30E+03
100	125.98	0.1435	1.30E+03	200	106.38	0.0000	1.30E+03

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 91
 PLATE NO.....P3
 PLATE LOCATION..4

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	124.95	1.147	2.150E+03	2	116.57	1.051	2.790E+03	3	106.70	0.981	2.910E+03	4	95.71	0.945	3.030E+03	5	84.29	0.945	3.380E+03
5	135.00	1.063	2.700E+03	10	126.87	0.981	3.330E+03	11	116.57	0.841	4.090E+03	12	104.04	0.775	4.460E+03	13	90.00	0.732	4.960E+03
17	45.00	1.064	3.000E+03	14	75.96	0.775	4.980E+03	15	63.44	0.841	4.450E+03	16	53.13	0.940	3.700E+03	17	45.00	1.064	3.000E+03
21	99.46	0.572	7.430E+03	18	139.40	0.867	3.860E+03	19	129.81	0.734	4.960E+03	20	116.57	0.631	5.640E+03	21	99.46	0.572	7.430E+03
25	40.60	0.867	4.450E+03	22	80.54	0.572	6.810E+03	23	63.44	0.631	6.470E+03	24	50.19	0.734	5.430E+03	25	40.60	0.867	4.450E+03
29	115.57	0.420	8.940E+03	26	153.43	0.841	4.240E+03	27	146.31	0.678	9.350E+03	28	135.00	0.532	7.410E+03	29	115.57	0.420	8.940E+03
33	33.69	0.878	6.820E+03	30	90.00	0.376	1.090E+04	31	63.44	0.420	1.060E+04	32	45.00	0.532	8.220E+03	33	33.69	0.878	6.820E+03
37	146.31	0.339	1.020E+04	34	26.57	0.441	4.880E+03	35	164.03	0.684	1.390E+04	36	158.20	0.506	8.350E+03	37	146.31	0.339	1.020E+04
41	21.80	0.506	9.530E+03	38	116.57	0.210	1.320E+04	39	63.43	0.210	1.460E+04	40	33.69	0.339	1.360E+04	41	21.80	0.506	9.530E+03
45	180.00	0.376	1.160E+04	42	15.95	0.684	6.610E+03	43	180.00	0.752	5.140E+03	44	180.00	0.564	7.600E+03	45	180.00	0.376	1.160E+04
49	0.	0.376	1.230E+04	46	180.00	0.188	1.400E+04	47	0.	0.	1.640E+04	48	0.	0.188	1.700E+04	49	0.	0.376	1.230E+04
53	201.80	0.506	5.450E+03	50	0.	0.564	8.840E+03	51	0.	0.752	5.520E+03	52	195.95	0.684	6.470E+03	53	201.80	0.506	5.450E+03
57	325.31	0.339	1.545E+04	54	213.69	0.339	1.270E+04	55	243.43	0.210	1.570E+04	56	296.57	0.210	1.860E+04	57	325.31	0.339	1.545E+04
61	213.69	0.678	7.070E+03	58	338.20	0.506	1.230E+04	59	344.05	0.684	7.140E+03	60	206.57	0.841	4.790E+03	61	213.69	0.678	7.070E+03
65	239.57	0.420	2.450E+04	62	225.00	0.532	9.610E+03	63	243.43	0.420	1.150E+04	64	270.00	0.376	1.800E+04	65	239.57	0.420	2.450E+04
69	220.80	0.867	4.720E+03	66	313.00	0.332	1.020E+04	67	326.31	0.678	7.630E+03	68	333.43	0.841	5.420E+03	69	220.80	0.867	4.720E+03
73	279.46	0.572	9.870E+03	70	230.19	0.734	6.160E+03	71	243.43	0.631	6.630E+03	72	260.54	0.572	9.580E+03	73	279.46	0.572	9.870E+03
77	225.00	1.064	3.370E+03	74	236.57	0.631	8.910E+03	75	309.81	0.734	7.220E+03	76	319.40	0.867	5.390E+03	77	225.00	1.064	3.370E+03
81	270.00	0.752	6.870E+03	78	233.10	0.940	4.620E+03	79	243.40	0.841	5.080E+03	80	255.96	0.775	6.060E+03	81	270.00	0.752	6.870E+03
85	315.00	1.064	3.650E+03	82	284.00	0.775	6.700E+03	83	236.57	0.841	5.530E+03	84	306.87	0.940	4.950E+03	85	315.00	1.064	3.650E+03
89	264.29	0.945	4.590E+03	86	235.00	1.147	2.950E+03	87	243.43	1.051	3.640E+03	88	253.30	0.981	4.210E+03	89	264.29	0.945	4.590E+03
93	304.99	1.147	3.200E+03	88	275.71	0.945	4.750E+03	89	286.70	0.981	4.300E+03	90	296.57	1.051	4.060E+03	93	304.99	1.147	3.200E+03
97	67.50	2.000	4.870E+02	94	0.	2.000	5.670E+02	95	22.50	2.000	5.280E+02	96	45.00	2.000	5.340E+02	97	67.50	2.000	4.870E+02
101	157.50	2.000	5.210E+02	98	90.00	2.000	4.910E+02	99	112.50	2.000	5.060E+02	100	135.00	2.000	5.135E+02	101	157.50	2.000	5.210E+02
105	247.50	2.000	5.500E+02	102	180.00	2.000	5.340E+02	103	202.50	2.000	4.970E+02	104	225.00	2.000	5.250E+02	105	247.50	2.000	5.500E+02
109	337.50	2.000	6.470E+02	106	270.00	2.000	7.375E+02	107	292.50	2.000	8.312E+02	108	315.00	2.000	9.250E+02	109	337.50	2.000	6.470E+02
113	67.50	3.000	1.230E+02	110	0.	3.000	1.270E+02	111	22.50	3.000	1.380E+02	112	45.00	3.000	1.420E+02	113	67.50	3.000	1.230E+02
117	157.50	3.000	1.150E+02	114	90.00	3.000	1.160E+02	115	112.50	3.000	1.190E+02	116	135.00	3.000	1.220E+02	117	157.50	3.000	1.150E+02
121	247.50	3.000	1.150E+02	118	180.00	3.000	1.210E+02	119	202.50	3.000	1.370E+02	120	225.00	3.000	1.380E+02	121	247.50	3.000	1.150E+02
125	337.50	3.000	1.420E+02	122	270.00	3.000	1.570E+02	123	292.50	3.000	1.440E+02	124	315.00	3.000	1.445E+02	125	337.50	3.000	1.420E+02
129	67.50	4.000	1.450E+01	126	0.	4.000	4.500E+01	127	22.50	4.000	4.500E+01	128	45.00	4.000	4.485E+01	129	67.50	4.000	1.450E+01
133	157.50	4.000	4.470E+01	130	90.00	4.000	3.870E+01	131	112.50	4.000	3.570E+01	132	135.00	4.000	4.220E+01	133	157.50	4.000	4.470E+01
137	247.50	4.000	3.930E+01	134	180.00	4.000	4.155E+01	135	202.50	4.000	4.380E+01	136	225.00	4.000	4.710E+01	137	247.50	4.000	3.930E+01
141	337.50	4.000	4.230E+01	138	270.00	4.000	4.460E+01	139	292.50	4.000	4.750E+01	140	315.00	4.000	4.480E+01	141	337.50	4.000	4.230E+01
145	67.50	5.000	1.750E+01	142	0.	5.000	1.840E+01	143	22.50	5.000	1.935E+01	144	45.00	5.000	2.030E+01	145	67.50	5.000	1.750E+01
149	157.50	5.000	1.750E+01	146	90.00	5.000	1.820E+01	147	112.50	5.000	1.720E+01	148	135.00	5.000	2.040E+01	149	157.50	5.000	1.750E+01
153	247.50	5.000	1.600E+01	150	180.00	5.000	1.910E+01	151	202.50	5.000	1.690E+01	152	225.00	5.000	1.980E+01	153	247.50	5.000	1.600E+01
157	337.50	5.000	1.650E+01	154	270.00	5.000	1.970E+01	155	292.50	5.000	2.090E+01	156	315.00	5.000	1.700E+01	157	337.50	5.000	1.650E+01
161	67.50	6.000	1.700E+01	158	0.	6.000	9.660E+00	159	11.25	6.000	1.020E+01	160	22.50	6.000	9.120E+00	161	67.50	6.000	1.700E+01
165	157.50	6.000	7.680E+00	162	45.00	6.000	9.100E+00	163	66.25	6.000	9.430E+00	164	67.50	6.000	9.760E+00	165	157.50	6.000	7.680E+00
169	247.50	6.000	9.500E+00	166	90.00	6.000	4.460E+00	167	101.25	6.000	9.130E+00	168	112.50	6.000	8.890E+00	169	247.50	6.000	9.500E+00
173	337.50	6.000	7.900E+00	170	135.00	6.000	9.610E+00	171	146.25	6.000	7.180E+00	172	157.50	6.000	9.650E+00	173	337.50	6.000	7.900E+00
177	67.50	6.000	6.730E+00	174	180.00	6.000	1.030E+01	175	191.25	6.000	1.020E+01	176	202.50	6.000	9.320E+00	177	67.50	6.000	6.730E+00
181	157.50	6.000	9.320E+00	178	225.00	6.000	9.790E+00	179	236.25	6.000	9.390E+00	180	247.50	6.000	1.060E+01	181	157.50	6.000	9.320E+00
185	247.50	6.000	9.540E+00	182	270.00	6.000	1.110E+01	183	281.25	6.000	8.980E+00	184	292.50	6.000	1.040E+01	185	247.50	6.000	9.540E+00
189	337.50	6.000	1.050E+01	186	315.00	6.000	1.030E+01	187	325.25	6.000	1.030E+01	188	337.50	6.000	9.720E+00	189	337.50	6.000	1.050E+01
193	67.50	7.000	1.020E+01	190	0.	7.000	5.060E+00	191	11.25	7.000	5.570E+00	192	22.50	7.000	5.180E+00	193	67.50	7.000	1.020E+01
197	157.50	7.000	4.810E+00	194	45.00	7.000	4.870E+00	195	56.25	7.000	4.085E+00	196	67.50	7.000	1.130E+01	197	157.50	7.000	4.810E+00
201	247.50	7.000	5.300E+00	198	90.00	7.000	5.240E+00	199	101.25	7.000	4.680E+00	200	112.50	7.000	4.600E+00	201	247.50	7.000	5.300E+00
205	337.50	7.000	5.270E+00	202	135.00	7.000	4.740E+00	203	146.25	7.000	5.120E+00	204	157.50	7.000	5.210E+00	205	337.50	7.000	5.270E+00

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....P₄ RUN 91
 PLATE NO.....P₄
 PLATE LOCATION..5

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	124.99	1.147	1.900E+03	2	116.57	1.051	2.240E+03	3	106.70	0.981	2.510E+03	4	95.71	0.945	2.790E+03	5	84.29	0.845	2.970E+03
6	84.29	0.945	2.970E+03	10	126.87	0.981	2.790E+03	11	116.57	0.845	3.380E+03	12	104.04	0.775	3.600E+03	13	90.00	0.752	3.980E+03
13	90.00	0.752	3.980E+03	14	78.96	0.775	3.730E+03	15	63.44	0.641	3.490E+03	16	53.13	0.540	3.200E+03	17	45.00	0.464	3.910E+03
17	45.00	0.464	3.910E+03	18	139.40	0.667	3.280E+03	19	129.81	0.734	3.910E+03	20	116.57	0.531	4.300E+03	21	99.46	0.572	4.690E+03
21	99.46	0.572	4.690E+03	22	80.54	0.572	4.880E+03	23	63.44	0.631	4.980E+03	24	50.19	0.534	4.570E+03	25	40.60	0.867	3.580E+03
25	40.60	0.867	3.580E+03	26	153.43	0.841	3.140E+03	27	146.31	0.678	4.360E+03	28	135.00	0.532	4.845E+03	29	116.57	0.420	5.330E+03
29	116.57	0.420	5.330E+03	30	90.00	0.376	6.280E+03	31	63.44	0.420	6.600E+03	32	45.00	0.532	6.090E+03	33	33.69	0.678	4.800E+03
33	33.69	0.678	4.800E+03	34	28.57	0.341	5.170E+03	35	164.05	0.684	4.020E+03	36	158.20	0.506	4.550E+03	37	146.31	0.339	6.450E+03
37	146.31	0.339	6.450E+03	38	116.57	0.210	3.230E+03	39	63.43	0.210	7.130E+03	40	33.69	0.339	7.230E+03	41	21.80	0.506	6.340E+03
41	21.80	0.506	6.340E+03	42	13.95	0.684	4.880E+03	43	180.00	0.752	3.640E+03	44	180.00	0.564	5.060E+03	45	180.00	0.376	5.440E+03
45	180.00	0.376	5.440E+03	46	180.00	0.188	7.450E+03	47	0.	0.	9.280E+03	48	0.	0.198	8.720E+03	49	0.	0.376	6.880E+03
49	0.	0.376	6.880E+03	50	0.	0.564	5.430E+03	51	0.	0.752	4.680E+03	52	195.95	0.584	4.240E+03	53	201.80	0.506	5.550E+03
53	201.80	0.506	5.550E+03	54	213.69	0.339	4.490E+03	55	243.43	0.210	9.010E+03	56	296.57	0.210	9.420E+03	57	326.31	0.339	5.520E+03
57	326.31	0.339	5.520E+03	58	338.20	0.506	6.580E+03	59	344.05	0.684	5.260E+03	60	206.57	0.841	3.160E+03	61	213.69	0.678	4.080E+03
61	213.69	0.678	4.080E+03	62	225.00	0.532	5.280E+03	63	243.43	0.420	6.410E+03	64	270.00	0.376	7.010E+03	65	296.57	0.420	8.020E+03
65	296.57	0.420	8.020E+03	66	315.00	0.532	6.600E+03	67	326.31	0.678	5.230E+03	68	333.43	0.841	4.430E+03	69	220.60	0.867	3.860E+03
69	220.60	0.867	3.860E+03	70	230.19	0.734	4.260E+03	71	243.43	0.631	4.800E+03	72	260.54	0.572	5.450E+03	73	279.45	0.572	5.520E+03
73	279.45	0.572	5.520E+03	74	296.57	0.631	5.380E+03	75	309.81	0.734	5.140E+03	76	319.40	0.867	3.920E+03	77	225.00	1.064	3.570E+03
77	225.00	1.064	3.570E+03	78	233.10	0.940	3.220E+03	79	243.40	0.841	4.300E+03	80	255.96	0.775	4.480E+03	81	270.00	0.752	4.880E+03
81	270.00	0.752	4.880E+03	82	284.00	0.775	4.900E+03	83	296.57	0.841	4.290E+03	84	306.87	0.940	3.730E+03	85	315.00	1.064	3.220E+03
85	315.00	1.064	3.220E+03	86	235.00	1.147	2.600E+03	87	243.43	0.981	3.580E+03	88	253.30	0.981	2.950E+03	89	264.29	0.945	3.260E+03
89	264.29	0.945	3.260E+03	90	275.71	0.945	3.540E+03	91	286.70	0.981	3.580E+03	92	296.57	1.051	2.760E+03	93	304.99	1.147	2.820E+03
93	304.99	1.147	2.820E+03	94	0.	2.000	7.760E+02	95	22.50	2.000	7.218E+02	96	45.00	2.000	6.870E+02	97	67.50	2.000	6.370E+02
97	67.50	2.000	6.370E+02	98	90.00	2.000	6.070E+02	99	112.50	2.000	6.110E+02	100	135.00	2.000	5.370E+02	101	157.50	2.000	5.190E+02
101	157.50	2.000	5.190E+02	102	180.00	2.000	5.940E+02	103	202.50	2.000	6.040E+02	104	225.00	2.000	6.755E+02	105	247.50	2.000	7.470E+02
105	247.50	2.000	7.470E+02	106	270.00	2.000	7.250E+02	107	292.50	2.000	7.840E+02	108	315.00	2.000	8.000E+02	109	337.50	2.000	7.380E+02
109	337.50	2.000	7.380E+02	110	0.	3.000	4.665E+02	111	22.50	3.000	1.950E+02	112	45.00	3.000	1.890E+02	113	67.50	3.000	1.880E+02
113	67.50	3.000	1.880E+02	114	90.00	3.000	1.550E+02	115	112.50	3.000	1.770E+02	116	135.00	3.000	1.680E+02	117	157.50	3.000	1.590E+02
117	157.50	3.000	1.590E+02	118	180.00	3.000	1.740E+02	119	202.50	3.000	1.750E+02	120	225.00	3.000	2.070E+02	121	247.50	3.000	2.120E+02
121	247.50	3.000	2.120E+02	122	270.00	3.000	2.180E+02	123	292.50	3.000	2.240E+02	124	315.00	3.000	1.970E+02	125	337.50	3.000	2.200E+02
125	337.50	3.000	2.200E+02	126	0.	4.000	7.110E+01	127	22.50	4.000	6.660E+01	128	45.00	4.000	7.270E+01	129	67.50	4.000	6.725E+01
129	67.50	4.000	6.725E+01	130	90.00	4.000	6.180E+01	131	112.50	4.000	6.440E+01	132	135.00	4.000	6.250E+01	133	157.50	4.000	6.040E+01
133	157.50	4.000	6.040E+01	134	180.00	4.000	6.130E+01	135	202.50	4.000	5.610E+01	136	225.00	4.000	6.850E+01	137	247.50	4.000	6.440E+01
137	247.50	4.000	6.440E+01	138	270.00	4.000	7.920E+01	139	292.50	4.000	7.410E+01	140	315.00	4.000	7.110E+01	141	337.50	4.000	6.240E+01
141	337.50	4.000	6.240E+01	142	0.	5.000	7.740E+01	143	22.50	5.000	2.860E+01	144	45.00	5.000	2.700E+01	145	67.50	5.000	2.685E+01
145	67.50	5.000	2.685E+01	146	90.00	5.000	2.670E+01	147	112.50	5.000	2.590E+01	148	135.00	5.000	2.880E+01	149	157.50	5.000	2.530E+01
149	157.50	5.000	2.530E+01	150	180.00	5.000	2.930E+01	151	202.50	5.000	3.120E+01	152	225.00	5.000	2.940E+01	153	247.50	5.000	3.020E+01
153	247.50	5.000	3.020E+01	154	270.00	5.000	2.760E+01	155	292.50	5.000	2.830E+01	156	315.00	5.000	1.390E+01	157	337.50	5.000	2.760E+01
157	337.50	5.000	2.760E+01	158	0.	6.000	3.140E+01	159	11.25	6.000	2.830E+01	160	22.50	6.000	1.390E+01	161	33.75	6.000	1.570E+01
161	33.75	6.000	1.570E+01	162	45.00	6.000	1.380E+01	163	55.25	6.000	1.470E+01	164	67.50	6.000	1.440E+01	165	78.75	6.000	1.350E+01
165	78.75	6.000	1.350E+01	166	90.00	6.000	1.390E+01	167	101.25	6.000	1.310E+01	168	112.50	6.000	1.330E+01	169	123.75	6.000	1.220E+01
169	123.75	6.000	1.220E+01	170	135.00	6.000	1.310E+01	171	146.25	6.000	1.270E+01	172	157.50	6.000	1.230E+01	173	168.75	6.000	1.370E+01
173	168.75	6.000	1.370E+01	174	180.00	6.000	1.350E+01	175	191.25	6.000	1.440E+01	176	202.50	6.000	1.410E+01	177	213.75	6.000	1.260E+01
177	213.75	6.000	1.260E+01	178	225.00	6.000	1.530E+01	179	236.25	6.000	1.550E+01	180	247.50	6.000	1.280E+01	181	258.75	6.000	1.350E+01
181	258.75	6.000	1.350E+01	182	270.00	6.000	1.470E+01	183	281.25	6.000	1.510E+01	184	292.50	6.000	1.550E+01	185	303.75	6.000	1.650E+01
185	303.75	6.000	1.650E+01	186	315.00	6.000	1.450E+01	187	326.25	6.000	1.510E+01	188	337.50	6.000	1.550E+01	189	348.75	6.000	1.450E+01
189	348.75	6.000	1.450E+01	190	0.	7.000	8.950E+00	191	11.25	7.000	7.820E+00	192	22.50	7.000	7.800E+00	193	33.75	7.000	8.740E+00
193	33.75	7.000	8.740E+00	194	45.00	7.000	7.990E+00	195	55.25	7.000	6.800E+00	196	67.50	7.000	7.900E+00	197	78.75	7.000	7.600E+00
197	78.75	7.000	7.600E+00	198	90.00	7.000	8.580E+00	199	101.25	7.000	4.770E+00	200	112.50	7.000	7.460E+00	201	123.75	7.000	8.800E+00
201	123.75	7.000	8.800E+00	202	135.00	7.000	7.170E+00	203	146.25	7.000	7.270E+00	204	157.50	7.000	6.470E+00				

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 91
 PLATE NO.....P5
 PLATE LOCATION..6

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	124.96	1.147	1.100E+03	2	116.57	1.051	1.330E+03	3	103.70	0.981	1.310E+03	4	89.44	0.951	1.470E+03	5	85.01	0.945	1.340E+03
5	84.29	0.945	1.550E+03	6	73.30	0.981	1.310E+03	7	63.44	0.841	1.590E+03	8	55.01	0.841	1.590E+03	9	45.00	0.841	1.590E+03
13	30.00	0.752	1.800E+03	14	175.96	0.775	1.860E+03	15	63.44	0.841	1.540E+03	16	53.13	0.841	1.540E+03	17	45.00	0.734	1.790E+03
21	99.46	0.572	1.140E+03	22	80.54	0.572	1.230E+03	23	63.44	0.631	2.080E+03	24	50.19	0.631	2.080E+03	25	40.60	0.631	2.080E+03
29	116.57	0.420	2.570E+03	30	90.00	0.375	2.790E+03	31	63.44	0.420	2.800E+03	32	45.00	0.420	2.800E+03	33	33.69	0.339	2.620E+03
37	145.31	0.339	2.620E+03	38	116.57	0.210	5.010E+03	39	63.43	0.210	5.010E+03	40	45.00	0.210	5.010E+03	41	21.80	0.506	2.690E+03
49	180.00	0.375	2.790E+03	46	180.00	0.188	3.250E+03	47	0.00	0.188	3.250E+03	48	0.00	0.188	3.250E+03	49	0.00	0.375	2.790E+03
53	201.80	0.506	2.470E+03	54	213.69	0.506	2.470E+03	55	243.43	0.339	3.290E+03	56	296.57	0.339	3.290E+03	57	326.31	0.339	3.290E+03
61	213.69	0.339	3.530E+03	58	338.20	0.532	2.440E+03	59	344.05	0.532	2.440E+03	60	206.57	0.532	2.440E+03	61	213.69	0.420	3.020E+03
65	236.57	0.420	3.010E+03	66	315.00	0.532	2.740E+03	67	326.31	0.532	2.740E+03	68	333.43	0.532	2.740E+03	69	333.43	0.532	2.740E+03
73	273.46	0.867	1.800E+03	74	236.57	0.631	2.140E+03	75	309.81	0.631	2.140E+03	76	319.40	0.631	2.140E+03	77	225.00	0.867	1.800E+03
81	270.00	1.064	1.440E+03	82	264.00	0.775	2.250E+03	83	296.57	0.775	2.250E+03	84	306.87	0.775	2.250E+03	85	315.00	1.064	1.440E+03
89	264.29	0.945	1.820E+03	90	275.71	0.945	1.820E+03	91	286.70	0.945	1.820E+03	92	296.57	0.945	1.820E+03	93	304.99	0.945	1.820E+03
97	304.99	1.147	1.470E+03	98	0.00	2.000	5.510E+02	99	222.50	2.000	5.510E+02	100	135.00	2.000	5.510E+02	101	157.50	2.000	5.510E+02
105	247.50	2.000	5.240E+02	106	270.00	2.000	5.240E+02	107	292.50	2.000	5.240E+02	108	315.00	2.000	5.240E+02	109	337.50	2.000	5.240E+02
113	67.50	3.000	2.250E+02	114	90.00	3.000	2.250E+02	115	112.50	3.000	2.250E+02	116	135.00	3.000	2.250E+02	117	157.50	3.000	2.250E+02
121	247.50	3.000	2.280E+02	122	270.00	3.000	2.280E+02	123	292.50	3.000	2.280E+02	124	315.00	3.000	2.280E+02	125	337.50	3.000	2.280E+02
129	67.50	4.000	9.870E+01	130	90.00	4.000	9.870E+01	131	112.50	4.000	9.870E+01	132	135.00	4.000	9.870E+01	133	157.50	4.000	9.870E+01
137	247.50	4.000	1.180E+02	138	270.00	4.000	1.180E+02	139	292.50	4.000	1.180E+02	140	315.00	4.000	1.180E+02	141	337.50	4.000	1.180E+02
145	67.50	5.000	4.720E+01	146	90.00	5.000	4.720E+01	147	112.50	5.000	4.720E+01	148	135.00	5.000	4.720E+01	149	157.50	5.000	4.720E+01
153	247.50	5.000	4.490E+01	154	180.00	5.000	4.490E+01	155	292.50	5.000	4.490E+01	156	315.00	5.000	4.490E+01	157	337.50	5.000	4.490E+01
161	33.75	6.000	5.130E+01	162	45.00	6.000	5.130E+01	163	56.25	6.000	5.130E+01	164	67.50	6.000	5.130E+01	165	78.75	6.000	5.130E+01
169	123.75	6.000	2.250E+01	170	135.00	6.000	2.250E+01	171	146.25	6.000	2.250E+01	172	157.50	6.000	2.250E+01	173	168.75	6.000	2.250E+01
177	213.75	6.000	2.620E+01	178	225.00	6.000	2.620E+01	179	236.25	6.000	2.620E+01	180	247.50	6.000	2.620E+01	181	258.75	6.000	2.620E+01
185	303.75	6.000	2.720E+01	186	315.00	6.000	2.720E+01	187	326.25	6.000	2.720E+01	188	337.50	6.000	2.720E+01	189	348.75	6.000	2.720E+01
193	33.75	7.000	1.425E+01	194	45.00	7.000	1.425E+01	195	56.25	7.000	1.425E+01	196	67.50	7.000	1.425E+01	197	78.75	7.000	1.425E+01
201	123.75	7.000	1.410E+01	202	135.00	7.000	1.410E+01	203	146.25	7.000	1.410E+01	204	157.50	7.000	1.410E+01	205	168.75	7.000	1.410E+01

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....PP RUN 92
 PLATE NO.....P0
 PLATE LOCATION..1

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	124.99	0.147	6.760E+00	2	125.75	0.151	9.230E+00	3	106.70	0.981	1.150E+01	4	95.71	0.946	1.260E+01				
5	84.29	0.945	1.360E+01	6	75.96	0.381	1.180E+01	7	63.14	1.051	1.010E+01	8	55.01	1.147	7.040E+00				
9	135.00	1.063	8.620E+00	10	126.57	0.940	1.290E+01	11	116.57	0.841	1.810E+01	12	104.04	0.775	2.410E+01				
13	90.00	0.732	2.510E+01	14	79.40	0.775	2.610E+01	15	63.44	0.841	1.910E+01	16	53.13	0.940	1.230E+01				
17	45.00	1.064	9.550E+00	18	133.40	0.867	2.187E+01	19	129.81	0.734	3.420E+01	20	116.57	0.631	7.460E+01				
21	95.46	0.572	1.150E+02	22	80.54	0.572	9.190E+01	23	63.44	0.631	6.750E+01	24	50.19	0.734	4.000E+01				
25	40.60	0.867	2.000E+01	26	153.43	0.841	2.300E+01	27	145.31	0.678	4.340E+01	28	135.00	0.532	1.240E+02				
29	116.57	0.420	2.910E+02	30	90.00	0.376	4.580E+02	31	63.44	0.420	4.250E+02	32	45.00	0.532	1.580E+02				
33	33.69	0.678	4.710E+01	34	26.57	0.841	2.190E+01	35	164.05	0.684	9.911E+03	36	158.20	0.506	1.980E+04				
37	146.31	0.339	1.660E+04	38	116.57	0.210	1.340E+04	39	63.43	0.210	3.320E+04	40	33.69	0.339	3.800E+03				
41	21.80	0.506	1.910E+02	42	15.95	0.684	5.240E+01	43	180.00	0.752	4.390E+01	44	180.00	0.564	1.880E+02				
45	180.00	0.376	2.404E+04	46	180.00	0.188	4.790E+04	47	0.	0.	8.600E+04	48	0.	0.188	4.350E+04				
49	0.	0.376	2.177E+04	50	0.	0.564	1.090E+04	51	0.	0.752	3.790E+01	52	195.95	0.684	7.880E+01				
53	201.80	0.506	1.093E+04	54	213.69	0.339	2.190E+04	55	243.43	0.210	5.540E+04	56	296.57	0.210	6.700E+04				
57	325.31	0.339	3.353E+04	58	338.20	0.306	1.690E+04	59	344.05	0.684	6.650E+01	60	206.57	0.841	3.330E+01				
61	213.69	0.678	1.070E+02	62	225.00	0.532	2.673E+03	63	243.43	0.420	5.240E+03	64	270.00	0.376	7.670E+03				
65	296.57	0.420	1.010E+04	66	315.00	0.532	3.440E+02	67	326.31	0.678	8.260E+01	68	333.43	0.841	2.970E+01				
69	220.60	0.867	3.260E+01	70	230.19	0.734	9.080E+01	71	243.43	0.631	2.709E+02	72	260.54	0.572	4.510E+02				
73	279.46	0.572	4.510E+02	74	296.57	0.631	1.940E+02	75	309.81	0.734	7.210E+01	76	319.40	0.867	2.660E+01				
77	225.00	1.064	1.470E+01	78	233.10	0.940	2.700E+01	79	243.40	0.841	1.010E+02	80	255.96	0.775	8.870E+01				
81	270.00	0.752	8.820E+01	82	284.00	0.775	8.770E+01	83	296.57	0.841	4.850E+01	84	306.87	0.940	2.490E+01				
85	315.00	1.064	1.370E+01	86	233.00	1.147	1.350E+01	87	243.43	1.051	2.220E+01	88	253.30	0.981	2.870E+01				
89	264.29	0.945	6.280E+01	90	275.71	0.945	3.330E+01	91	286.70	0.981	2.330E+01	92	296.57	1.051	1.830E+01				
93	304.99	1.147	1.280E+01	94	0.	2.000	2.060E+00	95	22.50	2.000	1.950E+00	96	45.00	2.000	1.790E+00				
97	67.50	2.000	1.550E+00	98	90.00	2.000	2.810E+00	99	112.50	2.000	1.520E+00	100	135.00	2.000	1.660E+00				
101	157.50	2.000	1.750E+00	102	180.00	2.000	1.660E+00	103	202.50	2.000	1.860E+00	104	225.00	2.000	2.100E+00				
105	247.50	2.000	1.990E+00	106	270.00	2.000	1.770E+00	107	292.50	2.000	1.695E+00	108	315.00	2.000	2.020E+00				
109	337.50	2.000	2.180E+00	110	0.	3.000	1.640E+00	111	22.50	3.000	1.100E+00	112	45.00	3.000	1.040E+00				
113	167.50	2.000	1.190E+00	114	90.00	3.000	2.350E+00	115	112.50	3.000	1.070E+00	116	135.00	3.000	9.880E-01				
117	157.50	3.000	1.020E+00	118	180.00	3.000	1.110E+00	119	202.50	3.000	1.130E+00	120	225.00	3.000	1.120E+00				
121	247.50	3.000	1.100E+00	122	270.00	3.000	1.190E+00	123	292.50	3.000	1.030E+00	124	315.00	3.000	1.050E+00				
125	337.50	3.000	1.340E+00	126	0.	4.000	8.310E-01	127	22.50	4.000	7.990E-01	128	45.00	4.000	7.950E-01				
129	67.50	4.000	8.125E-01	130	90.00	4.000	8.300E-01	131	112.50	4.000	8.650E-01	132	135.00	4.000	9.975E-01				
133	157.50	4.000	1.130E+00	134	180.00	4.000	8.630E-01	135	202.50	4.000	8.440E-01	136	225.00	4.000	8.430E-01				
137	247.50	4.000	8.070E-01	138	270.00	4.000	7.870E-01	139	292.50	4.000	8.490E-01	140	315.00	4.000	8.680E-01				
141	337.50	4.000	8.560E-01	142	0.	5.000	7.445E-01	143	22.50	5.000	6.330E-01	144	45.00	5.000	6.670E-01				
145	167.50	5.000	7.900E-01	146	90.00	5.000	2.020E+00	147	112.50	5.000	6.790E-01	148	135.00	5.000	6.840E-01				
149	157.50	5.000	7.140E-01	150	180.00	5.000	8.980E-01	151	202.50	5.000	6.260E-01	152	225.00	5.000	6.250E-01				
153	247.50	5.000	6.910E-01	154	270.00	5.000	8.980E-01	155	292.50	5.000	6.620E-01	156	315.00	5.000	6.650E-01				
157	337.50	5.000	6.780E-01	158	0.	6.000	6.900E-01	159	11.25	6.000	5.450E-01	160	22.50	6.000	6.070E-01				
161	33.75	6.000	5.650E-01	162	45.00	6.000	5.690E-01	163	55.25	6.000	5.670E-01	164	67.50	6.000	5.410E-01				
165	78.75	6.000	5.520E-01	166	90.00	6.000	2.120E+00	167	101.25	6.000	5.630E-01	168	112.50	6.000	5.100E-01				
169	123.75	6.000	5.900E-01	170	135.00	6.000	5.655E-01	171	146.25	6.000	5.310E-01	172	157.50	6.000	5.470E-01				
173	168.75	6.000	5.180E-01	174	180.00	6.000	5.870E-01	175	191.25	6.000	5.710E-01	176	202.50	6.000	6.000E-01				
177	213.75	6.000	6.290E-01	178	225.00	6.000	5.450E-01	179	236.25	6.000	5.40E-01	180	247.50	6.000	5.545E-01				
181	258.75	6.000	6.530E-01	182	270.00	6.000	8.010E-01	183	291.25	6.000	5.560E-01	184	302.50	6.000	5.900E-01				
185	303.75	6.000	5.630E-01	186	315.00	6.000	6.990E-01	187	326.25	6.000	6.370E-01	188	337.50	6.000	5.500E-01				
189	348.75	6.000	6.080E-01	190	0.	7.000	5.390E-01	191	11.25	7.000	5.120E-01	192	22.50	7.000	5.400E-01				
193	33.75	7.000	4.740E-01	194	45.00	7.000	5.110E-01	195	55.25	7.000	4.830E-01	196	67.50	7.000	5.320E-01				
197	78.75	7.000	5.370E-01	198	90.00	7.000	1.660E+00	199	101.25	7.000	4.310E-01	200	112.50	7.000	4.720E-01				
201	123.75	7.000	4.950E-01	202	135.00	7.000	4.925E-01	203	146.25	7.000	4.900E-01	204	157.50	7.000	4.980E-01				

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 92
 PLATE NO.....P7
 PLATE LOCATION...3

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	124.99	1.147	1.200E+03	2	116.57	1.051	1.510E+03	3	106.70	0.981	1.820E+03	4	95.71	0.945	1.950E+03	5	84.29	0.945	2.030E+03
5	84.29	0.945	2.030E+03	6	73.30	0.981	1.800E+03	7	63.44	1.051	1.510E+03	8	55.01	1.147	1.270E+03	9	135.00	1.053	1.420E+03
10	125.87	0.945	2.030E+03	11	116.57	0.945	2.030E+03	12	104.04	0.841	2.640E+03	13	90.00	0.752	3.590E+03	14	75.96	0.775	3.060E+03
15	63.44	0.775	3.060E+03	16	53.13	0.841	2.640E+03	17	45.00	0.734	4.170E+03	18	39.40	0.631	5.460E+03	19	29.81	0.572	6.330E+03
20	21.80	0.420	1.210E+04	21	16.57	0.376	1.310E+04	22	11.57	0.210	2.490E+04	23	6.34	0.068	5.470E+03	24	50.19	0.068	5.470E+03
25	99.46	0.572	6.330E+03	26	80.54	0.572	6.330E+03	27	63.44	0.631	5.470E+03	28	45.00	0.532	8.510E+03	29	33.69	0.420	1.330E+04
30	21.80	0.420	1.210E+04	31	16.57	0.376	1.310E+04	32	11.57	0.210	2.490E+04	33	6.34	0.068	5.470E+03	34	50.19	0.068	5.470E+03
35	99.46	0.572	6.330E+03	36	80.54	0.572	6.330E+03	37	63.44	0.631	5.470E+03	38	45.00	0.532	8.510E+03	39	33.69	0.420	1.330E+04
40	21.80	0.420	1.210E+04	41	16.57	0.376	1.310E+04	42	11.57	0.210	2.490E+04	43	6.34	0.068	5.470E+03	44	50.19	0.068	5.470E+03
45	99.46	0.572	6.330E+03	46	80.54	0.572	6.330E+03	47	63.44	0.631	5.470E+03	48	45.00	0.532	8.510E+03	49	33.69	0.420	1.330E+04
50	21.80	0.420	1.210E+04	51	16.57	0.376	1.310E+04	52	11.57	0.210	2.490E+04	53	6.34	0.068	5.470E+03	54	50.19	0.068	5.470E+03
55	99.46	0.572	6.330E+03	56	80.54	0.572	6.330E+03	57	63.44	0.631	5.470E+03	58	45.00	0.532	8.510E+03	59	33.69	0.420	1.330E+04
60	21.80	0.420	1.210E+04	61	16.57	0.376	1.310E+04	62	11.57	0.210	2.490E+04	63	6.34	0.068	5.470E+03	64	50.19	0.068	5.470E+03
65	99.46	0.572	6.330E+03	66	80.54	0.572	6.330E+03	67	63.44	0.631	5.470E+03	68	45.00	0.532	8.510E+03	69	33.69	0.420	1.330E+04
70	21.80	0.420	1.210E+04	71	16.57	0.376	1.310E+04	72	11.57	0.210	2.490E+04	73	6.34	0.068	5.470E+03	74	50.19	0.068	5.470E+03
75	99.46	0.572	6.330E+03	76	80.54	0.572	6.330E+03	77	63.44	0.631	5.470E+03	78	45.00	0.532	8.510E+03	79	33.69	0.420	1.330E+04
80	21.80	0.420	1.210E+04	81	16.57	0.376	1.310E+04	82	11.57	0.210	2.490E+04	83	6.34	0.068	5.470E+03	84	50.19	0.068	5.470E+03
85	99.46	0.572	6.330E+03	86	80.54	0.572	6.330E+03	87	63.44	0.631	5.470E+03	88	45.00	0.532	8.510E+03	89	33.69	0.420	1.330E+04
90	21.80	0.420	1.210E+04	91	16.57	0.376	1.310E+04	92	11.57	0.210	2.490E+04	93	6.34	0.068	5.470E+03	94	50.19	0.068	5.470E+03
95	99.46	0.572	6.330E+03	96	80.54	0.572	6.330E+03	97	63.44	0.631	5.470E+03	98	45.00	0.532	8.510E+03	99	33.69	0.420	1.330E+04
100	21.80	0.420	1.210E+04	101	16.57	0.376	1.310E+04	102	11.57	0.210	2.490E+04	103	6.34	0.068	5.470E+03	104	50.19	0.068	5.470E+03
105	99.46	0.572	6.330E+03	106	80.54	0.572	6.330E+03	107	63.44	0.631	5.470E+03	108	45.00	0.532	8.510E+03	109	33.69	0.420	1.330E+04
110	21.80	0.420	1.210E+04	111	16.57	0.376	1.310E+04	112	11.57	0.210	2.490E+04	113	6.34	0.068	5.470E+03	114	50.19	0.068	5.470E+03
115	99.46	0.572	6.330E+03	116	80.54	0.572	6.330E+03	117	63.44	0.631	5.470E+03	118	45.00	0.532	8.510E+03	119	33.69	0.420	1.330E+04
120	21.80	0.420	1.210E+04	121	16.57	0.376	1.310E+04	122	11.57	0.210	2.490E+04	123	6.34	0.068	5.470E+03	124	50.19	0.068	5.470E+03
125	99.46	0.572	6.330E+03	126	80.54	0.572	6.330E+03	127	63.44	0.631	5.470E+03	128	45.00	0.532	8.510E+03	129	33.69	0.420	1.330E+04
130	21.80	0.420	1.210E+04	131	16.57	0.376	1.310E+04	132	11.57	0.210	2.490E+04	133	6.34	0.068	5.470E+03	134	50.19	0.068	5.470E+03
135	99.46	0.572	6.330E+03	136	80.54	0.572	6.330E+03	137	63.44	0.631	5.470E+03	138	45.00	0.532	8.510E+03	139	33.69	0.420	1.330E+04
140	21.80	0.420	1.210E+04	141	16.57	0.376	1.310E+04	142	11.57	0.210	2.490E+04	143	6.34	0.068	5.470E+03	144	50.19	0.068	5.470E+03
145	99.46	0.572	6.330E+03	146	80.54	0.572	6.330E+03	147	63.44	0.631	5.470E+03	148	45.00	0.532	8.510E+03	149	33.69	0.420	1.330E+04
150	21.80	0.420	1.210E+04	151	16.57	0.376	1.310E+04	152	11.57	0.210	2.490E+04	153	6.34	0.068	5.470E+03	154	50.19	0.068	5.470E+03
155	99.46	0.572	6.330E+03	156	80.54	0.572	6.330E+03	157	63.44	0.631	5.470E+03	158	45.00	0.532	8.510E+03	159	33.69	0.420	1.330E+04
160	21.80	0.420	1.210E+04	161	16.57	0.376	1.310E+04	162	11.57	0.210	2.490E+04	163	6.34	0.068	5.470E+03	164	50.19	0.068	5.470E+03
165	99.46	0.572	6.330E+03	166	80.54	0.572	6.330E+03	167	63.44	0.631	5.470E+03	168	45.00	0.532	8.510E+03	169	33.69	0.420	1.330E+04
170	21.80	0.420	1.210E+04	171	16.57	0.376	1.310E+04	172	11.57	0.210	2.490E+04	173	6.34	0.068	5.470E+03	174	50.19	0.068	5.470E+03
175	99.46	0.572	6.330E+03	176	80.54	0.572	6.330E+03	177	63.44	0.631	5.470E+03	178	45.00	0.532	8.510E+03	179	33.69	0.420	1.330E+04
180	21.80	0.420	1.210E+04	181	16.57	0.376	1.310E+04	182	11.57	0.210	2.490E+04	183	6.34	0.068	5.470E+03	184	50.19	0.068	5.470E+03
185	99.46	0.572	6.330E+03	186	80.54	0.572	6.330E+03	187	63.44	0.631	5.470E+03	188	45.00	0.532	8.510E+03	189	33.69	0.420	1.330E+04
190	21.80	0.420	1.210E+04	191	16.57	0.376	1.310E+04	192	11.57	0.210	2.490E+04	193	6.34	0.068	5.470E+03	194	50.19	0.068	5.470E+03
195	99.46	0.572	6.330E+03	196	80.54	0.572	6.330E+03	197	63.44	0.631	5.470E+03	198	45.00	0.532	8.510E+03	199	33.69	0.420	1.330E+04
200	21.80	0.420	1.210E+04	201	16.57	0.376	1.310E+04	202	11.57	0.210	2.490E+04	203	6.34	0.068	5.470E+03	204	50.19	0.068	5.470E+03

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....300 MEV
 TARGET.....P
 PLATE NO.....PU
 PLATE LOCATION..5

B-9

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	124.99	1.147	2.130E+03	2	116.57	1.051	2.630E+03	3	106.70	0.981	2.590E+03	4	95.71	0.945	2.860E+03	5	85.01	1.147	2.020E+03
5	84.29	0.945	2.770E+03	6	73.30	0.981	2.650E+03	7	63.44	1.051	2.530E+03	8	65.01	0.775	6.400E+03	9	50.00	0.841	7.310E+03
9	131.00	1.063	2.690E+03	10	125.87	0.940	2.950E+03	11	116.57	0.841	7.310E+03	12	104.04	0.940	2.840E+03	13	90.00	0.752	6.890E+03
13	90.00	0.752	6.890E+03	14	75.95	0.775	6.810E+03	15	63.44	0.841	7.310E+03	16	55.13	0.631	4.330E+03	17	45.00	1.064	2.330E+03
17	45.00	1.064	2.330E+03	18	139.40	0.867	3.670E+03	19	129.81	0.734	3.660E+02	20	116.57	0.631	4.590E+03	21	99.46	0.572	4.850E+03
21	99.46	0.572	4.850E+03	22	80.54	0.572	4.720E+03	23	63.44	0.631	4.590E+03	24	50.19	0.734	4.740E+03	25	40.60	0.867	4.680E+03
25	40.60	0.867	4.680E+03	26	153.43	0.841	3.750E+03	27	146.31	0.678	1.810E+02	28	135.00	0.532	5.630E+03	29	116.57	0.420	5.150E+02
29	116.57	0.420	5.150E+02	30	90.00	0.375	9.150E+03	31	63.44	0.420	4.730E+02	32	45.00	0.532	4.810E+03	33	33.69	0.678	4.880E+03
33	33.69	0.678	4.880E+03	34	26.57	0.841	3.340E+03	35	164.05	0.684	1.100E+03	36	158.20	0.506	5.520E+03	37	146.31	0.339	6.670E+03
37	146.31	0.339	6.670E+03	38	116.57	0.210	7.300E+03	39	63.43	0.210	7.930E+03	40	33.69	0.339	1.120E+04	41	21.80	0.506	5.220E+03
41	21.80	0.506	5.220E+03	42	15.95	0.684	3.970E+03	43	180.00	0.752	4.840E+02	44	180.00	0.564	5.500E+03	45	180.00	0.376	2.910E+02
45	180.00	0.376	2.910E+02	46	180.00	0.188	8.640E+03	47	0.	0.	9.410E+03	48	0.	0.188	8.100E+03	49	0.	0.376	6.990E+03
49	0.	0.376	6.990E+03	50	0.	0.564	5.420E+03	51	0.	0.752	3.520E+03	52	195.95	0.684	5.270E+03	53	201.80	0.506	9.950E+01
53	201.80	0.506	9.950E+01	54	213.69	0.339	8.910E+03	55	243.43	0.210	5.700E+02	56	296.57	0.210	8.990E+02	57	315.71	0.375	7.190E+03
57	315.71	0.375	7.190E+03	58	338.20	0.506	6.110E+03	59	344.05	0.684	3.690E+03	60	206.57	0.841	4.610E+03	61	215.65	0.678	5.280E+03
61	215.65	0.678	5.280E+03	62	225.00	0.532	7.060E+02	63	243.43	0.420	6.180E+03	64	270.00	0.376	6.130E+03	65	296.57	0.420	5.340E+03
65	296.57	0.420	5.340E+03	66	315.00	0.532	4.850E+03	67	326.31	0.678	3.660E+03	68	333.43	0.841	4.030E+03	69	320.60	0.867	4.940E+03
69	320.60	0.867	4.940E+03	70	230.19	0.734	4.960E+03	71	243.43	0.631	5.190E+02	72	260.54	0.572	9.010E+02	73	279.46	0.572	6.950E+03
73	279.46	0.572	6.950E+03	74	296.57	0.631	6.470E+03	75	309.81	0.734	3.330E+03	76	319.40	0.867	4.640E+03	77	225.00	1.064	3.650E+03
77	225.00	1.064	3.650E+03	78	233.10	0.940	4.390E+03	79	243.40	0.641	4.340E+03	80	255.96	0.775	4.700E+03	81	270.00	0.752	5.360E+03
81	270.00	0.752	5.360E+03	82	284.00	0.775	3.950E+03	83	296.57	0.841	3.360E+03	84	306.87	0.940	4.220E+03	85	315.00	1.064	3.320E+03
85	315.00	1.064	3.320E+03	86	235.00	1.147	3.310E+03	87	243.43	1.051	3.830E+03	88	253.30	0.981	4.350E+03	89	264.29	0.945	4.420E+03
89	264.29	0.945	4.420E+03	90	273.71	0.845	4.550E+03	91	286.70	0.981	3.650E+03	92	296.57	1.051	3.370E+03	93	304.99	1.147	3.040E+03
93	304.99	1.147	3.040E+03	94	0.	2.000	6.810E+02	95	112.50	2.000	6.170E+02	96	45.00	2.000	6.230E+02	97	67.50	2.000	5.990E+02
97	67.50	2.000	5.990E+02	98	90.00	2.000	6.210E+02	99	100.00	2.000	7.810E+02	100	135.00	2.000	6.110E+02	101	157.50	2.000	6.870E+02
101	157.50	2.000	6.870E+02	102	100.00	2.000	8.490E+02	103	202.50	2.000	8.610E+02	104	225.00	2.000	8.025E+02	105	247.50	2.000	8.240E+02
105	247.50	2.000	8.240E+02	106	270.00	3.000	2.010E+02	107	292.50	3.000	1.800E+02	108	315.00	3.000	7.930E+02	109	337.50	3.000	7.620E+02
109	337.50	3.000	7.620E+02	110	0.	3.000	2.400E+02	111	22.50	3.000	1.850E+02	112	45.00	3.000	1.980E+02	113	67.50	3.000	3.320E+00
113	67.50	3.000	3.320E+00	114	90.00	3.000	1.720E+02	115	112.50	3.000	2.210E+02	116	135.00	3.000	1.840E+02	117	157.50	3.000	2.190E+02
117	157.50	3.000	2.190E+02	118	180.00	3.000	1.770E+02	119	202.50	3.000	2.540E+02	120	225.00	3.000	2.510E+02	121	247.50	3.000	2.660E+02
121	247.50	3.000	2.660E+02	122	270.00	4.000	7.180E+01	123	292.50	4.000	6.815E+01	124	315.00	4.000	1.980E+02	125	337.50	4.000	2.210E+02
125	337.50	4.000	2.210E+02	126	0.	4.000	6.370E+01	127	22.50	4.000	6.180E+01	128	45.00	4.000	6.450E+01	129	67.50	4.000	6.610E+01
129	67.50	4.000	6.610E+01	130	90.00	4.000	7.960E+01	131	112.50	4.000	7.400E+01	132	135.00	4.000	6.320E+01	133	157.50	4.000	7.120E+01
133	157.50	4.000	7.120E+01	134	180.00	4.000	7.680E+01	135	202.50	4.000	7.810E+01	136	225.00	4.000	8.070E+01	137	247.50	4.000	8.640E+01
137	247.50	4.000	8.640E+01	138	270.00	5.000	2.840E+01	139	292.50	5.000	2.740E+01	140	315.00	5.000	2.540E+01	141	337.50	5.000	2.200E+01
141	337.50	5.000	2.200E+01	142	0.	5.000	2.700E+01	143	22.50	5.000	2.240E+01	144	45.00	5.000	2.870E+01	145	67.50	5.000	2.810E+01
145	67.50	5.000	2.810E+01	146	90.00	5.000	2.630E+01	147	112.50	5.000	3.300E+01	148	135.00	5.000	2.920E+01	149	157.50	5.000	3.090E+01
149	157.50	5.000	3.090E+01	150	180.00	6.000	1.430E+01	151	202.50	6.000	1.310E+01	152	225.00	6.000	1.530E+01	153	247.50	6.000	2.830E+01
153	247.50	6.000	2.830E+01	154	270.00	6.000	1.190E+01	155	292.50	6.000	1.370E+01	156	315.00	6.000	1.220E+01	157	337.50	6.000	1.420E+01
157	337.50	6.000	1.420E+01	158	0.	6.000	1.350E+01	159	11.25	6.000	1.210E+01	160	22.50	6.000	1.250E+01	161	33.75	6.000	1.320E+01
161	33.75	6.000	1.320E+01	162	45.00	6.000	1.190E+01	163	56.25	6.000	1.370E+01	164	67.50	6.000	1.430E+01	165	78.75	6.000	1.370E+01
165	78.75	6.000	1.370E+01	166	90.00	6.000	1.340E+01	167	101.25	6.000	1.590E+01	168	112.50	6.000	1.560E+01	169	123.75	6.000	1.460E+01
169	123.75	6.000	1.460E+01	170	135.00	6.000	1.460E+01	171	146.25	6.000	1.510E+01	172	157.50	6.000	1.450E+01	173	168.75	6.000	1.630E+01
173	168.75	6.000	1.630E+01	174	180.00	6.000	1.600E+01	175	191.25	6.000	1.410E+01	176	202.50	6.000	1.620E+01	177	213.75	6.000	1.460E+01
177	213.75	6.000	1.460E+01	178	225.00	6.000	1.330E+01	179	236.25	6.000	1.540E+01	180	247.50	6.000	1.510E+01	181	258.75	6.000	1.630E+01
181	258.75	6.000	1.630E+01	182	270.00	7.000	7.660E+00	183	281.25	7.000	7.270E+00	184	292.50	7.000	7.110E+00	185	303.75	7.000	7.350E+00
185	303.75	7.000	7.350E+00	186	315.00	7.000	6.350E+00	187	326.25	7.000	7.410E+00	188	337.50	7.000	6.850E+00	189	348.75	7.000	6.500E+00
189	348.75	7.000	6.500E+00	190	0.	7.000	6.490E+00	191	11.25	7.000	6.570E+00	192	22.50	7.000	7.360E+00	193	33.75	7.000	6.500E+00
193	33.75	7.000	6.500E+00	194	45.00	7.000	7.120E+00	195	56.25	7.000	6.570E+00	196	67.50	7.000	7.360E+00	197	78.75	7.000	6.500E+00
197	78.75	7.000	6.500E+00	198	90.00	7.000	7.120E+00	199	101.25	7.000	6.570E+00	200	112.50	7.000	7.360E+00	201	123.75	7.000	6.500E+00
201	123.75	7.000	6.500E+00	202	135.00	7.000	7.120E+00	203	146.25	7.000	6.570E+00	204	157.50	7.000	7.360E+00				

RUN DATE.....1/17/78
 PARTICLE.....ELECTRON
 BEAM ENERGY.....500 MEV
 TARGET.....FP RUN 92
 PLATE NO.....P9
 PLATE LOCATION..6

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	124.99	0.147	9.500E+00	2	116.57	0.051	1.425E+01	3	106.70	0.981	1.900E+01	4	95.71	0.945	1.870E+01
5	84.29	0.945	1.970E+01	6	73.30	0.981	2.030E+01	7	63.44	1.051	3.480E+01	8	55.01	1.147	1.970E+01
9	135.00	1.063	2.050E+01	10	126.87	0.940	2.310E+01	11	116.57	0.841	2.140E+01	12	104.04	0.775	2.160E+01
13	90.00	0.752	2.170E+01	14	75.96	0.775	2.150E+01	15	63.44	0.841	1.830E+01	16	53.13	0.940	1.895E+01
17	45.00	1.064	1.960E+01	18	139.40	0.867	1.970E+01	19	129.81	0.734	2.140E+01	20	116.57	0.631	2.370E+01
21	99.46	0.572	2.170E+01	22	80.34	0.572	2.130E+01	23	63.44	0.631	2.290E+01	24	50.19	0.734	2.210E+01
25	40.60	0.867	2.050E+01	26	153.43	0.841	2.430E+01	27	146.31	0.678	2.180E+01	28	135.00	0.532	2.410E+01
29	116.57	0.420	2.340E+01	30	90.00	0.376	2.540E+01	31	63.44	0.420	2.240E+01	32	45.00	0.532	2.060E+01
33	33.69	0.678	2.220E+01	34	26.57	0.841	2.410E+01	35	164.05	0.684	2.600E+01	36	158.20	0.506	2.410E+01
37	145.31	0.339	2.710E+01	38	116.57	0.210	1.364E+01	39	63.43	0.210	1.730E+01	40	33.69	0.339	2.310E+01
41	21.80	0.506	2.330E+01	42	15.95	0.684	2.010E+01	43	180.00	0.752	2.600E+01	44	180.00	0.564	2.400E+01
45	180.00	0.376	2.370E+01	46	180.00	0.188	2.750E+01	47	0.	0.	2.990E+01	48	0.	0.188	2.280E+01
49	0.	0.376	2.250E+01	50	0.	0.564	2.490E+01	51	0.	0.752	1.910E+01	52	195.95	0.684	2.380E+01
53	201.80	0.506	2.180E+01	54	213.69	0.339	2.335E+01	55	243.43	0.210	2.490E+01	56	296.57	0.210	2.510E+01
57	326.31	0.339	2.330E+01	58	338.20	0.506	2.195E+01	59	344.05	0.684	2.060E+01	60	206.57	0.841	2.310E+01
61	313.69	0.678	2.370E+01	62	225.00	0.532	2.400E+01	63	243.43	0.420	2.760E+01	64	270.00	0.376	2.270E+01
65	296.57	0.420	2.370E+01	66	315.00	0.532	2.340E+01	67	326.31	0.678	2.040E+01	68	333.43	0.841	2.140E+01
69	220.60	0.867	2.090E+01	70	230.19	0.734	2.380E+01	71	243.43	0.631	2.500E+01	72	260.54	0.572	2.170E+01
73	279.46	0.572	2.360E+01	74	236.57	0.631	2.220E+01	75	309.81	0.734	2.080E+01	76	319.40	0.867	2.230E+01
77	225.00	1.064	2.050E+01	78	233.10	0.940	2.140E+01	79	243.40	0.841	2.190E+01	80	255.96	0.775	2.210E+01
81	270.00	0.752	1.960E+01	82	284.00	0.775	2.220E+01	83	296.57	0.841	2.090E+01	84	308.87	0.940	2.040E+01
85	315.00	1.064	1.780E+01	86	235.00	1.147	2.130E+01	87	243.43	1.051	1.990E+01	88	253.30	0.981	1.950E+01
89	364.29	0.945	2.220E+01	90	275.71	0.945	2.350E+01	91	286.70	0.981	1.850E+01	92	296.57	1.051	2.050E+01
93	304.99	1.147	1.930E+01	94	0.	2.000	2.120E+01	95	22.50	2.000	1.670E+01	96	45.00	2.000	1.710E+01
97	67.50	2.000	1.650E+01	98	90.00	2.000	1.720E+01	99	112.50	2.000	1.680E+01	100	135.00	2.000	1.620E+01
101	157.50	2.000	1.580E+01	102	180.00	2.000	1.770E+01	103	202.50	2.000	1.710E+01	104	225.00	2.000	1.840E+01
105	247.50	2.000	1.970E+01	106	270.00	2.000	1.770E+01	107	292.50	2.000	1.750E+01	108	315.00	2.000	1.710E+01
109	337.50	2.000	1.690E+01	110	0.	3.000	1.670E+01	111	22.50	3.000	1.410E+01	112	45.00	3.000	1.520E+01
113	157.50	3.000	1.580E+01	114	90.00	3.000	1.270E+01	115	112.50	3.000	1.420E+01	116	135.00	3.000	1.460E+01
117	157.50	3.000	1.450E+01	118	180.00	3.000	1.530E+01	119	202.50	3.000	1.350E+01	120	225.00	3.000	1.420E+01
121	247.50	3.000	1.500E+01	122	270.00	3.000	1.440E+01	123	292.50	3.000	1.510E+01	124	315.00	3.000	1.450E+01
125	337.50	3.000	1.390E+01	126	0.	4.000	1.220E+01	127	22.50	4.000	1.190E+01	128	45.00	4.000	1.265E+01
129	67.50	4.000	1.340E+01	130	90.00	4.000	1.230E+01	131	112.50	4.000	1.190E+01	132	135.00	4.000	1.280E+01
133	157.50	4.000	1.210E+01	134	180.00	4.000	1.270E+01	135	202.50	4.000	1.380E+01	136	225.00	4.000	1.440E+01
137	247.50	4.000	1.310E+01	138	270.00	4.000	1.330E+01	139	292.50	4.000	1.230E+01	140	315.00	4.000	1.160E+01
141	337.50	4.000	1.230E+01	142	0.	5.000	1.280E+01	143	22.50	5.000	1.170E+01	144	45.00	5.000	1.220E+01
145	67.50	5.000	1.100E+01	146	90.00	5.000	1.310E+01	147	112.50	5.000	1.160E+01	148	135.00	5.000	1.140E+01
149	157.50	5.000	1.100E+01	150	180.00	5.000	1.060E+01	151	202.50	5.000	1.070E+01	152	225.00	5.000	1.140E+01
153	247.50	5.000	1.260E+01	154	270.00	5.000	1.230E+01	155	292.50	5.000	1.190E+01	156	315.00	5.000	1.100E+01
157	337.50	5.000	1.150E+01	158	0.	6.000	1.060E+01	159	11.25	6.000	9.580E+00	160	22.50	6.000	9.500E+00
161	33.75	6.000	1.090E+01	162	45.00	6.000	1.150E+01	163	55.25	6.000	1.090E+01	164	67.50	6.000	1.110E+01
165	73.75	6.000	1.120E+01	166	90.00	6.000	1.090E+01	167	101.25	6.000	1.100E+01	168	112.50	6.000	1.000E+01
169	123.75	6.000	1.040E+01	170	135.00	6.000	1.110E+01	171	146.25	6.000	1.110E+01	172	157.50	6.000	1.030E+01
173	163.75	6.000	1.140E+01	174	180.00	6.000	1.020E+01	175	191.25	6.000	1.160E+01	176	202.50	6.000	1.070E+01
177	213.75	6.000	1.080E+01	178	225.00	6.000	1.170E+01	179	236.25	6.000	1.100E+01	180	247.50	6.000	1.070E+01
181	253.75	6.000	1.180E+01	182	270.00	6.000	1.100E+01	183	281.25	6.000	1.020E+01	184	292.50	6.000	1.150E+01
185	303.75	6.000	1.160E+01	186	315.00	6.000	1.180E+01	187	326.25	6.000	1.030E+01	188	337.50	6.000	1.000E+01
189	343.75	6.000	1.080E+01	190	0.	7.000	1.020E+01	191	11.25	7.000	9.120E+00	192	22.50	7.000	1.010E+01
193	33.75	7.000	9.600E+00	194	45.00	7.000	9.110E+00	195	56.25	7.000	9.020E+00	196	67.50	7.000	9.420E+00
197	73.75	7.000	9.150E+00	198	90.00	7.000	8.880E+00	199	101.25	7.000	1.030E+01	200	112.50	7.000	9.520E+00
201	123.75	7.000	9.480E+00	202	135.00	7.000	9.080E+00	203	146.25	7.000	9.230E+00	204	157.50	7.000	9.820E+00

RUN DATE.....1/1/70
 PARTICLE.....ALUMINUM
 INITIAL ENERGY.....600 MEV
 TARGET.....C-12 RUN 02
 WALL NO.....10
 PLATE LOCATION..7

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	124.99	1.147	6.160E+01	2	116.57	1.051	6.100E+01	3	106.70	0.981	6.560E+01	4	95.71	0.945	6.385E+01	5	84.29	0.945	6.620E+01
5	84.29	0.945	6.210E+01	6	73.30	0.981	6.310E+01	7	63.44	1.051	6.350E+01	8	55.01	1.147	5.620E+01	9	45.00	1.064	6.210E+01
13	135.00	1.064	7.470E+01	10	126.87	0.940	7.250E+01	11	116.37	0.841	6.460E+01	12	104.04	0.775	6.530E+01	13	90.00	0.752	7.070E+01
17	90.00	0.752	7.070E+01	14	75.96	0.775	7.030E+01	15	63.44	0.841	6.310E+01	16	53.13	0.940	6.440E+01	17	45.00	1.064	6.210E+01
21	99.46	1.064	6.210E+01	18	139.40	0.867	7.000E+01	19	129.81	0.734	7.330E+01	20	116.57	0.631	7.800E+01	21	99.46	0.872	8.080E+01
25	40.60	0.872	8.080E+01	22	80.54	0.841	7.030E+01	23	63.44	0.678	7.870E+01	24	50.19	0.734	6.585E+01	25	40.60	0.867	6.250E+01
29	116.57	0.420	7.930E+01	26	159.43	0.841	7.630E+01	27	146.31	0.678	7.870E+01	28	135.00	0.532	8.270E+01	29	116.57	0.420	7.930E+01
33	33.69	0.678	6.160E+01	30	90.00	0.376	8.570E+01	31	63.44	0.420	7.830E+01	32	45.00	0.532	6.995E+01	33	33.69	0.678	6.160E+01
37	146.31	0.339	8.440E+01	34	26.57	0.841	6.210E+01	35	164.05	0.684	7.620E+01	36	158.20	0.506	8.990E+01	37	146.31	0.339	8.440E+01
41	21.80	0.506	7.080E+01	38	116.57	0.210	7.890E+01	39	63.43	0.210	8.390E+01	40	33.69	0.339	7.550E+01	41	21.80	0.506	7.080E+01
45	180.00	0.376	9.140E+01	42	15.95	0.684	7.400E+01	43	180.00	0.752	6.710E+01	44	180.00	0.564	7.540E+01	45	180.00	0.376	9.140E+01
49	0.00	0.376	7.180E+01	46	180.00	0.188	9.290E+01	47	0.00	0.00	9.600E+01	48	0.00	0.188	8.790E+01	49	0.00	0.376	7.180E+01
53	201.80	0.306	9.690E+01	50	0.00	0.564	7.580E+01	51	0.00	0.752	6.630E+01	52	195.95	0.684	8.040E+01	53	201.80	0.306	9.690E+01
57	225.31	0.339	9.780E+01	54	213.69	0.339	1.130E+02	55	243.43	0.210	8.410E+01	56	296.57	0.210	9.290E+01	57	225.31	0.339	9.780E+01
61	211.69	0.678	7.780E+01	56	338.20	0.506	7.560E+01	59	344.05	0.684	6.550E+01	60	206.57	0.841	7.190E+01	61	211.69	0.678	7.780E+01
65	396.57	0.420	7.710E+01	62	225.00	0.532	8.630E+01	63	243.43	0.420	9.110E+01	64	270.00	0.376	8.460E+01	65	396.57	0.420	7.710E+01
69	320.60	0.867	7.160E+01	66	315.00	0.532	7.540E+01	67	326.31	0.678	6.840E+01	68	303.43	0.841	6.390E+01	69	320.60	0.867	7.160E+01
73	279.46	0.572	8.560E+01	70	230.19	0.734	7.930E+01	71	343.43	0.631	8.140E+01	72	260.34	0.572	8.350E+01	73	279.46	0.572	8.560E+01
77	325.00	1.064	6.890E+01	74	296.57	0.631	7.540E+01	75	309.81	0.734	6.730E+01	76	319.40	0.867	7.340E+01	77	325.00	1.064	6.890E+01
81	270.00	0.752	7.540E+01	76	233.10	0.940	6.960E+01	79	243.40	0.841	7.130E+01	80	255.96	0.775	6.940E+01	81	270.00	0.752	7.540E+01
85	315.00	1.064	6.340E+01	82	264.00	0.775	6.800E+01	83	296.67	0.841	6.500E+01	84	306.87	0.340	6.420E+01	85	315.00	1.064	6.340E+01
89	264.29	0.945	7.480E+01	86	235.00	1.147	7.120E+01	87	243.43	1.051	6.930E+01	88	253.30	0.981	7.190E+01	89	264.29	0.945	7.480E+01
93	304.99	1.147	6.150E+01	90	275.71	0.945	6.800E+01	91	286.70	0.981	7.090E+01	92	296.57	1.051	6.220E+01	93	304.99	1.147	6.150E+01
97	67.50	2.000	4.400E+01	94	0.00	2.000	4.620E+01	95	22.50	2.000	4.660E+01	96	45.00	2.000	4.540E+01	97	67.50	2.000	4.400E+01
101	157.50	2.000	5.010E+01	98	90.00	2.000	4.365E+01	99	112.50	2.000	4.330E+01	100	135.00	2.000	4.460E+01	101	157.50	2.000	5.010E+01
105	247.50	2.000	4.680E+01	102	180.00	2.000	5.230E+01	103	202.50	2.000	4.530E+01	104	225.00	2.000	5.110E+01	105	247.50	2.000	4.680E+01
109	337.50	2.000	4.960E+01	106	270.00	2.000	5.170E+01	107	292.50	2.000	4.490E+01	108	315.00	2.000	4.580E+01	109	337.50	2.000	4.960E+01
113	67.50	3.000	3.690E+01	110	0.00	3.000	3.590E+01	111	22.50	3.000	3.870E+01	112	45.00	3.000	3.270E+01	113	67.50	3.000	3.690E+01
117	157.50	3.000	3.480E+01	114	90.00	3.000	3.720E+01	115	112.50	3.000	3.130E+01	116	135.00	3.000	3.760E+01	117	157.50	3.000	3.480E+01
121	247.50	3.000	3.745E+01	118	165.00	3.000	3.350E+01	119	202.50	3.000	3.950E+01	120	225.00	3.000	3.740E+01	121	247.50	3.000	3.745E+01
125	337.50	3.000	3.310E+01	122	270.00	4.000	2.630E+01	123	292.50	4.000	2.540E+01	124	315.00	4.000	2.930E+01	125	337.50	3.000	3.310E+01
129	67.50	4.000	2.860E+01	126	0.00	4.000	2.910E+01	127	22.50	4.000	2.540E+01	128	45.00	4.000	2.930E+01	129	67.50	4.000	2.860E+01
133	157.50	4.000	2.970E+01	130	90.00	4.000	3.050E+01	131	112.50	4.000	3.250E+01	132	135.00	4.000	2.950E+01	133	157.50	4.000	2.970E+01
137	247.50	4.000	2.700E+01	134	180.00	4.000	3.050E+01	135	202.50	4.000	3.030E+01	136	225.00	4.000	3.090E+01	137	247.50	4.000	2.700E+01
141	337.50	4.000	2.900E+01	138	270.00	4.000	3.020E+01	139	292.50	4.000	2.820E+01	140	315.00	4.000	3.110E+01	141	337.50	4.000	2.900E+01
145	67.50	5.000	2.190E+01	142	0.00	5.000	2.050E+01	143	22.50	5.000	2.350E+01	144	45.00	5.000	2.400E+01	145	67.50	5.000	2.190E+01
149	157.50	5.000	2.460E+01	146	90.00	5.000	2.320E+01	147	112.50	5.000	1.980E+01	148	135.00	5.000	2.440E+01	149	157.50	5.000	2.460E+01
153	247.50	5.000	2.240E+01	148	180.00	5.000	2.530E+01	151	202.50	5.000	2.530E+01	152	225.00	5.000	2.770E+01	153	247.50	5.000	2.240E+01
157	337.50	5.000	2.000E+01	150	270.00	5.000	2.000E+01	155	292.50	5.000	2.400E+01	156	315.00	5.000	2.350E+01	157	337.50	5.000	2.000E+01
161	33.75	6.000	1.960E+01	158	0.00	6.000	2.000E+01	159	22.50	6.000	2.090E+01	160	22.50	6.000	1.040E+01	161	33.75	6.000	1.960E+01
165	78.75	6.000	2.130E+01	162	45.00	6.000	2.000E+01	163	56.25	6.000	2.110E+01	164	67.50	6.000	2.120E+01	165	78.75	6.000	2.130E+01
169	123.75	6.000	1.900E+01	166	90.00	6.000	1.740E+01	167	101.25	6.000	1.870E+01	168	112.50	6.000	2.000E+01	169	123.75	6.000	1.900E+01
173	168.75	6.000	1.880E+01	170	135.00	6.000	2.040E+01	171	146.25	6.000	2.000E+01	172	157.50	6.000	2.390E+01	173	168.75	6.000	1.880E+01
177	213.75	6.000	2.340E+01	174	180.00	6.000	2.150E+01	175	191.25	6.000	2.040E+01	176	202.50	6.000	2.190E+01	177	213.75	6.000	2.340E+01
181	258.75	6.000	2.010E+01	178	225.00	6.000	2.260E+01	179	236.25	6.000	2.180E+01	180	247.50	6.000	2.100E+01	181	258.75	6.000	2.010E+01
185	303.75	6.000	2.755E+01	182	270.00	6.000	2.100E+01	183	281.25	6.000	2.000E+01	184	292.50	6.000	1.910E+01	185	303.75	6.000	2.755E+01
189	348.75	6.000	2.010E+01	186	315.00	6.000	3.600E+01	187	326.25	6.000	2.030E+01	188	337.50	6.000	2.020E+01	189	348.75	6.000	2.010E+01
193	33.75	7.000	1.770E+01	190	0.00	7.000	1.670E+01	191	11.25	7.000	1.720E+01	192	22.50	7.000	1.830E+01	193	33.75	7.000	1.770E+01
197	78.75	7.000	1.530E+01	194	45.00	7.000	1.790E+01	195	56.25	7.000	1.630E+01	196	67.50	7.000	1.650E+01	197	78.75	7.000	1.530E+01
201	123.75	7.000	1.530E+01	198	90.00	7.000	1.760E+01	199	101.25	7.000	1.780E+01	202	112.50	7.000	1.780E+01	201	123.75	7.000	1.530E+01
				202	135.00	7.000	1.570E+01	203	146.25	7.000	1.650E+01	204	157.50	7.000	1.790E+01				

RUN DATE.....3/10/78
 PARTICLE.....PHOTON
 BEAM ENERGY.....200 MEV
 TARGET.....PP RUN 101
 PLATE NO.....P1
 PLATE LOCATION..1

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
40	150.00	2.328	3.530E+02	1	127.88	2.085	3.460E+02	2	119.06	1.883	3.730E+02	3	108.44	1.735	3.570E+02
44	98.34	1.856	3.370E+02	5	85.68	1.656	3.430E+02	6	71.57	1.735	3.650E+02	7	60.95	1.883	3.260E+02
8	52.13	2.085	3.370E+02	9	45.00	2.328	3.360E+02	10	142.10	2.085	3.320E+02	11	135.00	1.810	3.440E+02
12	125.54	1.573	3.340E+02	13	113.20	1.393	3.250E+02	14	98.13	1.293	3.460E+02	15	81.87	1.293	3.470E+02
16	66.80	1.393	3.890E+02	17	54.46	1.573	3.380E+02	18	45.00	1.810	3.140E+02	19	37.88	2.085	3.350E+02
20	150.95	1.883	3.490E+02	21	144.46	1.573	3.550E+02	22	135.00	1.293	3.520E+02	23	120.96	1.066	3.590E+02
24	101.31	0.933	3.540E+02	25	78.69	0.933	3.670E+02	26	59.04	1.066	3.480E+02	27	45.00	1.293	3.340E+02
28	35.34	1.573	3.430E+02	29	29.06	1.883	3.830E+02	30	161.57	1.735	3.250E+02	31	156.80	1.393	3.500E+02
32	149.04	1.066	3.480E+02	33	135.00	0.776	3.570E+02	34	108.44	0.578	3.480E+02	35	71.57	0.578	3.540E+02
36	45.00	0.776	3.420E+02	37	30.96	1.066	3.550E+02	38	23.20	1.393	3.450E+02	39	18.44	1.735	3.450E+02
40	173.66	1.656	3.460E+02	41	171.87	1.293	3.440E+02	42	168.69	0.933	3.900E+02	43	161.57	0.578	3.660E+02
44	135.00	0.259	3.500E+02	45	45.00	0.259	3.500E+02	46	18.44	0.578	3.450E+02	47	11.31	0.933	3.450E+02
48	8.13	1.293	3.530E+02	49	6.34	1.656	3.420E+02	50	186.34	1.656	3.350E+02	51	188.13	1.293	3.370E+02
52	191.31	0.933	3.680E+02	53	198.44	0.578	3.550E+02	54	225.00	0.259	3.450E+02	55	315.00	0.259	3.460E+02
56	341.57	0.578	3.510E+02	57	348.69	0.933	3.430E+02	58	351.87	1.293	3.170E+02	59	353.66	1.656	3.490E+02
60	198.44	1.735	3.930E+02	61	203.20	1.393	3.460E+02	62	210.96	1.066	3.660E+02	63	226.00	0.776	3.730E+02
64	251.57	0.578	3.610E+02	65	288.44	0.578	3.420E+02	66	315.00	0.776	3.570E+02	67	329.00	1.066	3.310E+02
68	336.80	1.393	3.890E+02	69	341.57	1.735	3.310E+02	70	209.05	1.883	3.580E+02	71	215.84	1.573	3.470E+02
72	225.00	1.293	3.770E+02	73	239.04	1.066	3.450E+02	74	258.69	0.933	3.330E+02	75	281.31	0.933	3.370E+02
76	300.96	1.066	3.430E+02	77	315.00	1.293	3.380E+02	78	324.46	1.573	3.410E+02	79	330.95	1.883	3.880E+02
80	217.88	2.085	3.500E+02	81	225.00	1.810	3.280E+02	82	234.46	1.573	3.550E+02	83	246.80	1.393	3.600E+02
84	261.87	1.293	3.560E+02	85	278.13	1.293	3.270E+02	86	293.20	1.393	3.440E+02	87	306.54	1.573	3.280E+02
88	315.00	1.810	3.310E+02	89	322.13	2.085	3.230E+02	90	225.00	2.328	3.310E+02	91	232.13	2.085	3.420E+02
92	240.95	1.883	3.570E+02	93	251.57	1.735	3.470E+02	94	263.66	1.656	3.700E+02	95	276.34	1.656	3.380E+02
96	288.44	1.735	3.540E+02	97	299.06	1.883	3.400E+02	98	307.88	2.085	3.810E+02	99	315.00	2.328	3.310E+02
100	0.	2.445	3.200E+02	101	0.	3.175	3.420E+02	102	0.	4.445	2.780E+02	103	0.	5.715	2.430E+02
104	0.	6.985	2.070E+02	105	22.50	2.445	3.780E+02	106	22.50	3.175	3.120E+02	107	22.50	4.445	2.960E+02
108	22.50	6.985	2.610E+02	109	22.50	6.985	2.230E+02	110	45.00	3.175	3.300E+02	111	45.00	4.445	3.020E+02
112	45.00	5.715	2.700E+02	113	45.00	6.985	2.410E+02	114	67.50	2.445	3.230E+02	115	67.50	3.175	3.670E+02
116	67.50	4.445	2.980E+02	117	67.50	5.715	3.350E+02	118	67.50	6.985	2.440E+02	119	90.00	2.445	3.460E+02
120	90.00	3.175	3.900E+02	121	90.00	4.445	2.920E+02	122	90.00	5.715	2.810E+02	123	90.00	6.985	2.690E+02
124	112.50	2.445	3.350E+02	125	112.50	3.175	3.380E+02	126	112.50	4.445	3.280E+02	127	112.50	5.715	3.030E+02
128	112.50	6.985	2.780E+02	129	135.00	3.175	3.500E+02	130	135.00	4.445	3.760E+02	131	135.00	5.715	2.940E+02
132	135.00	6.985	2.680E+02	133	157.50	2.445	3.450E+02	134	157.50	3.175	3.500E+02	135	157.50	4.445	3.270E+02
136	157.50	5.715	2.930E+02	137	157.50	6.985	2.780E+02	138	180.00	2.445	3.430E+02	139	180.00	3.175	3.470E+02
140	180.00	4.445	3.690E+02	141	180.00	5.715	2.910E+02	142	180.00	6.985	2.700E+02	143	202.50	2.445	3.520E+02
144	202.50	3.175	3.390E+02	145	202.50	4.445	3.180E+02	146	202.50	5.715	3.260E+02	147	202.50	6.985	2.580E+02
148	225.00	3.175	3.300E+02	149	225.00	4.445	3.160E+02	150	225.00	5.715	2.740E+02	151	225.00	6.985	2.580E+02
152	247.50	2.445	3.270E+02	153	247.50	3.175	3.330E+02	154	247.50	4.445	3.180E+02	155	247.50	5.715	2.850E+02
156	247.50	6.985	2.450E+02	157	270.00	2.445	3.300E+02	158	270.00	3.175	3.220E+02	159	270.00	4.445	3.030E+02
160	270.00	5.715	2.740E+02	161	270.00	6.985	2.460E+02	162	292.50	2.445	3.290E+02	163	292.50	3.175	3.160E+02
164	292.50	4.445	2.840E+02	165	292.50	5.715	2.660E+02	166	292.50	6.985	2.580E+02	167	315.00	3.175	3.210E+02
168	315.00	4.445	2.820E+02	169	315.00	5.715	2.660E+02	170	315.00	6.985	2.200E+02	171	337.50	2.445	3.060E+02
172	337.50	3.175	3.230E+02	173	337.50	4.445	2.860E+02	174	337.50	5.715	2.400E+02	175	337.50	6.985	2.160E+02

RUN DATE 3/16/73
 PARTICLE PROTON
 BEAM ENERGY 250 MCV
 TARGET FP RUN 101
 PLATE NO 01
 PLATE LOCATION .. 1

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	108.43	2.214	3.660E+02	2	90.00	2.100	3.700E+02	3	71.57	2.214	3.580E+02	4	135.00	1.900	3.790E+02
5	116.57	1.565	3.750E+02	6	90.00	1.400	3.650E+02	7	63.43	1.565	3.590E+02	8	45.00	1.950	3.770E+02
9	161.57	2.214	3.820E+02	10	153.43	1.565	3.790E+02	11	135.00	0.990	3.800E+02	12	90.00	0.700	3.610E+02
13	45.00	0.990	3.650E+02	14	26.57	1.565	4.090E+02	15	18.43	2.214	3.990E+02	16	180.00	2.100	3.600E+02
17	180.00	1.400	3.730E+02	18	180.00	0.700	3.910E+02	19	0.	0.	4.040E+02	20	0.	0.700	3.600E+02
21	0.	1.400	3.660E+02	22	0.	2.100	4.130E+02	23	198.43	2.214	3.820E+02	24	206.57	1.565	3.750E+02
25	225.00	0.990	3.620E+02	26	270.00	0.700	3.860E+02	27	315.00	0.990	3.580E+02	28	333.43	1.565	3.740E+02
29	341.57	2.214	3.610E+02	30	225.00	1.980	3.800E+02	31	243.43	1.565	3.820E+02	32	270.00	1.400	3.700E+02
33	206.57	1.565	3.640E+02	34	315.00	1.980	3.500E+02	35	251.57	2.214	4.050E+02	36	270.00	2.100	4.000E+02
37	288.43	2.214	3.630E+02	38	0.	3.000	3.430E+02	39	0.	4.500	3.690E+02	40	0.	6.000	2.600E+02
41	0.	7.500	2.470E+02	42	45.00	3.000	3.630E+02	43	45.00	4.500	3.400E+02	44	45.00	6.000	3.700E+02
45	45.00	7.500	2.510E+02	46	90.00	3.000	3.750E+02	47	90.00	4.500	3.430E+02	48	90.00	6.000	3.610E+02
49	90.00	7.500	2.880E+02	50	135.00	3.000	3.800E+02	51	135.00	4.500	3.560E+02	52	135.00	6.000	3.210E+02
53	135.00	7.500	2.990E+02	54	180.00	3.000	3.620E+02	55	180.00	4.500	3.620E+02	56	180.00	6.000	3.200E+02
57	180.00	7.500	2.850E+02	58	225.00	3.000	4.050E+02	59	225.00	4.500	3.860E+02	60	225.00	6.000	3.210E+02
61	225.00	7.500	2.770E+02	62	270.00	3.000	3.590E+02	63	270.00	4.500	3.210E+02	64	270.00	6.000	3.190E+02
65	270.00	7.500	2.750E+02	66	315.00	3.000	3.390E+02	67	315.00	4.500	3.570E+02	68	315.00	6.000	2.560E+02
69	315.00	7.500	2.650E+02												

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 101
 PLATE NO.....P2
 PLATE LOCATION..2

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	3.630E+02	1	127.88	2.085	3.980E+02	2	119.06	1.883	4.460E+02	3	108.44	1.735	3.740E+02
4	98.34	1.656	3.740E+02	5	83.66	1.656	3.930E+02	6	71.57	1.735	3.680E+02	7	60.98	1.883	3.710E+02
8	52.13	2.085	3.760E+02	9	45.00	2.328	3.480E+02	10	142.10	2.085	3.920E+02	11	135.00	1.810	3.830E+02
12	125.54	1.573	3.580E+02	13	113.20	1.393	4.010E+02	14	98.13	1.293	3.810E+02	15	81.87	1.293	3.920E+02
16	66.80	1.393	3.740E+02	17	54.46	1.573	3.770E+02	18	45.00	1.810	3.740E+02	19	37.88	2.085	3.560E+02
20	150.95	1.883	3.730E+02	21	144.46	1.573	3.790E+02	22	135.00	1.293	3.760E+02	23	120.96	1.066	3.800E+02
24	101.31	0.933	3.880E+02	25	78.69	0.933	3.910E+02	26	59.04	1.066	3.780E+02	27	45.00	1.293	3.950E+02
28	35.54	1.573	3.580E+02	29	29.06	1.883	3.840E+02	30	161.57	1.735	3.860E+02	31	156.80	1.393	3.790E+02
32	149.04	1.066	3.880E+02	33	135.00	0.776	3.860E+02	34	108.44	0.578	3.820E+02	35	71.57	0.578	4.680E+02
36	45.00	0.776	3.800E+02	37	30.96	1.066	4.490E+02	38	23.20	1.393	3.800E+02	39	18.44	1.735	3.720E+02
40	173.66	1.656	3.620E+02	41	171.87	1.293	3.790E+02	42	168.69	0.933	3.840E+02	43	161.57	0.578	3.900E+02
44	135.00	0.259	4.310E+02	45	45.00	0.259	3.840E+02	46	18.44	0.578	3.820E+02	47	11.31	0.933	3.810E+02
48	6.13	1.293	3.740E+02	49	6.34	1.656	3.760E+02	50	186.34	1.656	3.790E+02	51	188.13	1.293	3.810E+02
52	191.31	0.933	3.660E+02	53	198.44	0.578	3.910E+02	54	225.00	0.259	4.520E+02	55	315.00	0.259	4.500E+02
56	341.57	0.578	3.810E+02	57	348.69	0.933	4.620E+02	58	351.87	1.293	3.620E+02	59	353.66	1.656	3.790E+02
60	198.44	1.735	3.990E+02	61	203.20	1.393	3.740E+02	62	210.96	1.066	4.690E+02	63	225.00	0.776	3.750E+02
64	281.57	0.578	3.930E+02	65	288.44	0.578	4.510E+02	66	315.00	0.776	3.870E+02	67	329.00	1.066	3.720E+02
68	336.80	1.393	3.760E+02	69	341.57	1.735	3.560E+02	70	209.03	1.883	3.700E+02	71	215.54	1.573	3.940E+02
72	225.00	1.293	3.760E+02	73	239.04	1.066	4.540E+02	74	258.69	0.933	3.530E+02	75	281.31	0.933	3.710E+02
76	300.96	1.066	4.710E+02	77	315.00	1.293	3.790E+02	78	324.46	1.573	3.780E+02	79	330.95	1.883	3.670E+02
80	217.88	2.085	3.630E+02	81	225.00	1.810	3.700E+02	82	234.46	1.573	3.750E+02	83	246.80	1.393	3.800E+02
84	261.87	1.293	3.570E+02	85	278.13	1.293	4.540E+02	86	293.20	1.393	3.720E+02	87	305.54	1.573	3.630E+02
88	315.00	1.810	3.620E+02	89	322.13	2.085	3.710E+02	90	295.00	2.328	3.830E+02	91	292.13	2.085	3.920E+02
92	240.95	1.883	3.780E+02	93	251.57	1.735	3.820E+02	94	269.66	1.656	4.630E+02	95	276.34	1.656	4.510E+02
96	288.44	1.735	3.830E+02	97	299.06	1.883	3.690E+02	98	307.88	2.085	3.560E+02	99	315.00	2.328	3.510E+02
100	0.00	2.445	4.240E+02	101	0.00	3.175	3.510E+02	102	0.00	4.445	3.040E+02	103	0.00	5.715	2.770E+02
104	0.00	5.985	2.460E+02	105	22.50	2.445	3.610E+02	106	22.50	3.175	3.510E+02	107	22.50	4.445	3.140E+02
108	22.50	5.715	2.830E+02	109	22.50	6.985	2.580E+02	110	45.00	3.175	3.580E+02	111	45.00	4.445	3.320E+02
112	45.00	5.715	2.910E+02	113	45.00	6.985	2.640E+02	114	67.50	2.445	3.790E+02	115	67.50	3.175	3.720E+02
116	67.50	4.445	3.300E+02	117	67.50	5.715	2.970E+02	118	67.50	6.985	2.770E+02	119	90.00	2.445	3.550E+02
120	90.00	4.445	3.740E+02	121	90.00	4.445	4.130E+02	122	90.00	5.715	3.980E+02	123	90.00	6.985	2.860E+02
124	112.50	2.445	3.780E+02	125	112.50	3.175	3.710E+02	126	112.50	4.445	4.440E+02	127	112.50	5.715	3.190E+02
128	112.50	5.985	2.970E+02	129	135.00	3.175	3.700E+02	130	135.00	4.445	3.440E+02	131	135.00	5.715	3.250E+02
132	135.00	5.985	2.880E+02	133	157.50	2.445	3.800E+02	134	157.50	3.175	3.710E+02	135	157.50	4.445	3.490E+02
136	157.50	5.715	3.230E+02	137	157.50	6.985	3.520E+02	138	180.00	2.445	3.770E+02	139	180.00	3.175	3.680E+02
140	180.00	4.445	3.270E+02	141	180.00	5.715	3.130E+02	142	180.00	5.985	2.890E+02	143	202.50	2.445	3.640E+02
144	202.50	3.175	3.630E+02	145	202.50	4.445	3.460E+02	146	202.50	5.715	3.180E+02	147	202.50	6.985	2.860E+02
148	225.00	3.175	3.480E+02	149	225.00	4.445	3.370E+02	150	225.00	5.715	3.180E+02	151	225.00	6.985	2.800E+02
152	247.50	2.445	3.660E+02	153	247.50	3.175	3.510E+02	154	247.50	4.445	3.390E+02	155	247.50	5.715	3.080E+02
156	247.50	5.985	2.860E+02	157	270.00	2.445	3.580E+02	158	270.00	3.175	3.530E+02	159	270.00	4.445	3.110E+02
160	270.00	5.715	3.960E+02	161	270.00	6.985	3.710E+02	162	292.50	2.445	3.540E+02	163	292.50	3.175	3.340E+02
164	292.50	4.445	3.650E+02	165	292.50	5.715	3.600E+02	166	292.50	6.985	3.300E+02	167	315.00	3.175	3.370E+02
168	315.00	4.445	3.170E+02	169	315.00	5.715	2.860E+02	170	315.00	6.985	3.380E+02	171	337.50	2.445	3.600E+02
172	337.50	3.175	3.590E+02	173	337.50	4.445	2.960E+02	174	337.50	5.715	3.350E+02	175	337.50	6.985	2.480E+02

RUN DATE... 3/16/70
 PARTICLE... PROTON
 BEAM ENERGY... 250 MEV
 TARGET... FP RUN 101
 PLATE NO... 02
 PLATE LOCATION.. 2

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	71.57	2.214	3.880E+02	2	90.00	2.100	3.820E+02	3	108.43	2.214	3.940E+02	4	135.00	1.980	3.920E+02
5	63.43	1.565	3.910E+02	6	90.00	1.400	3.760E+02	7	116.57	1.565	3.810E+02	8	135.00	1.980	4.750E+02
9	18.43	2.214	4.030E+02	10	25.57	1.565	3.960E+02	11	45.00	0.990	4.120E+02	12	90.00	0.700	3.630E+02
13	135.00	0.990	3.840E+02	14	153.43	1.565	3.860E+02	15	161.57	2.214	3.780E+02	16	0.	2.100	3.850E+02
17	0.	1.400	3.980E+02	18	0.	0.700	3.870E+02	19	0.	0.	3.810E+02	20	180.00	0.700	3.960E+02
21	180.00	1.400	3.770E+02	22	180.00	2.100	3.770E+02	23	341.57	2.214	3.820E+02	24	333.43	1.565	4.040E+02
25	315.00	0.990	3.420E+02	26	270.00	0.700	3.950E+02	27	225.00	0.990	3.860E+02	28	206.67	1.565	3.840E+02
29	198.43	2.214	3.810E+02	30	315.00	1.980	4.680E+02	31	256.67	1.565	3.930E+02	32	270.00	1.400	3.860E+02
33	243.43	1.565	3.840E+02	34	225.00	1.980	3.680E+02	35	288.43	2.214	3.840E+02	36	270.00	2.100	4.740E+02
37	251.57	2.214	3.600E+02	38	180.00	3.000	3.690E+02	39	180.00	4.500	3.140E+02	40	180.00	6.000	2.540E+02
41	180.00	7.500	3.660E+02	42	135.00	3.000	3.540E+02	43	135.00	4.500	4.130E+02	44	135.00	6.000	3.120E+02
45	135.00	7.500	2.690E+02	46	90.00	3.000	2.830E+02	47	90.00	4.500	4.420E+02	48	90.00	6.000	3.310E+02
49	90.00	7.500	2.880E+02	50	45.00	3.000	3.850E+02	51	45.00	4.500	3.710E+02	52	45.00	6.000	3.450E+02
53	45.00	7.500	3.100E+02	54	0.	3.000	3.760E+02	55	0.	4.500	3.550E+02	56	0.	6.000	3.300E+02
57	0.	7.500	3.430E+02	58	315.00	3.000	3.940E+02	59	315.00	4.500	3.650E+02	60	315.00	6.000	3.340E+02
61	315.00	7.500	3.540E+02	62	270.00	3.000	3.730E+02	63	270.00	4.500	3.470E+02	64	270.00	6.000	3.230E+02
65	270.00	7.500	2.700E+02	66	225.00	3.000	3.790E+02	67	225.00	4.500	3.390E+02	68	225.00	6.000	2.930E+02
69	225.00	7.500	2.560E+02												

RUN DATE 3/16/70
 PARTIAL PROTON
 PLANT ENERGY 350 MEV
 TARGET EP RUN 101
 PLAT NO. P9
 PLAT LOCATION .. 3

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.478	3.990E+02	1	127.88	2.085	3.940E+02	2	119.05	1.883	3.930E+02	3	108.44	1.735	3.780E+02
4	96.44	1.626	3.740E+02	5	83.86	1.435	3.670E+02	6	71.57	1.295	3.600E+02	7	60.94	1.183	3.780E+02
8	63.14	1.085	3.910E+02	9	45.00	2.328	3.590E+02	10	142.10	2.085	3.920E+02	11	135.00	1.810	4.040E+02
12	125.54	1.573	5.030E+02	13	113.20	1.393	3.910E+02	14	98.13	1.293	4.150E+02	15	81.87	1.293	4.060E+02
16	66.80	1.393	4.000E+02	17	54.46	1.573	3.960E+02	18	45.00	1.810	3.950E+02	19	37.86	2.085	5.050E+02
20	150.95	1.883	4.010E+02	21	144.46	1.573	4.960E+02	22	135.00	1.293	3.790E+02	23	120.96	1.066	3.980E+02
24	101.31	0.933	4.100E+02	25	78.69	0.933	3.950E+02	26	59.04	1.066	3.810E+02	27	45.00	1.293	3.850E+02
28	35.54	1.573	3.850E+02	29	29.06	1.803	3.890E+02	30	161.57	1.735	3.860E+02	31	156.80	1.393	3.910E+02
32	149.04	1.066	3.640E+02	33	135.00	0.776	4.120E+02	34	108.44	0.578	5.050E+02	35	71.57	0.578	4.100E+02
36	45.00	0.776	3.830E+02	37	30.96	1.066	5.070E+02	38	23.20	1.393	3.900E+02	39	18.44	1.735	3.730E+02
40	173.66	1.656	4.060E+02	41	171.87	1.293	5.310E+02	42	168.69	0.933	4.930E+02	43	161.57	0.578	4.160E+02
44	135.00	0.259	3.850E+02	45	45.00	0.259	4.090E+02	46	18.44	0.578	4.050E+02	47	11.31	0.933	3.810E+02
48	8.13	1.293	3.940E+02	49	6.34	1.656	3.950E+02	50	185.34	1.656	4.140E+02	51	188.13	1.293	4.120E+02
52	191.31	0.933	3.730E+02	53	198.44	0.578	4.010E+02	54	225.00	0.259	4.160E+02	55	315.00	0.259	3.930E+02
56	341.57	0.578	3.120E+02	57	346.69	0.933	3.950E+02	58	351.87	1.293	3.960E+02	59	353.66	1.656	3.740E+02
60	198.44	1.735	3.930E+02	61	203.20	1.393	3.090E+02	62	210.96	1.066	3.970E+02	63	225.00	0.776	5.060E+02
64	751.57	0.578	4.010E+02	65	288.44	0.578	3.830E+02	66	315.00	0.776	3.770E+02	67	329.00	1.066	3.870E+02
68	136.80	1.393	3.820E+02	69	341.57	1.735	3.780E+02	70	209.05	1.883	3.880E+02	71	215.54	1.573	3.830E+02
72	325.00	1.293	4.100E+02	73	339.04	1.066	3.950E+02	74	258.69	0.933	3.960E+02	75	281.31	0.933	3.960E+02
76	300.96	1.066	3.980E+02	77	315.00	1.293	3.820E+02	78	324.46	1.573	3.880E+02	79	330.95	1.883	3.720E+02
80	217.88	2.085	3.720E+02	81	225.00	1.810	3.930E+02	82	234.46	1.573	4.090E+02	83	246.60	1.393	3.810E+02
84	261.87	1.293	3.820E+02	85	278.13	1.293	3.780E+02	86	293.20	1.393	3.720E+02	87	305.54	1.573	4.000E+02
88	315.00	1.810	3.900E+02	89	322.13	2.085	3.680E+02	90	225.00	2.328	4.000E+02	91	232.13	2.085	3.800E+02
92	240.95	1.883	3.790E+02	93	251.57	1.735	3.810E+02	94	263.66	1.656	3.760E+02	95	276.34	1.656	3.910E+02
96	266.44	1.735	3.940E+02	97	299.00	1.683	3.860E+02	98	307.68	2.085	3.720E+02	99	315.00	2.328	3.930E+02
100	0.	2.445	3.410E+02	101	0	3.175	5.050E+02	102	0	4.445	3.270E+02	103	0	5.715	3.690E+02
104	0.	6.985	2.390E+02	105	22.50	2.445	3.740E+02	106	22.50	3.175	3.710E+02	107	22.50	4.445	3.570E+02
108	22.50	5.715	2.940E+02	109	22.50	6.985	2.670E+02	110	45.00	3.175	3.760E+02	111	45.00	4.445	3.490E+02
112	45.00	5.715	3.110E+02	113	45.00	6.985	2.710E+02	114	67.50	2.445	4.070E+02	115	67.50	3.175	3.600E+02
116	67.50	4.445	3.360E+02	117	67.50	5.715	3.110E+02	118	67.50	6.985	2.710E+02	119	90.00	2.445	5.100E+02
120	90.00	3.175	3.770E+02	121	90.00	4.445	3.570E+02	122	90.00	5.715	3.380E+02	123	90.00	6.985	2.970E+02
124	112.50	2.445	3.840E+02	125	112.50	3.175	3.940E+02	126	112.50	4.445	3.680E+02	127	112.50	5.715	3.170E+02
128	112.50	6.985	3.060E+02	129	175.00	3.175	3.790E+02	130	135.00	4.445	3.780E+02	131	135.00	5.715	3.150E+02
132	135.00	6.985	3.010E+02	133	157.50	2.445	3.960E+02	134	157.50	3.175	3.770E+02	135	157.50	4.445	3.470E+02
136	157.50	5.715	4.370E+02	137	157.50	6.985	3.960E+02	138	180.00	4.445	3.710E+02	139	180.00	5.715	3.840E+02
140	180.00	4.445	3.570E+02	141	180.00	5.715	3.220E+02	142	180.00	6.985	2.950E+02	143	202.50	2.445	3.890E+02
144	202.50	3.175	3.630E+02	145	202.50	4.445	3.50E+02	146	202.50	5.715	3.260E+02	147	202.50	6.985	3.760E+02
148	225.00	3.175	3.840E+02	149	225.00	4.445	3.430E+02	150	225.00	5.715	3.290E+02	151	225.00	6.985	3.750E+02
152	247.50	2.445	5.330E+02	153	247.50	3.175	3.750E+02	154	247.50	4.445	3.430E+02	155	247.50	5.715	3.150E+02
156	247.50	6.985	2.930E+02	157	270.00	2.445	3.780E+02	158	270.00	3.175	3.760E+02	159	270.00	4.445	3.500E+02
160	270.00	5.715	3.180E+02	161	270.00	6.985	2.710E+02	162	292.50	2.445	3.900E+02	163	292.50	3.175	3.740E+02
164	292.50	4.445	3.360E+02	165	292.50	5.715	3.030E+02	166	292.50	6.985	2.710E+02	167	315.00	3.175	3.650E+02
168	315.00	4.445	3.360E+02	169	315.00	5.715	2.970E+02	170	315.00	6.985	2.600E+02	171	337.50	2.445	3.690E+02
172	337.50	3.175	3.500E+02	173	337.50	4.445	3.350E+02	174	337.50	5.715	2.890E+02	175	337.50	6.985	3.320E+02

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 101
 PLATE NO.....D3
 PLATE LOCATION..3

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	71.57	2.214	5.280E+02	2	90.00	2.100	3.830E+02	3	108.43	2.214	4.120E+02	4	45.00	1.980	4.190E+02
5	63.43	1.565	3.880E+02	6	90.00	1.400	4.150E+02	7	116.57	1.565	3.880E+02	8	135.00	1.980	4.030E+02
9	18.43	2.214	4.250E+02	10	26.57	1.565	3.930E+02	11	45.00	0.990	4.340E+02	12	90.00	0.700	3.910E+02
13	135.00	0.990	4.190E+02	14	153.43	1.565	4.040E+02	15	161.57	2.214	4.000E+02	16	0.	2.100	4.180E+02
17	0.	1.400	4.180E+02	18	0.	0.700	4.220E+02	19	0.	0.	4.280E+02	20	180.00	0.700	3.900E+02
21	180.00	1.400	4.090E+02	22	180.00	2.100	3.860E+02	23	341.57	2.214	4.110E+02	24	333.43	1.565	4.180E+02
25	315.00	0.990	4.000E+02	26	270.00	0.700	5.330E+02	27	225.00	0.990	4.220E+02	28	206.57	1.565	4.100E+02
29	198.43	2.214	3.870E+02	30	315.00	1.980	5.340E+02	31	296.57	1.565	4.060E+02	32	270.00	1.400	4.050E+02
33	243.43	1.565	5.260E+02	34	225.00	1.980	4.140E+02	35	288.43	2.214	4.050E+02	36	270.00	2.100	4.140E+02
37	251.57	2.214	3.880E+02	38	180.00	3.000	3.730E+02	39	180.00	4.500	3.420E+02	40	180.00	6.000	3.000E+02
41	180.00	7.500	2.640E+02	42	135.00	3.000	3.900E+02	43	135.00	4.500	3.650E+02	44	135.00	6.000	3.340E+02
45	135.00	7.500	2.860E+02	46	90.00	3.000	5.210E+02	47	90.00	4.500	3.700E+02	48	90.00	6.000	3.510E+02
49	90.00	7.500	3.100E+02	50	45.00	3.000	4.150E+02	51	45.00	4.500	4.590E+02	52	45.00	6.000	3.580E+02
53	45.00	7.500	3.140E+02	54	0.	3.000	4.140E+02	55	0.	4.500	3.840E+02	56	0.	6.000	3.420E+02
57	0.	7.500	3.040E+02	58	315.00	3.000	4.080E+02	59	315.00	4.500	3.740E+02	60	315.00	6.000	3.430E+02
61	315.00	7.500	4.040E+02	62	270.00	3.000	3.970E+02	63	270.00	4.500	3.730E+02	64	270.00	6.000	3.090E+02
65	270.00	7.500	2.950E+02	66	225.00	3.000	3.860E+02	67	225.00	4.500	3.630E+02	68	225.00	6.000	3.770E+02
69	225.00	7.500	3.210E+02												

RUN DATE.....3/18/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 101
 PLATE NO.....P4
 PLATE LOCATION..4

B-18

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	4.020E+02	1	127.88	2.085	5.830E+02	2	119.06	1.883	4.030E+02	3	108.44	1.735	4.160E+02
4	96.34	1.856	4.020E+02	5	83.66	1.656	4.150E+02	6	71.57	1.735	3.800E+02	7	60.95	1.683	4.200E+02
8	82.13	2.085	4.030E+02	9	45.00	2.328	3.940E+02	10	142.10	2.085	5.060E+02	11	135.00	1.810	4.230E+02
12	125.54	1.573	4.100E+02	13	113.20	1.393	6.070E+02	14	98.13	1.293	4.130E+02	15	81.87	1.293	4.100E+02
16	66.80	1.393	4.140E+02	17	54.46	1.573	4.150E+02	18	45.00	1.810	3.920E+02	19	37.88	2.085	5.900E+02
20	150.95	1.883	4.010E+02	21	144.46	1.573	4.050E+02	22	135.00	1.293	4.000E+02	23	120.96	1.066	4.060E+02
24	101.31	0.933	4.080E+02	25	78.69	0.933	4.330E+02	26	59.04	1.066	3.940E+02	27	45.00	1.293	4.040E+02
28	35.54	1.573	4.090E+02	29	29.06	1.883	3.840E+02	30	161.57	1.735	6.090E+02	31	156.80	1.393	4.200E+02
32	149.04	1.066	6.000E+02	33	135.00	0.776	4.310E+02	34	108.44	0.578	4.140E+02	35	71.57	0.578	4.030E+02
36	45.00	0.776	4.010E+02	37	30.96	1.066	6.290E+02	38	23.20	1.393	4.050E+02	39	18.44	1.735	3.890E+02
40	173.66	1.556	4.100E+02	41	171.87	1.293	4.110E+02	42	168.69	0.933	4.010E+02	43	161.57	0.578	4.240E+02
44	135.00	0.259	4.110E+02	45	45.00	0.259	3.950E+02	46	18.44	0.578	4.080E+02	47	11.31	0.933	3.910E+02
48	8.13	1.293	4.060E+02	49	6.34	1.656	3.850E+02	50	186.34	1.656	5.970E+02	51	188.13	1.293	3.890E+02
52	191.31	0.933	3.980E+02	53	198.44	0.578	4.090E+02	54	225.00	0.259	4.040E+02	55	315.00	0.259	4.180E+02
56	341.57	0.578	4.180E+02	57	346.69	0.933	3.970E+02	58	351.87	1.293	3.870E+02	59	353.66	1.656	3.830E+02
60	198.44	1.735	5.840E+02	61	203.20	1.393	4.050E+02	62	210.98	1.066	4.020E+02	63	225.00	0.776	3.910E+02
64	251.37	0.578	4.140E+02	65	288.44	0.578	4.350E+02	66	315.00	0.776	4.180E+02	67	329.00	1.066	4.140E+02
68	336.80	1.393	3.930E+02	69	341.57	1.735	3.820E+02	70	209.05	1.883	4.060E+02	71	215.54	1.573	4.270E+02
72	225.00	1.293	4.160E+02	73	239.04	1.066	4.120E+02	74	258.69	0.933	3.960E+02	75	281.31	0.933	3.950E+02
76	300.96	1.066	3.970E+02	77	315.00	1.293	4.050E+02	78	324.46	1.573	4.130E+02	79	330.95	1.883	4.010E+02
80	317.88	2.085	4.020E+02	81	225.00	1.810	4.180E+02	82	234.46	1.573	4.030E+02	83	246.80	1.393	4.020E+02
84	261.87	1.293	4.030E+02	85	278.13	1.293	4.010E+02	86	293.20	1.393	4.120E+02	87	305.54	1.573	4.000E+02
88	315.00	1.810	4.040E+02	89	322.13	2.085	4.000E+02	90	225.00	2.328	3.900E+02	91	232.13	2.085	4.040E+02
92	240.95	1.883	4.150E+02	93	251.57	1.735	3.990E+02	94	263.66	1.656	3.880E+02	95	276.34	1.656	6.100E+02
96	288.44	1.735	3.990E+02	97	299.06	1.883	5.970E+02	98	307.88	2.085	3.890E+02	99	315.00	2.328	6.180E+02
100	0.	2.445	3.920E+02	101	0.	3.175	3.710E+02	102	0.	4.445	3.300E+02	103	0.	5.715	3.030E+02
104	0.	6.985	3.840E+02	105	22.50	2.445	3.960E+02	106	45.00	3.175	3.680E+02	107	22.50	4.445	3.310E+02
108	45.00	5.715	3.050E+02	109	22.50	6.985	2.640E+02	110	45.00	3.175	3.950E+02	111	45.00	4.445	3.450E+02
112	45.00	5.715	3.150E+02	113	45.00	6.985	2.850E+02	114	67.50	2.445	4.040E+02	115	67.50	3.175	3.990E+02
116	67.50	4.445	3.660E+02	117	67.50	5.715	3.310E+02	118	67.50	6.985	4.140E+02	119	90.00	2.445	3.820E+02
120	90.00	3.175	4.130E+02	121	90.00	4.445	3.850E+02	122	90.00	5.715	3.380E+02	123	90.00	6.985	4.280E+02
124	112.50	2.445	4.000E+02	125	112.50	3.175	4.050E+02	126	112.50	4.445	3.710E+02	127	112.50	5.715	5.470E+02
128	112.50	6.985	3.260E+02	129	135.00	3.175	5.930E+02	130	135.00	4.445	4.340E+02	131	135.00	5.715	3.600E+02
132	135.00	6.985	3.180E+02	133	157.50	2.445	6.060E+02	134	157.50	3.175	3.810E+02	135	157.50	4.445	3.770E+02
136	157.50	5.715	3.530E+02	137	157.50	6.985	4.400E+02	138	180.00	2.445	4.100E+02	139	180.00	3.175	3.770E+02
140	180.00	4.445	3.790E+02	141	180.00	5.715	3.750E+02	142	180.00	6.985	4.190E+02	143	202.50	2.445	3.980E+02
144	202.50	3.175	3.890E+02	145	202.50	4.445	3.730E+02	146	202.50	5.715	3.310E+02	147	202.50	6.985	3.100E+02
148	225.00	3.175	3.950E+02	149	225.00	4.445	3.650E+02	150	225.00	5.715	3.310E+02	151	225.00	6.985	4.560E+02
152	247.50	2.445	3.870E+02	153	247.50	3.175	3.830E+02	154	247.50	4.445	5.400E+02	155	247.50	5.715	4.910E+02
156	247.50	6.985	3.020E+02	157	270.00	2.445	3.880E+02	158	270.00	3.175	3.730E+02	159	270.00	4.445	5.550E+02
160	270.00	5.715	3.270E+02	161	270.00	6.985	2.930E+02	162	270.00	2.445	4.010E+02	163	292.50	3.175	3.860E+02
164	292.50	4.445	3.500E+02	165	292.50	5.715	3.190E+02	166	292.50	6.985	2.730E+02	167	315.00	3.175	3.650E+02
168	315.00	4.445	3.400E+02	169	315.00	5.715	2.990E+02	170	315.00	6.985	2.730E+02	171	337.50	2.445	3.650E+02
172	337.50	3.175	3.650E+02	173	337.50	4.445	3.170E+02	174	337.50	5.715	3.050E+02	175	337.50	6.985	2.480E+02

RUN DATE.....3/16/78
 PARTICLE.....PHOTON
 BLANK ENERGY.....250 KEV
 TARGET.....F' RUT 101
 PLATE NO.....DM
 PLATE LOCATION..4

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	108.43	2.214	4.910E+02	2	90.00	2.100	4.840E+02	3	71.57	2.214	4.700E+02	4	135.00	1.980	4.790E+02
5	116.57	1.565	4.930E+02	6	90.00	1.400	4.790E+02	7	63.43	1.565	4.660E+02	8	45.00	1.980	4.600E+02
9	161.57	2.214	4.620E+02	10	153.43	1.565	4.870E+02	11	135.00	0.990	4.990E+02	12	90.00	0.700	4.720E+02
13	45.00	0.990	4.860E+02	14	26.57	1.565	4.710E+02	15	18.43	2.214	4.690E+02	16	180.00	2.100	4.600E+02
17	180.00	1.400	4.840E+02	18	160.00	0.700	4.780E+02	19	0.	0.	4.620E+02	20	0.	0.700	4.480E+02
21	0.	1.400	4.840E+02	22	0.	2.100	4.640E+02	23	198.43	2.214	4.790E+02	24	206.57	1.565	4.680E+02
25	225.00	0.990	4.850E+02	26	270.00	0.700	4.690E+02	27	315.00	0.990	4.680E+02	28	333.43	1.565	4.440E+02
29	341.57	2.214	4.540E+02	30	225.00	1.980	4.740E+02	31	243.43	1.565	4.860E+02	32	270.00	1.400	4.690E+02
33	296.57	1.565	4.740E+02	34	315.00	1.980	4.700E+02	35	251.57	2.214	4.550E+02	36	270.00	2.100	4.610E+02
37	268.43	2.214	4.680E+02	38	0.	3.000	4.490E+02	39	0.	4.500	4.010E+02	40	0.	6.000	3.640E+02
41	0.	7.500	3.120E+02	42	45.00	3.000	4.710E+02	43	45.00	4.500	4.160E+02	44	45.00	6.000	3.920E+02
45	45.00	7.500	3.430E+02	46	90.00	3.000	4.520E+02	47	90.00	4.500	4.480E+02	48	90.00	6.000	4.120E+02
49	90.00	7.500	3.510E+02	50	135.00	3.000	5.440E+02	51	135.00	4.500	4.560E+02	52	135.00	6.000	4.100E+02
53	135.00	7.500	3.860E+02	54	180.00	3.000	4.700E+02	55	180.00	4.500	4.500E+02	56	180.00	6.000	4.570E+02
57	180.00	7.500	3.580E+02	58	225.00	3.000	4.690E+02	59	225.00	4.500	4.480E+02	60	225.00	6.000	4.050E+02
61	225.00	7.500	3.910E+02	62	270.00	3.000	5.050E+02	63	270.00	4.500	4.250E+02	64	270.00	6.000	3.940E+02
65	270.00	7.500	3.320E+02	66	315.00	3.000	5.170E+02	67	315.00	4.500	4.160E+02	68	315.00	6.000	3.760E+02
69	315.00	7.500	3.230E+02												

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 IN AM ENERGY.....250 MLV
 TARGET.....F1 RUN 101
 PLATE NO.....10
 PLATE LOCATION..B

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	5.770E+02	1	127.88	2.085	5.750E+02	2	119.06	1.883	5.230E+02	3	108.44	1.735	5.420E+02
4	96.34	1.656	5.140E+02	5	83.66	1.656	5.470E+02	6	71.57	1.735	5.260E+02	7	60.95	1.883	5.490E+02
8	52.13	2.085	4.690E+02	9	45.00	2.328	4.840E+02	10	142.10	2.085	5.620E+02	11	135.00	1.810	5.160E+02
12	125.54	1.573	5.400E+02	13	113.20	1.393	5.420E+02	14	98.13	1.293	5.060E+02	15	81.87	1.293	5.300E+02
16	66.00	1.393	5.400E+02	17	54.46	1.573	5.260E+02	18	45.00	1.810	4.970E+02	19	37.80	2.085	5.020E+02
20	150.55	1.656	5.420E+02	21	144.46	1.573	5.140E+02	22	135.00	1.293	5.070E+02	23	120.96	1.066	5.820E+02
24	101.31	0.933	5.240E+02	25	78.59	0.933	5.450E+02	26	59.04	1.066	5.140E+02	27	45.00	1.293	5.240E+02
28	35.54	1.573	5.230E+02	29	29.06	1.883	5.300E+02	30	161.57	1.735	5.820E+02	31	158.80	1.393	5.410E+02
32	149.04	1.066	5.420E+02	33	135.00	0.776	5.640E+02	34	108.44	0.578	5.110E+02	35	71.57	0.578	5.630E+02
36	45.00	0.776	5.380E+02	37	30.96	1.066	4.940E+02	38	23.20	1.393	4.940E+02	39	18.44	1.735	5.250E+02
40	173.66	1.656	5.730E+02	41	171.87	1.293	5.610E+02	42	168.69	0.933	5.240E+02	43	161.57	0.578	5.940E+02
44	135.00	0.259	5.330E+02	45	45.00	0.259	5.180E+02	46	18.44	0.578	5.350E+02	47	11.31	0.933	5.260E+02
48	8.13	1.293	5.170E+02	49	6.34	1.656	5.210E+02	50	186.34	1.656	5.080E+02	51	188.13	1.293	5.330E+02
52	191.31	0.933	5.320E+02	53	198.44	0.578	5.450E+02	54	225.00	0.259	5.530E+02	55	315.00	0.259	5.360E+02
56	341.57	0.578	5.160E+02	57	348.69	0.933	5.130E+02	58	351.87	1.293	5.020E+02	59	353.66	1.656	5.030E+02
60	198.44	1.735	6.070E+02	61	203.20	1.393	5.650E+02	62	210.96	1.066	5.420E+02	63	225.00	0.776	5.320E+02
64	251.57	0.578	5.440E+02	65	288.44	0.578	5.340E+02	66	315.00	0.776	5.250E+02	67	329.00	1.066	4.980E+02
68	336.80	1.393	5.420E+02	69	341.57	1.735	5.270E+02	70	209.05	1.883	5.720E+02	71	215.54	1.573	5.500E+02
72	225.00	1.293	5.500E+02	73	239.04	1.066	5.170E+02	74	258.69	0.933	5.150E+02	75	281.31	0.933	5.440E+02
76	300.96	1.066	5.130E+02	77	315.00	1.293	5.570E+02	78	324.46	1.573	5.050E+02	79	330.95	1.883	5.190E+02
80	217.88	2.085	5.680E+02	81	223.00	1.810	5.450E+02	82	234.46	1.573	5.260E+02	83	246.80	1.393	5.500E+02
84	261.87	1.293	5.260E+02	85	278.13	1.293	5.850E+02	86	293.20	1.393	5.460E+02	87	305.54	1.573	4.990E+02
88	315.00	1.810	5.140E+02	89	322.13	2.085	5.070E+02	90	225.00	2.328	5.610E+02	91	232.13	2.085	5.660E+02
92	240.95	1.883	5.030E+02	93	251.57	1.735	5.230E+02	94	263.66	1.656	5.230E+02	95	276.34	1.656	5.300E+02
96	238.44	1.735	5.080E+02	97	299.06	1.883	5.060E+02	98	307.88	2.085	5.100E+02	99	315.00	2.328	5.160E+02
100	0.	2.445	5.200E+02	101	0.	3.175	4.720E+02	102	0.	4.445	4.450E+02	103	0.	5.715	4.050E+02
104	0.	6.985	3.550E+02	105	22.50	2.445	5.360E+02	106	22.50	3.175	5.010E+02	107	22.50	4.445	4.610E+02
108	22.50	5.715	3.900E+02	109	22.50	6.985	3.730E+02	110	45.00	3.175	4.760E+02	111	45.00	4.445	4.550E+02
112	45.00	5.715	4.260E+02	113	45.00	6.985	3.760E+02	114	67.50	2.445	5.160E+02	115	67.50	3.175	4.970E+02
116	67.50	4.445	4.800E+02	117	67.50	5.715	4.410E+02	118	67.50	6.985	4.140E+02	119	90.00	2.445	5.550E+02
120	90.00	3.175	5.100E+02	121	90.00	4.445	4.950E+02	122	90.00	5.715	4.710E+02	123	90.00	6.985	4.150E+02
124	112.50	2.445	5.340E+02	125	112.50	3.175	5.660E+02	126	112.50	4.445	4.740E+02	127	112.50	5.715	4.540E+02
129	112.50	6.985	4.880E+02	129	135.00	3.175	5.140E+02	130	135.00	4.445	4.910E+02	131	135.00	5.715	5.260E+02
132	135.00	6.985	4.700E+02	133	157.50	2.445	5.110E+02	134	157.50	3.175	5.120E+02	135	157.50	4.445	5.040E+02
136	157.50	5.715	4.360E+02	137	157.50	6.985	3.970E+02	138	180.00	2.445	5.310E+02	139	180.00	3.175	4.720E+02
140	180.00	4.445	4.090E+02	141	180.00	5.715	4.410E+02	142	180.00	6.985	4.010E+02	143	202.50	2.445	5.340E+02
144	202.50	3.175	4.950E+02	145	202.50	4.445	4.030E+02	146	202.50	5.715	4.580E+02	147	202.50	6.985	4.090E+02
148	245.00	3.175	5.060E+02	149	225.00	4.445	4.820E+02	150	225.00	5.715	4.560E+02	151	225.00	6.985	4.120E+02
152	247.50	2.445	5.280E+02	153	247.50	3.175	5.000E+02	154	247.50	4.445	4.810E+02	155	247.50	5.715	4.060E+02
156	247.50	6.985	4.510E+02	157	270.00	2.445	5.130E+02	158	270.00	3.175	4.900E+02	159	270.00	4.445	5.170E+02
160	270.00	5.715	4.410E+02	161	270.00	6.985	3.930E+02	162	292.50	2.445	4.960E+02	163	292.50	3.175	4.960E+02
164	292.50	4.445	4.830E+02	165	292.50	5.715	4.970E+02	166	292.50	6.985	3.780E+02	167	315.00	3.175	4.810E+02
168	315.00	4.445	4.610E+02	169	315.00	5.715	4.170E+02	170	315.00	6.985	3.630E+02	171	337.50	2.445	4.950E+02
172	337.50	3.175	5.020E+02	173	337.50	4.445	4.570E+02	174	337.50	5.715	4.140E+02	175	337.50	6.985	4.060E+02

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 102
 PLATE NO.....D5
 PLATE LOCATION..1

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	108.43	2.214	4.290E+02	2	90.00	2.100	4.050E+02	3	71.57	2.214	4.200E+02	4	135.00	1.980	4.190E+02	5	116.57	1.565	4.270E+02
5	116.57	1.565	4.270E+02	6	90.00	1.400	4.230E+02	7	63.43	1.565	4.570E+02	8	45.00	1.980	4.250E+02	9	161.57	2.214	4.020E+02
13	45.00	0.990	4.220E+02	14	26.57	1.565	4.410E+02	15	18.43	2.214	3.970E+02	16	180.00	2.100	4.380E+02	17	180.00	1.400	4.150E+02
21	0.	1.400	4.710E+02	22	0.	2.100	4.720E+02	23	198.43	2.214	4.020E+02	24	205.57	1.565	4.200E+02	25	225.00	0.990	4.060E+02
29	341.57	2.214	3.690E+02	30	225.00	1.980	4.180E+02	31	243.43	1.565	4.080E+02	32	270.00	1.400	4.170E+02	33	295.57	1.565	4.270E+02
37	286.43	2.214	4.060E+02	38	0.	3.000	4.540E+02	39	0.	4.500	3.490E+02	40	0.	6.000	3.150E+02	41	0.	7.500	2.590E+02
45	45.00	7.500	2.830E+02	46	90.00	3.000	3.990E+02	47	90.00	4.500	3.910E+02	48	90.00	6.000	3.550E+02	49	90.00	7.500	3.400E+02
53	135.00	7.500	2.940E+02	54	180.00	3.000	4.010E+02	55	180.00	4.500	3.880E+02	56	180.00	6.000	3.340E+02	57	180.00	7.500	2.810E+02
61	225.00	7.500	2.780E+02	62	270.00	3.000	4.060E+02	63	270.00	4.500	3.710E+02	64	270.00	6.000	3.610E+02	65	270.00	7.500	2.920E+02
69	315.00	7.500	2.510E+02	70	315.00	3.000	3.920E+02	71	315.00	4.500	3.600E+02	72	315.00	6.000	3.130E+02	73	315.00	7.500	2.510E+02

RUN DATE.....3/18/70
 PARTICLE.....PHOTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 102
 PLATE NO.....D6
 PLATE LOCATION..2

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	108.43	2.214	4.460E+02	2	90.00	2.100	4.230E+02	3	71.57	2.214	4.270E+02	4	135.00	1.980	4.390E+02				
5	116.57	1.565	4.000E+02	6	90.00	1.400	4.370E+02	7	63.43	1.565	4.190E+02	8	45.00	1.980	4.670E+02				
9	161.57	2.214	3.850E+02	10	133.43	1.565	5.000E+02	11	135.00	0.990	4.470E+02	12	90.00	0.700	5.130E+02				
13	45.00	0.990	4.330E+02	14	26.57	1.565	4.270E+02	15	18.43	2.214	4.250E+02	16	180.00	2.100	4.350E+02				
17	180.00	1.400	4.250E+02	18	180.00	0.700	4.360E+02	19	0.	0.	4.310E+02	20	0.	0.700	4.180E+02				
21	0.	1.400	4.780E+02	22	0.	2.100	4.000E+02	23	198.43	2.214	4.150E+02	24	206.57	1.565	4.380E+02				
25	225.00	0.990	4.300E+02	26	270.00	0.700	4.220E+02	27	315.00	0.990	4.150E+02	28	333.43	1.565	4.220E+02				
29	341.57	2.214	4.600E+02	30	225.00	1.980	4.250E+02	31	243.43	1.565	4.530E+02	32	270.00	1.400	4.340E+02				
33	296.57	1.565	4.770E+02	34	315.00	1.980	4.060E+02	35	251.57	2.214	4.210E+02	36	270.00	2.100	4.780E+02				
37	288.43	2.214	4.120E+02	38	0.	3.000	3.980E+02	39	0.	4.500	3.570E+02	40	0.	6.000	3.090E+02				
41	0.	7.500	2.550E+02	42	45.00	3.000	4.050E+02	43	45.00	4.500	3.920E+02	44	45.00	6.000	3.360E+02				
45	45.00	7.500	2.930E+02	46	90.00	3.000	4.180E+02	47	90.00	4.500	3.800E+02	48	90.00	6.000	3.600E+02				
49	90.00	7.500	3.050E+02	50	135.00	3.000	4.070E+02	51	135.00	4.500	3.910E+02	52	135.00	6.000	3.570E+02				
53	135.00	7.500	3.040E+02	54	180.00	3.000	4.090E+02	55	180.00	4.500	3.800E+02	56	180.00	6.000	3.390E+02				
57	180.00	7.500	2.990E+02	58	225.00	3.000	4.230E+02	59	225.00	4.500	3.870E+02	60	225.00	6.000	3.220E+02				
61	225.00	7.500	2.920E+02	62	270.00	3.000	3.820E+02	63	270.00	4.500	3.720E+02	64	270.00	6.000	3.200E+02				
65	270.00	7.500	3.350E+02	66	315.00	3.000	3.930E+02	67	315.00	4.500	3.520E+02	68	315.00	6.000	3.070E+02				
69	315.00	7.500	2.750E+02																

DATE.....9/16/78
 ICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FP RUN 102
 PLATE NO.....D7
 PLATE LOCATION..3

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	71.57	2.214	5.390E+02	2	90.00	2.100	4.290E+02	3	108.43	2.214	5.250E+02	4	135.00	1.980	4.490E+02
5	63.43	1.565	4.220E+02	6	90.00	1.400	4.470E+02	7	116.57	1.565	4.320E+02	8	135.00	1.980	4.330E+02
9	19.43	2.214	4.290E+02	10	26.57	1.565	4.440E+02	11	143.00	0.990	5.050E+02	12	90.00	0.700	5.170E+02
13	135.00	0.990	4.560E+02	14	153.43	1.565	4.450E+02	15	161.57	2.214	4.350E+02	16	0.00	2.100	4.140E+02
17	0.00	1.400	4.420E+02	18	0.00	0.700	4.340E+02	19	0.00	0.00	4.430E+02	20	180.00	0.700	4.400E+02
21	180.00	1.400	4.220E+02	22	180.00	2.100	4.180E+02	23	341.57	2.214	4.180E+02	24	333.43	1.565	4.220E+02
25	315.00	0.990	4.570E+02	26	270.00	0.700	4.540E+02	27	225.00	0.990	4.640E+02	28	206.57	1.565	4.410E+02
29	198.43	2.214	4.080E+02	30	315.00	1.980	4.360E+02	31	296.57	1.565	4.280E+02	32	270.00	1.400	4.420E+02
33	243.43	1.565	4.390E+02	34	225.00	1.980	4.290E+02	35	288.43	2.214	4.300E+02	36	270.00	2.100	5.360E+02
37	251.57	2.214	4.350E+02	38	180.00	3.000	4.220E+02	39	180.00	4.500	3.630E+02	40	180.00	6.000	3.190E+02
41	180.00	7.500	2.840E+02	42	135.00	3.000	4.160E+02	43	135.00	4.500	3.820E+02	44	135.00	6.000	3.250E+02
45	135.00	7.500	3.000E+02	46	90.00	3.000	4.390E+02	47	90.00	4.500	5.130E+02	48	90.00	6.000	3.540E+02
49	90.00	7.500	2.930E+02	50	45.00	3.000	4.420E+02	51	45.00	4.500	4.280E+02	52	45.00	6.000	3.760E+02
53	45.00	7.900	3.380E+02	54	0.00	3.000	4.220E+02	55	0.00	4.500	4.040E+02	56	0.00	6.000	3.830E+02
57	0.00	7.500	3.800E+02	58	315.00	3.000	4.280E+02	59	315.00	4.500	3.860E+02	60	315.00	6.000	3.700E+02
61	315.00	7.500	3.050E+02	62	270.00	3.000	4.190E+02	63	270.00	4.500	3.880E+02	64	270.00	6.000	3.470E+02
65	270.00	7.500	3.000E+02	66	225.00	3.000	4.220E+02	67	225.00	4.500	4.340E+02	68	225.00	6.000	3.260E+02
69	225.00	7.500	2.670E+02												

RUN DATE.....3/16/78
 PARTICLE.....PHOTON
 BEAM ENERGY.....250 MEV
 TARGT.....EP RUN 102
 PLATE NO.....D8
 PLATE LOCATION..4

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	7.850E+00	1	127.88	2.065	9.130E+00	2	119.06	1.883	1.170E+01	3	108.44	1.735	3.430E+01	4	96.34	1.556	1.240E+01	
4	96.34	1.556	1.240E+01	5	83.66	1.656	1.150E+01	6	71.57	1.735	1.150E+01	7	60.95	1.883	1.070E+01	8	52.13	2.085	9.940E+00	
12	125.54	1.573	3.070E+01	13	113.20	1.393	1.660E+01	14	90.13	1.293	1.470E+01	15	81.87	1.293	1.370E+01	16	66.80	1.393	1.360E+01	
20	150.95	1.883	1.240E+01	21	144.46	1.573	1.360E+01	22	135.00	1.293	1.270E+01	23	120.96	1.066	1.470E+01	24	101.31	0.933	1.400E+01	
28	35.54	1.573	1.290E+01	29	29.06	1.883	1.010E+01	30	161.57	1.735	1.450E+01	31	156.80	1.393	1.450E+01	32	149.04	1.066	1.470E+01	
36	45.00	0.776	1.410E+01	37	30.96	1.066	1.450E+01	38	23.20	1.393	1.330E+01	39	18.44	1.735	3.380E+01	40	173.66	1.656	1.380E+01	
44	135.00	0.259	1.490E+01	45	45.00	0.259	1.540E+01	46	18.44	0.570	1.590E+01	47	11.31	0.933	1.500E+01	48	8.13	1.293	1.420E+01	
52	191.31	0.933	1.370E+01	53	198.44	0.570	1.680E+01	54	225.00	0.259	2.700E+01	55	315.00	0.259	2.560E+01	56	341.57	0.570	1.400E+01	
60	133.44	1.735	1.200E+01	61	203.20	1.293	2.960E+01	62	210.96	1.066	1.430E+01	63	225.00	0.776	1.510E+01	64	251.57	0.570	1.310E+01	
68	339.80	1.393	1.320E+01	69	341.57	1.735	3.440E+01	70	209.05	1.883	1.310E+01	71	215.54	1.573	1.430E+01	72	225.00	1.293	1.400E+01	
76	300.96	1.066	1.380E+01	77	315.00	1.293	1.190E+01	78	324.46	1.573	1.160E+01	79	330.55	1.883	9.370E+00	80	217.88	2.085	1.100E+01	
84	261.87	1.293	2.940E+01	85	278.13	1.293	1.350E+01	86	293.20	1.393	1.440E+01	87	305.54	1.573	1.620E+01	88	315.00	1.810	1.470E+01	
92	240.95	1.883	1.400E+01	93	251.57	1.735	1.320E+01	94	263.66	1.656	1.610E+01	95	276.34	1.656	1.420E+01	96	288.44	1.735	1.440E+01	
100	0	2.445	9.570E+00	101	0	3.175	9.130E+00	102	0	4.445	4.950E+00	103	0	5.715	4.200E+00	104	0	6.985	4.560E+00	
108	22.50	5.715	2.520E+00	109	22.50	6.985	2.360E+00	110	45.00	3.175	6.430E+00	111	45.00	4.445	5.860E+00	112	45.00	5.715	4.670E+00	
116	67.50	4.445	3.430E+00	117	67.50	5.715	2.690E+00	118	67.50	6.985	2.530E+00	119	90.00	2.445	8.770E+00	120	90.00	3.175	5.830E+00	
124	112.50	2.445	8.170E+00	125	112.50	4.445	6.680E+00	126	112.50	5.715	5.530E+00	127	112.50	6.985	4.460E+01	128	112.50	8.170E+00	2.445	9.400E+00
132	135.00	6.985	2.520E+00	133	135.00	3.175	6.700E+00	134	135.00	4.445	5.230E+00	135	135.00	5.715	4.580E+00	136	135.00	6.985	3.870E+00	
140	160.00	5.715	2.640E+00	141	157.50	2.445	9.940E+00	142	180.00	3.175	5.500E+00	143	157.50	4.445	3.150E+00	144	160.00	4.445	2.640E+00	
148	202.50	4.445	4.920E+00	149	180.00	6.985	2.540E+00	150	202.50	5.715	4.400E+00	151	180.00	3.175	7.670E+00	152	202.50	3.175	5.700E+00	
156	225.00	3.175	7.380E+00	157	202.50	4.445	3.360E+00	158	225.00	5.715	2.550E+00	159	202.50	6.985	2.570E+00	160	225.00	3.175	7.080E+00	
164	247.50	2.445	1.010E+01	165	225.00	3.175	5.680E+00	166	247.50	4.445	3.150E+00	167	225.00	5.715	2.630E+00	168	247.50	6.985	3.670E+00	
172	270.00	5.715	2.370E+00	173	270.00	2.445	1.010E+01	174	270.00	3.175	8.680E+00	175	270.00	4.445	4.810E+00	176	270.00	5.715	3.670E+00	
180	292.50	4.445	3.200E+00	181	270.00	6.985	3.640E+00	182	292.50	2.445	1.020E+01	183	292.50	3.175	6.200E+00	184	292.50	4.445	4.810E+00	
188	315.00	4.445	4.560E+00	189	292.50	5.715	2.410E+00	190	315.00	6.985	3.200E+00	191	315.00	8.170E+00	7.300E+00	192	315.00	9.370E+00	1.130E+01	
196	337.50	3.175	5.620E+00	197	315.00	5.715	3.950E+00	198	337.50	6.985	2.440E+00	199	337.50	8.170E+00	2.300E+00	200	337.50	9.370E+00	3.430E+01	

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGT.....FP RUN 102
 PLATE NO.....D9
 PLATE LOCATION..5

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	71.57	2.214	5.290E+02	22	90.00	2.100	5.180E+02	3	108.43	2.214	5.080E+02	4	45.00	1.980	5.380E+02	25	315.00	0.990	5.070E+02
5	63.43	1.565	4.990E+02	6	90.00	1.400	5.400E+02	7	116.57	1.565	5.420E+02	8	135.00	1.980	5.300E+02	26	270.00	0.700	5.200E+02
9	18.43	2.214	6.300E+02	10	26.57	1.565	6.640E+02	11	45.00	0.990	5.440E+02	12	90.00	0.700	5.390E+02	27	225.00	0.990	5.180E+02
13	135.00	0.990	6.230E+02	14	153.43	1.565	4.850E+02	15	161.57	2.214	5.040E+02	16	0.	2.100	5.170E+02	28	206.57	1.565	6.180E+02
17	0.	1.400	5.260E+02	18	0.	0.700	5.250E+02	19	0.	0.	5.170E+02	20	180.00	0.700	4.900E+02	29	198.43	2.214	4.820E+02
21	180.00	1.400	4.630E+02	22	180.00	2.100	5.020E+02	23	341.57	2.214	6.710E+02	24	333.43	1.565	5.110E+02	30	315.00	1.980	6.630E+02
25	315.00	0.990	5.070E+02	26	270.00	0.700	5.200E+02	27	225.00	0.990	5.180E+02	28	206.57	1.565	6.180E+02	31	296.57	1.565	5.120E+02
29	198.43	2.214	4.820E+02	30	315.00	1.980	6.630E+02	31	296.57	1.565	5.120E+02	32	270.00	1.400	4.950E+02	33	243.43	1.565	6.460E+02
33	243.43	1.565	6.460E+02	34	225.00	1.980	5.230E+02	35	288.43	2.214	6.500E+02	36	270.00	2.100	5.100E+02	37	251.57	2.214	4.930E+02
37	251.57	2.214	4.930E+02	38	180.00	3.000	4.920E+02	39	180.00	4.500	4.560E+02	40	180.00	6.000	3.010E+02	41	180.00	7.500	3.430E+02
41	180.00	7.500	3.430E+02	42	135.00	3.000	6.350E+02	43	135.00	4.500	4.670E+02	44	135.00	6.000	3.080E+02	45	135.00	7.500	3.630E+02
45	135.00	7.500	3.630E+02	46	90.00	3.000	4.980E+02	47	90.00	4.500	4.730E+02	48	90.00	6.000	4.400E+02	49	90.00	7.500	4.770E+02
49	90.00	7.500	4.770E+02	50	45.00	3.000	5.090E+02	51	45.00	4.500	5.180E+02	52	45.00	6.000	4.530E+02	53	45.00	7.500	3.860E+02
53	45.00	7.500	3.860E+02	54	0.	3.000	5.220E+02	55	0.	4.500	4.550E+02	56	0.	6.000	4.310E+02	57	0.	7.500	4.440E+02
57	0.	7.500	4.440E+02	58	315.00	3.000	5.110E+02	59	315.00	4.500	4.720E+02	60	315.00	6.000	4.240E+02	61	315.00	7.500	3.820E+02
61	315.00	7.500	3.820E+02	62	270.00	3.000	4.720E+02	63	270.00	4.500	6.000E+02	64	270.00	6.000	4.080E+02	65	270.00	7.500	3.410E+02
65	270.00	7.500	3.410E+02	66	225.00	3.000	4.990E+02	67	225.00	4.500	4.530E+02	68	225.00	6.000	4.600E+02	69	225.00	7.500	3.360E+02

RUN DATE.....3/16/78
 PARTICLE.....PROTON
 BEAM ENERGY.....250 MEV
 TARGET.....FF RUN 102
 PLATE NO.....PC
 PLATE LOCATION..3

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.320	5.340E+02	1	127.68	2.085	5.360E+02	2	119.06	1.683	5.370E+02	3	108.44	1.735	5.570E+02
4	96.34	1.656	7.910E+02	5	83.66	1.656	5.220E+02	6	71.57	1.735	5.140E+02	7	60.95	1.683	5.390E+02
8	52.13	2.085	5.460E+02	9	45.00	2.328	5.250E+02	10	142.10	2.085	5.480E+02	11	135.00	1.810	5.450E+02
12	125.54	1.573	5.360E+02	13	113.20	1.393	5.580E+02	14	98.13	1.293	5.660E+02	15	81.87	1.293	5.500E+02
16	66.80	1.573	5.490E+02	17	54.46	1.573	5.390E+02	18	45.00	1.810	5.210E+02	19	37.88	2.085	5.190E+02
20	150.95	1.833	5.430E+02	21	144.46	1.573	5.470E+02	22	135.00	1.293	5.970E+02	23	120.86	1.066	7.060E+02
24	101.31	0.933	5.430E+02	25	78.69	0.933	5.480E+02	26	59.04	1.066	5.420E+02	27	45.00	1.293	5.500E+02
28	35.54	1.573	7.370E+02	29	29.06	1.883	5.520E+02	30	161.57	1.735	5.120E+02	31	156.80	1.393	5.580E+02
32	149.04	1.066	5.370E+02	33	135.00	0.776	5.470E+02	34	100.44	0.578	5.430E+02	35	71.57	0.578	5.580E+02
36	13.99	0.776	5.430E+02	37	30.96	1.066	5.300E+02	38	23.20	1.393	5.330E+02	39	18.44	1.735	5.400E+02
40	173.00	1.066	5.450E+02	41	171.87	1.293	5.460E+02	42	168.69	0.933	5.450E+02	43	161.57	0.578	5.400E+02
44	135.00	0.259	5.240E+02	45	45.00	0.259	5.480E+02	46	18.44	0.578	5.460E+02	47	11.31	0.933	7.750E+02
48	8.13	1.293	5.470E+02	49	6.34	1.656	5.220E+02	50	106.34	1.656	5.600E+02	51	168.13	1.293	5.540E+02
52	191.31	0.933	7.730E+02	53	198.44	0.578	5.660E+02	54	225.00	0.259	5.530E+02	55	315.00	0.259	5.410E+02
56	341.57	0.578	5.470E+02	57	348.69	0.933	5.340E+02	58	351.87	1.293	7.610E+02	59	353.66	1.656	5.010E+02
60	198.44	1.735	5.310E+02	61	203.20	1.393	5.940E+02	62	210.95	1.066	5.320E+02	63	225.00	0.776	5.240E+02
64	251.57	0.578	7.440E+02	65	238.44	0.578	5.460E+02	66	315.00	0.776	5.530E+02	67	329.09	1.066	5.310E+02
68	336.80	1.393	5.250E+02	69	341.57	1.735	5.090E+02	70	309.05	1.883	5.430E+02	71	215.54	1.573	7.630E+02
72	325.00	1.293	5.360E+02	73	239.04	1.066	7.510E+02	74	250.69	0.933	5.550E+02	75	201.31	0.933	5.430E+02
76	300.96	1.066	5.510E+02	77	315.00	1.293	5.370E+02	78	324.46	1.573	5.720E+02	79	330.95	1.883	5.410E+02
80	217.68	2.085	5.130E+02	81	225.00	1.810	5.300E+02	82	234.46	1.573	7.260E+02	83	246.80	1.393	5.500E+02
84	161.87	1.293	5.220E+02	85	276.13	1.293	5.250E+02	86	293.20	1.393	5.030E+02	87	305.54	1.573	5.200E+02
88	315.00	1.810	5.300E+02	89	322.13	2.085	5.270E+02	90	225.00	2.328	5.140E+02	91	232.13	2.085	5.470E+02
92	240.95	1.883	7.330E+02	93	251.57	1.735	5.350E+02	94	263.66	1.656	7.570E+02	95	276.34	1.656	5.500E+02
96	208.44	1.735	5.160E+02	97	299.08	1.883	7.270E+02	98	307.88	2.085	5.500E+02	99	315.00	2.328	5.470E+02
100	0	2.445	7.480E+02	101	0	3.175	5.370E+02	102	0	4.445	4.510E+02	103	0	5.715	4.370E+02
104	0	9.985	3.600E+02	105	22.50	2.445	5.220E+02	106	22.50	3.175	5.270E+02	107	22.50	4.445	4.810E+02
108	0	5.715	4.570E+02	109	22.50	6.985	3.880E+02	110	45.00	3.175	5.260E+02	111	45.00	4.445	5.230E+02
112	67.50	5.715	4.610E+02	113	45.00	6.985	3.500E+02	114	67.50	2.445	7.590E+02	115	67.50	3.175	4.990E+02
116	67.50	1.445	5.010E+02	117	67.50	5.715	4.500E+02	118	67.50	6.985	4.200E+02	119	90.00	2.445	5.400E+02
120	90.00	3.175	5.460E+02	121	90.00	4.445	5.250E+02	122	90.00	5.715	4.820E+02	123	90.00	6.985	4.100E+02
124	112.50	2.445	5.430E+02	125	112.50	3.175	5.670E+02	126	112.50	4.445	5.220E+02	127	112.50	5.715	4.590E+02
128	112.50	6.985	4.420E+02	129	135.00	1.735	7.760E+02	130	135.00	4.445	5.250E+02	131	135.00	5.715	4.760E+02
132	135.00	6.985	5.990E+02	133	157.50	2.445	5.270E+02	134	157.50	3.175	5.560E+02	135	157.50	4.445	5.000E+02
136	157.50	3.175	4.790E+02	137	157.50	6.985	5.240E+02	138	180.00	2.445	5.360E+02	139	180.00	3.175	5.400E+02
140	180.00	1.445	5.010E+02	141	180.00	5.715	6.810E+02	142	180.00	6.985	4.080E+02	143	202.50	2.445	5.510E+02
144	202.50	3.175	5.130E+02	145	202.50	4.445	7.350E+02	146	202.50	5.715	4.740E+02	147	202.50	6.985	4.190E+02
148	202.50	1.735	5.290E+02	149	225.00	2.445	4.950E+02	150	225.00	5.715	4.630E+02	151	225.00	6.985	4.070E+02
152	247.50	2.445	5.380E+02	153	247.50	3.175	5.470E+02	154	247.50	4.445	5.140E+02	155	247.50	5.715	4.700E+02
156	247.50	6.985	4.130E+02	157	270.00	2.445	5.050E+02	158	270.00	3.175	5.200E+02	159	270.00	4.445	4.700E+02
160	270.00	5.715	4.130E+02	161	270.00	6.985	3.910E+02	162	292.50	2.445	5.190E+02	163	292.50	3.175	7.600E+02
164	292.50	4.445	4.730E+02	165	352.50	5.715	6.410E+02	166	292.50	6.985	5.520E+02	167	315.00	3.175	5.500E+02
168	315.00	4.445	4.280E+02	169	315.00	5.715	4.300E+02	170	315.00	6.985	3.590E+02	171	337.50	2.445	5.160E+02
172	337.50	3.175	4.850E+02	173	337.50	4.445	4.800E+02	174	337.50	5.715	4.100E+02	175	337.50	6.985	3.670E+02

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	108.43	2.214	9.120E+01	16	90.00	2.100	9.910E+01	3	71.57	2.214	7.500E+01	1	135.00	1.500	1.500E+02
2	108.43	2.214	9.770E+01	17	90.00	1.400	1.020E+02	4	63.43	1.565	9.800E+02	2	135.00	1.500	1.500E+02
3	116.57	2.214	9.300E+01	18	133.43	1.565	9.970E+01	5	135.00	0.900	1.000E+02	3	180.00	0.700	1.700E+02
4	161.57	2.214	1.020E+02	19	136.57	1.565	9.320E+01	6	18.43	0.214	1.100E+02	4	180.00	0.700	1.700E+02
5	161.57	2.214	1.020E+02	20	180.00	0.200	1.160E+02	7	0.00	0.214	1.100E+02	5	200.43	0.565	1.100E+02
6	180.00	1.400	9.840E+01	21	0.00	0.700	0.440E+01	8	198.43	0.214	1.100E+02	6	200.43	0.565	1.100E+02
7	180.00	1.400	9.930E+01	22	270.00	0.700	0.440E+01	9	315.00	0.990	1.300E+02	7	270.00	1.400	1.400E+01
8	225.00	0.990	1.070E+02	23	270.00	1.580	0.820E+01	10	315.00	0.990	1.300E+02	8	270.00	1.400	1.400E+01
9	225.00	0.990	1.070E+02	24	315.00	1.580	0.820E+01	11	315.00	0.990	1.300E+02	9	315.00	1.400	1.400E+01
10	266.43	2.214	9.440E+01	25	0.00	3.000	0.740E+01	12	45.00	0.400	1.300E+02	10	45.00	0.900	1.300E+02
11	266.43	2.214	9.280E+01	26	0.00	3.000	0.870E+01	13	45.00	0.400	1.300E+02	11	45.00	0.900	1.300E+02
12	45.00	3.000	6.620E+01	27	45.00	3.000	6.300E+01	14	135.00	0.400	1.300E+02	12	135.00	0.900	1.300E+02
13	45.00	3.000	6.620E+01	28	135.00	3.000	6.300E+01	15	180.00	0.400	1.300E+02	13	180.00	0.900	1.300E+02
14	135.00	3.000	6.300E+01	29	135.00	3.000	6.300E+01	16	225.00	0.400	1.300E+02	14	225.00	0.900	1.300E+02
15	135.00	3.000	6.300E+01	30	225.00	3.000	6.860E+01	17	270.00	0.400	1.300E+02	15	270.00	0.900	1.300E+02
16	225.00	3.000	6.860E+01	31	270.00	3.000	6.860E+01	18	315.00	0.400	1.300E+02	16	315.00	0.900	1.300E+02
17	270.00	3.000	6.860E+01	32	315.00	3.000	6.430E+01	19	315.00	0.400	1.300E+02	17	315.00	0.900	1.300E+02
18	315.00	3.000	6.430E+01	33	315.00	3.000	6.430E+01	20	315.00	0.400	1.300E+02	18	315.00	0.900	1.300E+02
19	315.00	3.000	6.430E+01	34	315.00	3.000	6.430E+01	21	315.00	0.400	1.300E+02	19	315.00	0.900	1.300E+02
20	315.00	3.000	6.430E+01	35	315.00	3.000	6.430E+01	22	315.00	0.400	1.300E+02	20	315.00	0.900	1.300E+02
21	315.00	3.000	6.430E+01	36	315.00	3.000	6.430E+01	23	315.00	0.400	1.300E+02	21	315.00	0.900	1.300E+02
22	315.00	3.000	6.430E+01	37	315.00	3.000	6.430E+01	24	315.00	0.400	1.300E+02	22	315.00	0.900	1.300E+02
23	315.00	3.000	6.430E+01	38	315.00	3.000	6.430E+01	25	315.00	0.400	1.300E+02	23	315.00	0.900	1.300E+02
24	315.00	3.000	6.430E+0												

RUN DATE 3/16/78
 PARTICLE PROTON
 BEAM ENERGY 250 MEV
 TARGET EP RUN 102
 PLATE NO. P9
 PLATE LOCATION. . 4

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	7.850E+00	1	127.88	2.085	9.130E+00	2	119.06	1.883	1.170E+01	3	108.44	1.735	3.430E+01				
4	95.94	1.656	1.240E+01	5	83.66	1.656	1.150E+01	6	71.57	1.735	1.150E+01	7	60.95	1.883	1.070E+01				
8	52.13	2.085	1.050E+01	9	45.00	2.328	8.150E+00	10	142.10	2.085	9.940E+00	11	135.00	1.810	1.220E+01				
12	123.54	1.573	3.070E+01	13	113.20	1.393	1.660E+01	14	98.13	1.293	1.470E+01	15	81.87	1.293	1.370E+01				
16	66.00	1.393	1.360E+01	17	54.46	1.573	1.260E+01	18	45.00	1.810	1.150E+01	19	37.88	2.085	9.150E+00				
20	150.95	1.883	1.240E+01	21	144.16	1.573	1.360E+01	22	135.00	1.293	1.270E+01	23	120.95	1.066	1.470E+01				
24	101.31	0.933	1.400E+01	25	70.69	0.933	2.710E+01	26	59.04	1.066	1.490E+01	27	45.00	1.293	2.850E+01				
28	35.51	1.573	1.230E+01	29	29.06	1.883	1.010E+01	30	161.57	1.735	1.450E+01	31	156.80	1.393	1.450E+01				
32	149.04	1.066	1.470E+01	33	135.00	0.776	1.540E+01	34	108.44	0.578	1.780E+01	35	71.57	0.578	1.770E+01				
36	45.00	0.776	1.410E+01	37	30.96	1.066	1.450E+01	38	23.20	1.393	1.330E+01	39	18.44	1.735	3.380E+01				
40	173.66	1.656	1.380E+01	41	171.87	1.293	1.480E+01	42	168.69	0.933	1.460E+01	43	161.57	0.578	1.630E+01				
44	135.00	0.259	1.490E+01	45	45.00	0.259	1.540E+01	46	18.44	0.578	1.590E+01	47	11.31	0.933	1.500E+01				
48	3.13	1.293	1.420E+01	49	6.34	1.656	1.250E+01	50	186.34	1.656	1.300E+01	51	188.13	1.293	1.310E+01				
52	191.31	0.933	1.370E+01	53	198.44	0.578	1.680E+01	54	225.00	0.259	2.700E+01	55	315.00	0.259	2.660E+01				
56	341.57	0.578	1.400E+01	57	348.69	0.933	1.300E+01	58	351.87	1.293	1.290E+01	59	353.66	1.656	1.160E+01				
60	138.44	1.735	1.200E+01	61	203.20	1.293	2.960E+01	62	210.96	1.066	1.430E+01	63	225.00	0.776	1.510E+01				
64	251.57	0.578	1.310E+01	65	288.44	0.578	1.260E+01	66	315.00	0.776	1.290E+01	67	323.00	1.066	2.740E+01				
68	336.80	1.393	1.320E+01	69	341.57	1.735	3.440E+01	70	209.05	1.883	1.313E+01	71	215.54	1.573	1.430E+01				
72	225.00	1.293	1.340E+01	73	239.04	1.066	1.490E+01	74	258.69	0.933	1.350E+01	75	281.31	0.933	2.840E+01				
76	300.96	1.066	1.380E+01	77	315.00	1.233	1.180E+01	78	324.46	1.573	1.160E+01	79	330.95	1.883	9.570E+00				
80	217.88	2.085	1.100E+01	81	225.00	1.810	1.200E+01	82	234.46	1.573	1.280E+01	83	246.80	1.393	1.300E+01				
84	261.87	1.293	2.940E+01	85	278.13	1.293	1.350E+01	86	293.20	1.393	1.440E+01	87	305.54	1.573	1.820E+01				
88	315.00	1.810	1.470E+01	89	322.13	2.085	1.030E+01	90	225.00	2.328	1.000E+01	91	232.13	2.085	1.140E+01				
92	240.95	1.883	1.400E+01	93	251.57	1.735	1.320E+01	94	263.66	1.656	1.610E+01	95	276.34	1.656	1.420E+01				
96	288.44	1.735	1.440E+01	97	299.06	1.883	1.250E+01	98	307.88	2.085	1.370E+01	99	315.00	2.328	9.240E+00				
100	0.	2.445	9.570E+00	101	0.	3.175	9.130E+00	102	0.	4.445	4.980E+00	103	0.	5.715	4.200E+00				
104	0.	6.985	4.560E+00	105	22.50	2.445	8.190E+00	106	22.50	3.175	5.440E+00	107	22.50	4.445	6.400E+00				
108	22.50	5.715	2.520E+00	109	22.50	6.985	2.360E+00	110	45.00	3.175	6.430E+00	111	45.00	4.445	5.860E+00				
112	45.00	5.715	4.670E+00	113	45.00	6.985	3.440E+00	114	67.50	2.445	8.720E+00	115	67.50	3.175	8.830E+00				
116	67.50	4.445	3.430E+00	117	67.50	5.715	2.690E+00	118	67.50	6.985	2.530E+00	119	90.00	2.445	8.770E+00				
120	90.00	3.175	0.170E+00	121	90.00	4.445	6.680E+00	122	90.00	5.715	5.530E+00	123	90.00	6.985	4.460E+00				
124	112.50	2.445	9.400E+00	125	112.50	3.175	5.520E+00	126	112.50	4.445	3.340E+00	127	112.50	5.715	5.880E+00				
128	112.50	6.985	2.520E+00	129	135.00	3.175	6.700E+00	130	135.00	4.445	5.230E+00	131	135.00	5.715	4.580E+00				
132	135.00	6.985	3.870E+00	133	157.50	2.445	9.940E+00	134	157.50	3.175	5.500E+00	135	157.50	4.445	3.150E+00				
136	157.50	5.715	2.640E+00	137	157.50	6.985	2.840E+00	138	180.00	2.445	4.400E+00	139	180.00	3.175	7.370E+00				
140	180.00	4.445	4.820E+00	141	180.00	5.715	4.400E+00	142	180.00	6.985	4.090E+00	143	202.50	2.445	9.080E+00				
144	202.50	3.175	5.700E+00	145	202.50	4.445	3.360E+00	146	202.50	5.715	2.550E+00	147	202.50	6.985	2.570E+00				
148	225.00	3.175	7.380E+00	149	225.00	4.445	4.790E+00	150	225.00	5.715	5.310E+00	151	225.00	6.985	3.670E+00				
152	247.50	2.445	1.010E+01	153	247.50	3.175	5.680E+00	154	247.50	4.445	3.150E+00	155	247.50	5.715	2.630E+00				
156	247.50	6.985	2.370E+00	157	270.00	2.445	1.010E+01	158	270.00	3.175	8.680E+00	159	270.00	4.445	4.810E+00				
160	270.00	5.715	3.670E+00	161	270.00	6.985	3.640E+00	162	292.50	2.445	1.020E+01	163	292.50	3.175	6.200E+00				
164	292.50	4.445	3.240E+00	165	292.50	5.715	2.840E+00	166	315.00	6.985	4.400E+00	167	315.00	8.175	7.300E+00				
168	315.00	4.445	4.660E+00	169	315.00	5.715	3.950E+00	170	315.00	6.985	3.280E+00	171	337.50	2.445	9.130E+00				
172	337.50	3.175	5.620E+00	173	337.50	4.445	3.060E+00	174	337.50	5.715	2.440E+00	175	337.50	6.985	2.300E+00				

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 110
 PLATE NO.....P1
 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	9.390E+01	1	127.88	2.085	9.110E+01	2	119.06	1.883	1.060E+02	3	108.44	1.735	1.040E+02	4	96.34	1.656	1.080E+02
4	96.34	1.656	1.070E+02	5	83.66	1.656	1.100E+02	6	71.57	1.735	1.140E+02	7	60.95	1.883	1.080E+02	8	52.13	2.085	1.080E+02
8	52.13	2.085	1.140E+02	9	45.00	2.328	1.060E+02	10	142.10	2.085	9.960E+01	11	135.00	1.810	1.150E+02	12	125.54	1.573	1.100E+02
12	125.54	1.573	1.100E+02	13	113.20	1.393	1.070E+02	14	98.13	1.293	1.160E+02	15	81.87	1.293	1.150E+02	16	66.80	1.393	1.140E+02
16	66.80	1.393	1.140E+02	17	54.46	1.573	1.120E+02	18	45.00	1.810	1.130E+02	19	37.88	2.085	9.150E+01	20	150.95	1.883	1.180E+02
20	150.95	1.883	1.180E+02	21	144.46	1.573	1.160E+02	22	135.00	1.293	1.180E+02	23	120.96	1.066	1.190E+02	24	101.31	0.933	1.070E+02
24	101.31	0.933	1.070E+02	25	78.69	0.933	1.210E+02	26	59.04	1.066	1.230E+02	27	45.00	1.293	9.990E+01	28	35.64	1.573	1.170E+02
28	35.64	1.573	1.170E+02	29	29.06	1.883	9.640E+01	30	181.37	1.735	1.120E+02	31	156.80	1.393	1.130E+02	32	149.04	1.066	1.150E+02
32	149.04	1.066	1.150E+02	33	135.00	0.776	1.280E+02	34	108.44	0.578	1.190E+02	35	71.57	0.578	1.040E+02	36	45.00	0.776	1.240E+02
36	45.00	0.776	1.240E+02	37	30.96	1.066	1.080E+02	38	23.20	1.393	1.260E+02	39	18.44	1.735	9.890E+01	40	173.66	1.656	1.160E+02
40	173.66	1.656	1.160E+02	41	171.87	1.293	1.200E+02	42	168.69	0.933	1.120E+02	43	161.57	0.578	1.250E+02	44	135.00	0.259	1.250E+02
44	135.00	0.259	1.250E+02	45	45.00	0.259	1.100E+02	46	18.44	0.578	1.290E+02	47	11.31	0.933	1.030E+02	48	8.13	1.293	1.280E+02
48	8.13	1.293	1.280E+02	49	6.34	1.656	1.040E+02	50	186.34	1.656	1.220E+02	51	188.13	1.293	1.180E+02	52	191.31	0.933	1.210E+02
52	191.31	0.933	1.210E+02	53	198.44	0.578	1.170E+02	54	225.00	0.259	1.300E+02	55	315.00	0.259	1.110E+02	56	341.67	0.378	1.330E+02
56	341.67	0.378	1.330E+02	57	348.69	0.933	1.040E+02	58	351.87	1.293	1.400E+02	59	353.66	1.656	1.070E+02	60	190.44	1.735	1.230E+02
60	190.44	1.735	1.230E+02	61	203.20	1.393	1.270E+02	62	210.96	1.066	1.170E+02	63	225.00	0.776	1.170E+02	64	231.67	0.578	1.270E+02
64	231.67	0.578	1.270E+02	65	288.44	0.578	1.160E+02	66	315.00	0.778	1.330E+02	67	329.00	1.066	1.120E+02	68	336.80	1.393	1.310E+02
68	336.80	1.393	1.310E+02	69	341.67	1.735	1.010E+02	70	209.05	1.683	1.280E+02	71	215.54	1.573	1.320E+02	72	223.00	1.293	1.160E+02
72	223.00	1.293	1.160E+02	73	239.04	1.066	1.210E+02	74	258.69	0.933	1.100E+02	75	281.61	0.933	1.150E+02	76	300.96	1.066	1.270E+02
76	300.96	1.066	1.270E+02	77	315.00	1.293	1.060E+02	78	324.46	1.673	1.330E+02	79	330.95	1.883	9.880E+01	80	217.88	2.085	1.320E+02
80	217.88	2.085	1.320E+02	81	225.00	1.810	1.190E+02	82	234.46	1.673	1.200E+02	83	246.80	1.393	1.160E+02	84	261.87	1.293	1.100E+02
84	261.87	1.293	1.100E+02	85	278.13	1.293	1.040E+02	86	293.20	1.393	1.050E+02	87	305.54	1.573	1.290E+02	88	315.00	1.810	1.270E+02
88	315.00	1.810	1.270E+02	89	322.13	2.085	9.200E+01	90	225.00	2.328	1.180E+02	91	232.13	2.085	1.250E+02	92	240.95	1.803	1.190E+02
92	240.95	1.803	1.190E+02	93	251.57	1.735	1.310E+02	94	263.66	1.656	1.230E+02	95	278.34	1.686	1.200E+02	96	288.44	1.735	1.050E+02
96	288.44	1.735	1.050E+02	97	299.06	1.883	1.080E+02	98	307.88	2.085	9.890E+01	99	315.00	2.320	9.650E+01	100	0	2.445	1.240E+02
100	0	2.445	1.240E+02	101	0	3.175	1.210E+02	102	0	4.445	1.150E+02	103	0	5.715	1.190E+02	104	0	6.985	9.500E+01
104	0	6.985	9.500E+01	105	22.50	2.445	8.570E+01	106	22.50	3.175	5.420E+01	107	22.50	4.445	5.170E+01	108	22.50	5.715	4.445
108	22.50	5.715	4.445	109	22.50	6.985	2.710E+01	110	45.00	3.175	1.050E+02	111	45.00	4.445	9.790E+01	112	45.00	5.715	7.500E+01
112	45.00	5.715	7.500E+01	113	45.00	6.985	9.120E+01	114	67.50	2.445	7.660E+01	115	67.50	3.175	7.500E+01	116	67.50	4.445	5.460E+01
116	67.50	4.445	5.460E+01	117	67.50	5.715	3.940E+01	118	67.50	6.985	2.740E+01	119	90.00	2.445	2.400E+01	120	90.00	3.175	9.430E+01
120	90.00	3.175	9.430E+01	121	90.00	4.445	8.490E+01	122	90.00	5.715	7.640E+01	123	90.00	6.985	7.570E+01	124	112.50	2.445	5.590E+01
124	112.50	2.445	5.590E+01	125	112.50	3.175	5.290E+01	126	112.50	4.445	3.550E+01	127	112.50	5.715	3.670E+01	128	112.50	6.985	2.070E+01
128	112.50	6.985	2.070E+01	129	135.00	3.175	1.860E+01	130	135.00	4.445	8.330E+01	131	135.00	5.715	8.920E+01	132	135.00	6.985	7.000E+01
132	135.00	6.985	7.000E+01	133	157.50	2.445	7.200E+01	134	157.50	3.175	5.670E+01	135	157.50	4.445	5.300E+01	136	157.50	5.715	2.750E+01
136	157.50	5.715	2.750E+01	137	157.50	6.985	2.430E+01	138	180.00	2.445	1.780E+01	139	180.00	3.175	1.620E+01	140	180.00	4.445	9.310E+01
140	180.00	4.445	9.310E+01	141	180.00	5.715	7.560E+01	142	180.00	6.985	7.920E+01	143	202.50	2.445	4.600E+01	144	202.50	3.175	5.600E+01
144	202.50	3.175	5.600E+01	145	202.50	4.445	5.400E+01	146	202.50	5.715	2.450E+01	147	202.50	6.985	2.650E+01	148	225.00	3.175	1.580E+01
148	225.00	3.175	1.580E+01	149	225.00	4.445	2.130E+01	150	225.00	5.715	1.000E+02	151	225.00	6.985	1.090E+02	152	247.50	2.445	6.340E+01
152	247.50	2.445	6.340E+01	153	247.50	3.175	5.540E+01	154	247.50	4.445	6.670E+01	155	247.50	5.715	7.660E+01	156	247.50	6.985	2.445
156	247.50	6.985	2.445	157	270.00	2.445	3.420E+01	158	270.00	3.175	1.760E+01	159	270.00	4.445	1.960E+01	160	270.00	5.715	1.250E+02
160	270.00	5.715	1.250E+02	161	270.00	6.985	1.060E+02	162	292.50	2.445	1.110E+02	163	292.50	3.175	7.980E+01	164	292.50	4.445	9.100E+01
164	292.50	4.445	9.100E+01	165	292.50	5.715	4.160E+01	166	292.50	6.985	5.000E+01	167	315.00	3.175	5.200E+01	168	315.00	4.445	2.030E+01
168	315.00	4.445	2.030E+01	169	315.00	5.715	2.830E+01	170	315.00	6.985	1.250E+02	171	337.50	2.445	1.190E+02	172	337.50	3.175	9.220E+01
172	337.50	3.175	9.220E+01	173	337.50	4.445	5.190E+01	174	337.50	5.715	2.930E+01	175	337.50	6.985	2.780E+01				

RUN DATE.....7/15/79
 PARTICLE.....DEUTERON
 BEAM ENLROY.....330 MEV
 TARGET.....FP RUN 110
 PLATE NO.....DI
 PLATE LOCATION..1

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	108.43	2.214	1.550E+02	2	90.00	2.100	1.550E+02	3	71.57	2.214	1.600E+02	4	135.00	1.980	1.500E+02				
5	116.57	1.565	1.640E+02	8	90.00	1.400	1.700E+02	7	63.43	1.565	1.720E+02	8	45.00	1.980	1.650E+02				
9	161.57	2.214	1.350E+02	10	183.43	1.565	1.670E+02	11	135.00	0.990	1.640E+02	12	90.00	0.700	1.610E+02				
13	45.00	0.990	1.730E+02	14	26.57	1.565	1.760E+02	15	18.43	2.214	1.810E+02	16	180.00	2.100	1.460E+02				
17	180.00	1.400	1.550E+02	18	180.00	0.700	1.610E+02	19	0.	0.	1.610E+02	20	0.	0.700	1.850E+02				
21	0.	1.400	1.940E+02	22	0.	2.100	1.750E+02	23	190.43	2.214	1.490E+02	24	206.57	1.565	1.630E+02				
25	225.00	0.990	1.620E+02	26	270.00	0.700	1.660E+02	27	315.00	0.990	1.790E+02	28	333.43	1.565	1.800E+02				
29	341.57	2.214	1.850E+02	30	226.50	1.980	1.520E+02	31	243.43	1.565	1.790E+02	32	270.00	1.400	1.640E+02				
33	296.57	1.565	1.860E+02	34	315.00	1.980	1.930E+02	35	251.57	2.214	1.600E+02	36	270.00	2.100	1.630E+02				
37	208.43	2.214	1.690E+02	38	0.	3.000	1.870E+02	39	0.	4.500	1.510E+02	40	0.	6.000	9.600E+01				
41	0.	7.500	7.120E+01	42	45.00	3.000	1.560E+02	43	45.00	4.500	1.220E+02	44	45.00	6.000	8.170E+01				
45	45.00	7.500	6.920E+01	46	90.00	3.000	1.470E+02	47	90.00	4.500	1.060E+02	48	90.00	6.000	7.820E+01				
49	90.00	7.500	5.840E+01	50	135.00	3.000	1.330E+02	51	135.00	4.500	9.990E+01	52	135.00	6.000	7.280E+01				
53	135.00	7.500	5.730E+01	54	180.00	3.000	1.180E+02	55	180.00	4.500	8.570E+01	56	180.00	6.000	6.880E+01				
57	180.00	7.500	5.980E+01	58	225.00	3.000	1.260E+02	59	225.00	4.500	8.050E+01	60	225.00	6.000	5.990E+01				
61	225.00	7.500	5.100E+01	62	270.00	3.000	1.590E+02	63	270.00	4.500	1.180E+02	64	270.00	6.000	8.270E+01				
65	270.00	7.500	6.190E+01	66	315.00	3.000	1.750E+02	67	315.00	4.500	1.390E+02	68	315.00	6.000	1.070E+02				
69	315.00	7.500	8.160E+01																

RUN DATE.....7/15/78
 PARTICLES.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 110
 PLATE NO.....P2
 PLATE LOCATION..2

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	1.040E+02	1	127.88	2.085	1.070E+02	2	119.06	1.883	1.150E+02	3	108.44	1.735	1.240E+02
4	96.34	1.656	1.210E+02	5	83.66	1.656	1.220E+02	6	71.57	1.735	1.420E+02	7	60.95	1.883	1.290E+02
8	52.13	2.085	1.350E+02	9	45.00	2.328	1.260E+02	10	142.10	2.085	1.100E+02	11	135.00	1.810	1.120E+02
12	125.54	1.573	1.240E+02	13	113.20	1.393	1.200E+02	14	98.13	1.293	1.260E+02	15	81.87	1.293	1.420E+02
16	66.00	1.293	1.300E+02	17	54.46	1.573	1.320E+02	18	45.00	1.810	1.360E+02	19	37.88	2.085	1.360E+02
20	150.35	1.883	1.090E+02	21	144.46	1.573	1.130E+02	22	135.00	1.293	1.190E+02	23	120.96	1.066	1.250E+02
24	101.31	0.933	1.360E+02	25	78.69	0.933	1.370E+02	26	59.04	1.066	1.440E+02	27	45.00	1.293	1.450E+02
28	35.54	1.573	1.390E+02	29	29.06	1.883	1.420E+02	30	161.57	1.735	1.190E+02	31	156.80	1.393	1.370E+02
32	149.04	1.066	1.450E+02	33	135.00	0.776	1.340E+02	34	108.44	0.578	1.300E+02	35	71.57	0.578	1.380E+02
36	45.00	0.776	1.390E+02	37	30.96	1.066	1.460E+02	38	23.20	1.393	1.390E+02	39	18.44	1.735	1.480E+02
40	173.66	1.656	1.140E+02	41	171.87	1.293	1.250E+02	42	168.69	0.933	1.290E+02	43	161.57	0.578	1.390E+02
44	135.00	0.259	1.340E+02	45	45.00	0.259	1.420E+02	46	18.44	0.578	1.520E+02	47	11.31	0.933	1.420E+02
48	8.13	1.293	1.540E+02	49	6.34	1.656	1.620E+02	50	186.34	1.656	1.080E+02	51	188.13	1.293	1.250E+02
52	191.31	0.933	1.280E+02	53	198.44	0.578	1.390E+02	54	225.00	0.259	1.390E+02	55	315.00	0.259	1.460E+02
56	341.57	0.578	1.400E+02	57	348.69	0.933	1.510E+02	58	351.87	1.293	1.550E+02	59	353.66	1.656	1.520E+02
60	198.44	1.735	1.210E+02	61	203.20	1.393	1.140E+02	62	210.96	1.066	1.230E+02	63	225.00	0.776	1.500E+02
64	231.57	0.578	1.440E+02	65	288.44	0.578	1.310E+02	66	315.00	0.776	1.440E+02	67	325.00	1.066	1.400E+02
68	336.80	1.393	1.360E+02	69	341.57	1.735	1.480E+02	70	209.05	1.066	1.100E+02	71	215.84	1.573	1.230E+02
72	225.00	1.293	1.250E+02	73	239.04	1.066	1.290E+02	74	258.69	0.933	1.340E+02	75	281.31	0.933	1.390E+02
76	300.96	1.066	1.360E+02	77	315.00	1.293	1.490E+02	78	324.46	1.573	1.390E+02	79	330.95	1.883	1.570E+02
80	217.88	2.085	1.120E+02	81	225.00	1.810	1.200E+02	82	234.46	1.573	1.410E+02	83	246.80	1.393	1.460E+02
84	261.87	1.293	1.320E+02	85	278.13	1.293	1.430E+02	86	293.20	1.393	1.410E+02	87	305.54	1.573	1.440E+02
88	315.00	1.810	1.510E+02	89	322.13	2.085	1.400E+02	90	225.00	2.328	1.110E+02	91	232.13	2.085	1.220E+02
92	240.95	1.883	1.180E+02	93	251.57	1.735	1.280E+02	94	263.66	1.656	1.260E+02	95	276.34	1.656	1.330E+02
96	288.44	1.735	1.420E+02	97	299.06	1.883	1.380E+02	98	307.88	2.085	1.370E+02	99	315.00	2.328	1.390E+02
100	0.	2.445	1.450E+02	101	0.	3.175	1.410E+02	102	0.	4.445	1.340E+02	103	0.	5.715	7.020E+01
104	0.	6.985	2.920E+01	105	22.50	2.445	1.440E+02	106	22.50	3.175	1.420E+02	107	22.50	4.445	7.470E+00
108	22.50	5.715	6.500E+01	109	22.50	6.985	2.160E+01	110	45.00	3.175	1.190E+02	111	45.00	4.445	9.030E+01
112	45.00	5.715	5.710E+01	113	45.00	6.985	4.150E+01	114	67.50	2.445	1.240E+02	115	67.50	3.175	1.070E+02
116	67.50	4.445	7.020E+01	117	67.50	5.715	5.270E+01	118	67.50	6.985	2.830E+01	119	90.00	2.445	1.270E+02
120	90.00	3.175	1.150E+02	121	90.00	4.445	6.390E+01	122	90.00	5.715	4.290E+01	123	90.00	6.985	2.600E+01
124	112.50	2.445	1.060E+02	125	112.50	3.175	9.470E+01	126	112.50	4.445	5.900E+01	127	112.50	5.715	5.040E+01
128	112.50	6.985	2.350E+01	129	135.00	3.175	7.840E+01	130	135.00	4.445	5.510E+01	131	135.00	5.715	3.300E+01
132	135.00	6.985	1.950E+01	133	157.50	2.445	1.030E+02	134	157.50	3.175	8.150E+01	135	157.50	4.445	5.310E+01
136	157.50	5.715	2.850E+01	137	157.50	6.985	1.940E+01	138	180.00	2.445	9.940E+01	139	180.00	3.175	7.790E+01
140	180.00	4.445	5.400E+01	141	180.00	5.715	3.080E+01	142	180.00	6.985	1.870E+01	143	202.50	2.445	1.030E+02
144	202.50	3.175	8.020E+01	145	202.50	4.445	6.870E+01	146	202.50	5.715	2.980E+01	147	202.50	6.985	1.820E+01
148	225.00	3.175	9.020E+01	149	225.00	4.445	5.590E+01	150	225.00	5.715	3.240E+01	151	225.00	6.985	2.120E+01
152	247.50	2.445	1.120E+02	153	247.50	3.175	9.700E+01	154	247.50	4.445	6.620E+01	155	247.50	5.715	3.700E+01
156	247.50	6.985	2.340E+01	157	270.00	2.445	1.250E+02	158	270.00	3.175	1.060E+02	159	270.00	4.445	6.450E+01
160	270.00	5.715	4.800E+01	161	270.00	6.985	2.720E+01	162	292.50	2.445	1.400E+02	163	292.50	3.175	1.180E+02
164	292.50	4.445	9.740E+01	165	292.50	5.715	6.030E+01	166	292.50	6.985	3.090E+01	167	315.00	3.175	1.340E+02
168	315.00	4.445	9.750E+01	169	315.00	5.715	6.400E+01	170	315.00	6.985	3.380E+01	171	337.50	2.445	1.410E+02
172	337.50	3.175	1.680E+02	173	337.50	4.445	1.120E+02	174	337.50	5.715	6.440E+01	175	337.50	6.985	3.240E+01

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 ION AM ENERGY.....330 MEV
 TARGET.....FP RUN 110
 PLATE NO.....02
 PLATE LOCATION..2

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	108.43	2.214	1.590E+02	2	90.00	2.100	1.720E+02	3	71.57	2.214	1.870E+02	4	135.00	1.980	1.570E+02				
5	115.57	1.565	1.850E+02	6	90.00	1.400	1.790E+02	7	63.43	1.565	1.920E+01	8	45.00	1.980	1.780E+02				
9	161.57	2.214	1.600E+02	10	153.43	1.565	1.680E+02	11	135.00	0.890	1.660E+02	12	90.00	0.700	1.800E+02				
13	45.00	0.990	1.790E+02	14	26.57	1.565	2.130E+02	15	18.43	2.214	1.890E+02	16	180.00	2.100	1.350E+02				
17	180.00	1.400	1.720E+02	18	180.00	0.700	1.700E+02	19	0.	0.	1.800E+02	20	0.	0.700	1.930E+02				
21	0.	1.400	1.880E+02	22	0.	2.100	1.860E+02	23	198.43	2.214	1.710E+02	24	206.57	1.565	1.570E+02				
25	225.00	0.990	1.720E+02	26	270.00	0.700	1.920E+02	27	315.00	0.990	1.920E+02	28	333.43	1.565	1.990E+02				
29	341.57	2.214	1.950E+02	30	225.00	1.980	1.610E+02	31	243.43	1.565	1.810E+02	32	270.00	1.400	1.780E+02				
33	296.57	1.565	1.990E+02	34	315.00	1.980	1.870E+02	35	251.57	2.214	1.710E+02	36	270.00	2.100	1.910E+02				
37	288.43	2.214	1.790E+02	38	0.	3.000	1.900E+02	39	0.	4.500	1.460E+02	40	0.	6.000	9.780E+01				
41	0.	7.500	5.950E+01	42	45.00	3.000	1.710E+02	43	90.00	4.500	1.250E+02	44	45.00	6.000	8.040E+01				
45	45.00	7.500	5.750E+01	46	90.00	3.000	1.460E+02	47	90.00	4.500	1.080E+02	48	90.00	6.000	8.930E+01				
49	90.00	7.500	6.140E+01	50	135.00	3.000	1.370E+02	51	135.00	4.500	1.040E+02	52	135.00	6.000	7.660E+01				
53	135.00	7.500	5.820E+01	54	180.00	3.000	1.420E+02	55	180.00	4.500	9.710E+01	56	180.00	6.000	6.600E+01				
57	180.00	7.500	5.870E+01	58	225.00	3.000	1.280E+02	59	225.00	4.500	9.020E+01	60	225.00	6.000	6.510E+01				
61	225.00	7.500	5.090E+01	62	270.00	3.000	1.860E+02	63	270.00	4.500	1.260E+02	64	270.00	6.000	8.260E+01				
65	270.00	7.500	6.310E+01	66	315.00	3.000	1.010E+02	67	315.00	4.500	1.470E+02	68	315.00	6.000	9.460E+01				
69	315.00	7.500	6.810E+01																

RUN DATE 7/15/70
 FACILITY DUBUQUO
 PLANT ENERGY 330 MEV
 TARGET EP RUN 110
 PLANT NO.
 PLANT LOCATION ..

NO	ANOLE	RADIUS	DOSE	NO	ANOLE	RADIUS	DOSE	NO	ANOLE	RADIUS	DOSE	NO	ANOLE	RADIUS	DOSE
0	135.00	2.328	1.120E+02	1	127.88	2.085	1.190E+02	2	119.06	1.803	1.190E+02	3	108.44	1.735	1.290E+02
4	96.34	1.656	1.630E+02	5	83.66	1.656	1.290E+02	6	71.07	1.735	1.310E+02	7	60.95	1.883	1.370E+02
8	52.13	2.085	1.310E+02	9	45.00	2.328	1.390E+02	10	142.10	2.085	1.100E+02	11	135.00	1.810	1.240E+02
12	125.54	1.573	1.350E+02	13	113.20	1.393	1.800E+02	14	98.13	1.293	1.340E+02	15	81.87	1.293	1.380E+02
16	66.80	1.393	1.430E+02	17	54.46	1.573	1.440E+02	18	45.00	1.810	1.650E+02	19	37.88	2.085	1.500E+02
20	150.95	1.883	1.110E+02	21	144.46	1.573	1.220E+02	22	135.00	1.293	1.280E+02	23	120.95	1.066	1.340E+02
24	101.31	0.933	1.300E+02	25	78.69	0.933	1.420E+02	26	59.04	1.066	1.460E+02	27	45.00	1.293	1.500E+02
28	35.54	1.573	1.720E+02	29	29.06	1.883	1.440E+02	30	161.57	1.735	1.270E+02	31	156.80	1.393	1.240E+02
32	149.04	1.066	1.290E+02	33	135.00	0.776	1.420E+02	34	108.44	0.578	1.430E+02	35	71.57	0.578	1.470E+02
36	45.00	0.776	1.450E+02	37	30.96	1.066	1.460E+02	38	23.20	1.393	1.430E+02	39	18.44	1.735	1.550E+02
40	173.66	1.656	1.690E+02	41	171.87	1.293	1.330E+02	42	168.69	0.933	1.390E+02	43	161.57	0.578	1.350E+02
44	135.00	0.259	1.490E+02	45	45.00	0.259	1.460E+02	46	18.44	0.578	1.530E+02	47	11.31	0.933	1.500E+02
48	8.13	1.293	1.630E+02	49	6.34	1.656	1.540E+02	50	186.34	1.656	1.250E+02	51	188.13	1.293	1.330E+02
52	191.31	0.933	1.330E+02	53	198.44	0.578	1.360E+02	54	225.00	0.259	1.450E+02	55	315.00	0.259	1.530E+02
56	341.57	0.578	1.480E+02	57	348.69	0.933	1.910E+02	58	351.87	1.293	1.540E+02	59	353.66	1.656	1.590E+02
60	192.44	1.735	1.200E+02	61	203.20	1.393	1.240E+02	62	210.96	1.066	1.490E+02	63	225.00	0.776	1.500E+02
64	251.57	0.578	1.490E+02	65	288.44	0.578	1.500E+02	66	315.00	0.776	1.630E+02	67	329.00	1.066	1.530E+02
68	336.80	1.393	1.570E+02	69	341.57	1.735	1.680E+02	70	209.05	1.883	1.150E+02	71	215.34	1.573	1.320E+02
72	225.00	1.293	1.330E+02	73	239.04	1.066	1.450E+02	74	258.69	0.933	1.520E+02	75	281.31	0.933	1.420E+02
76	300.96	1.066	1.420E+02	77	315.00	1.293	1.580E+02	78	324.46	1.573	1.580E+02	79	330.95	1.883	1.630E+02
80	217.88	2.085	1.130E+02	81	225.00	1.810	1.290E+02	82	234.46	1.573	1.320E+02	83	246.80	1.393	1.650E+02
84	261.87	1.293	1.400E+02	85	278.13	1.293	1.500E+02	86	293.20	1.393	1.400E+02	87	305.54	1.573	1.500E+02
88	315.00	1.810	1.480E+02	89	322.13	2.085	1.540E+02	90	225.00	2.328	1.180E+02	91	232.13	2.085	1.190E+02
92	240.95	1.883	1.290E+02	93	251.57	1.735	1.840E+02	94	263.66	1.656	1.800E+02	95	276.34	1.656	1.000E+02
96	208.44	1.735	1.470E+02	97	299.06	1.883	1.400E+02	98	307.88	2.085	1.480E+02	99	315.00	2.328	1.460E+02
100	0.	2.445	1.540E+02	101	0.	3.175	1.460E+02	102	0.	4.445	1.190E+02	103	0.	5.715	6.790E+01
104	0.	6.985	3.120E+01	105	22.50	2.445	1.460E+02	106	22.50	3.175	1.430E+02	107	22.50	4.445	1.410E+02
108	22.50	5.715	6.500E+01	109	22.50	6.985	3.480E+01	110	45.00	3.175	1.420E+02	111	45.00	4.445	9.550E+01
112	45.00	5.715	6.290E+01	113	45.00	6.985	3.370E+01	114	67.50	2.445	1.330E+02	115	67.50	3.175	1.330E+02
116	67.50	4.445	7.600E+01	117	67.50	5.715	5.430E+01	118	67.50	6.985	2.970E+01	119	90.00	2.445	1.100E+02
120	90.00	3.175	1.410E+02	121	90.00	4.445	7.560E+01	122	90.00	5.715	4.580E+01	123	90.00	6.985	2.610E+01
124	112.50	2.445	1.190E+02	125	112.50	3.175	1.020E+02	126	112.50	4.445	6.490E+01	127	112.50	5.715	3.290E+01
128	112.50	6.985	2.430E+01	129	135.00	3.175	9.560E+01	130	135.00	4.445	6.010E+01	131	135.00	5.715	3.600E+01
132	135.00	6.985	2.110E+01	133	157.50	2.445	1.400E+02	134	157.50	3.175	9.040E+01	135	157.50	4.445	5.360E+01
136	157.50	5.715	3.500E+01	137	157.50	6.985	1.990E+01	138	180.00	2.445	1.060E+02	139	180.00	3.175	8.200E+01
140	180.00	4.445	5.600E+01	141	180.00	5.715	3.280E+01	142	180.00	6.985	1.950E+01	143	202.50	2.445	1.070E+02
144	202.50	3.175	1.130E+02	145	202.50	4.445	5.940E+01	146	202.50	5.715	3.180E+01	147	202.50	6.985	1.920E+01
148	225.00	3.175	1.210E+02	149	225.00	4.445	6.120E+01	150	225.00	5.715	3.780E+01	151	225.00	5.985	2.170E+01
152	247.50	2.445	1.220E+02	153	247.50	3.175	1.070E+02	154	247.50	4.445	9.410E+01	155	247.50	5.715	4.350E+01
156	247.50	6.985	2.530E+01	157	270.00	2.445	1.280E+02	158	270.00	3.175	1.190E+02	159	270.00	4.445	8.480E+01
160	270.00	5.715	5.500E+01	161	270.00	6.985	3.030E+01	162	292.50	2.445	1.400E+02	163	292.50	3.175	1.250E+02
164	292.50	4.445	1.050E+02	165	292.50	5.715	6.320E+01	166	292.50	6.985	3.410E+01	167	315.00	3.175	1.440E+02
168	315.00	4.445	1.110E+02	169	315.00	5.715	6.770E+01	170	315.00	6.985	3.630E+01	171	337.50	2.445	1.090E+02
172	337.50	3.175	1.390E+02	173	337.50	4.445	1.080E+02	174	337.50	5.715	7.320E+01	175	337.50	6.985	3.560E+01

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 110
 PLATE NO.....03
 PLATE LOCATION..3

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	108.43	2.214	1.610E+02	2	90.00	2.100	1.320E+02	3	71.57	2.214	1.600E+02	4	135.00	1.980	1.580E+02
5	116.37	1.565	1.730E+02	6	90.00	1.400	1.820E+02	7	63.43	1.565	1.810E+02	8	45.00	1.980	1.760E+02
9	161.57	2.214	1.600E+02	10	153.43	1.565	1.660E+02	11	135.00	0.990	1.760E+02	12	90.00	0.700	1.860E+02
13	45.00	0.990	2.160E+02	14	26.37	1.565	1.940E+02	15	18.43	2.214	1.820E+02	16	180.00	2.100	1.850E+02
17	180.00	1.400	2.000E+02	18	180.00	0.700	1.830E+02	19	0.	0.	1.790E+02	20	0.	0.700	1.880E+02
21	0.	1.400	2.010E+02	22	0.	2.100	2.010E+02	23	198.43	2.214	1.560E+02	24	206.57	1.565	2.030E+02
25	225.00	0.990	1.770E+02	26	270.00	0.700	1.890E+02	27	315.00	0.990	1.960E+02	28	333.43	1.565	1.950E+02
29	341.57	2.214	2.030E+02	30	225.00	1.980	1.690E+02	31	243.43	1.565	1.820E+02	32	270.00	1.400	1.760E+02
33	296.57	1.565	1.910E+02	34	315.00	1.980	1.680E+02	35	261.57	2.214	1.740E+02	36	270.00	2.100	1.790E+02
37	268.43	2.214	1.890E+02	38	0.	3.000	2.000E+02	39	0.	4.500	1.430E+02	40	0.	6.000	9.650E+01
41	0.	7.500	6.110E+01	42	45.00	3.000	1.730E+02	43	45.00	4.500	4.490E+01	44	45.00	6.000	9.270E+01
45	45.00	7.500	6.020E+01	46	90.00	3.000	1.340E+02	47	90.00	4.500	1.120E+02	48	90.00	6.000	8.160E+01
49	90.00	7.500	5.860E+01	50	135.00	3.000	1.470E+02	51	135.00	4.500	9.600E+01	52	135.00	6.000	7.280E+01
53	135.00	7.500	5.530E+01	54	180.00	3.000	1.380E+02	55	180.00	4.500	8.900E+01	56	180.00	6.000	9.260E+01
57	180.00	7.500	5.230E+01	58	225.00	3.000	1.320E+02	59	225.00	4.500	8.850E+01	60	225.00	6.000	6.330E+01
61	225.00	7.500	4.830E+01	62	270.00	3.000	1.590E+02	63	270.00	4.500	1.590E+02	64	270.00	6.000	1.100E+02
65	270.00	7.500	5.650E+01	66	315.00	3.000	1.890E+02	67	315.00	4.500	1.440E+02	68	315.00	6.000	8.900E+01
69	315.00	7.500	6.910E+01												

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....P4 RUN 110
 PLATE NO.....P4
 PLATE LOCATION..4

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	1.278	1.200E+02	1	127.80	2.005	1.230E+02	2	119.06	1.853	1.280E+02	3	108.44	1.735	1.300E+02
4	96.34	1.656	1.380E+02	5	83.68	1.656	1.320E+02	6	71.07	1.735	1.360E+02	7	60.95	1.863	1.890E+02
8	52.13	2.085	1.400E+02	9	45.00	2.328	1.430E+02	10	143.10	2.085	1.230E+02	11	135.00	1.610	1.270E+02
12	125.54	1.573	1.450E+02	13	113.20	1.393	1.370E+02	14	98.13	1.293	1.470E+02	15	81.87	1.293	1.540E+02
16	66.80	1.393	1.550E+02	17	54.46	1.673	1.500E+02	18	45.00	1.810	1.450E+02	19	37.88	2.085	1.570E+02
20	150.95	1.803	1.200E+02	21	144.16	1.673	1.350E+02	22	135.00	1.293	1.750E+02	23	120.96	1.066	1.480E+02
24	101.31	0.933	1.460E+02	25	70.69	0.933	1.410E+02	26	59.04	1.066	1.470E+02	27	45.00	1.293	1.580E+02
28	35.54	1.573	1.470E+02	29	29.06	1.803	1.460E+02	30	161.57	1.735	1.310E+02	31	156.80	1.393	1.400E+02
32	149.04	1.066	1.570E+02	33	135.00	0.776	1.470E+02	34	108.44	0.578	1.500E+02	35	71.07	0.578	1.590E+02
36	45.00	0.776	1.570E+02	37	30.96	1.066	1.590E+02	38	23.20	1.393	1.300E+02	39	18.44	1.735	1.590E+02
40	173.66	1.656	1.260E+02	41	171.87	1.293	1.300E+02	42	168.69	0.933	1.920E+02	43	161.37	0.578	1.480E+02
44	135.00	0.259	1.500E+02	45	45.00	0.259	1.580E+02	46	18.44	0.578	1.530E+02	47	11.31	0.933	1.550E+02
48	8.13	1.293	2.110E+02	49	6.34	1.656	1.670E+02	50	186.34	1.656	1.740E+02	51	188.13	1.293	1.460E+02
52	191.31	0.933	1.410E+02	53	198.44	0.578	1.500E+02	54	225.00	0.259	1.470E+02	55	315.00	0.259	1.520E+02
56	341.57	0.578	1.600E+02	57	348.69	0.933	2.240E+02	58	351.87	1.293	1.640E+02	59	353.68	1.656	1.670E+02
60	190.44	1.735	1.240E+02	61	203.20	1.393	1.280E+02	62	210.96	1.566	1.400E+02	63	225.00	0.776	1.460E+02
64	251.57	0.578	1.550E+02	65	288.44	0.578	1.530E+02	66	315.00	0.776	1.660E+02	67	329.00	1.066	1.620E+02
68	336.80	1.393	1.640E+02	69	341.57	1.735	2.270E+02	70	200.03	1.583	1.310E+02	71	215.54	1.673	1.340E+02
72	225.00	1.293	1.390E+02	73	239.04	1.066	1.460E+02	74	258.69	0.933	1.440E+02	75	281.31	0.933	1.490E+02
76	300.96	1.066	1.500E+02	77	315.00	1.293	1.480E+02	78	324.48	1.673	1.820E+02	79	330.95	1.883	1.730E+02
80	217.80	2.085	1.280E+02	81	225.00	1.810	1.300E+02	82	234.46	1.573	1.400E+02	83	248.80	1.393	1.900E+02
84	251.87	1.293	1.470E+02	85	278.13	1.393	1.300E+02	86	293.20	1.393	1.570E+02	87	305.54	1.673	1.530E+02
88	315.00	1.810	1.550E+02	89	322.13	2.085	1.600E+02	90	295.00	2.328	1.170E+02	91	232.13	2.085	1.840E+02
92	240.95	1.066	1.360E+02	93	251.57	1.735	1.390E+02	94	263.66	1.836	1.480E+02	95	276.34	1.656	1.430E+02
96	288.44	1.735	1.650E+02	97	293.06	1.883	1.510E+02	98	307.80	2.085	1.550E+02	99	315.00	2.328	1.580E+02
100	0.	2.445	1.660E+02	101	0.	3.175	1.480E+02	102	0.	4.445	1.200E+02	103	0.	5.715	7.050E+01
104	0.	6.985	3.670E+01	105	22.50	2.445	1.610E+02	106	22.50	3.175	1.480E+02	107	22.50	4.445	1.230E+02
108	22.50	5.715	1.150E+02	109	22.50	6.985	3.580E+01	110	45.00	3.175	1.320E+02	111	45.00	4.445	1.450E+02
112	45.00	5.715	1.020E+02	113	45.00	6.985	3.870E+01	114	67.50	2.445	1.400E+02	115	67.50	3.175	1.190E+02
116	67.50	4.445	9.170E+01	117	67.50	5.715	5.810E+01	118	67.50	6.985	3.300E+01	119	90.00	2.445	1.270E+02
120	90.00	3.175	1.080E+02	121	90.00	4.445	7.740E+01	122	90.00	5.715	5.030E+01	123	90.00	6.985	3.040E+01
124	112.50	2.445	1.200E+02	125	112.50	3.175	1.490E+02	126	112.50	4.445	6.680E+01	127	112.50	5.715	4.130E+01
128	112.50	6.985	7.720E+01	129	135.00	3.175	1.430E+02	130	135.00	4.445	6.480E+01	131	135.00	5.715	7.430E+01
132	135.00	6.985	3.000E+01	133	157.50	2.445	1.120E+02	134	157.50	3.175	8.680E+01	135	157.50	4.445	6.090E+01
136	157.50	5.715	6.630E+01	137	157.50	6.985	2.100E+01	138	180.00	2.445	1.120E+02	139	180.00	3.175	9.720E+01
140	180.00	4.445	5.590E+01	141	180.00	5.715	3.550E+01	142	180.00	6.985	1.930E+01	143	202.50	2.445	1.160E+02
144	202.50	3.175	8.850E+01	145	202.50	4.445	5.740E+01	146	202.50	5.715	6.590E+01	147	202.50	6.985	4.730E+01
148	225.00	3.175	1.020E+02	149	225.00	4.445	6.470E+01	150	225.00	5.715	3.540E+01	151	225.00	6.985	2.340E+01
152	247.50	2.445	1.270E+02	153	247.50	3.175	1.080E+02	154	247.50	4.445	7.570E+01	155	247.50	5.715	7.820E+01
156	247.50	6.985	1.470E+01	157	270.00	2.445	1.300E+02	158	270.00	3.175	1.260E+02	159	270.00	4.445	9.070E+01
160	270.00	3.175	6.10E+01	161	292.50	6.985	2.810E+01	162	292.50	2.445	1.500E+02	163	292.50	3.175	1.400E+02
164	292.50	4.445	1.080E+02	165	292.50	5.715	6.330E+01	166	292.50	6.985	8.970E+01	167	315.00	3.175	1.500E+02
168	315.00	4.445	1.170E+02	169	315.00	5.715	6.980E+01	170	315.00	6.985	3.900E+01	171	337.50	3.175	1.500E+02
172	337.50	3.175	1.560E+02	173	337.50	4.445	1.170E+02	174	337.50	5.715	7.140E+01	175	337.50	6.985	3.620E+01

RUN DATE.....7/15/73
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 110
 PLATE NO.....24
 PLATE LOCATION..5

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	108.43	2.214	1.730E+02	2	90.00	2.100	2.020E+02	3	71.57	2.214	1.970E+02	4	135.00	1.980	1.770E+02	5	116.57	1.565	2.000E+02
6	161.57	2.214	1.790E+02	7	90.00	1.400	2.130E+02	8	63.43	1.565	2.220E+02	9	45.00	1.980	2.100E+02	10	153.43	1.565	1.860E+02
11	180.00	1.400	1.910E+02	12	26.57	1.565	2.260E+02	13	135.00	0.990	1.960E+02	14	90.00	0.750	2.330E+02	15	18.43	2.214	2.470E+02
16	45.00	0.990	2.120E+02	17	180.00	0.700	2.150E+02	18	0.00	0.00	2.020E+02	19	0.00	0.700	2.290E+02	20	206.57	1.565	2.020E+02
21	0.00	1.400	2.380E+02	22	0.00	2.100	2.320E+02	23	193.43	2.214	1.770E+02	24	333.43	1.565	2.440E+02	25	270.00	1.400	2.160E+02
26	225.00	0.990	2.140E+02	27	270.00	0.700	2.280E+02	28	251.57	2.214	1.840E+02	29	0.00	2.100	2.110E+02	30	296.57	1.565	2.210E+02
31	341.57	2.214	2.490E+02	32	315.00	1.980	1.830E+02	33	0.00	4.500	1.900E+02	34	45.00	6.000	1.010E+02	35	290.43	2.214	2.380E+02
36	0.00	7.500	7.960E+01	37	45.00	3.000	1.900E+02	38	90.00	4.500	1.300E+02	39	90.00	6.000	9.550E+01	40	0.00	7.500	8.150E+01
41	0.00	7.500	7.980E+01	42	135.00	3.000	1.470E+02	43	180.00	4.500	1.070E+02	44	180.00	6.000	7.500E+01	45	225.00	7.500	6.350E+01
46	270.00	7.500	6.350E+01	47	270.00	3.000	1.450E+02	48	270.00	4.500	1.170E+02	49	270.00	6.000	7.700E+01	50	315.00	7.500	7.870E+01
51	315.00	7.500	8.280E+01	52	315.00	3.000	2.150E+02	53	315.00	4.500	1.810E+02	54	315.00	6.000	1.150E+02	55	315.00	7.500	8.280E+01

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MeV
 TARGET.....FP RUN 110
 PLATE NO.....PB
 PLATE LOCATION..B

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
4	135.00	2.328	1.440E+02	1	127.88	2.065	1.470E+02	2	119.06	1.883	1.490E+02	3	108.44	1.735	1.650E+02
8	96.34	2.656	1.640E+02	5	83.66	1.656	1.840E+02	6	71.57	1.735	1.790E+02	7	60.95	1.883	1.730E+02
12	52.13	2.085	1.750E+02	9	45.00	2.328	1.800E+02	10	142.10	2.085	1.540E+02	11	135.00	1.810	1.520E+02
16	125.54	1.573	1.830E+02	13	112.20	1.393	1.910E+02	14	98.13	1.293	1.940E+02	15	81.87	1.293	2.050E+02
20	66.80	1.393	1.900E+02	17	54.46	1.373	1.900E+02	18	45.00	1.810	1.820E+02	19	37.88	2.085	1.950E+02
24	150.95	1.883	1.520E+02	21	144.46	1.573	1.680E+02	22	135.00	1.293	1.850E+02	23	120.96	1.066	1.670E+02
28	101.31	0.933	1.620E+02	25	78.69	0.933	1.890E+02	26	59.04	1.066	1.940E+02	27	45.00	1.293	2.020E+02
32	35.34	1.573	1.910E+02	29	29.06	1.883	1.750E+02	30	161.57	1.735	1.650E+02	31	156.80	1.393	1.590E+02
36	149.04	1.066	1.760E+02	33	135.00	0.776	1.740E+02	34	108.44	0.578	1.850E+02	35	71.57	0.578	1.880E+02
40	45.00	0.776	1.910E+02	37	30.96	1.066	2.010E+02	38	23.20	1.393	2.000E+02	39	18.44	1.735	1.970E+02
44	173.66	1.656	1.570E+02	41	171.87	1.293	1.700E+02	42	168.69	0.933	1.690E+02	43	161.57	0.578	1.760E+02
48	135.00	0.259	1.870E+02	45	45.00	0.259	1.940E+02	46	18.44	0.378	1.870E+02	47	11.31	0.933	2.010E+02
52	8.13	1.293	1.930E+02	49	6.34	1.656	1.950E+02	50	186.34	1.656	1.540E+02	51	188.13	1.293	1.670E+02
56	191.31	0.933	1.850E+02	53	198.44	0.578	1.810E+02	54	225.00	0.259	1.840E+02	55	315.00	0.259	1.860E+02
60	341.57	0.578	1.870E+02	57	348.69	0.933	1.930E+02	58	351.87	1.293	1.740E+02	59	353.66	1.656	2.050E+02
64	251.57	0.578	1.740E+02	61	203.20	1.393	1.700E+02	62	210.96	1.066	1.640E+02	63	225.00	0.776	1.750E+02
68	336.80	1.393	1.660E+02	65	288.44	0.578	1.910E+02	66	315.00	0.776	1.950E+02	67	329.00	1.066	1.840E+02
72	225.00	1.293	1.730E+02	69	341.87	1.735	2.000E+02	70	209.05	1.883	1.560E+02	71	215.54	1.573	1.670E+02
76	300.96	1.066	1.750E+02	73	239.04	1.066	1.920E+02	74	258.69	0.933	1.860E+02	75	261.31	0.933	1.600E+02
80	217.88	2.085	1.620E+02	77	315.00	1.293	2.010E+02	78	324.46	1.573	1.650E+02	79	330.95	1.883	2.060E+02
84	261.87	1.293	1.820E+02	81	225.00	1.810	1.660E+02	82	234.46	1.573	1.670E+02	83	246.80	1.393	1.870E+02
88	315.00	1.810	1.910E+02	85	278.13	1.293	1.850E+02	86	293.20	1.393	1.810E+02	87	305.54	1.573	1.750E+02
92	240.95	1.883	1.720E+02	89	322.13	2.085	1.910E+02	90	225.00	2.328	1.450E+02	91	232.13	2.085	1.550E+02
96	288.44	1.735	1.890E+02	93	251.57	1.735	1.680E+02	94	263.66	1.656	1.720E+02	95	276.34	1.656	1.790E+02
100	0.	2.445	1.990E+02	97	299.06	1.883	1.800E+02	98	307.88	2.085	1.940E+02	99	315.00	2.328	1.990E+02
104	0.	6.985	3.090E+01	105	22.50	2.445	1.860E+02	106	22.50	3.175	1.730E+02	107	22.50	4.445	1.260E+02
108	22.50	5.715	8.980E+01	109	22.50	6.985	3.220E+01	110	45.00	3.175	1.700E+02	111	45.00	4.445	1.200E+02
112	45.00	5.715	6.900E+01	113	45.00	6.985	3.410E+01	114	67.50	2.445	1.600E+02	115	67.50	3.175	1.550E+02
116	67.50	4.445	9.570E+01	117	67.50	5.715	5.590E+01	118	67.50	6.985	3.390E+01	119	90.00	2.445	1.490E+02
120	90.00	3.175	1.470E+02	121	90.00	4.445	8.640E+01	122	90.00	5.715	5.260E+01	123	90.00	6.985	2.320E+01
124	112.50	2.445	1.400E+02	125	112.50	3.175	1.260E+02	126	112.50	4.445	7.470E+01	127	112.50	5.715	5.020E+01
128	112.50	6.985	2.050E+01	129	135.00	3.175	1.210E+02	130	135.00	4.445	6.950E+01	131	135.00	5.715	3.880E+01
132	135.00	6.985	2.440E+01	133	157.50	2.445	1.570E+02	134	157.50	3.175	1.060E+02	135	157.50	4.445	7.350E+01
136	157.50	5.715	3.360E+01	137	157.50	6.985	1.320E+01	138	180.00	2.445	1.400E+02	139	180.00	3.175	9.350E+01
140	180.00	4.445	6.770E+01	141	180.00	5.715	3.250E+01	142	180.00	6.985	1.410E+01	143	202.50	2.445	1.300E+02
144	202.50	3.175	1.100E+02	145	202.50	4.445	6.530E+01	146	202.50	5.715	3.230E+01	147	202.50	6.985	1.390E+02
148	225.00	3.175	1.090E+02	149	225.00	4.445	6.550E+01	150	225.00	5.715	3.350E+01	151	225.00	6.985	2.130E+02
152	247.50	2.445	1.460E+02	153	247.50	3.175	1.080E+02	154	247.50	4.445	9.160E+01	155	247.50	5.715	4.930E+01
156	247.50	6.985	1.720E+01	157	270.00	2.445	1.740E+02	158	270.00	3.175	1.320E+02	159	270.00	4.445	1.010E+02
160	270.00	5.715	5.450E+01	161	270.00	6.985	2.270E+01	162	292.50	2.445	1.73E+02	163	292.50	3.175	1.380E+02
164	292.50	4.445	1.150E+02	165	292.50	5.715	5.770E+01	166	292.50	6.985	3.050E+01	167	315.00	3.175	1.560E+02
168	315.00	4.445	1.320E+02	169	315.00	5.715	7.690E+01	170	315.00	6.985	3.700E+01	171	337.50	2.445	1.970E+02
172	337.50	3.175	1.630E+02	173	337.50	4.445	1.340E+02	174	337.50	5.715	7.900E+01	175	337.50	6.985	3.460E+01

RUN DATE: 7/19/78
 PARTICLE: MUON
 BEAM ENERGY: 500 MEV
 TARGET: FE RUN 111
 PLATE NO: P11
 PLATE LOCATION: 1

NO	ANGLE	RADIUS	DOSE	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	9.470E+01	1	127.80	2.085	9.080E+01	2	119.06	1.883	9.720E+01	3	108.44	1.735	9.800E+01	4	96.34	1.656	1.140E+02	5	83.66	1.856	1.140E+02	6	71.57	1.735	1.100E+02	7	60.95	1.803	1.130E+02																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
8	52.13	2.085	1.070E+02	9	45.00	2.328	1.040E+02	10	142.10	2.085	1.080E+02	11	139.00	1.810	9.660E+01	12	125.54	1.573	1.060E+02	13	113.20	1.393	1.150E+02	14	98.13	1.293	1.150E+02	15	81.87	1.293	1.150E+02	16	66.80	1.493	1.120E+02	17	54.46	1.573	1.150E+02	18	45.00	1.810	1.210E+02	19	37.88	2.085	1.090E+02	20	30.95	1.803	1.020E+02	21	144.46	1.573	1.040E+02	22	135.00	1.293	1.120E+02	23	120.96	1.066	1.100E+02	24	101.31	0.933	1.190E+02	25	70.69	0.933	1.160E+02	26	59.04	1.066	1.170E+02	27	45.00	1.293	1.160E+02	28	35.54	1.573	1.100E+02	29	29.06	1.803	1.190E+02	30	161.57	1.735	1.140E+02	31	156.80	1.393	1.140E+02	32	149.04	1.066	1.120E+02	33	135.00	0.776	1.210E+02	34	100.44	0.578	1.190E+02	35	71.57	0.578	1.260E+02	36	45.00	0.776	1.200E+02	37	30.95	1.066	1.230E+02	38	23.20	1.393	1.230E+02	39	18.44	1.735	1.320E+02	40	175.66	1.656	1.100E+02	41	171.87	1.293	1.100E+02	42	168.69	0.933	1.120E+02	43	161.57	0.578	1.220E+02	44	135.00	0.259	1.200E+02	45	45.00	0.259	1.290E+02	46	18.44	0.578	1.370E+02	47	11.31	0.933	1.290E+02	48	8.13	1.293	1.310E+02	49	6.34	1.656	1.320E+02	50	186.34	1.656	1.070E+02	51	188.13	1.293	1.180E+02	52	191.31	0.933	1.180E+02	53	196.44	0.578	1.270E+02	54	225.00	0.259	1.240E+02	55	315.00	0.259	1.310E+02	56	341.57	0.578	1.400E+02	57	348.69	0.933	1.310E+02	58	351.87	1.293	1.350E+02	59	353.66	1.656	1.320E+02	60	190.44	1.735	1.100E+02	61	203.20	1.993	1.200E+02	62	210.96	1.066	1.240E+02	63	225.00	0.776	1.290E+02	64	251.57	0.578	1.210E+02	65	280.44	0.578	1.400E+02	66	315.00	0.776	1.290E+02	67	329.00	1.066	1.310E+02	68	336.80	1.393	1.360E+02	69	341.57	1.735	1.370E+02	70	209.05	1.603	1.120E+02	71	215.54	1.573	1.170E+02	72	225.00	1.293	1.240E+02	73	239.01	1.066	1.240E+02	74	258.69	0.933	1.320E+02	75	281.31	0.933	1.300E+02	76	300.96	1.066	1.390E+02	77	315.00	1.293	1.410E+02	78	324.46	1.573	1.360E+02	79	330.95	1.803	1.310E+02	80	217.07	1.293	1.190E+02	81	201.87	1.066	1.190E+02	82	234.46	1.573	1.230E+02	83	246.80	1.393	1.210E+02	84	261.07	1.810	1.370E+02	85	278.13	1.293	1.350E+02	86	293.20	1.393	1.350E+02	87	305.54	1.573	1.370E+02	88	315.00	1.810	1.370E+02	89	324.13	2.085	1.340E+02	90	225.00	2.328	1.070E+02	91	232.13	2.085	1.070E+02	92	240.95	1.803	1.250E+02	93	251.57	1.735	1.280E+02	94	263.66	1.656	1.180E+02	95	263.66	1.656	1.180E+02	96	307.88	2.085	1.390E+02	97	307.88	2.085	1.390E+02	98	307.88	2.085	1.390E+02	99	307.88	2.085	1.390E+02	100	0	0	0	101	0	0	0	102	0	0	0	103	0	0	0	104	0	0	0	105	0	0	0	106	0	0	0	107	0	0	0	108	0	0	0	109	0	0	0	110	0	0	0	111	0	0	0	112	0	0	0	113	0	0	0	114	0	0	0	115	0	0	0	116	0	0	0	117	0	0	0	118	0	0	0	119	0	0	0	120	0	0	0	121	0	0	0	122	0	0	0	123	0	0	0	124	0	0	0	125	0	0	0	126	0	0	0	127	0	0	0	128	0	0	0	129	0	0	0	130	0	0	0	131	0	0	0	132	0	0	0	133	0	0	0	134	0	0	0	135	0	0	0	136	0	0	0	137	0	0	0	138	0	0	0	139	0	0	0	140	0	0	0	141	0	0	0	142	0	0	0	143	0	0	0	144	0	0	0	145	0	0	0	146	0	0	0	147	0	0	0	148	0	0	0	149	0	0	0	150	0	0	0	151	0	0	0	152	0	0	0	153	0	0	0	154	0	0	0	155	0	0	0	156	0	0	0	157	0	0	0	158	0	0	0	159	0	0	0	160	0	0	0	161	0	0	0	162	0	0	0	163	0	0	0	164	0	0	0	165	0	0	0	166	0	0	0	167	0	0	0	168	0	0	0	169	0	0	0	170	0	0	0	171	0	0	0	172	0	0	0	173	0	0	0	174	0	0	0	175	0	0	0	176	0	0	0	177	0	0	0	178	0	0	0	179	0	0	0	180	0	0	0	181	0	0	0	182	0	0	0	183	0	0	0	184	0	0	0	185	0	0	0	186	0	0	0	187	0	0	0	188	0	0	0	189	0	0	0	190	0	0	0	191	0	0	0	192	0	0	0	193	0	0	0	194	0	0	0	195	0	0	0	196	0	0	0	197	0	0	0	198	0	0	0	199	0	0	0	200	0	0	0

RUN DATE.....7/13/70
 PARTICLE.....DEUTERON
 BEAM ENERGY....330 MEV
 TARGET.....PP RUN 111
 PLATE NO.....00
 PLATE LOCATION..1

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	100.43	2.214	1.350E+02	2	90.00	2.100	1.580E+02	3	71.57	2.214	1.620E+02	4	135.00	1.980	1.480E+02
5	115.57	1.565	1.640E+02	6	90.00	1.400	1.660E+02	7	63.43	1.568	1.750E+02	8	45.00	1.980	1.480E+02
9	161.57	2.214	1.420E+02	10	153.43	1.565	1.610E+02	11	135.00	0.990	1.840E+02	12	90.00	0.700	1.760E+02
13	45.00	0.990	1.720E+02	14	26.37	1.565	1.860E+02	15	18.43	2.214	1.770E+02	16	180.00	2.100	1.470E+02
17	180.00	1.400	1.760E+02	18	180.00	0.700	1.710E+02	19	0.	0.	1.680E+02	20	0.	0.700	1.860E+02
21	0.	1.400	1.810E+02	22	0.	2.100	1.870E+02	23	198.43	2.214	1.480E+02	24	206.57	1.565	1.640E+02
25	223.00	0.990	1.650E+02	26	270.00	0.700	1.670E+02	27	315.00	0.990	1.830E+02	28	333.43	1.565	1.860E+02
29	341.57	2.214	1.770E+02	30	225.00	1.980	1.470E+02	31	243.43	1.565	1.600E+02	32	270.00	1.400	1.760E+02
33	296.57	1.565	1.770E+02	34	315.00	1.980	1.810E+02	35	251.57	2.214	1.640E+02	36	270.00	2.100	1.580E+02
37	288.43	2.214	1.670E+02	38	0.	3.000	1.590E+02	39	0.	4.500	1.450E+02	40	0.	6.000	8.870E+01
41	0.	7.500	6.120E+01	42	45.00	3.000	1.450E+02	43	45.00	4.500	1.150E+02	44	45.00	6.000	7.810E+01
45	45.00	7.500	5.620E+01	46	90.00	3.000	1.360E+02	47	90.00	4.500	1.130E+02	48	90.00	6.000	7.990E+01
49	90.00	7.500	6.210E+01	50	135.00	3.000	1.340E+02	51	135.00	4.500	8.990E+01	52	135.00	6.000	6.620E+01
53	135.00	7.500	5.670E+01	54	180.00	3.000	1.260E+02	55	180.00	4.500	9.360E+01	56	180.00	6.000	6.500E+01
57	180.00	7.500	5.600E+01	58	225.00	3.000	1.320E+02	59	225.00	4.500	8.630E+01	60	225.00	6.000	6.330E+01
61	225.00	7.500	4.860E+01	62	270.00	3.000	1.570E+02	63	270.00	4.500	1.210E+02	64	270.00	6.000	7.600E+01
65	270.00	7.500	6.740E+01	66	315.00	3.000	1.580E+02	67	315.00	4.500	1.360E+02	68	315.00	6.000	8.660E+01
69	315.00	7.500	6.230E+01												

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 111
 PLATE NO.....D6
 PLATE LOCATION..2

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	108.43	2.214	1.530E+02	2	90.00	2.100	1.730E+02	3	71.57	2.214	1.650E+02	4	135.00	1.980	1.650E+02
5	116.57	1.565	1.680E+02	6	90.00	1.400	1.640E+02	7	63.43	1.565	1.790E+02	8	45.00	1.980	1.660E+02
9	161.57	2.214	1.420E+02	10	153.43	1.565	1.630E+02	11	135.00	0.990	1.780E+02	12	90.00	0.700	1.950E+02
13	45.00	0.990	1.630E+02	14	26.57	1.565	1.880E+02	15	18.43	2.214	1.780E+02	16	180.00	2.100	1.580E+02
17	180.00	1.400	1.710E+02	18	180.00	0.700	1.730E+02	19	0.	0.	1.800E+02	20	0.	0.700	1.660E+02
21	0.	1.400	1.930E+02	22	0.	2.100	1.760E+02	23	198.43	2.214	1.490E+02	24	206.57	1.565	1.760E+02
25	225.00	0.990	1.690E+02	26	270.00	0.700	1.920E+02	27	315.00	0.990	1.870E+02	28	333.43	1.565	1.840E+02
29	341.57	2.214	1.880E+02	30	225.00	1.980	1.490E+02	31	243.43	1.565	1.720E+02	32	270.00	1.400	1.810E+02
33	296.57	1.565	1.860E+02	34	315.00	1.980	1.860E+02	35	251.57	2.214	1.610E+02	36	270.00	2.100	1.610E+02
37	288.43	2.214	1.830E+02	38	0.	3.000	1.720E+02	39	0.	4.500	1.360E+02	40	0.	6.000	8.910E+01
41	0.	7.500	5.950E+01	42	45.00	3.000	1.690E+02	43	45.00	4.500	1.240E+02	44	45.00	6.000	8.120E+01
45	45.00	7.500	5.880E+01	46	90.00	3.000	1.410E+02	47	90.00	4.500	1.090E+02	48	90.00	6.000	7.500E+01
49	90.00	7.500	6.290E+01	50	135.00	3.000	1.340E+02	51	135.00	4.500	9.630E+01	52	135.00	6.000	7.090E+01
53	135.00	7.500	5.740E+01	54	180.00	3.000	1.310E+02	55	180.00	4.500	9.460E+01	56	180.00	6.000	7.570E+01
57	180.00	7.500	5.690E+01	58	225.00	3.000	1.290E+02	59	225.00	4.500	9.910E+01	60	225.00	6.000	8.770E+01
61	225.00	7.500	4.910E+01	62	270.00	3.000	1.630E+02	63	270.00	4.500	1.250E+02	64	270.00	6.000	9.080E+01
65	270.00	7.500	6.100E+01	66	315.00	3.000	1.670E+02	67	315.00	4.500	1.510E+02	68	315.00	6.000	8.860E+01
69	315.00	7.500	6.330E+01												

RUN DATE.....7/16/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....3.10 MEV
 TARGET.....PP RUN 111
 PLATE NO.....P13
 PLATE LOCATION..3

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	135.00	2.328	1.010E+02	1	127.88	2.085	1.230E+02	2	119.06	1.883	1.180E+02	3	108.44	1.735	1.160E+02
4	96.34	1.656	1.420E+02	5	83.66	1.658	1.240E+02	6	71.57	1.735	1.340E+02	7	60.95	1.883	1.310E+02
8	52.13	2.085	1.280E+02	9	45.00	2.328	1.160E+02	10	142.10	2.085	1.280E+02	11	135.00	1.810	1.180E+02
12	125.54	1.573	1.210E+02	13	113.20	1.393	1.490E+02	14	98.13	1.293	1.190E+02	15	81.87	1.293	1.360E+02
16	68.80	1.393	1.300E+02	17	54.46	1.573	1.400E+02	18	45.00	1.810	1.620E+02	19	37.88	2.085	1.360E+02
20	150.95	1.883	1.140E+02	21	144.46	1.573	1.190E+02	22	135.00	1.293	1.290E+02	23	120.96	1.086	1.280E+02
24	131.31	0.933	1.280E+02	25	78.69	0.933	1.160E+02	26	59.04	1.066	1.420E+02	27	45.00	1.293	1.400E+02
28	35.54	1.573	1.430E+02	29	29.06	1.083	1.120E+02	30	181.57	1.735	1.290E+02	31	156.80	1.393	1.300E+02
32	149.04	1.066	1.300E+02	33	35.00	0.778	1.390E+02	34	108.44	0.578	1.550E+02	35	71.57	0.578	1.400E+02
36	45.00	0.778	1.500E+02	37	30.36	1.066	1.480E+02	38	23.20	1.393	1.550E+02	39	16.44	1.735	1.450E+02
40	173.66	1.656	1.240E+02	41	171.87	1.293	1.250E+02	42	168.69	0.933	1.340E+02	43	161.57	0.878	1.440E+02
44	135.00	0.259	1.460E+02	45	45.00	0.359	1.410E+02	46	18.44	0.578	1.530E+02	47	11.31	0.833	1.470E+02
48	8.13	1.293	1.540E+02	49	6.34	1.656	1.490E+02	50	186.34	1.656	1.280E+02	51	188.13	1.293	1.290E+02
52	191.31	0.933	1.300E+02	53	198.44	0.578	1.430E+02	54	225.00	0.259	1.520E+02	55	315.00	0.259	1.580E+02
56	341.57	0.578	1.530E+02	57	348.69	0.933	1.600E+02	58	351.87	1.293	1.580E+02	59	353.66	1.856	1.570E+02
60	190.44	1.735	1.320E+02	61	203.20	1.393	1.360E+02	62	210.96	1.066	1.350E+02	63	225.00	0.778	1.480E+02
64	261.57	0.578	1.670E+02	65	268.44	0.578	1.400E+02	66	315.00	0.778	1.550E+02	67	329.00	1.066	1.560E+02
68	356.80	1.393	1.590E+02	69	341.57	1.735	1.570E+02	70	209.03	1.883	1.170E+02	71	215.54	1.873	1.330E+02
72	225.00	1.293	1.420E+02	73	239.04	1.066	1.510E+02	74	258.69	0.933	1.480E+02	75	281.31	0.938	9.330E+01
76	300.96	1.066	1.670E+02	77	316.00	1.293	1.840E+02	78	324.46	1.573	1.580E+02	79	330.85	1.883	1.630E+02
80	217.88	2.085	1.190E+02	81	225.00	1.910	1.320E+02	82	234.48	1.573	1.800E+02	83	248.80	1.393	1.480E+02
84	261.07	1.293	1.480E+02	85	278.13	1.293	1.650E+02	86	293.20	1.393	1.550E+02	87	305.54	1.573	1.600E+02
88	315.00	1.810	1.550E+02	89	322.13	2.085	1.650E+02	90	225.00	2.328	1.250E+02	91	232.13	2.085	1.300E+02
92	240.95	1.883	1.430E+02	93	251.57	1.735	1.440E+02	94	263.66	1.656	1.600E+02	95	276.34	1.656	1.560E+02
96	268.44	1.735	1.520E+02	97	299.06	1.683	1.550E+02	98	307.88	2.085	1.440E+02	99	315.00	2.328	1.610E+02
100	0.	2.445	1.550E+02	101	0.	3.175	1.330E+02	102	0.	4.445	1.290E+02	103	0.	5.715	5.860E+01
104	0.	5.905	2.900E+01	105	22.50	2.445	1.420E+02	106	22.50	3.175	1.320E+02	107	22.50	4.445	9.010E+01
108	22.50	5.715	5.710E+01	109	22.50	6.985	2.770E+01	110	45.00	3.175	1.070E+02	111	45.00	4.445	8.360E+01
112	45.00	5.715	4.530E+01	113	45.00	5.985	2.600E+01	114	67.50	2.445	1.390E+02	115	67.50	3.175	9.380E+01
116	67.50	4.445	6.830E+01	117	67.50	5.715	3.040E+01	118	67.50	6.985	2.320E+01	119	90.00	2.445	9.800E+01
120	90.00	3.175	9.010E+01	121	90.00	4.445	5.970E+01	122	90.00	5.715	3.680E+01	123	90.00	6.985	2.300E+01
124	112.50	2.445	1.000E+02	125	112.50	3.175	1.010E+02	126	112.50	4.445	5.870E+01	127	112.50	5.715	3.400E+01
128	112.50	5.905	1.920E+01	129	135.00	3.175	9.530E+01	130	135.00	4.445	5.830E+01	131	135.00	5.715	3.360E+01
132	135.00	5.905	2.000E+01	133	157.50	2.445	1.060E+02	134	157.50	3.175	8.850E+01	135	157.50	4.445	5.600E+01
136	157.50	5.715	3.200E+01	137	157.50	6.985	1.980E+01	138	180.00	2.445	1.120E+02	139	180.00	3.175	8.280E+01
140	180.00	4.445	5.770E+01	141	180.00	5.715	3.410E+01	142	180.00	6.985	1.960E+01	143	202.50	2.445	1.150E+02
144	202.50	3.175	9.500E+01	145	202.50	4.445	6.290E+01	146	202.50	5.715	3.750E+01	147	202.50	6.985	2.260E+01
148	225.00	3.175	1.000E+02	149	225.00	4.445	8.300E+01	150	225.00	5.715	4.620E+01	151	225.00	6.985	2.540E+01
152	247.50	2.445	1.250E+02	153	247.50	3.175	1.160E+02	154	247.50	4.445	1.060E+02	155	247.50	5.715	5.270E+01
156	247.50	6.985	2.930E+01	157	270.00	2.445	1.120E+02	158	270.00	3.175	1.310E+02	159	270.00	4.445	9.840E+01
160	270.00	5.715	6.630E+01	161	270.00	6.985	3.210E+01	162	292.50	2.445	1.490E+02	163	292.50	3.175	1.400E+02
164	292.50	4.445	1.500E+02	165	292.50	5.715	7.420E+01	166	292.50	6.985	3.840E+01	167	315.00	3.175	1.430E+02
168	315.00	4.445	1.140E+02	169	315.00	5.715	7.110E+01	170	315.00	6.985	4.190E+01	171	337.50	2.445	1.820E+02
172	337.50	3.175	1.400E+02	173	337.50	4.445	1.180E+02	174	337.50	5.715	6.620E+01	175	337.50	6.985	4.280E+01

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330.MEV
 TARGET.....FP RUN 111
 PLATE NO.....D7
 PLATE LOCATION..3

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	108.43	2.214	1.640E+02	2	90.00	2.100	1.750E+02	3	71.57	2.214	1.670E+02	4	135.00	1.980	1.650E+02	5	116.57	1.565	1.700E+02
6	90.00	1.400	1.750E+02	7	63.43	1.565	1.650E+02	8	45.00	1.980	1.830E+02	9	161.57	2.214	1.520E+02	10	153.43	1.565	1.650E+02
11	135.00	0.990	1.600E+02	12	90.00	0.990	1.600E+02	13	45.00	1.980	1.830E+02	14	26.57	1.565	1.650E+02	15	18.43	2.214	1.670E+02
16	180.00	2.100	1.750E+02	17	180.00	0.700	1.860E+02	18	180.00	0.700	1.860E+02	19	0.	0.	1.850E+02	20	0.	0.	1.850E+02
21	0.	1.400	1.750E+02	22	0.	2.100	1.950E+02	23	198.43	2.214	1.530E+02	24	206.57	1.565	1.700E+02	25	225.00	0.990	1.600E+02
26	225.00	1.800E+02	27	315.00	0.990	1.600E+02	28	315.00	0.990	1.600E+02	29	341.57	2.214	1.520E+02	30	225.00	1.980	1.830E+02	
31	243.43	1.565	1.650E+02	32	270.00	1.400	1.910E+02	33	296.57	1.565	1.700E+02	34	315.00	1.980	1.830E+02	35	251.57	2.214	1.670E+02
36	270.00	2.100	1.750E+02	37	288.43	2.214	1.670E+02	38	0.	3.000	1.790E+02	39	0.	4.500	1.380E+02	40	0.	6.000	8.920E+01
41	0.	7.500	6.020E+01	42	45.00	3.000	1.710E+02	43	45.00	4.500	1.250E+02	44	45.00	6.000	8.780E+01	45	45.00	7.500	6.910E+01
46	90.00	3.000	1.430E+02	47	90.00	4.500	1.300E+02	48	90.00	6.000	7.480E+01	49	90.00	7.500	6.340E+01	50	135.00	3.000	1.360E+02
51	135.00	4.500	1.360E+02	52	135.00	6.000	7.360E+01	53	135.00	7.500	6.780E+01	54	180.00	3.000	1.360E+02	55	180.00	4.500	1.250E+02
56	180.00	6.000	7.480E+01	57	180.00	7.500	6.910E+01	58	225.00	3.000	1.330E+02	59	225.00	4.500	1.290E+02	60	225.00	6.000	8.240E+01
61	225.00	7.500	6.070E+01	62	270.00	3.000	1.760E+02	63	270.00	4.500	1.300E+02	64	270.00	6.000	8.930E+01	65	270.00	7.500	6.800E+01
66	315.00	3.000	1.760E+02	67	315.00	4.500	1.300E+02	68	315.00	6.000	8.930E+01	69	315.00	7.500	6.800E+01				

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 NEV
 TARGET.....FP RUN 111
 PLATE NO.....DU
 PLATE LOCATION..4

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	108.43	2.214	1.810E+02	2	90.00	2.100	1.840E+02	3	71.57	2.214	1.830E+02	4	135.00	1.980	1.780E+02				
5	116.57	1.565	1.830E+02	6	90.00	1.400	1.810E+02	7	63.43	1.565	2.150E+02	8	45.00	1.980	1.860E+02				
9	161.57	2.214	1.670E+02	10	153.43	1.565	1.830E+02	11	135.00	0.990	1.870E+02	12	90.00	0.700	2.020E+02				
13	45.00	0.990	1.950E+02	14	26.57	1.565	1.980E+02	15	18.43	2.214	2.100E+02	16	180.00	2.100	1.940E+02				
17	180.00	1.400	1.950E+02	18	180.00	0.700	1.880E+02	19	0.	0.	1.980E+02	20	0.	0.700	1.980E+02				
21	0.	1.400	2.110E+02	22	0.	2.100	2.200E+02	23	198.43	2.214	1.770E+02	24	206.57	1.565	1.860E+02				
25	225.00	0.990	1.890E+02	26	270.00	0.700	2.010E+02	27	315.00	0.990	2.040E+02	28	333.43	1.565	2.250E+02				
29	341.57	2.214	2.310E+02	30	225.00	1.980	1.720E+02	31	243.43	1.565	1.830E+02	32	270.00	1.400	2.040E+02				
33	296.57	1.565	2.060E+02	34	315.00	1.980	2.150E+02	35	251.57	2.214	1.790E+02	36	270.00	2.100	1.970E+02				
37	288.43	2.214	1.930E+02	38	0.	0.	2.300E+02	39	0.	4.500	1.540E+02	40	0.	6.000	9.830E+01				
41	0.	7.500	6.880E+01	42	45.00	3.000	1.860E+02	43	45.00	4.500	1.280E+02	44	45.00	6.000	9.350E+01				
45	45.00	7.500	6.200E+01	46	90.00	3.000	1.600E+02	47	90.00	4.500	1.230E+02	48	90.00	6.000	8.880E+01				
49	90.00	7.500	7.030E+01	50	135.00	3.000	1.520E+02	51	135.00	4.500	1.220E+02	52	135.00	6.000	8.260E+01				
53	135.00	7.500	6.390E+01	54	180.00	3.000	1.480E+02	55	180.00	4.500	1.130E+02	56	180.00	6.000	7.850E+01				
57	180.00	7.500	6.450E+01	58	225.00	3.000	1.470E+02	59	225.00	4.500	1.050E+02	60	225.00	6.000	7.630E+01				
61	225.00	7.500	7.000E+01	62	270.00	3.000	1.780E+02	63	270.00	4.500	1.460E+02	64	270.00	6.000	9.090E+01				
65	270.00	7.500	7.710E+01	66	315.00	3.000	1.940E+02	67	315.00	4.500	1.470E+02	68	315.00	6.000	9.490E+01				
69	315.00	7.500	7.650E+01																

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 111
 PLATE NO.....D9
 PLATE LOCATION..5

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	108.43	2.214	2.160E+02	2	90.00	2.100	2.180E+02	3	71.57	2.214	2.350E+02	4	135.00	1.980	2.190E+02	5	45.00	1.980	2.100E+02
5	116.57	1.565	2.310E+02	6	90.00	1.400	2.190E+02	7	63.43	1.565	2.050E+02	8	45.00	1.980	2.050E+02	9	90.00	0.700	2.050E+02
10	161.57	2.214	2.160E+02	11	135.00	0.990	2.060E+02	12	135.00	0.990	2.220E+02	13	180.00	2.100	2.190E+02	14	180.00	2.100	2.190E+02
15	45.00	0.990	2.360E+02	16	180.00	0.700	2.130E+02	17	180.00	0.700	2.260E+02	18	180.00	0.700	2.120E+02	19	0.00	0.700	2.120E+02
20	180.00	1.400	2.350E+02	21	0.00	2.100	2.350E+02	22	0.00	2.100	2.350E+02	23	198.43	2.214	2.140E+02	24	206.57	1.565	1.910E+02
25	0.00	1.400	2.410E+02	26	270.00	0.700	2.200E+02	27	315.00	0.990	2.200E+02	28	333.43	1.565	1.970E+02	29	333.43	1.565	1.970E+02
30	225.00	0.990	2.230E+02	31	243.43	1.565	1.860E+02	32	243.43	1.565	1.860E+02	33	270.00	1.400	2.110E+02	34	270.00	2.100	1.950E+02
35	296.57	1.565	2.390E+02	36	270.00	2.214	2.030E+02	37	288.43	2.214	2.030E+02	38	0.00	6.000	1.780E+02	39	0.00	6.000	1.780E+02
40	0.00	2.214	1.850E+02	41	0.00	3.000	2.120E+02	42	45.00	3.000	1.710E+02	43	45.00	4.600	1.730E+02	44	45.00	6.000	2.000E+02
45	45.00	7.500	1.770E+02	46	90.00	3.000	1.700E+02	47	90.00	4.600	1.390E+02	48	90.00	6.000	1.560E+02	49	90.00	6.000	1.560E+02
50	90.00	7.500	1.320E+02	51	135.00	3.000	1.180E+02	52	135.00	4.600	1.200E+02	53	135.00	6.000	1.520E+02	54	180.00	6.000	9.990E+01
55	135.00	7.500	1.730E+02	56	180.00	3.000	1.280E+02	57	180.00	4.600	9.940E+01	58	180.00	6.000	1.060E+02	59	225.00	6.000	8.020E+01
60	180.00	7.500	9.700E+01	61	225.00	3.000	8.640E+01	62	225.00	4.600	8.600E+01	63	270.00	6.000	8.020E+01	64	270.00	6.000	8.020E+01
65	225.00	7.500	1.060E+02	66	270.00	3.000	7.520E+01	67	315.00	4.600	7.650E+01	68	315.00	6.000	7.270E+01	69	315.00	6.000	7.270E+01
70	270.00	7.500	7.430E+01	71	315.00	3.000	7.450E+01												
72	315.00	7.500	8.910E+01	73	315.00	3.000	7.450E+01												

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 111
 PLATE NO.....P16
 PLATE LOCATION..G

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
0	133.00	2.328	1.400E+02	1	127.88	2.078	1.810E+02	2	119.06	1.883	2.184E+02	3	108.44	1.735	1.860E+02
4	98.34	1.886	1.650E+02	5	83.86	1.628	1.710E+02	6	71.37	1.795	1.840E+02	7	60.98	1.893	1.670E+02
8	52.13	2.085	1.630E+02	9	45.00	2.098	1.700E+02	10	142.10	2.008	1.840E+02	11	135.00	1.810	1.540E+02
12	125.54	1.573	1.670E+02	13	113.20	1.393	1.650E+02	14	98.13	1.293	1.810E+02	15	81.07	1.203	2.400E+02
16	66.80	1.393	1.820E+02	17	54.46	1.573	1.790E+02	18	45.00	1.810	1.800E+02	19	37.86	2.085	1.910E+02
20	150.95	1.883	1.560E+02	21	144.46	1.573	1.540E+02	22	135.00	1.293	1.650E+02	23	120.96	1.066	1.830E+02
24	101.31	0.933	1.740E+02	25	78.69	0.933	1.760E+02	26	59.04	1.066	1.730E+02	27	45.00	1.293	1.840E+02
28	35.54	1.573	1.970E+02	29	29.06	1.893	1.940E+02	30	161.57	1.735	1.540E+02	31	156.80	1.393	1.590E+02
32	149.04	1.066	1.680E+02	33	135.00	0.776	1.790E+02	34	108.44	0.578	1.890E+02	35	71.37	0.578	2.310E+02
36	45.00	0.776	1.940E+02	37	30.96	1.066	2.030E+02	38	23.20	1.393	1.910E+02	39	18.44	1.735	1.920E+02
40	173.66	1.686	1.630E+02	41	171.87	1.293	1.740E+02	42	160.69	0.933	1.760E+02	43	161.57	0.878	1.830E+02
44	135.00	0.259	1.890E+02	45	45.00	0.259	2.020E+02	46	18.44	0.578	1.890E+02	47	11.31	0.933	1.800E+02
48	8.13	1.293	1.960E+02	49	6.34	1.656	2.660E+02	50	186.34	1.656	1.630E+02	51	188.13	1.293	1.760E+02
52	181.31	0.933	1.650E+02	53	198.44	0.578	1.800E+02	54	225.00	0.259	2.000E+02	55	315.00	0.259	2.590E+02
56	341.57	0.578	2.010E+02	57	348.69	0.933	2.080E+02	58	351.87	1.293	2.060E+02	59	363.68	1.656	2.030E+02
60	198.44	1.735	1.510E+02	61	203.20	1.393	1.650E+02	62	210.96	1.066	1.840E+02	63	225.00	0.776	1.880E+02
64	251.37	0.578	1.820E+02	65	288.44	0.578	1.960E+02	66	315.00	0.776	1.950E+02	67	329.00	1.066	1.960E+02
68	336.60	1.393	2.540E+02	69	311.57	1.735	2.060E+02	70	209.05	1.883	1.640E+02	71	215.54	1.673	1.650E+02
72	223.00	1.293	1.750E+02	73	239.04	1.066	1.910E+02	74	250.69	0.933	2.480E+02	75	201.31	0.933	1.980E+02
76	300.96	1.066	1.900E+02	77	315.00	1.293	2.090E+02	78	324.46	1.573	2.120E+02	79	330.95	1.883	2.080E+02
80	217.88	2.085	1.600E+02	81	225.00	1.810	1.890E+02	82	234.46	1.573	1.680E+02	83	246.80	1.393	1.800E+02
84	261.37	1.293	1.720E+02	85	278.13	1.293	1.970E+02	86	293.20	1.393	2.080E+02	87	308.54	1.573	1.910E+02
88	315.00	1.810	2.010E+02	89	322.43	2.085	2.040E+02	90	325.00	2.328	1.470E+02	91	332.13	2.085	1.700E+02
92	240.95	1.883	1.690E+02	93	251.37	1.735	1.870E+02	94	263.66	1.656	1.760E+02	95	276.34	1.656	1.550E+02
96	288.44	1.735	1.890E+02	97	299.06	1.883	1.940E+02	98	307.88	2.085	2.000E+02	99	315.00	2.328	1.910E+02
100	0.	2.445	2.600E+02	101	0.	3.175	1.660E+02	102	0.	4.445	1.370E+02	103	0.	5.715	1.120E+02
104	0.	6.985	2.760E+01	105	22.50	2.445	1.760E+02	106	22.50	3.175	1.630E+02	107	22.50	4.445	1.240E+02
108	22.50	5.715	6.600E+01	109	22.50	6.985	2.640E+01	110	45.00	3.175	1.580E+02	111	45.00	4.445	1.110E+02
112	45.00	5.715	6.150E+01	113	45.00	6.985	5.660E+01	114	67.50	2.445	1.630E+02	115	67.50	3.175	1.350E+02
116	67.50	4.445	9.000E+01	117	67.50	5.715	4.910E+01	118	67.50	6.985	2.170E+01	119	90.00	2.445	1.480E+02
120	90.00	3.175	1.250E+02	121	90.00	4.445	0.450E+01	122	90.00	5.715	4.540E+01	123	90.00	6.985	2.080E+01
124	112.50	2.445	1.370E+02	125	112.50	3.175	1.180E+02	126	112.80	4.445	1.180E+02	127	112.50	5.715	3.800E+01
128	112.50	6.985	1.630E+01	129	135.00	3.175	1.150E+02	130	135.00	4.445	7.180E+01	131	135.00	5.715	3.590E+01
132	135.00	6.985	1.740E+01	133	157.50	2.445	1.330E+02	134	157.50	3.175	1.110E+02	135	157.50	4.445	7.450E+01
136	157.50	5.715	2.930E+01	137	157.50	6.985	1.400E+01	138	180.00	2.445	1.350E+02	139	180.00	3.175	1.050E+02
140	180.00	4.445	1.080E+02	141	180.00	5.715	3.120E+01	142	180.00	6.985	1.430E+01	143	202.50	2.445	1.970E+02
144	202.50	3.175	1.140E+02	145	202.50	4.445	6.900E+01	146	202.50	5.715	3.200E+01	147	202.50	6.985	1.460E+01
148	225.00	2.175	1.320E+02	149	225.00	4.445	8.260E+01	150	225.00	5.715	4.020E+01	151	225.00	6.985	1.630E+01
152	247.50	2.445	1.610E+02	153	247.50	3.175	1.990E+02	154	247.50	4.445	1.340E+02	155	247.50	5.715	9.000E+01
156	247.50	6.985	1.750E+01	157	270.00	2.445	1.360E+02	158	270.00	3.175	1.520E+02	159	270.00	4.445	1.160E+02
160	270.00	5.715	6.060E+01	161	270.00	6.985	2.430E+01	162	292.50	2.445	1.940E+02	163	292.50	3.175	2.240E+02
164	292.50	4.445	1.290E+02	165	292.50	5.715	6.800E+01	166	292.50	6.985	2.890E+01	167	315.00	3.175	1.830E+02
168	315.00	4.445	1.310E+02	169	315.00	5.715	7.690E+01	170	315.00	6.985	7.320E+01	171	337.50	2.445	2.070E+02
172	337.50	3.175	2.360E+02	173	337.50	4.445	1.280E+02	174	337.50	5.715	1.200E+02	175	337.50	6.985	2.800E+01

RUN DATE.....7/15/78
 PARTICLE.....DEUTERON
 BEAM ENERGY.....330 MEV
 TARGET.....FP RUN 111
 PLATE NO.....D10
 PLATE LOCATION..7

NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE	NO	ANGLE	RADIUS	DOSE
1	108.43	2.214	4.270E+01	2	90.00	2.100	5.210E+01	3	71.57	2.214	5.220E+01	4	135.00	1.980	5.350E+01
5	116.57	1.565	4.930E+01	6	90.00	1.400	4.310E+01	7	63.43	1.565	4.200E+01	8	45.00	1.980	5.220E+01
9	161.57	2.214	5.450E+01	10	153.43	1.565	5.160E+01	11	135.00	0.990	5.250E+01	12	90.00	0.700	5.230E+01
13	45.00	0.990	5.270E+01	14	26.57	1.565	5.420E+01	15	18.43	2.214	5.190E+01	16	180.00	2.100	5.040E+01
17	180.00	1.400	5.540E+01	18	180.00	0.700	5.220E+01	19	0.	0.	5.020E+01	20	0.	0.700	5.260E+01
21	0.	1.400	5.580E+01	22	0.	2.100	5.110E+01	23	198.43	2.214	4.350E+01	24	206.57	1.565	4.010E+01
25	225.00	0.990	4.980E+01	26	270.00	0.700	5.360E+01	27	315.00	0.990	4.860E+01	28	333.43	1.565	5.330E+01
29	341.57	2.214	5.290E+01	30	225.00	1.980	5.100E+01	31	243.43	1.565	5.060E+01	32	270.00	1.400	5.320E+01
33	296.57	1.565	5.290E+01	34	315.00	1.980	4.990E+01	35	251.57	2.214	5.880E+01	36	270.00	2.100	5.190E+01
37	208.43	2.214	5.170E+01	38	0.	3.000	5.050E+01	39	0.	4.500	3.810E+01	40	0.	6.000	4.750E+01
41	0.	7.500	4.920E+01	42	45.00	3.000	4.740E+01	43	45.00	4.500	3.740E+01	44	45.00	6.000	4.930E+01
45	45.00	7.500	5.050E+01	46	90.00	3.000	4.710E+01	47	90.00	4.500	5.070E+01	48	90.00	6.000	4.650E+01
49	90.00	7.500	4.600E+01	50	135.00	3.000	4.560E+01	51	135.00	4.500	4.040E+01	52	135.00	6.000	4.400E+01
53	135.00	7.500	4.820E+01	54	180.00	3.000	4.580E+01	55	180.00	4.500	3.560E+01	56	180.00	6.000	4.710E+01
57	180.00	7.500	4.570E+01	58	225.00	3.000	6.320E+01	59	225.00	4.500	3.390E+01	60	225.00	6.000	4.620E+01
61	225.00	7.500	4.470E+01	62	270.00	3.000	4.280E+01	63	270.00	4.500	3.610E+01	64	270.00	6.000	5.820E+01
65	270.00	7.500	4.660E+01	66	315.00	3.000	4.360E+01	67	315.00	4.500	4.130E+01	68	315.00	6.000	4.270E+01
69	315.00	7.500	4.570E+01												

APPENDIX C

REDUCED FISSION DATA

All data presented are for the 330-MeV deuteron runs because the equivalent proton data had little structure. The data labeled D1 through D10 are deduced from the small Lexan foils that were part of the Lexan/TLD/Lexan sandwich embedded within the ^{238}U plates. The data labeled 110-1 through 110-4 and 111-5 through 111-10 are horizontal and vertical scans across the large 7-by-7-in. Lexan foils pressed against the outside of ^{238}U plates. The labels are consistent with those called out in Fig. 4. The data have been converted to rads for ease of comparison with TLD data.

FIG. C1. Run 110 data, plates D1 and D2.

FIG. C2. Run 110 data, plates D3 and D4.

FIG. C3. Top row, 110-1; second row, 110-2; third row, 110-3; bottom row, 110-4.

FIG. C4. Run 111 data, plates D5 and D6 (re-read).

FIG. C5. Run 111 data, plates D6 (original readings) and D7.

FIG. C6. Run 111 data, plates D8 and D9.

FIG. C7. Run 111 data, plate D10.

FIG. C8. Top row, 111-5; second row, 111-6; third row, 111-7; bottom row, 111-8.

FIG. C9. Top row, 111-9; bottom row, 111-10.

APPENDIX D
NEUTRON AND GAMMA-RAY EMISSION DATA

FIG. D1. Neutron time-of-flight spectrum for a Lucite target bombarded with 330-MeV deuterons. The detector was located at 100° .

FIG. D2. As Fig. D1, except that the target is Al.

FIG. D3. As Fig. D1, except that the target is Fe.

FIG. D4. As Fig. D1, except that the target is ^{238}U .

FIG. D5. As Fig. D1, except that the target was removed and a degrader block of Al (13.02-cm thick) was placed in the beam path, 254-cm upstream of the target site.

FIG. D6. Neutron time-of-flight spectrum for a Fe target bombarded by 260-MeV protons. The detector was located at 100° .

FIG. D7. As Fig. D6, except that the target is ^{238}U .

FIG. D8. Gamma-ray time-of-flight spectrum for a Lucite target bombarded with 330-MeV deuterons. The detector was located at 100° .

FIG. D9. As Fig. D8, except that the target is Al.

FIG. D10. As Fig. D8, except that the target is Fe.

FIG. D11. As Fig. D8, except that the target is ^{238}U .

FIG. D12. As Fig. D8, except that the target was removed and a degrader block of Al (13.02-cm thick) was placed in the beam path, 254 cm upstream of the target site.

FIG. D13. Gamma-ray time-of-flight spectrum for a Fe target bombarded by 260 MeV protons. The detector angle is located at 100° .

FIG. D14. As Fig. D13, except that the target is ^{238}U .

FIG. D15. Neutron time-of-flight spectrum taken with a ^{252}Cf source (spontaneous fission) at the target site.

FIG. D16. The gamma-ray time-of-flight spectrum corresponding to Fig. D15.