**Annual Report
August 1976-July 1977**

**Radiation Dose to
Construction Workers at
Operating Nuclear Power
Plant Sites**

January 1978

**Prepared for the
U.S. Nuclear Regulatory Commission**

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ANNUAL REPORT
AUGUST 1976 - JULY 1977

RADIATION DOSE TO CONSTRUCTION
WORKERS AT OPERATING NUCLEAR
POWER PLANT SITES

by
G. W. R. Endres

JANUARY 1978

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ANNUAL REPORT
AUGUST 1976 - JULY 1977

RADIATION DOSE TO CONSTRUCTION WORKERS AT
OPERATING NUCLEAR POWER PLANT SITES(a)

INTRODUCTION

In complying with the National Environmental Policy Act of 1969, agencies of the Federal government must assess the environmental impact of construction and operations of projects under their jurisdiction.

Radiation exposures received by most construction workers have not been measured routinely because field surveys have indicated exposure levels below the point for which monitoring is required. As a consequence, the dose to individuals and groups of workers is not known to the degree desired for adequate environmental impact assessment.

This study was developed to measure and evaluate radiation exposure and exposure rates received by construction workers at various reactor sites where one or more reactors are operating while construction is proceeding on one or more additional reactors. This study is providing a data base (1) from which a realistic assessment of radiological impact can be made for the construction workers of proposed multiunit nuclear power plants and (2) to help arrive at a decision as to whether increased control of the radiation exposure of these workers is warranted. Four nuclear sites were included in this study after receiving approval of the operating utilities.

The measurements of exposure to construction workers at the four selected nuclear sites has continued essentially as planned except for minor changes in schedules resulting from reactor outages.

(a) Work performed under DOE Contract EY-76-C-06-1830-related services.
Sponsored by the U.S. Nuclear Regulatory Commission.

SUMMARY

During the time period from August 1, 1976 to July 31, 1977, most of the actual data for the study was taken. The fifth dosimeter exchanges were completed at Sites A, B and D; the fourth exchange was completed at Site C. In addition site surveys with a gamma spectrometer and an environmental monitoring system were completed at each site.

Generally, the dose equivalent evaluated from personnel dosimeters showed that the construction workers receive very little exposure above background. In most cases the workers receive less than 10 mrem per month above background. There have been a few instances where an individual worker received a factor of two or more times background. One case in particular seems to be a deliberate exposure of about 400 mrem penetrating gamma and 100 mrem fast neutrons. This exposure occurred at Site C and has not happened again. At Site B one particular safety engineer regularly receives a higher exposure than the other personnel being monitored. At Site A the evaluated dose equivalent for each worker group falls within a more narrow range than the other sites. The standard deviation calculated for the average exposure in each worker group is less than 5 mrem for most of the groups. At Site D the personnel dosimeters were placed on water phantoms at selected locations around the construction site. One location on the fenceline between the operating unit and the construction site shows a consistent reading above background at about 10 mrem per month for the last two dosimeter exchanges.

The environmental dosimeters were placed at selected locations both in the operating units and around the construction area at each site. Most of the locations outside the operating units showed radiation exposures at or near background levels. In some cases onsite measurements were below those of offsite control dosimeters. The highest readings are near rad-waste facilities and refueling areas at the operating units. Dosimeters placed in-line perpendicular to the turbine buildings show a decrease in radiation levels as the distance from the turbine increases, though the decrease is small (less than 10 mrem per month difference). Measurements on the stack at Site A show that radiation levels increase as a function of stack height. At Site B, however, the radiation level partway up the cooling tower is essentially at background. Site A is a BWR; Site B is a PWR.

Exposure rate surveys were taken with an environmental monitoring instrument at all four sites. Gamma spectral measurements were made at selected locations where a majority of people at the construction site work at each site except Site A.

PERSONNEL DOSIMETER RESULTS

The personnel dosimeter is a modification of the Hanford Multipurpose Dosimeter. The modification allows the removal of the thermoluminescent dosimeters (TLDs) for readout in a manual reader. There are five filters in the dosimeter which is designed to provide an estimate of the 1 cm depth dose equivalent, skin dose equivalent and dose equivalent due to fast and thermal neutrons. For the Dose to Construction Worker Study two TLDs are used at each filter location to improve the precision of the field measurements. Lithium-7 fluoride (TLD-700) is used for photon and beta dosimetry and lithium-6 fluoride is used for fast and thermal neutron dosimetry. Fast neutrons are detected by the albedo technique which involves backscattered neutrons from the body or phantom placed behind the dosimeter.

Calibration of the personnel dosimeters has been conducted by the Radiological Calibration Laboratory at Battelle-Northwest with sources traceable to the National Bureau of Standards. A ^{137}Cs source is used for penetrating photon calibration. A ^{90}Sr - ^{90}Y source with about 50 mg/cm^2 covering is used for nonpenetrating radiation calibration. A graphite standard pile is used for thermal neutron calibration exposure. For fast neutron calibration a ^{252}Cf spontaneous fission source is used with exposures conducted at 150 cm. A set of calibration dosimeters is exposed exclusively for each set of personnel dosimeters sent to the reactor sites. During this year some variations in sensitivity were observed from one cycle to the next as the TLDs were readout, annealed and then recalibrated. These variations were generally within the range of $\pm 10\%$.

The personnel dosimeters and controls are read out and evaluated as soon as possible after return of the dosimeter set from the reactor sites. Calibration sets are read out at approximately the middle of the exposure cycle to minimize any fading. TLD read out is evaluated by the use of a computer code to determine the measured dose equivalent due to photons, betas and neutrons.

At Sites A, B and C, approximately 100 personnel dosimeters have been exchanged for each cycle with most of the dosimeters worn by construction workers. At Sites A and B a few dosimeters are worn by workers at the operating reactors. At Site D dosimeters could not be worn by construction workers so they were placed on water jug phantoms in several construction buildings around the construction site.

For essentially all the measurements on construction workers the 1 cm depth dose equivalent and the skin dose equivalent are the same. There has been no significant nonpenetrating radiation. All results listed in Tables I through IV for the personnel dosimeters are in terms of 1 cm depth dose equivalent. Standard deviations are shown for the results obtained from each group of workers as an indication of the range of the results.

At Site A (BWR), Table I, the results from the various groups of workers show a very small range in most cases. For only two sets of data out of 40 is the standard deviation greater than 5 mrem. There are 9 or 10 workers in all the worker groups.

The highest readings on site for dosimetry cycles 1 through 4 were obtained at a station near the circulating water pumps. For the fifth cycle sheetmetal workers received on the average 53 mrem which was 2 mrem more than dosimeters at the circulating water pumps. The personnel dosimeters at the water pumps were left there permanently, so were in effect more like an environmental dosimeter.

Background readings on the personnel dosimeters were generally as high as most of the average readings on the construction workers. For the first and fifth cycles the offsite background was higher than most of the readings on the workers. During the fifth cycle at Site A the operating unit had a refueling outage, the cycle was extended to cover that outage. The offsite background read higher than the reading on the construction workers because of the refueling outage. The first cycle offsite background readings at an individual home 20 miles from the site were higher than the readings on the workers. Measurements taken during the first site survey indicated a high level of natural radioactivity in the bricks used to construct the home. The offsite background dosimeters were kept in a different home for Cycles 3, 4 and 5.

Since none of the construction workers have received a significant non-penetrating radiation exposure all the tables, I through IV, list only the average 1 cm depth dose equivalent as evaluated from the personnel dosimeter. None of the values for 1 cm depth dose equivalent have been background subtracted.

At Site B (PWR) the personnel dosimeters were placed on engineering construction workers. The largest category was field engineers who work with the contractor workers on the construction site. At this site the construction workers receive dose equivalents generally higher than the dose equivalents evaluated from the onsite and offsite controls. At this site the onsite and offsite site controls have read very nearly the same.

One of the two safety engineers has consistently received a relatively high 1 cm depth dose equivalent, especially for the first and fourth cycles. One of the field engineers on the fifth cycle received a 1 cm depth dose equivalent of 223 mrem which raised the average for his worker group and greatly increased the standard deviation of the set of readings. This is the highest reading at this site for any of the personnel dosimeters worn by the workers. At Site B the borated water storage tank (BWST) is located so that a large number of construction workers receive a small radiation exposure from it. Measurements taken with the environmental monitoring instrument (see Table 9) indicate an exposure rate of 41.2 μ R/hr at the First Aid Room and the NE corner of the construction building. These locations are on the reactor side of the operating unit.

Site B is on a two-month dosimeter cycle. Cycle 3 was about 2-1/2 months to allow a more convenient exchange for the operating plant health physicist who conducted the exchange.

At Site C (BWR) some delays were encountered due to several changes in personnel who helped coordinate the assignment of personnel dosimeters to the construction workers. The first cycle started on October 1, 1976. Since that time the exchanges have gone very well on an approximate three month cycle. The health physicists and safety engineer at this site requested a three-month cycle to coordinate with their schedule for retrieving environmental dosimeters.

Worker group sizes varied from six to ten, and included teamsters and quality control engineers. The power plant under construction at Site C was approximately 25% complete at the end of Cycle 3. Onsite control dosimeters were kept in a lead cave at this site and they read consistently lower than any of the dosimeters worn by the construction workers.

The average of the 1 cm depth dose equivalent for the various groups of workers falls within a small range as indicated by the standard deviation. Standard deviations for all worker groups except construction supervisors in Cycle 3 are ± 6 mrem or less. Only one really high result was obtained at Site C, that was a dosimeter worn by a teamster in Cycle 2. A dose equivalent of 400 mrem penetrating photon and 98 mrem fast neutrons was evaluated from the readings on that dosimeter. After discussing the results with personnel on site, it was decided that the dosimeter was deliberately exposed. There is no location on the construction site where such an exposure could have occurred.

Generally, all the average dose equivalents for the worker groups fall within a range of ≤ 10 mrem greater than the offsite controls. The maximum expected annual dose equivalent would be 120 mrem above the offsite controls.

At Site D (BWR,PWR) personnel dosimeters were placed on water phantoms at selected locations around the construction site. The operating reactors and the construction area are in line with the construction area on the end. In this case the PWR operating unit tends to shield some of the construction area from any radiation due to the BWR unit on the other end of the site.

Station number 11 shows the highest 1 cm depth dose equivalent for all the exchange cycles. Dose equivalents determined at Station 11, which is on the fence between Unit 2 and the construction site, vary from 10 to 24 mrem above the offsite controls. The personnel dosimeters on water phantoms remain in place for the entire two month exchange period, so the measured dose equivalent is a maximum which could be accumulated if a worker were on the job 24 hours a day at that location. All other locations have readings less than station 11. For a total of eight months the total dose equivalent

above background at station 11 was 65 mrem. Workers near that location and working an 8-hour day would have received approximately one-third of 65 mrem or about 22 mrem above background.

Cycle 1 at Site D is not included because of an extraneous exposure of the dosimeters which made the results invalid for the study.

ENVIRONMENTAL DOSIMETERS

Environmental dosimeters were specially designed to measure thermal neutrons, low and high energy photon dose equivalent. Three different thermoluminescent materials are used: ^7LiF , ^6LiF and $\text{CaF}_2\text{:Mn}$. For the Construction Worker Dose Study, 25 environmental dosimeters were sent to each site for location around the construction area and at selected locations in the operating unit. Generally, dosimeters placed near the turbines, refueling areas, and reactors of the operating unit have shown high readings. In general most areas in the unit under construction have shown low readings, near background levels. In Tables V through VIII, the columns listed as LiF(bare) show dose equivalents which include both low and high energy photons. The columns listed as LiF(filtered) and $\text{CaF}_2\text{:Mn}(\text{filtered})$ show dose equivalents which include only penetrating photons. The $\text{CaF}_2\text{:Mn}$ has a different photon response and is about a factor of 10 more sensitive than the LiF. LiF is very nearly tissue equivalent in its response while $\text{CaF}_2\text{:Mn}$ is more nearly bone equivalent. All thermal neutron dose equivalents are low and have not been included in the tables.

At Site A the highest readings, 1.3 R to 2.6 R, were near the operating reactor and the radwaste facilities at the operating unit. Most of the exposures evaluated from measurements in the unit under construction are within a range of ± 20 mR of the offsite background. In fact, the offsite background is higher than many of the onsite measurements.

Offsite controls were kept at a home 20 miles from the site. After Cycle 3 the controls were kept in a new home. Onsite controls were kept in a lead pig so will generally have lower readings than any of the other dosimeters.

Measurements taken in a line perpendicular to the operating unit's turbine have shown a slight decrease as distance from the turbine is increased. The location labeled switchyard is closest to the turbine and for Cycle 5 has a

dose equivalent of 47 mrem. The switchyard is about 200 yards from the turbine building. The first transmission towers are next in line, about 500 yards from the turbine and show an exposure of 36 mR. The second set of transmission towers is about 1000 yards from the turbine building and within the uncertainty of the readings show the same result as the first set of transmission towers.

Environmental dosimeters were placed on the main stack at three heights: 150, 200 and 228 feet. The measured dose equivalents show that the dose rate increases as the distance up the stack increases. The exposure rate at 228 feet is about twice that at 150 feet. The increase in dose rate at higher elevations indicates that the dosimeters are picking up some radiation from the turbine building which is shielded on the sides all the way to the top of the building.

At Site B (PWR) the highest exposures measured were during the second cycle in the spent fuel area of the operating unit (See table VI). The next highest measurements were in a storeroom near the radwaste facility. This storeroom is used by operating unit workers rather than construction workers. Most locations near work sites for construction workers show very little, if any, radiation exposure above background. At this site the First Aid Room is near the borated water storage tank (BWST) and readings from the environmental dosimeters show a significant reading above background for all cycles. The total exposure above background is about 120 mR for 9 months' exposure, 24 hours a day. A worker who spent most of his time near this location would have received approximately 50 mrem annual dose equivalent above background. Environmental dosimeters were placed on transmission towers and in the switchyards perpendicular to the turbine at Site B. At the switchyard closest to the turbine building the exposure was from 12 to 20 mR above the controls depending on which dosimetry cycle. Exposures decrease as the distance from the turbine buildings increases. Number two switchyard is the farthest away and shows an exposure essentially equal to the controls. At Site B, there has been very little difference between offsite and onsite controls.

Site C (BWR) has two operating reactors nearby. One is immediately adjacent to the plant under construction and the other is about 1000 yards from the main construction area on the opposite side. A location on the

fence (#4) near the radwaste facility for the adjacent reactor shows the highest exposure measurements on the construction site. These readings are roughly 10 times the readings on the control dosimeters (See Table VII). At location three about 300 feet from location #4, the exposure is down to just slightly above the offsite control dosimeters.

The offsite controls at Site C are kept at the home of the Health Physicist, about 50 miles away. The onsite controls are kept in a lead cave. Some of the dosimeters were lost because of construction activities, such as moving buildings and tearing down fences as construction progressed. Dosimeters 4 in Cycle 3, No. 5 in Cycle 4 and No. 11 in Cycle 2 were not found.

Most of the measured exposures are essentially equal to the offsite controls. One exception is location No. 7 which is closest to the operating reactor on the opposite side of the site. Very little construction activity is going on near this location.

A set of dosimeters placed in a line perpendicular to the turbine of one of the operating reactors during the second cycle showed the same decrease with distance observed at Sites A and B. Because of the difficulty in getting to some of the locations, the measurements perpendicular to the turbine were not repeated at this site.

At Site D (BWR, PWR) the radiation levels around the construction site are quite low. Construction workers are more isolated from the operating units than they are at Sites B and C. Measurements with the environmental dosimeters show few readings above the control dosimeters. Highest exposures above the controls were measured at a location called A-7 switchgear which is on the boundary between the operating units and the construction site. The location called "Cherry Tree" is close to one of the operating units off the construction site. At this site, the radwaste facilities are well away from the construction zone, so there are no high readings near the construction workers.

SITE SURVEYS

Site surveys were taken with an environmental monitoring system which is compensated to read out directly in exposure rate. Measurements were conducted at all four reactor sites with the operating units at or near full power. The

program plan is scheduled for a repeat of the site surveys during the first quarter of FY 1978.

The environmental monitoring system consists of a 2"x2" NaI(Tl) scintillator, a stabilized gain amplifier and a nonlinear charge digitizer which electronically corrects for the response of the detector. It is possible to very accurately measure background radiation levels with this system.

Results from the first site surveys at all four sites are given in Table IX. The exposure rates are an average of three measurements at each location. At Site A the highest readings were obtained in and just outside the plant entrance to the operating reactor. Exposure rates at all other locations were less than the exposure rate measured in a motel room which was 16.7 μ R/hr. There are no really high readings at any of the locations at Site A.

A similar survey at Site B showed several locations where exposure rates were well above background levels. The highest readings were taken near the oil/water separator. At that location the exposure rate was 80.2 μ R/hr, which is more than 10 times the background. Few construction workers have jobs near this location, however. Other locations with relatively high exposure rates are: the construction first aid room, northeast corner of the construction office, 100 yards east of the radwaste building, and the borated water storage tank (BWST). Many of the construction workers spend some time in the area of the first aid room and the construction office. These two locations are next to each other. The relatively high exposure rates probably contribute to the high 1 cm depth dose equivalent measured for the safety engineers since they spend considerable time in the area near these locations. In general, the average dose equivalents are somewhat higher above background for the workers at this site than for workers at the other three sites.

At Site C, the exposure rates are all low except for location No. 4 on the Unit No. 1 fence. No other exposure rates are as much as twice the exposure rate in the motel room located 5 miles from the site. Location No. 4 is on the fence near the Unit No. 1 radwaste building.

At Site D, only locations within 50 feet of a 120 Vac line were obtained because of problems with a portable battery pack. The exposure rate at Location No. 11, which is on the boundary between the construction site and operating unit No. 2, is the only reading which is significantly higher than background around the construction site. Measurements taken at the security trailer for Unit No. 2 were close enough to the radwaste facilities to give an exposure rate of 41.2 μ R/hr.

Spectra were taken with a Ge(Li) detector at locations where a large number of construction personnel work. At Sites B, C and D the most favorable location to set up the spectrometry equipment for a long count was in the construction office building. Radiation exposure rates in the construction office were also typical of many locations around the construction site. There was no possibility of setting up the spectrometers in the shop areas or in the excavation at these sites.

Summaries of the spectra taken at Sites B, C and D are given in Tables X, XI and XII. Measured and actual energies of the photons are identified by radionuclide. Most of the photons are identified with the decay of naturally occurring radioactive materials. At Site B, ^{137}Cs and ^{60}Co were observed in the spectrum. At Site C, ^{137}Cs and ^{16}N were observed.

TABLE I. Average Dose Equivalents to Construction Workers at Site A - BWR
(mrem)

	Cycle 1 (5/19-7/14/76)		Cycle 2 (7/14-9/25/76)		Cycle 3 (9/25-11/30/76)		Cycle 4 (12/1/76-3/2/77)		Cycle 5 (3/2/77-6/22/77)	
	1 cm Depth Dose Equiv.	Sx*	1 cm Depth Dose Equiv.	Sx*	1 cm Depth Dose Equiv.	Sx*	1 cm Depth Dose Equiv.	Sx*	1 cm Depth Dose Equiv.	Sx*
Pipefitters	21	1	36	1	29	1	39	5	40	2
Printers	21	1	36	1	28	1	37	2	44	5
Operators from Standard	20	1	36	3	30	2	36	1	44	4
Ironworkers	22	1	36	2	29	2	37	1	40	2
Sheetmetal Workers	22	1	37	2	30	2	37	2	53	8
Electricians	19	1	36	1	30	2	39	3	40	1
Carpenters	23	1	35	1	28	2	40	6	38	2
Millwrights	22	1	36	1	33	5	41	5	43	2
Safety Trailer	22	2	40	1	28	2				
Circ. Water Pumps	23		45		34		44		51	
Lead Pig	15	1	32	1	22	2	26	1	28	1
Background -Offsite	29		Missing		25	4	36	2	52	1
Safety Office									42	5

* Sx = standard deviation of the set.

TABLE II. Average Dose Equivalent to Construction Workers at Site B - PWR
(mrem)

	No. of Dosimeters Per Category					Cycle 1 (7/15-9/17/76)		Cycle 2 (9/18-11/29/76)		Cycle 3 (11/29/76-2/14/77)		Cycle 4 (2/14-4/8/77)		Cycle 5 (4/4-6/8/77)	
	1	2	3	4	5	1 cm Depth Dose Equiv.	Sx*	1 cm Depth Dose Equiv.	Sx*	1 cm Depth Dose Equiv.	Sx*	1 cm Depth Dose Equiv.	Sx*	1 cm Depth Dose Equiv.	Sx*
Welding Engineer	4	3	4	3	3	35	5	27	8	48	18	25	1	43	12
Time Keeper	3	3	3	3	2	40	1	32	1	30	1	30	3	45	1
Electrical Engineer	1	0	1	1	2					30		62		37	4
Safety Engineer	2	2	2	2	2	99	7	57	3	42	8	50	(71) (29)	49	7
Supervisor	7	8	7	6	6	43	4	34	3	29	3	33	3	41	3
Construction Engineer	1	1	1	1	1					40		62		51	
Field Engineer	26	26	31	28	28	47	17	37	8	32	8	37	10	43(49)**	8(34)**
Offsite Control	2	2	2	2	2					24	1	23	1	31	1
Onsite Control	4	3	4	2	5					23	1	23	1	29	1
Controls - Offsite						31	1	25	1						

* Sx = standard deviation of the set.

**One high reading (223 mrem) included.

TABLE III. Average Dose Equivalent to Construction Workers at Site C
Three-Month Cycle (mrem)

	No. of Dosimeters Per Category			Cycle 1 (10/1/76-1/29/77)		Cycle 2 (1/29-4/12/77)		Cycle 3 (4/12-7/12/77)	
	Cycle			1 cm Depth Dose Equiv.	Sx*	1 cm Depth Dose Equiv.	Sx*	1 cm Depth Dose Equiv.	Sx*
	1	2	3						
Construction Supervisor	6	6	7	27	2	41	2	44	9
Laborers-Turbine Area	2	6	6	28	2	40	2	42	5
Construction Engineer	1	1		27		40			
Carpenters-Turbine Area	10	8	9	29	5	41	1	41	2
Operators-General Site Area	6	7	8	30	3	41	4	42	3
Teamsters	7	7	8	30	2	44**	6	43	6
Main Office	10	10	10	29	2	43	5	42	4
Office Area 1 & 2	8	5	8	31	1	42	2	43	2
Area 1 & 2 Field	8	10	9	29	2	40	2	40	2
Quality Control-Field	8	7	9	29	2	41	1	41	2
Field Engineer	2	2		26	1	40	3		
Onsite Control				17		32			
Offsite Control				29	2	41	1	42	
Ironworkers		4	4			45	4	44	3

* Sx = standard deviation of the set.

** One high reading - 400 mrem penetrating gamma and 98 mrem fast neutrons - not included.

TABLE IV. Site D Personnel Dosimeters on Water Phantoms
(mrem)

Location	Cycle 2 (11/23/76-2/15/77) 1 cm Depth Dose Equivalent	Cycle 3 (2/15-3/30/77) 1 cm Depth Dose Equivalent	Cycle 4 (3/30-5/26/77) 1 cm Depth Dose Equivalent	Cycle 5 (5/26-7/22/77) 1 cm Depth Dose Equivalent
2	40	33	35	32
3	31	28	27	24
4	33	28	28	23
5	39	38	28	23
5	39	38	42	33
6	31	30	31	29
7	36	27	28	26
8	32	27	27	25
10	33	29	29	24
11	41	42	51	49
12 (Offsite Control)	31	30	32	25
Controls (Onsite)	41*	26	25	25

* Inadvertently left in high background area.

TABLE V. Site A Environmental Dosimeter Results

(in units of mR)

Location	Cycle 5 (3/2-6/22/77) (a)			Cycle 4 (12/1/76-3/2/77) (a)			Cycle 3 (9/25-12/1/76) (b)		
	LiF (Bare)	LiF (Filtered)	CaF ₂ :Mn (Filtered)	LiF (Bare)	LiF (Filtered)	CaF ₂ :Mn (Filtered)	LiF (Bare)	LiF (Filtered)	CaF ₂ :Mn (Filtered)
Turbine Deck-164'	58	53	51				33	30	32
Turbine Deck-164' Crane Cab	44	46	42	44	42	34	31	30	30
Turbine Deck-164' Operating Reactor							134	98	135
Turbine Bldg.-114'				190	156	133			
NE End Refueling-228'	52	53	53	230	223	188	29	29	29
SE End Refueling-228'	67	61	60	46	49	34	26	25	25
NE End Reactor-185'	1440	1150	1250	97	79	73	65	56	67
SE End Reactor-185'	63	60	56	60	52	43	41	38	37
Safety Office	38	39	33	37	33	26	26	23	24
Background-Offsite	55	51	45	25	22	18	38	35	36
Background Onsite Lead Pig	25	26	32	36	33	27	18	17	17
Security Headquarters	59	59	52	52	50	41	38	38	42
Reactor-130'	45	43	41	33	31	28	1260	1140	1340
Switchyard	47	44	38	39	37	30	30	27	30
1st Transmission Towers	36	35	30	31	27	23	23	21	22
2nd Transmission Towers	38	35	29	32	29	23	24	23	22

TABLE V (Cont'd)

Location	Cycle 5 (3/2-6/22/77) (a)			Cycle 4 (12/1/76-3/2/77) (a)			Cycle 3 (9/25-12/1/76) (b)		
	LiF (Bare)	LiF (Filtered)	CaF ₂ :Mn (Filtered)	LiF (Bare)	LiF (Filtered)	CaF ₂ :Mn (Filtered)	LiF (Bare)	LiF (Filtered)	CaF ₂ :Mn (Filtered)
Control Room Turbine	225	158	160				267	169	234
Circ. Water Pumps	45	43	41	40	40	31	30	27	31
N. End Turbine Generator	124	98	92						
Radwaste-132'	1560	1510	1310				146	135	165
Reactor-228' Equip. Hatch	2620	2730	2560	1640	1580	1130			
Stack-150'	36	31	30	66	64	50	39	34	38
Stack-200'	52	39	30	86	64	51	55	37	38
Stack-228'	60	53	46						
Stack-250'							25	24	25
Toolcage-North				51	44	40			
Toolcage-South				44	35	31			
North Demin				37	34	26	28	27	27
Unit II Refuel				57	52	40			
Visitor Center	40	39	33	48	45	38			
Dosimetry Unit #1	72	65	56						
Reactor-228' At Refueling Floor							74	68	82

TABLE VI. Site B Environmental Dosimeter Results
(in units of mR)

Location	Cycle 5 (4/8-6/8/77)			Cycle 4 (2/14-4/18/77)			Cycle 3 (11/29/76-2/14/77)			Cycle 2 (9/14-11/29/76)		
	LiF (Bare)	LiF (Filtered)	CaF ₂ :Mn (Filtered)	LiF (Bare)	LiF (Filtered)	CaF ₂ :Mn (Filtered)	LiF (Bare)	LiF (Filtered)	CaF ₂ :Mn (Filtered)	LiF (Bare)	LiF (Filtered)	CaF ₂ :Mn (Filtered)
Health Physics Supervisor's Home	30	31	36	21	21	19	33	25	22	26	28	30
Surveyors Office	34	34	37	25	22	20	33	28	24	31	27	30
Switchyard-Closest to Turbine	44	45	49	37	35	31	51	43	42	42	38	43
Cond. Demin.	29	27	25	20	19	16	26	21	20	24	24	25
#1 Switchyard	38	36	42	26	25	23	38	40	29	30	29	33
Unit #1 Turbine Bldg.	33	30	31	22	24	21	26	23	22	27	25	28
Unit #2-372'	30	32	36	21	20	19	31	27	23	25	25	27
Storeroom	193	182	221	380	345	340	49	40	40	240	214	274
Oil/Water Separator	50	40	47	35	32	29	75	60	60	40	35	43
Unit #2-335'	30	29	30	19	19	18	26	22	19	39	28	34
Unit #2-354'	33	34	36	20	21	18	25	23	20	25	24	28
Aid Room	60	56	66	51	47	43	43	37	37	62	54	69
Spent Fuel Area*	570	515	567	58	54	52	93	71	75	*710	732	1030
Start-up	33	35	38	25	25	21	35	31	27	30	29	34
TLD Readout Room	31	32	35	24	21	19	33	24	20	27	26	29
Cooling Tower	34	40	43	24	23	22	31	29	23	34	31	34
Unit #2-335'	31	31	33	21	21	19	27	24	23	29	28	32
Unit #2-317'	33	30	29	23	23	19	32	25	25			
#2 Switchyard	34	31	33	24	21	22	32	23	21	27	25	28
Control #1	32	33	37	21	21	18	29	27	21	27	28	31
Control #2	32	32	35	22	21	18	31	26	21	27	27	29
Control #3	34	32	35									

* One-month in spent fuel storage area.

TABLE VII. Environmental Dosimeter Results - Site C

(in units of mR)

TLD No.	Location	Cycle 4 (4/12 - 7/21/77)			Cycle 3 (1/29 - 4/12/77)			Cycle 2 (10/20/76 - 1/21/77)		
		LiF (Bare)	LiF (Filtered)	CaF ₂ :Mn (Filtered)	LiF (Bare)	LiF (Filtered)	CaF ₂ :Mn (Filtered)	LiF (Bare)	LiF (Filtered)	CaF ₂ :Mn (Filtered)
1	Tower FNM-14 345 KV	39	36	32	45	38	34	34	28	30
2	NE Corner - Rx Excavation	48	38	36	45	39	31			
3	Survey Panel On Lake	41	37	31	44	39	33	33	29	30
4	Mid-East Gate (Unit I Fence)	420	430	360	(No results)			267	222	236
5	Elec. Shop W. End				40	36	31	29	26	27
6	Pipe Fabrication Shop NW Corner	36	35	29	41	36	30	31	31	28
7	D ₁ On Site	51	49	42	54	48	40	44	42	42
8	Entrance Door - Office Bldg.(East)	35	34	30	44	38	31			
9	Substation - Office Bldg.(West)	34	32	27	47	44	36	25	22	22
10	JAF Twin Pole 115 KV	46	46	40	38	35	29	48	42	43
11	Substation - Sanitary Structure (South)	38	34	31	46	38	32			
12	Tower FNM-13 345 KV	33	39	28	37	33	27	27	25	25
13	Substation - Batch Plant	36	35	31	40	34	29	27	24	26
14	D ₂ On Site - Laydown Area (Southwest)	34	33	28	36	33	27	28	25	25
15	E On Site - South of Lake Road	34	33	29	37	32	28	26	23	24
16	SE of Shop on Fence (Unit I)	40	37	33	42	37	30	33	28	29
17	Construction Overflow Parking Lot - Twin Pole - 115 KV	36	35	29	46	39	29	29	26	28
18	East of Laydown Area - Twin Pole - 115 KV	40	37	33	35	31	25	33	29	29
19	Control - Onsite	30	28	25	20	19	14	21	19	20
20	Control - Offsite	38	33	29	40	37	30	29	27	29
21	Closest to Turbine Building	42					42	42	38	39
22	1st Set Transmission Towers							29	28	27
23	2nd Set Transmission Towers							28	25	27
24	West on Lake Road South							25	24	24

TABLE VIII. Environmental Dosimeter Results - Site D

(in units of mR)

Location	Cycle 5 (5/26 - 7/22/77)			Cycle 4 (3/30 - 5/26/77)			Cycle 3 (2/15 - 3/30/77)			Cycle 1 (9/1 - 11/23/76)		
	LiF (Bare)	LiF (Filtered)	CaF ₂ :Mn (Filtered)	LiF (Bare)	LiF (Filtered)	CaF ₂ :Mn (Filtered)	LiF (Bare)	LiF (Filtered)	CaF ₂ :Mn (Filtered)	LiF (Bare)	LiF (Filtered)	CaF ₂ :Mn (Filtered)
Cherry Tree	42	35	33	49	43	54	36	34	32	48	42	54
Ocean Systems	38	37	30	41	39	59	30	29	28	40	37	43
100'x300' Warehouse	27	27	45	34	32	49	25	27	24	32	31	37
Equip. Room-Const.Office	26	25	23	33	30	41	26	25	23	33	32	35
Electronics Shop	33	32	32	39	35	47	31	28	27	37	35	43
Field Const. Office	33	30	27	37	37	47	28	29	25	35	34	41
Prefab Shop	28	28	24	34	31	38	26	24	22	34	32	41
Security Gate	27	25	25	31	28	36	25	23	21	29	28	35
Cond. Laydown Area	29	27	26	34	32	40	27	25	22	34	32	38
345 KV Switchyard	28	27	27	34	32	42	27	26	22	31	31	39
A-7 Switchgear	58	50	43	57	54	74	39	--	30	58	51	66
Offsite Control	*28	27	27	37	33	41	27	27	23	33	34	39
Onsite Control	32	31	27	29	25	33				17	18	18
Onsite Control	31	30	29							17	19	19

* Offsite controls lost, estimates based on previous measurements.

TABLE IX Location and Dose Rates for TASC-4 System
Field Surveys

Site A - February 23-24, 1977

<u>Location</u>	<u>Exposure Rate (μR/hr)</u>	
Background-offsite, 20 miles - location of offsite controls.	Mid-room 6.2 $\pm$ 0.2	On Fireplace 10.2 $\pm$ 0.1
Security headquarters-plant entrance	Inside 15.1 $\pm$ 0.6	Outside 21.3 $\pm$ 1.3
Makeup demineralizer - N. end (SE Corner)	9.6 $\pm$ 0.4	
Circulation pumps	10.2 $\pm$ 0.2	
Main stack - 150' level, mea- surement at 130' elevation	11.6 $\pm$ 0.1	
Chlorine bldg., NW corner	7.8 $\pm$ 0.1	
Recombiner bldg., 100' from NW Corner	5.0 $\pm$ 0.1	
Radwaste bldg., 305' from center of radwaste	7.3 $\pm$ 0.2	
Visitor center - $\sim$ 1/4 mi SE of plant	5.0 $\pm$ 0.1	
Other near site - roadside park $\sim$ 1 mi W	4.1 $\pm$ 0.1	
Security bldg., construction	4.9 $\pm$ 0.1	
Motel Room-200 miles away	16.7 $\pm$ 0.6	

Site B - April 21-22, 1977

<u>Location</u>	<u>Exposure Rate (μR/hr)</u>	<u>Location</u>	<u>Exposure Rate (μR/hr)</u>
Surveyor's Office	6.7	100 Yards E of Radwaste	57.4
H.P. Supervisor's Office	14.3	100 Yards NE of #2 Turbine	21.2
Storeroom	53.9	Construction Office	16.3
Oil/Water Separator	88.2	NE Corner Construction Office	49.7
First-Aid Room	49.7	Plumber's Shack	13.0
Startup	20.3	Construction Water/Ice Shack	13.6
TLD Readout Room	14.0	Guard House	13.2
Cooling Tower	8.4	Access Road 1/2 mile E	12.5
BWST	71.8		

TABLE IX. (Cont'd)

Site C - October 28-29, 1976

<u>Location</u>	<u>Exposure Rate</u> (μ R/hr)
Motel Room	6.2
Open Air (5 mi from site)	3.5
Station 8-Office Bldg. East	4.7
9-Substation	5.2
6-Pipe Shop	5.7
3-Survey Panel	6.6
7-D ₁ On Site	8.7
10-115 KV Twin Pole	9.4
18-East Laydown Area	6.3
14-D ₂ On Site	5.9
15-South Lake Road	4.2
22-345 KV	4.2
13-Batch Plant	5.8
17-Overflow Parking Lot	5.5
12-345 KV #13	3.9
11-Substation, South	6.5
5-Electronic Shop	6.8
1-345 KV #14	6.7
4-Unit 1 Fence	80.5

Site D - December 9, 1976

<u>Location</u>	<u>Exposure Rate</u> (μ R/hr)
Station 1 - Cherry Tree	6.4 $\pm$ 0.2
2 - Ocean Systems	N.A.*
3 - 100' x 300' Warehouse	6.6 $\pm$ 0.1
4 - Equipment Room -Construction Office	5.3 $\pm$ 0.1
5 - Electronics Shop	5.1 $\pm$ 0.1
6 - Field Construction Office	5.8 $\pm$ 0.2
7 - Prefab Shop	4.6 $\pm$ 0.1
8 - Security Gate	4.7 $\pm$ 0.1
9 - Condenser Laydown	N.A.*
10 - 345 KV Switchyard	6.9 $\pm$ 0.1
11 - A-7 Switch Gear	15.2 $\pm$ 0.2
12 - Offsite-Motel	5.7 $\pm$ 0.2
Security Trailer Unit No. 2	41.2 $\pm$ 3.2

* Not available.

TABLE X. Gamma Characterization at Construction
Office Building (Station 7 - Figure 1)

April 19-20, 1977

<u>Measured</u>	<u>Energy (keV)</u>		<u>Isotope(s)</u>
	<u>Interpreted</u>	<u>Actual</u>	
231	240	239-242	Pb-214, Pb-212
290	299	300	Pb-212
343	352	352	
502	511	511	MoC
574	583	583	Tl-208
601	610	609	Bi-214, Ra-226
653	662	662	Ag-110m, Cs-137
805	814	814	Ra-226, Ag-110m
878	887	885	Ag-110m
904	913	912	Ac-228
293	940	237	Ag-110m, B8-214
957	966		Ac-228
1,109	1,118	1,117	Bi-214, Zn-65
1,168	1,177	1,177	Co-60
1,228	1,237	1,236	Bi-214
1,327	1,336	1,335	Co-60
1,376	1,385	1,384	Ag-110m, Bi-214
1,452	1,461	1,460	K-40
1,498	1,507	1,506	Ag-110m, Bi-214
1,584	1,593	1,592	Tl-208
1,624	1,633	1,631	
1,670	1,679	1,678	
1,683	1,692	1,691	
1,723	1,732	1,728	Bi-214
1,756	1,765	1,764	Bi-214, Ra-226
1,841	1,850	1,848	Bi-214
2,099	2,108		
2,198	2,207	2,204	Bi-214
2,363	2,372	2,370	
2,435	2,444	2,442	Bi-214
2,607	2,616	2,613	Tl-208

TABLE XI. Gamma Characterization at Stone & Webster
Office Building - Site C

<u>Energy (keV)</u>		<u>Isotope(s)</u>
<u>Measured</u>	<u>Actual</u>	
77.2	---	---
185	186	Ra-226
238	239	Th-228, Pb-212
295	295	Ra-226, Pb-214
351	352	Ra-226, Pb-214
511	511	MoC
584	583	Th-228, Tl-208
609	609	Ra-226, Bi-214
662	662	Cs-137
920	911	Ac-228
940	964	Ac-228
973	969	
1,123	1,120	Ra-226, Bi-214
1,460	1,461	K-40
1,520		
1,590	1,589, 1,593	Bi-214, Tl-208
1,730	1,730	Ra-226, Bi-214
1,770	1,765	Bi-214
2,200	2,204	H ² (n, γ), Bi-214
2,610	2,614	Tl-208, Th-228
4,280		C-15, Cl-32
5,110	5,107	N-16 D.E.
5,620	5,618	N16 S.E.
6,130	6,129	N-16

TABLE XII. Gamma Characterization of Construction
Office Building - Site D

<u>Energy (keV)</u>		<u>Isotope(s)</u>
<u>Measured</u>	<u>Actual</u>	
238	239	Th-228, Pb-212
298	298	Ra-226, Pb-214
351	352	Ra-226, Pb-214
511	511	MoC
585	583	Th-228, Tl-208
611	609	Ra-226, Bi-214
728		---
766	769	Bi-214
913	911	Ac-228
973	964, 969	Ac-228
1,125	1,120	Ra-226, Bi-214
1,469	1,461	K-40
1,602	1,593	Bi-214, Tl-208
1,774	1,765	Bi-214

Due to equipment setup, no energies above 1.8 MeV were observed.

APPENDIX A

CALCULATIONAL FORMULAS
AND
RAW DATA

APPENDIX A

This appendix contains the formulas used for determining the dose equivalent from the personnel dosimeter TLD readings and for the exposure from the environmental dosimeters. It also includes the raw data obtained to date and the calibration constants for each exchange.

Calibration Constants - Environmental

<u>Site</u>	<u>K₁</u>	<u>K₂</u>	<u>K₃</u>	<u>K₄</u>	<u>K₅</u>	<u>K₆</u>	<u>K₇</u>	<u>K₈</u>
B-1	7.154	7.414	435	8.428	8.439	373	21	82.22
A-1	7.989	7.496	434	9.141	8.926	417	27.3	92.31
A-2	7.154	7.414	435	8.428	8.439	373	21.0	82.22
A-3	7.651	7.501	456	8.735	8.151	370	24.8	92.76
C-1	7.154	7.414	435	8.428	8.439	373	21	82.22
A-2	8.103	7.932	532	9.085	8.912	478	21	89.75
D-1	8.103	7.932	532	9.085	8.912	478	21	89.75
C-2	7.702	6.733	413	8.992	8.442	369	24	79.9
B-3	7.168	7.379	406	9.025	8.669	340	13	7.18
D-2	7.969	7.668	484	9.152	9.041	422	22	71.1
A-4	7.196	6.700	393	7.982	7.798	362	29	86.2
B-4	8.042	7.193	458	8.932	7.991	384	20	75.0
C-3	7.019	7.026	456	8.216	8.084	387	19	74.3
D-3	7.787	7.414	440	8.552	8.976	400	22	76.4
A-5	7.487	7.539	452	8.424	8.455	400	17	72.15

Calibration Constants - Personnel

<u>Site</u>	<u>K₁</u>	<u>K₂</u>	<u>K₃</u>	<u>K₄</u>	<u>K₅</u>	<u>K₆</u>	<u>K₇</u>
B-1	6.968	1.194	3.708	259.64	1.077	1.388	5.345
A-1	7.549	1.197	3.89	273.14	1.2115	1.365	5.642
A-2	6.968	1.194	3.708	259.64	1.077	1.388	5.345
A-3	7.654	1.189	4.100	290.2	1.082	1.301	7.234
C-1	6.968	1.194	3.708	259.64	1.077	1.388	5.345
A-2	8.312	1.112	4.084	360	1.128	1.285	7.008
D-1	8.312	1.112	4.084	360	1.128	1.285	7.008
C-2	7.383	1.131	4.090	310	1.026	1.273	5.219
B-3	7.676	1.084	4.077	290	1.221	1.268	6.148
D-2	8.383	1.094	4.433	341	0.9824	1.141	7.496
A-4	7.035	1.116	3.983	262	1.069	1.278	5.453
B-4	6.987	1.090	4.138	292	1.116	1.335	5.752
C-3	7.232	1.021	4.294	259	1.073	1.293	5.297
D-3	7.295	1.173	4.607	288	1.167	1.248	7.703
A-5	7.356	1.096	3.652	307	1.046	1.324	7.490

DOSE CALCULATIONS FOR ENVIRONMENTAL DOSIMETERS

TLD-700 - Bare

$$\text{Dose } \gamma = \frac{R(700B)}{K_1}$$

TLD-600 - Bare

$$\text{Dose } N_{th} = \frac{R(600B) - (D_{\gamma} k_2)}{K_3}$$

TLD-700 - Filtered

$$\text{Dose } \gamma = \frac{R_1 (700F)}{K_4}$$

TLD-600 - Filtered

$$\text{Dose } N_{th} = \frac{R(600F) - K_5 D_{\gamma} F}{K_6}$$

TLD-400 - Filtered

$$\text{Dose} = \frac{R(400) - K_7 (D_{N_{th}} 400)}{K_8}$$

K_1 , K_4 , and K_8 derived from penetrating gamma exposure.

K_2 , K_5 , TLD-600 gamma response.

K_3 , K_6 , K_7 derived from thermal neutron exposure.

R is the net response of a chip.

R_1 , R_2 , . . . is the response of a chip in position 1, 2, . . . of a dosimeter.

B refers to a bare chip.

F refers to a chip behind or enclosed in a filter.

DOSE CALCULATIONS FOR PERSONNEL DOSIMETERS

$$PEN = \frac{R_2}{K_1}$$

$$NONPEN = PEN + \frac{R_1 - K_2 R_2}{K_3}$$

$$N_{th} = \frac{R_3 - R_4}{K_4}$$

$$N_F = \frac{R_4 - K_6 R_5 - K_5 (R_3 - R_4)}{K_7}$$

K_1 = derived from penetrating photon calibration. Ra gamma.

$K_2 = \frac{R_1}{R_2}$ for penetrating photons.

K_3 = derived from nonpenetrating photon calibration. Uranium or Sr-90.

K_4 = derived from thermal neutron exposure.

$K_5 = R_4/R_3 - R_4$ corrects for back-scattered thermal neutrons.

$K_6 = R_4/R_5$ from penetrating gamma calibration corrects for different photon responses.

K_7 = derived from known fast neutron exposure.

$R_1, R_2, \dots$ is the response of a chip in position 1, 2, $\dots$ of a dosimeter.

APPENDIX B

OUTPUT DATA FOR SPECTRUM MEASUREMENTS AT SITE B
AND DOSIMETER RAW DATA

PAGE 1 BILIN

11/09/77 18:10
INPUT DATA FOR CWD PROGRAM

[illegible]

BILIN

BILIN

11/09/77 18:10
INPUT DATA FOR CWD PROGRAM

1390	40-8	.304	.299	.322	.435	.429	.283	.321	.323	.444	.450
1400	40-9	.471	.349	.373	.531	.524	.482	.394	.376	.571	.560
1410	40-10	.365	.300	.354	.544	.442	.304	.320	.357	.509	.482
1420	40-1	.362	.326	.311	.479	.467	.295	.314	.327	.487	.429
1430	40-2	.367	.315	.311	.454	.462	.285	.309	.331	.490	.457
1440	40-3	.377	.241	.342	.588	.540	.323	.354	.394	.587	.480
1450	40-4	.319	.322	.353	.522	.479	.306	.344	.367	.556	.483
1460	40-5	.363	.341	.385	.552	.457	.320	.322	.373	.507	.514
1470	40-6	.311	.316	.391	.534	.494	.304	.323	.372	.561	.518
1480	40-7	.325	.328	.367	.522	.483	.308	.326	.360	.538	.497
1490	40-8	.295	.297	.402	.521	.483	.294	.292	.381	.538	.449
1500	225-1	.302	.314	.363	.508	.457	.306	.326	.373	.471	.463
1510	225-2	.246	.305	.352	.485	.495	.297	.320	.371	.525	.491
1520	225-3	.367	.319	.356	.534	.453	.333	.309	.372	.542	.490
1530	225-4	.306	.311	.332	.521	.473	.309	.317	.341	.528	.466
1540	225-5	.296	.291	.305	.456	.446	.298	.309	.300	.455	.444
1550	225-6	.344	.364	.390	.545	.512	.352	.366	.407	.590	.536
1560	225-7	.321	.294	.355	.541	.451	.298	.312	.342	.518	.504
1570	225-8	.294	.302	.341	.521	.476	.303	.279	.349	.508	.468
1580	45-1	.244	.293	.326	.494	.463	.284	.295	.349	.545	.460

1590	AF-2	.294	.296	.354	.533	.468	.309	.295	.346	.491	.480
1600	AF-3	.307	.314	.365	.547	.475	.300	.299	.347	.544	.469
1610	AF-4	.294	.295	.340	.521	.449	.294	.298	.327	.521	.452
1620	AF-5	.305	.319	.312	.513	.466	.314	.317	.318	.483	.430
1630	AF-6	.314	.313	.364	.573	.513	.307	.315	.376	.537	.489
1640	AF-7	.302	.300	.296	.453	.450	.319	.299	.298	.493	.434
1650	AF-8	.308	.322	.363	.516	.445	.321	.309	.347	.543	.480
1660	AF-9	.307	.297	.370	.501	.459	.275	.297	.373	.510	.454
1670	OCF-1	.316	.325	.385	.594	.504	.298	.325	.398	.553	.506
1680	OCF-2	.310	.309	.355	.558	.517	.306	.320	.354	.542	.489
1690	OCF-3	.275	.280	.275	.462	.432	.285	.285	.277	.456	.438
1700	OCF-4	.294	.310	.367	.554	.476	.295	.307	.371	.561	.469
1710	OCF-5	.316	.305	.308	.497	.445	.308	.297	.306	.478	.415
1720	OCF-6	.294	.311	.345	.459	.496	.319	.329	.369	.496	.504
1730	OCF-8	.319	.310	.375	.573	.448	.316	.291	.373	.552	.456
1740	OCF-9	.311	.309	.349	.549	.509	.290	.324	.358	.557	.499
1750	OCF-10	.304	.307	.358	.542	.523	.312	.323	.384	.525	.522
1760	CS-1	.294	.317	.345	.566	.486	.306	.297	.354	.537	.465
1770	CS-2	.499	.475	.368	.556	.491	.477	.483	.361	.541	.485
1780	CS-3	.292	.300	.291	.464	.435	.305	.303	.296	.454	.440
1790	CS-4	.311	.312	.310	.452	.432	.301	.297	.298	.480	.456
1800	CS-5	.243	.302	.366	.516	.449	.298	.298	.365	.531	.472
1810	CS-6	.321	.326	.314	.490	.455	.320	.335	.301	.499	.458
1820	CS-7	.203	.317	.376	.533	.485	.316	.302	.364	.520	.465
1830	I-1	.298	.301	.359	.549	.483	.310	.301	.387	.541	.511
1840	I-2	.305	.307	.368	.544	.495	.330	.336	.353	.522	.480
1850	I-3	.322	.312	.366	.550	.463	.301	.310	.365	.540	.503

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1860	I-4	.313	.312	.374	.505	.450	.304	.325	.373	.543	.509
1870	I-5	.317	.319	.350	.532	.469	.298	.305	.351	.560	.492
1880	I-6	.313	.318	.328	.467	.458	.318	.309	.313	.506	.466
1890	I-7	.291	.303	.250	.481	.422	.295	.303	.275	.473	.427
1900	I-8	.408	.411	.503	.666	.580	.411	.440	.497	.659	.567
1930	56										
1940	#A1	.298	.308	.349	.474	.411	.308	.325	.344	.426	.408
1950	#B1	.312	.316	.347	.477	.443	.320	.314	.349	.486	.432
1960	#B2	.277	.277	.320	.417	.370	.270	.286	.306	.385	.388
1970	#B3	.244	.245	.272	.361	.350	.230	.243	.267	.390	.319
1980	#C1	1.550	1.524	1.623	2.119	1.974	1.638	1.642	1.569	2.052	1.953
1990	#C2	.311	.315	.340	.448	.397	.309	.327	.341	.501	.419
2000	#C2	.234	.234	.293	.393	.354	.227	.236	.272	.376	.343
2010	#C3	.275	.259	.312	.298	.334	.241	.249	.303	.416	.343
2020	#C4	.231	.215	.314	.439	.415	.296	.285	.317	.455	.425
2030	#D1	.323	.323	.344	.448	.403	.297	.331	.339	.449	.420
2040	#D2	.312	.297	.350	.461	.422	.290	.310	.347	.507	.425
2050	#D3	.442	.275	.354	.773	.607	.500	.447	.519	.706	.673
2060	#D4	.337	.338	.459	.633	.567	.386	.384	.431	.650	.554
2070	#D5	.334	.310	.425	.631	.538	.405	.415	.453	.583	.588
2080	#D6	.335	.438	.516	.610	.681	.501	.500	.504	.697	.610
2090	#D7	.324	.339	.345	.472	.395	.323	.340	.350	.494	.430
2100	#E1	.315	.361	.356	.441	.463	.320	.319	.338	.451	.419
2110	#E1	.328	.316	.351	.453	.461	.316	.336	.356	.470	.435
2120	#F2	1.440	1.448	1.531	5.687	2.139	1.574	1.496	1.535	5.724	4.089
2130	#F3	.543	1.002	1.007	1.210	1.255	.966	1.014	1.038	1.243	1.227
2140	#G1	.485	.502	.451	2.451	1.619	.392	.573	.544	2.547	1.636
2150	#G2	.258	.258	.293	.431	.376	.240	.244	.291	.289	.267
2160	#H1	.335	.327	.359	.461	.405	.308	.321	.338	.486	.440
2170	#H2	.257	.261	.305	.415	.416	.268	.268	.322	.400	.399
2180	#J1	.251	.248	.284	.405	.357	.233	.247	.284	.277	.334
2190	#K1	.330	.368	.406	.545	.525	.379	.362	.393	.539	.529
2200	#K2	.245	.304	.345	.459	.442	.301	.311	.332	.454	.428
2210	#K3	.239	.250	.258	.397	.327	.237	.223	.264	.364	.322
2220	#L1	.324	.324	.352	.442	.443	.315	.303	.365	.524	.408
2230	#L2	.273	.283	.320	.430	.364	.275	.286	.345	.455	.409

2240	#L3	.217	.235	.273	.381	.358	.240	.251	.271	.391	.337
2250	#L4	.313	.284	.313	.474	.425	.287	.288	.319	.473	.279
2260	#M1	.270	.245	.293	.385	.345	.267	.255	.313	.424	.392
2270	#M2	.310	.309	.350	.425	.403	.292	.310	.322	.462	.455
2280	#M3	.455	.408	.491	3.528	2.143	.458	.459	.470	3.395	2.068
2290	#M4	.333	.335	.357	.472	.436	.323	.317	.356	.485	.445
2300	#M5	.270	.308	.313	.438	.385	.291	.280	.313	.465	.363
2310	#M6	.254	.248	.318	.432	.431	.287	.291	.330	.454	.380
2320	#M7	4.791	5.306	5.048	6.181	4.192	4.812	5.023	4.697	7.096	6.126

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INPUT DATA FOR CWD PROGRAM

2330	#N1	1.333	1.228	1.256	1.679	1.534	1.168	1.262	1.258	1.710	1.530
2340	#P1	.243	.278	.333	.464	.423	.278	.290	.333	.455	.402
2350	#P2	.255	.275	.308	.450	.394	.283	.253	.319	.443	.486
2360	#R1	.275	.254	.308	.427	.396	.274	.262	.310	.286	.370
2370	#S1	.322	.324	.384	.453	.476	.338	.323	.358	.509	.464
2380	#S2	.364	.357	.475	.533	.504	.343	.354	.373	.535	.489
2390	#S3	.235	.288	.349	.440	.414	.274	.299	.322	.453	.403
2400	#S4	.221	.244	.274	1.160	1.021	.956	.845	.834	1.114	1.190
2410	#S5	.757	.785	.797	1.031	.914	.746	.743	.813	1.026	1.030
2420	#S6	.272	.272	.314	.452	.354	.263	.288	.294	.420	.379
2430	#T1	.232	.233	.274	.358	.326	.245	.249	.270	.397	.344
2440	#T2	.422	.407	.460	.651	.584	.386	.427	.451	.638	.602
2450	#T3	1.122	1.027	1.115	1.407	1.381	1.136	1.100	1.139	1.438	1.349
2460	#R2	.215	.220	.244	.344	.329	.215	.218	.268	.369	.314
2470	#R2	.215	.215	.251	.358	.300	.205	.212	.253	.343	.329
2480	#M1	.222	.281	.325	.395	.400	.262	.281	.298	.408	.354
2490	#M2	.254	.225	.304	.465	.375	.269	.285	.322	.441	.408
2500	#Z1	.841	.845	.933	1.308	1.276	.910	.890	.929	1.189	1.112
2510	#T01	.219	.207	.240	.337	.287	.200	.202	.251	.353	.297
2520	#T02	.215	.207	.248	.351	.286	.207	.200	.249	.358	.326
2530	#M1	.177	.191	.229	.330	.272	.195	.183	.237	.312	.268
2540	#M2	.180	.194	.219	.310	.268	.193	.185	.230	.310	.279
2550	#C01	.514	.484	.584	.880	.748	.505	.498	.547	.849	.752
2560	#C02	.530	.431	.523	.795	.797	.520	.495	.595	.813	.794
2570	#VJ1	.210	.192	.235	.329	.301	.213	.202	.239	.332	.329
2580	#VJ2	.215	.216	.234	.364	.290	.193	.209	.254	.359	.292
2590	#VJ3	.211	.211	.255	.374	.298	.212	.209	.278	.362	.311

2620	25										
2630	#1	.195	.202	.215	.313	.260	.206	.200	.223	.318	.275
2640	#2	.225	.246	.272	.349	.283	.231	.231	.213	.349	.290
2650	#3	.154	.180	.197	.327	.255	.182	.185	.202	.295	.255
2660	#4	.151	.175	.199	.328	.263	.174	.174	.217	.306	.271
2670	#5	.241	.255	.265	.362	.328	.240	.241	.260	.352	.332
2680	#6	.223	.229	.242	.348	.300	.223	.207	.244	.336	.313
2690	#7	.192	.197	.214	.305	.268	.194	.192	.199	.300	.267
2700	#8	.175	.179	.187	.272	.259	.183	.190	.170	.290	.245
2710	#9	.154	.191	.202	.310	.281	.198	.189	.204	.307	.260
2720	#10	.142	.178	.215	.322	.274	.186	.190	.215	.297	.242
2730	#11	.154	.177	.194	.374	.525	.383	.367	.373	.614	.511
2740	#12	.193	.190	.199	.278	.235	.198	.187	.180	.288	.254
2750	#13	.192	.191	.205	.319	.288	.195	.202	.207	.306	.240
2760	#14	.185	.192	.210	.334	.285	.200	.193	.230	.328	.270
2770	#15	.190	.181	.215	.315	.279	.186	.184	.220	.321	.279
2780	#16	.185	.182	.213	.322	.283	.189	.196	.220	.290	.241
2790	#17	.149	.257	.252	.381	.313	.230	.230	.268	.335	.310

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INPUT DATA FOR CWD PROGRAM

2800	#18	.218	.222	.275	.348	.305	.223	.235	.257	.335	.295
2810	#19	.235	.245	.256	.351	.331	.252	.239	.258	.351	.326
2820	#20	.235	.240	.244	.338	.300	.242	.221	.247	.340	.297
2830	#21	.245	.245	.254	.354	.323	.231	.206	.223	.346	.289
2840	#22	.195	.208	.226	.320	.286	.199	.193	.216	.308	.278
2850	#23	.192	.178	.222	.339	.270	.188	.187	.208	.343	.265
2860	#24	.205	.201	.198	.292	.282	.205	.210	.187	.271	.255
2870	#25	.187	.187	.201	.303	.302	.178	.197	.199	.306	.263

2880	
2890	
2900	15
2910	#1 .714 .694 .769 22.800 22.000 .705 .720 .789 28.600 22.400
2920	#9 .551 .553 .614 17.300 10.700 .661 .520 .636 16.700 10.900
2930	#12 .184 .172 .207 .299 .253 .201 .185 .197 .303 .256
2940	#13 .411 .502 .635 12.500 8.024 .401 .407 .433 12.500 7.783
2950	#14 .443 .448 .467 5.332 3.159 .464 .449 .460 5.497 3.030
2960	#15 .425 .445 .505 5.369 5.043 .429 .466 .472 6.780 5.654
2970	#16 .311 .305 .311 2.014 1.476 .293 .296 .312 1.799 1.423
2980	#17 .735 .651 .739 25.400 19.000 .725 .657 .798 26.300 19.3000
2990	#18 .185 .197 .216 .253 .251 .191 .194 .203 .287 .192
3000	#20 .511 .497 .514 4.340 2.764 .535 .517 .558 4.494 3.701
3010	#21 .193 .181 .202 .271 .251 .207 .180 .204 .317 .255
3020	#22 .199 .175 .203 .291 .261 .194 .176 .201 .295 .234
3030	#23 .420 .411 .453 9.080 5.764 .422 .421 .462 9.583 5.859
3040	#24 .435 .432 .448 11.400 7.516 .433 .435 .466 10.800 8.365
3050	#25 .344 .350 .408 4.464 4.494 .365 .355 .411 5.564 4.313
3210	#03 .299 .301 .342 .460 .375 .302 .284 .348 .478 .427
3220	#04 .271 .286 .283 .412 .394 .275 .271 .275 .403 .392
3230	#05 .302 .245 .325 .459 .425 .287 .297 .343 .445 .418
3240	#06 .253 .273 .270 .439 .386 .269 .270 .341 .450 .386
3250	#07 .305 .285 .357 .442 .443 .294 .299 .352 .494 .442
3260	#08 .235 .260 .235 .466 .412 .290 .303 .325 .464 .413

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3270	#09 .289 .295 .365 .449 .408 .313 .309 .340 .452 .417
3280	#10 .272 .277 .325 .458 .419 .263 .289 .325 .486 .443
3290	#01 .201 .297 .355 .449 .421 .266 .308 .339 .419 .444
3300	#02 .271 .295 .313 .446 .413 .293 .274 .326 .456 .407
3310	#04 .272 .277 .327 .455 .431 .285 .289 .344 .427 .439
3320	#05 .254 .245 .322 .449 .422 .276 .282 .331 .459 .403
3330	#06 .275 .273 .341 .434 .417 .264 .293 .329 .423 .402
3340	#07 .275 .293 .355 .493 .431 .284 .293 .322 .459 .435
3350	#08 .254 .315 .320 .495 .422 .300 .350 .340 .465 .422
3360	#09 .277 .291 .324 .475 .418 .284 .277 .303 .491 .439
3370	#10 .255 .271 .324 .428 .419 .276 .268 .322 .427 .394
3380	#01 .271 .289 .314 .446 .390 .276 .290 .338 .450 .412
3390	#02 .305 .315 .357 .491 .443 .321 .315 .342 .502 .443
3400	#03 .270 .271 .323 .475 .446 .288 .296 .348 .468 .370
3410	#04 .274 .280 .325 .463 .420 .286 .273 .340 .474 .454
3420	#06 .270 .298 .344 .442 .402 .275 .285 .322 .429 .429
3430	#08 .272 .273 .332 .435 .395 .266 .284 .322 .470 .396
3440	#09 .305 .290 .354 .483 .475 .305 .302 .349 .497 .364
3450	#10 .291 .293 .287 .407 .376 .276 .278 .269 .391 .371
3460	#01 .293 .305 .350 .478 .418 .312 .308 .364 .496 .446
3470	#02 .305 .318 .350 .528 .440 .325 .302 .354 .496 .438
3480	#03 .305 .316 .355 .440 .423 .303 .325 .352 .457 .448
3490	#05 .294 .301 .355 .514 .435 .304 .295 .371 .467 .432
3500	#06 .311 .301 .354 .489 .433 .299 .311 .372 .496 .428
3510	#07 .293 .301 .351 .448 .409 .293 .306 .370 .438 .414
3520	#08 .307 .315 .357 .515 .435 .316 .327 .388 .495 .456
3530	#09 .305 .322 .357 .475 .435 .300 .307 .365 .495 .449
3540	#10 .324 .334 .310 .438 .409 .309 .364 .311 .424 .427
3550	#01 .327 .329 .317 .414 .427 .327 .338 .317 .424 .412
3560	#02 .294 .345 .376 .482 .414 .307 .365 .419 .503 .455
3570	#03 .315 .365 .418 .490 .451 .306 .314 .344 .505 .448
3580	#04 .295 .309 .305 .466 .405 .299 .309 .351 .487 .432
3590	#05 .297 .290 .367 .467 .427 .292 .323 .372 .441 .452
3600	#06 .301 .322 .322 .477 .397 .289 .293 .370 .469 .405
3610	#07 .297 .246 .346 .450 .396 .305 .277 .346 .450 .408
3620	#08 .310 .324 .344 .482 .450 .300 .319 .374 .505 .435
3630	#09 .290 .301 .337 .431 .410 .282 .289 .323 .464 .417
3640	#10 .345 .391 .451 .541 .511 .375 .387 .413 .569 .517
3650	#01 .321 .321 .353 .481 .414 .305 .311 .354 .454 .413
3660	#02 .334 .313 .355 .485 .504 .340 .330 .399 .559 .481
3670	#03 .315 .317 .352 .475 .434 .299 .283 .358 .449 .440
3680	#04 .351 .343 .352 .499 .517 .393 .354 .457 .501 .493
3690	#05 .333 .328 .327 .473 .434 .325 .315 .382 .497 .436
3700	#06 .313 .334 .352 .505 .440 .317 .316 .352 .500 .409
3710	#07 .437 .425 .442 .682 .583 .423 .422 .503 .665 .631
3720	#08 .255 .351 .351 .454 .438 .326 .313 .327 .483 .450
3730	#09 .307 .335 .359 .459 .416 .289 .293 .351 .428 .442

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INPUT DATA FOR CWD PROGRAM							
3740	P10	.232	.285	.342	.459	.399	.291 .305 .346 .483 .364
3750	S01	.255	.362	.370	.499	.430	.310 .340 .366 .483 .440
3750	S02	.341	.413	.448	.578	.494	.330 .364 .452 .533 .501
3770	S03	.323	.335	.33	.525	.449	.328 .341 .365 .497 .447
3780	S04	.315	.477	.449	.414	.390	.501 .485 .528 .389 .392
3790	S05	.353	.357	.383	.511	.458	.325 .351 .387 .493 .430
3800	S06	.335	.315	.343	.497	.447	.335 .317 .373 .486 .428
3810	S07	.344	.410	.443	.581	.526	.421 .413 .499 .613 .547
3820	S08	.353	.342	.365	.527	.472	.364 .364 .427 .523 .529
3830	S09	.345	.348	.465	.513	.473	.321 .332 .385 .491 .454
3840	S10	.372	.395	.439	.600	.563	.425 .527 .550 .625 .597
3850	S001	.297	.285	.333	.455	.414	.292 .269 .352 .481 .411
3860	S002	.304	.340	.356	.493	.469	.300 .327 .368 .506 .453
3870	P1001	.187	.207	.249	.360	.299	.200 .203 .237 .351 .315
3880	P1002	.211	.225	.252	.364	.327	.201 .211 .259 .372 .301
3890	TRC01	.402	.357	.459	.587	.526	.399 .404 .424 .608 .541
3900	TRC02	.397	.367	.433	.577	.540	.397 .396 .436 .531 .533
3910	CW001	.405	.358	.478	.573	.489	.391 .381 .373 .543 .498
3920	JVM49	.420	.357	.432	.591	.553	.404 .413 .422 .592 .540
3930	A2001	1.423	1.715	1.918	2.402	2.543	1.802 1.693 1.439 2.468 2.253
3940	A2002	.423	.417	.503	.504	.431	.423 .477 .575 .609
3950	A2003	5.262	5.722	5.874	7.550	8.110	6.386 5.418 5.989 7.821 7.724
3950	C401	1.153	1.212	1.1931	1.613	1.540	1.197 1.136 1.159 1.673 1.517
3970	C402	.944	.995	1.065	1.575	1.282	.969 1.043 1.053 1.475 1.385
3980	C401	.917	.899	1.000	1.501	1.280	3.906 .885 1.097 1.460 1.349
3990	A201	1.252	1.602	1.392	1.841	1.936	1.191 1.105 1.608 1.816 1.990
4000	A202	2.546	3.114	2.403	4.532	4.371	3.254 3.161 3.525 4.428 4.512
4010	P001	2.477	3.402	3.071	4.440	4.225	3.232 3.164 3.351 4.469 4.510
4020	S001	1.430	1.573	1.585	2.304	2.040	1.413 1.307 1.615 2.035 2.186
4030	I05	.548	.542	.597	.844	.758	.562 .557 .611 .867 .779
4040	V04	1.220	1.425	1.418	1.918	1.409	1.276 1.482 1.370 1.827 1.432
4050	P03	.449	.427	.493	.701	.635	.433 .452 .485 .701 .647
4060	P5002	1.798	1.715	1.992	2.555	2.508	1.739 2.013 1.759 2.340 2.382

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INPUT DATA FOR CWD PROGRAM							
5150	#1	.134	.172	.205	.278	.252	.179 .174 .206 .282 .262
5160	#2	.259	.342	.349	.383	.306	.250 .255 .254 .411 .321
5170	#3	.193	.197	.218	.293	.280	.191 .187 .208 .322 .258
5180	#4	.209	.191	.222	.295	.262	.200 .197 .216 .303 .281
5190	#5	.297	.289	.343	.401	.336	.277 .306 .276 .410 .371
5200	#6	.242	.212	.243	.349	.323	.228 .218 .240 .338 .342
5210	#7	.205	.198	.212	.282	.273	.196 .197 .209 .291 .275
5220	#8	.193	.193	.224	.310	.279	.198 .189 .223 .306 .277
5230	#9	.182	.171	.216	.285	.231	.185 .165 .190 .275 .231
5240	#10	.214	.204	.231	.341	.278	.209 .197 .232 .340 .267
5250	#11	.253	.247	.283	.362	.303	.341 .371 .319 .556 .482
5260	#12	.227	.233	.244	.326	.275	.258 .220 .252 .326 .307
5270	#13	.223	.213	.255	.330	.302	.220 .217 .241 .342 .295
5280	#14	.175	.172	.219	.258	.217	.190 .169 .183 .276 .225
5290	#15	.153	.154	.183	.275	.231	.173 .174 .190 .253 .244
5300	#16	.153	.142	.200	.289	.245	.177 .176 .209 .274 .241
5310	#17	.145	.170	.212	.242	.235	.182 .174 .195 .252 .238
5320	#18	.170	.144	.206	.291	.245	.170 .187 .194 .275 .241
5330	#19	.154	.172	.225	.250	.243	.165 .168 .208 .294 .242
5340	#20	.151	.154	.212	.285	.239	.162 .181 .202 .261 .251
5350	#21	.141	.173	.215	.285	.225	.174 .173 .197 .261 .246
5360	#22	.143	.172	.212	.298	.249	.173 .164 .201 .258 .258
5370	#23	.142	.172	.215	.275	.228	.159 .166 .198 .286 .252
5380	#24	.174	.169	.217	.252	.236	.179 .179 .162 .226 .224
5390	#25	.175	.177	.230	.266	.252	.165 .176 .208 .275 .241

5500	B1
5510	CS-1 .272 .296 .377 .474 .458 .300 .283 .347 .513 .416
5520	CS-2 .305 .301 .373 .499 .454 .289 .284 .360 .527 .475
5530	CS-3 .301 .294 .331 .522 .448 .290 .325 .343 .523 .451
5540	CS-4 .269 .291 .353 .513 .466 .287 .294 .350 .524 .438
5550	CS-5 .303 .296 .347 .439 .443 .282 .290 .331 .506 .408
5560	CS-6 .313 .312 .315 .545 .457 .313 .322 .367 .548 .482
5570	LTA-1 .255 .280 .332 .501 .431 .286 .298 .318 .490 .396
5580	LTA-2 .303 .327 .362 .534 .447 .320 .304 .360 .565 .522
5590	LTA-3 .262 .267 .315 .310 .443 .284 .288 .339 .468 .421
5600	LTA-4 .299 .294 .341 .508 .417 .304 .278 .339 .491 .454
5610	LTA-5 .296 .275 .344 .480 .457 .298 .285 .309 .472 .444

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5620	LTA-5	.294	.295	.358	.445	.443	.299	.300	.348	.494	.447
5630	CA-1	.294	.295	.358	.490	.394	.280	.287	.343	.471	.399
5640	CTA-1	.294	.295	.323	.507	.430	.264	.288	.342	.494	.454
5650	CTA-2	.293	.301	.341	.504	.442	.327	.301	.347	.528	.467
5660	CTA-3	.293	.304	.341	.524	.453	.299	.302	.353	.507	.439
5670	CTA-4	.311	.299	.312	.499	.429	.319	.319	.351	.500	.428
5680	CTA-5	.294	.291	.313	.511	.412	.297	.303	.359	.481	.432
5690	CTA-6	.299	.297	.356	.507	.418	.289	.258	.315	.503	.401
5700	CTA-7	.292	.297	.354	.447	.424	.279	.286	.336	.492	.405
5710	CTA-8	.304	.332	.356	.547	.469	.327	.305	.356	.534	.463
5720	O-1	.275	.275	.317	.474	.416	.287	.271	.363	.496	.413
5730	O-2	.279	.275	.329	.520	.441	.285	.294	.304	.494	.430
5740	O-3	.293	.301	.337	.490	.424	.301	.311	.337	.493	.438
5750	O-4	.294	.284	.340	.470	.401	.262	.281	.335	.478	.410
5760	O-5	.295	.295	.342	.503	.430	.280	.321	.375	.517	.460
5770	O-6	.295	.285	.341	.513	.447	.324	.349	.324	.552	.456
5780	O-7	.277	.282	.327	.461	.492	.715	.716	.741	.926	.980
5790	T-1	.273	.285	.329	.516	.431	.298	.292	.341	.475	.470
5800	T-2	.297	.293	.348	.494	.449	.301	.323	.359	.526	.419
5810	T-3	.295	.306	.349	.513	.446	.296	.278	.349	.526	.431
5820	T-4	.293	.298	.349	.501	.429	.296	.285	.344	.485	.450
5830	T-5	.294	.291	.345	.483	.451	.290	.284	.317	.479	.431
5840	T-6	.413	.393	.317	.483	.358	.403	.420	.320	.467	.398
5850	T-7	.294	.302	.348	.499	.400	.290	.299	.357	.527	.424
5860	MO-1	.295	.314	.347	.525	.445	.290	.289	.351	.517	.453
5870	MO-2	.295	.298	.354	.534	.469	.266	.316	.359	.509	.448
5880	MO-3	.294	.294	.352	.506	.444	.282	.292	.324	.494	.445
5890	MO-4	.304	.273	.349	.523	.437	.294	.302	.352	.522	.424
5900	MO-5	.295	.291	.342	.505	.434	.314	.292	.322	.475	.411
5910	MO-6	.294	.325	.361	.508	.445	.313	.303	.362	.539	.464
5920	MO-7	.309	.279	.349	.504	.450	.286	.294	.342	.506	.451
5930	MO-8	.295	.290	.349	.490	.431	.288	.303	.333	.530	.449
5940	MO-9	.405	.425	.365	.605	.574	.398	.409	.443	.581	.541
5950	MO-10	.294	.293	.339	.516	.410	.311	.297	.343	.524	.468
5960	AO-1	.299	.311	.369	.553	.450	.313	.298	.357	.516	.465
5970	AO-2	.291	.299	.339	.466	.413	.283	.292	.334	.484	.420
5980	AO-3	.295	.298	.370	.537	.471	.299	.300	.368	.489	.471
5990	AO-4	.291	.325	.359	.497	.449	.304	.304	.363	.504	.481
6000	AO-5	.311	.318	.368	.492	.457	.317	.301	.368	.532	.451
6010	AF-1	.295	.275	.322	.435	.407	.290	.251	.327	.470	.418
6020	AF-2	.293	.293	.341	.460	.451	.281	.285	.329	.465	.455
6030	AF-3	.297	.317	.355	.465	.447	.296	.298	.366	.533	.424
6040	AF-4	.295	.297	.349	.500	.421	.284	.291	.345	.462	.429
6050	AF-5	.312	.293	.342	.513	.426	.300	.312	.348	.506	.451
6060	AF-6	.314	.310	.348	.522	.455	.288	.322	.356	.527	.474
6070	AF-7	.277	.278	.324	.494	.419	.283	.273	.336	.492	.431
6080	AF-8	.314	.294	.364	.506	.464	.296	.300	.347	.523	.468

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6090	AFL-9	.277	.285	.331	.505 .430 .293 .311 .336 .512 .435
6100	AFL-10	.271	.275	.339	.464 .394 .271 .264 .348 .478 .417
6110	QCF-1	.283	.288	.349	.516 .432 .302 .291 .340 .483 .439
6120	QCF-2	.315	.288	.355	.517 .434 .312 .288 .370 .501 .458
6130	QCF-3	.275	.304	.349	.478 .425 .279 .309 .353 .507 .430
6140	QCF-4	.275	.280	.344	.521 .410 .279 .292 .342 .492 .431
6150	QCF-5	.310	.291	.337	.498 .409 .286 .276 .351 .454 .415
6160	QCF-6	.313	.295	.353	.474 .438 .289 .304 .344 .517 .440
6170	QCF-7	.298	.294	.354	.482 .446 .284 .301 .341 .477 .444
6180	QCF-8	.311	.304	.345	.531 .455 .313 .326 .369 .549 .486
6190	QCF-9	.312	.317	.344	.550 .511 .417 .340 .379 .529 .529
6200	QCF-10	.311	.331	.366	.584 .501 .324 .336 .398 .543 .501
6210	QCF-11	.280	.282	.339	.473 .443 .297 .290 .351 .537 .473
6220	QCF-12	.309	.304	.367	.511 .453 .302 .317 .365 .491 .464
6230	QCF-13	.297	.311	.344	.514 .411 .299 .291 .365 .494 .435
6240	QCF-14	.277	.270	.325	.458 .411 .284 .263 .341 .470 .386
6250	QCF-15	.285	.284	.344	.487 .421 .286 .291 .339 .485 .420
6260	QCF-16	.327	.296	.329	.493 .443 .319 .312 .356 .478 .469
6270	QCF-17	.297	.304	.341	.494 .612 .285 .299 .382 .553 .519
6280	QCF-18	.301	.309	.346	.508 .455 .303 .302 .362 .526 .462
6290	QCF-19	.274	.288	.326	.504 .422 .281 .291 .360 .490 .429
6300	QCF-20	.291	.289	.352	.515 .462 .295 .298 .342 .543 .437
6310	QCF-21	.288	.289	.351	.444 .380 .231 .235 .282 .429 .352
6340	56				
6350	3-1	.247	.245	.316	.393 .385 .249 .273 .268 .375 .345
6360	3-2	.280	.282	.327	.297 .291 .207 .190 .208 .327 .289
6370	3-3	.435	.444	.494	.698 .638 .444 .429 .470 .728 .625
6380	3-4	.281	.225	.245	.351 .311 .218 .225 .233 .353 .332
6390	3-5	.193	.199	.219	.318 .271 .188 .203 .198 .305 .279
6400	3-6	.192	.204	.217	.295 .294 .198 .197 .200 .323 .293
6410	3-7	.197	.178	.214	.320 .293 .198 .197 .211 .307 .286
6420	3-8	.221	.224	.235	.304 .318 .224 .225 .240 .322 .329
6430	3-9	.447	.427	.420	.549 .539 .408 .441 .436 .580 .540
6440	3-10	.502	.498	.540	.619 .691 .489 .498 .505 .639 .650
6450	3-11	.270	.255	.276	.403 .348 .260 .274 .270 .428 .358
6460	3-12	.225	.215	.255	.333 .300 .219 .228 .256 .347 .308
6470	3-13	.243	.245	.215	.456 .384 .286 .314 .311 .452 .402
6480	3-14	.282	.272	.215	.348 .344 .278 .273 .299 .342 .335
6490	3-15	.244	.242	.250	.359 .284 .284 .240 .259 .366 .321
6500	4-1	.293	.251	.277	.384 .356 .248 .249 .286 .374 .353
6510	4-2	.271	.272	.287	.388 .358 .277 .268 .294 .393 .376
6520	4-3	.272	.234	.252	.377 .329 .240 .254 .262 .371 .355
6530	4-4	.294	.294	.313	.396 .421 .282 .286 .317 .415 .408
6540	4-5	.248	.255	.274	.368 .373 .245 .251 .264 .394 .374
6550	4-6	.405	.405	.449	.549 .526 .422 .395 .435 .528 .535
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6560	K-3	.259	.275	.275	.369
6570	K-4	.225	.242	.251	.358
6580	K-5	.215	.224	.233	.348
6590	L-1	.210	.225	.233	.337
6600	L-2	.211	.226	.232	.355
6610	L-3	.170	.175	.177	.257
6620	L-4	.197	.186	.205	.299
6630	L-5	.217	.222	.233	.349
6640	M-1	.242	.242	.246	.372
6650	M-2	.217	.233	.233	.312
6660	M-3	.165	.144	.155	.293
6670	M-4	.175	.215	.225	.322
6680	M-5	.180	.149	.224	.326
6690	P-1	.212	.215	.243	.415
6700	P-1	.425	.440	.435	.827
6710	P-2	.212	.221	.234	.343
6720	P-3	.155	.163	.169	.279
6730	P-1	.393	.413	.427	.577
6740	P-2	.228	.234	.259	.373
6750	S-1	.231	.231	.255	.363
6760	S-2	.224	.215	.230	.325
6770	S-3	.162	.162	.169	.254
6780	W-1	.141	.200	.210	.310
6790	W-2	.204	.203	.225	.322
6800	505	3.243	3.292	3.259	4.307
6810	507	1.414	1.414	1.449	1.941
6820	515	6.775	6.372	6.720	8.600
6830	518	3.832	3.555	3.706	5.180
6840	519	6.613	6.055	6.14	7.98
6850	520	6.442	6.454	6.140	8.875
6860	509	2.344	2.403	2.412	3.142
6870	516	3.114	3.095	3.208	4.136
6880	543	8.550	8.444	8.226	10.700
6890	545	3.208	2.898	2.569	4.105
6900	545	2.501	2.345	2.423	3.122
6910	FLD-1	.154	.162	.165	.279
6920	FLD-2	.154	.170	.191	.280
6930	RSC-1	.146	.153	.161	.272
6940	RSC-2	.149	.157	.163	.265
6950	HP-1	.200	.194	.245	.312
6960	HP-2	.187	.204	.237	.330
6970	C-1	.157	.161	.165	.253
6980	C-2	.159	.153	.174	.249
6990	C-3	.152	.164	.167	.259
7000	C-4	.157	.161	.165	.281

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7570	15				
7580	0002	.249	.249	.247	.399
7590	0003	.216	.216	.231	.355
7600	0004	.215	.220	.231	.324
7610	0005	.225	.225	.276	.452
7620	0006	.227	.215	.230	.373
7630	0007	.212	.205	.224	.361
7640	0008	.211	.202	.237	.363
7650	0010	.224	.215	.245	.367
7660	0011	.223	.227	.245	.353
7670	0012	.232	.217	.251	.350
7680	0112	.236	.217	.254	.363
7690	0007	.224	.215	.275	.285
7700	0007	.224	.215	.277	.345
7710	0007	.224	.215	.277	.336
7720	0007	.224	.215	.277	.320

7840	ST#10	.267	.277	.264	.352	.369	.276	.282	.268	.329	.376
7850	ST#10	.254	.263	.268	.405	.364	.247	.255	.293	.394	.364
7860	ST#11	.265	.267	.255	.357	.363	.282	.279	.291	.353	.358
7870	ST#11	.261	.261	.283	.425	.377	.263	.253	.289	.393	.380
7880	ST#12	.172	.174	.159	.250	.257	.168	.176	.161	.248	.257
7890	ST#12	.170	.170	.173	.274	.225	.181	.191	.176	.257	.251
7900	PUMP5	.294	.317	.349	.496	.461	.321	.303	.368	.501	.440
7910	VC-1	.129	.129	.342	.532	.462	.330	.325	.384	.519	.463
7920	AP001	1.715	1.715	1.418	1.904	1.749	1.289	1.413	1.339	1.803	1.712
7930	AP002	.354	.413	.424	.558	.538	.392	.408	.438	.595	.501
7940	AP003	2.030	1.740	1.955	2.748	2.679	1.937	2.039	2.090	2.695	2.769
7950	AP01	2.141	2.141	2.382	3.235	3.000	2.077	2.157	2.244	3.279	3.034
7960	SF01	.014	.037	.042	1.313	1.198	.925	.839	.919	1.313	1.240

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7970	C401	.375	.390	.406	.556	.533	.395	.425	.395	.541	.530
7980	C402	.752	.779	.877	1.211	1.128	.800	.805	.875	1.257	1.086
7990	C401	.434	.457	.475	.697	.673	.432	.422	.502	.721	.681
8000	EX225	.324	.321	.372	.499	.434	.347	.326	.397	.508	.480
8010	EX154	.356	.373	.385	.565	.522	.361	.386	.385	.566	.496
8020	F01	.254	.251	.265	.395	.359	.263	.254	.328	.410	.379
8030	F02	.251	.277	.264	.352	.345	.257	.275	.264	.340	.352
8040	F03	.254	.252	.272	.417	.386	.253	.278	.300	.398	.394
8050	F04	.255	.256	.254	.373	.331	.267	.256	.252	.358	.353
8060	F05	.253	.270	.271	.414	.395	.281	.282	.318	.413	.410
8070	F06	.257	.257	.269	.441	.409	.257	.253	.331	.443	.382
8080	F07	.255	.259	.311	.426	.381	.236	.260	.294	.418	.382
8090	F08	.273	.334	.365	.294	.284	.395	.385	.414	.296	.301
8100	F09	.254	.275	.255	.342	.359	.284	.275	.264	.369	.376
8110	F10	.255	.257	.257	.408	.368	.229	.268	.304	.390	.347
8120	F01	.254	.257	.277	.431	.384	.261	.263	.296	.433	.373
8130	F02	.255	.275	.256	.419	.384	.275	.249	.322	.398	.393
8140	F03	.259	.264	.275	.347	.359	.258	.265	.247	.369	.307
8150	F04	.254	.275	.247	.451	.404	.276	.278	.309	.472	.392
8160	F05	.259	.274	.256	.423	.390	.259	.281	.320	.416	.355
8170	F06	.253	.257	.259	.365	.352	.273	.265	.269	.379	.362
8180	F07	.251	.265	.253	.367	.352	.277	.266	.243	.342	.342
8190	F08	.251	.259	.311	.454	.375	.255	.267	.293	.447	.373
8200	F10	.241	.245	.245	.352	.311	.257	.256	.250	.372	.355
8210	F01	.243	.249	.250	.419	.361	.239	.266	.285	.415	.356
8220	F02	.246	.252	.253	.426	.356	.373	.279	.293	.414	.372
8230	F03	.249	.249	.243	.357	.353	.245	.252	.256	.370	.343
8240	F04	.240	.253	.253	.362	.341	.239	.242	.258	.320	.319
8250	F05	.253	.257	.317	.466	.375	.272	.266	.331	.423	.358
8260	F06	.250	.250	.300	.387	.375	.248	.248	.310	.423	.384
8270	F07	.244	.256	.250	.358	.349	.252	.247	.243	.365	.360
8280	F08	.254	.275	.269	.386	.367	.256	.247	.262	.369	.345
8290	F09	.247	.261	.260	.344	.328	.261	.241	.244	.330	.360
8300	F10	.247	.251	.252	.352	.324	.241	.247	.248	.353	.319
8310	F01	.270	.265	.268	.404	.381	.290	.240	.327	.398	.387
8320	F02	.255	.263	.269	.415	.383	.250	.249	.284	.429	.363
8330	F03	.255	.265	.268	.414	.375	.255	.268	.292	.390	.380
8340	F04	.273	.263	.263	.447	.368	.268	.270	.303	.415	.413
8350	F07	.253	.255	.259	.327	.319	.240	.261	.254	.378	.338
8360	F08	.243	.245	.284	.410	.366	.243	.261	.294	.425	.394
8370	F09	.249	.255	.256	.390	.343	.249	.263	.293	.404	.360
8380	F10	.271	.247	.234	.389	.340	.253	.287	.250	.369	.358
8390	S01	.251	.255	.295	.438	.359	.249	.251	.301	.421	.332
8400	S02	.252	.250	.240	.364	.367	.242	.250	.249	.366	.337
8410	S03	.249	.257	.260	.408	.378	.251	.259	.313	.416	.373
8420	S04	.242	.275	.267	.399	.393	.243	.264	.302	.448	.365
8430	S05	.273	.274	.278	.449	.391	.263	.289	.351	.430	.374

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8440	506	.241	.245	.252	.341	.332	.261	.257	.258	.358	.357			
8450	507	.240	.272	.272	.459	.361	.256	.264	.278	.413	.384			
8460	508	.237	.239	.240	.414	.401	.247	.239	.307	.425	.329			
8470	509	.263	.272	.343	.429	.382	.260	.271	.332	.452	.371			
8480	510	.239	.265	.314	.441	.403	.292	.278	.308	.427	.405			
8490	501	.240	.318	.266	.415	.396	.290	.300	.264	.373	.400			
8500	502	.237	.274	.325	.442	.389	.280	.293	.322	.465	.421			
8510	503	.235	.245	.302	.440	.388	.264	.266	.300	.441	.388			
8520	504	.241	.271	.267	.402	.367	.249	.265	.297	.373	.364			
8530	505	.238	.247	.271	.408	.362	.275	.274	.267	.411	.375			
8540	506	.232	.253	.355	.343	.362	.254	.244	.258	.399	.316			
8550	508	.240	.241	.305	.351	.377	.265	.282	.274	.394	.382			
8560	509	.235	.267	.303	.423	.369	.252	.232	.276	.414	.368			
8570	510	.232	.263	.275	.346	.379	.236	.260	.260	.371	.366			
8580	501	.237	.262	.305	.341	.327	.245	.280	.309	.434	.362			
8590	502	.229	.233	.253	.377	.333	.249	.234	.254	.377	.379			
8600	503	.249	.305	.323	.448	.416	.311	.285	.340	.453	.368			
8610	504	.243	.263	.309	.399	.369	.247	.255	.312	.364	.346			
8620	505	.231	.232	.228	.330	.333	.222	.236	.230	.341	.285			
8630	506	.343	.373	.377	.502	.495	.341	.334	.346	.516	.477			
8640	507	.235	.270	.374	.382	.350	.260	.273	.255	.347	.344			
8650	508	.236	.244	.308	.422	.385	.264	.280	.316	.441	.387			
8660	509	.255	.258	.263	.430	.342	.260	.251	.301	.452	.371			
8670	510	.267	.247	.305	.505	.491	.351	.334	.399	.540	.490			
8680	501	.323	.384	.455	.500	.490	.333	.297	.367	.474	.514			
8690	502	.311	.301	.225	.502	.463	.299	.296	.314	.474	.453			
8700	503	.350	.335	.355	.521	.505	.340	.351	.391	.467	.492			
8710	505	.301	.261	.301	.408	.361	.246	.252	.291	.400	.358			
8720	506	.234	.252	.269	.437	.366	.247	.259	.301	.437	.382			
8730	507	.260	.243	.303	.419	.365	.248	.278	.309	.410	.347			
8740	508	.345	.342	.340	.476	.492	.369	.344	.380	.470	.511			
8750	510	.247	.267	.320	.425	.399	.251	.269	.290	.413	.369			
8760	5407	1.358	1.530	1.730	2.428	2.214	1.488	1.490	1.743	2.282	2.306			
8770	5401	.252	.277	.326	.473	.418	.292	.277	.340	.461	.425			
8810	4-1	.233	.231	.272	.378	.312	.229	.239	.238	.349	.300			
8820	4-2	.319	.311	.359	.527	.472	.308	.304	.351	.528	.451			
8830	5-1	.230	.229	.263	.334	.306	.233	.222	.250	.355	.304			
8840	3-3	.242	.233	.248	.324	.312	.223	.221	.245	.336	.295			
8850	3-5	.227	.226	.249	.329	.298	.224	.220	.278	.361	.302			
8860	5-1	.212	.219	.249	.335	.286	.192	.222	.254	.326	.285			
8870	5-2	.234	.224	.256	.329	.294	.203	.237	.248	.357	.287			
8880	5-3	.183	.215	.240	.324	.269	.186	.293	.247	.303	.299			
8890	5-4	.217	.209	.244	.346	.298	.211	.217	.235	.348	.288			
8900	5-3	.240	.205	.314	.404	.407	.295	.309	.333	.431	.391			

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INPUT DATA FOR CWD PROGRAM				
8910	J-4	.372 .353 .354 .441 .429 .347 .371 .371 .513 .413		
8920	J-5	.240 .244 .252 .350 .332 .243 .228 .266 .367 .322		
8930	J-6	.200 .217 .221 .315 .273 .207 .316 .231 .307 .267		
8940	E-1	.211 .226 .237 .355 .308 .232 .221 .263 .338 .312		
8950	E-1	.203 .235 .253 .335 .287 .218 .215 .236 .354 .286		
8960	S-1	.210 .235 .250 .355 .312 .229 .227 .284 .352 .293		
8970	S-3	.221 .232 .257 .350 .313 .228 .230 .249 .372 .322		
8980	L-2	.205 .204 .249 .315 .307 .217 .201 .243 .334 .294		
8990	L-3	.210 .222 .239 .377 .289 .229 .226 .242 .327 .289		
9000	L-4	.177 .199 .207 .308 .305 .196 .207 .227 .319 .274		
9010	L-5	.213 .233 .259 .343 .340 .208 .232 .260 .347 .317		
9020	J-1	.208 .193 .211 .329 .274 .209 .200 .244 .320 .268		
9030	J-2	.205 .187 .217 .308 .285 .213 .215 .229 .354 .272		
9040	S-1	.214 .240 .251 .394 .359 .286 .271 .302 .400 .375		
9050	S-3	.210 .218 .253 .321 .302 .199 .207 .231 .337 .287		
9060	S-4	.201 .241 .257 .367 .334 .231 .231 .255 .380 .323		
9070		.557		
9080	L-1	.271 .267 .299 .375 .365 .267 .281 .308 .358 .358		
9090	L-2	.257 .255 .292 .397 .349 .256 .278 .304 .396 .351		
9100	L-3	.215 .210 .232 .313 .289 .215 .224 .230 .305 .281		
9110	L-4	.200 .240 .251 .350 .314 .213 .223 .224 .319 .288		
9120	L-5	.205 .222 .251 .352 .309 .216 .220 .237 .325 .294		
9130	M-1	.202 .245 .255 .352 .315 .259 .241 .265 .351 .313		
9140	M-2	.193 .195 .221 .298 .288 .208 .189 .225 .313 .270		
9150	M-3	.411 .455 .467 .549 .459 .408 .463 .485 .540 .529		
9160	M-4	.190 .209 .230 .300 .266 .191 .196 .228 .301 .293		
9170	M-5	.200 .220 .214 .319 .269 .193 .211 .219 .306 .284		
9180	P-1	.257 .254 .255 .403 .346 .267 .267 .297 .384 .392		
9190	P-2	.218 .210 .237 .328 .300 .203 .227 .230 .322 .273		
9200	P-3	.320 .294 .226 .451 .435 .293 .288 .324 .464 .415		
9210	P-3	.204 .220 .256 .294 .265 .204 .208 .234 .293 .288		
9220	R-1	.404 .402 .400 .527 .549 .403 .372 .428 .531 .511		
9230	R-2	.210 .215 .253 .316 .293 .220 .225 .251 .319 .288		
9240	S-1	.207 .226 .226 .359 .309 .213 .230 .231 .336 .293		
9250	S-2	.203 .223 .235 .370 .284 .217 .216 .247 .331 .290		
9260	S-3	.210 .213 .263 .299 .277 .203 .214 .240 .309 .275		
9270	S-4	.227 .232 .250 .354 .296 .211 .244 .257 .349 .286		
9280	L-2	.431 .443 .459 .475 .639 .418 .510 .506 .694 .626		
9290	M-1	.195 .200 .245 .317 .280 .190 .205 .217 .302 .269		
9300	M-2	.214 .253 .259 .419 .366 .289 .274 .302 .385 .348		
9310	505	1.405 1.462 1.325 1.652 1.668 1.507 1.408 1.355 1.755 1.683		
9320	507	4.401 1.805 .556 12.9 8.878 .964 .971 .997 13.4 8.386		
9330	518	1.747 1.291 1.254 5.892 4.845 1.337 1.359 1.313 6.368 4.674		
9340	519	.715 .647 .749 1.349 1.136 .708 .682 .695 1.383 1.190		
9350	520	3.000 3.300 3.579 4.856 4.711 3.182 3.757 3.494 4.617 4.441		
9360	516	4.412 4.521 4.617 7.871 7.000 4.470 4.187 4.617 7.834 7.819		
9370	503	1.755 1.757 1.693 2.281 2.213 1.871 1.912 1.888 2.293 2.229		

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BILIN	PAGE 19	11/09/77 18:10	PAGE 19	BILIN
INPUT DATA FOR CWD PROGRAM				
9380	516	1.941 2.202 2.131 2.758 2.761 2.127 2.078 2.182 2.791 2.783		
9390	543	1.401 1.307 1.282 1.727 1.687 1.417 1.341 1.475 1.871 1.688		
9400	545	1.755 1.501 1.553 2.161 2.048 1.731 1.623 1.692 2.249 2.130		
9410	546	1.712 1.820 1.709 2.276 2.496 1.942 1.712 1.959 2.140 2.511		
9420	CONTR	.161 .162 .168 .291 .254 .179 .172 .196 .293 .254		
9430	CONTR	.152 .175 .181 .285 .258 .173 .179 .213 .262 .236		
9440	CONTR	.175 .192 .217 .301 .258 .175 .179 .216 .287 .246		
9450	CONTR	.182 .194 .214 .274 .263 .171 .190 .212 .279 .281		
9460	FLD-1	.187 .177 .212 .288 .265 .189 .190 .218 .315 .249		
9470	FLD-2	.180 .180 .222 .287 .260 .185 .182 .199 .282 .243		
9480	CH-1	.189 .180 .221 .297 .298 .173 .191 .209 .298 .261		
9490	CH-2	.177 .187 .225 .313 .265 .192 .184 .206 .303 .268		

9530	00002	.314	.352	.342	1.226	.814	.306	.315	.358	1.230	.802
9540	00003	.355	.281	.295	1.136	.732	.270	.265	.303	1.085	.795
9550	00004	.258	.227	.244	1.064	.788	.269	.279	.309	1.073	.665
9560	00005	.337	.335	.345	1.199	.813	.328	.322	.352	1.178	.861
9570	00006	.255	.247	.243	1.080	.730	.276	.279	.299	1.069	.785
9580	00007	.241	.240	.237	1.113	.735	.307	.308	.326	1.080	.747
9590	00008	.244	.244	.234	1.049	.760	.265	.274	.313	1.143	.812
9600	00010	.274	.274	.311	1.143	.765	.287	.272	.313	1.079	.798
9610	00011	.276	.333	.354	1.205	.852	.299	.347	.377	1.289	.898
9620	00012	.258	.245	.318	1.553	1.028	.272	.263	.337	1.623	1.061
9630	CONT	.345	.351	.345	4.276	2.892	.363	.340	.422	4.270	2.807
9640	CONT	.343	.344	.341	4.389	2.735	.357	.343	.429	4.429	2.831
9650	CONT	.372	.34	.366	4.414	2.841	.365	.352	.421	4.452	2.535
9660	CONT	.342	.355	.332	4.417	2.840	.357	.349	.454	4.513	2.869
9770	70										
9780	CS-1	.214	.198	.224	.370	.304	.212	.197	.240	.358	.330
9790	CS-2	.215	.214	.266	.331	.311	.208	.194	.247	.369	.342
9800	CS-3	.214	.214	.224	.352	.320	.204	.218	.228	.318	.321
9810	CS-4	.214	.225	.222	.322	.315	.233	.228	.236	.328	.311
9820	CS-5	.213	.21	.263	.368	.333	.221	.198	.244	.366	.303
9830	CS-6	.198	.198	.206	.298	.292	.208	.198	.189	.306	.294
9840	TA-1	.255	.241	.265	.372	.339	.233	.219	.265	.388	.306

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INPUT DATA FOR CWD PROGRAM

9850	TA-2	.241	.212	.255	.404	.339	.219	.207	.256	.406	.322
9860	CS-1	.212	.215	.255	.347	.302	.209	.204	.239	.351	.297
9870	TA-1	.211	.213	.246	.339	.332	.212	.217	.250	.368	.308
9880	TA-2	.203	.197	.255	.342	.313	.196	.206	.238	.336	.309
9890	TA-3	.225	.217	.287	.320	.305	.221	.217	.205	.326	.319
9900	TA-4	.203	.221	.256	.377	.327	.215	.227	.246	.368	.324
9910	TA-5	.210	.215	.245	.369	.323	.203	.209	.254	.364	.315
9920	TA-6	.232	.212	.253	.368	.330	.201	.201	.246	.376	.311
9930	TA-7	.207	.217	.26	.362	.294	.205	.219	.210	.304	.312
9940	TA-8	.171	.148	.237	.365	.298	.182	.200	.226	.336	.303
9950	TA-9	.225	.224	.261	.372	.345	.209	.211	.253	.394	.306
9960	TA10	.251	.327	.397	.377	.326	.340	.340	.394	.423	.354
9970	T-1	.254	.227	.295	.397	.360	.236	.228	.266	.405	.361
9980	T-2	.233	.224	.271	.367	.344	.222	.229	.270	.404	.355
9990	T-3	.215	.222	.271	.386	.319	.213	.223	.273	.385	.313
10000	T-4	.214	.233	.234	.433	.385	.393	.276	.305	.431	.374
10010	T-5	.235	.235	.265	.397	.377	.236	.246	.288	.407	.372
10020	T-6	.211	.219	.271	.369	.352	.223	.236	.277	.405	.367
10030	T-1	.225	.225	.290	.392	.335	.233	.222	.294	.393	.380
10040	T-2	.246	.249	.283	.414	.374	.261	.259	.301	.403	.380
10050	T-3	1.152	2.14	1.173	4.256	3.600	1.303	2.329	1.692	4.845	3.439
10060	T-4	.241	.241	.287	.416	.365	.238	.237	.280	.397	.329
10070	T-5	.221	.210	.264	.310	.313	.211	.223	.219	.332	.300
10080	T-6	.244	.234	.290	.410	.363	.248	.236	.304	.432	.371
10090	MO-1	.207	.217	.245	.376	.355	.213	.222	.264	.379	.340
10100	MO-2	.210	.214	.277	.378	.332	.206	.226	.265	.389	.333
10110	MO-3	.202	.205	.267	.370	.318	.196	.218	.256	.372	.311
10120	MO-4	.202	.222	.267	.327	.302	.222	.219	.228	.342	.318
10130	MO-5	.206	.217	.283	.336	.324	.218	.205	.229	.291	.318
10140	MO-6	.229	.228	.274	.391	.373	.230	.224	.273	.389	.361
10150	MO-7	.216	.233	.270	.357	.342	.221	.229	.281	.377	.340
10160	MO-8	.207	.20	.244	.330	.308	.228	.232	.234	.321	.312
10170	MO-9	.205	.207	.265	.487	.465	.323	.263	.348	.467	.474
10180	MO-10	.232	.21	.257	.338	.374	.214	.219	.226	.344	.317
10190	AO-1	.231	.247	.268	.360	.343	.236	.235	.254	.345	.347
10200	AO-2	.245	.235	.268	.397	.365	.242	.245	.285	.396	.356
10210	AO-3	.222	.242	.239	.363	.335	.246	.246	.237	.368	.337
10220	AO-4	.212	.225	.278	.428	.348	.239	.241	.294	.428	.359
10230	AO-5	.207	.253	.271	.416	.354	.232	.249	.297	.421	.355
10240	AO-6	.223	.235	.230	.410	.328	.235	.238	.284	.415	.338
10250	AO-7	.222	.235	.230	.400	.367	.228	.235	.283	.422	.342
10260	AO-8	.245	.253	.275	.359	.361	.235	.243	.299	.413	.379
10270	AF-1	.213	.221	.262	.355	.332	.229	.223	.260	.333	.294
10280	AF-2	.215	.218	.271	.368	.321	.219	.221	.256	.336	.343
10290	AF-3	.225	.227	.269	.405	.344	.230	.223	.265	.375	.348
10300	AF-4	.214	.215	.275	.328	.303	.211	.231	.269	.330	.308
10310	AF-5	.245	.251	.273	.423	.334	.257	.244	.263	.408	.318

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INPUT DATA FOR CWD PROGRAM					
10320	AF-5	.235	.247	.257	.402 .355 .232 .239 .280 .380 .360
10330	AF-7	.217	.207	.254	.344 .310 .209 .213 .252 .396 .307
10340	AF-8	.220	.222	.222	.416 .351 .224 .238 .278 .388 .368
10350	OCF-1	.237	.227	.216	.318 .313 .221 .226 .219 .305 .291
10360	OCF-2	.226	.227	.217	.347 .324 .229 .224 .255 .380 .324
10370	OCF-3	.210	.231	.243	.394 .334 .237 .242 .265 .406 .347
10380	OCF-4	.224	.241	.274	.427 .356 .234 .239 .287 .403 .349
10390	OCF-5	.205	.221	.255	.369 .325 .204 .206 .248 .330 .321
10400	OCF-6	.214	.211	.258	.369 .325 .211 .219 .259 .361 .337
10410	OCF-7	.209	.220	.235	.344 .333 .222 .225 .238 .360 .328
10420	OCF-8	.212	.227	.284	.393 .363 .218 .229 .275 .402 .367
10430	FE-1	.224	.211	.244	.363 .303 .216 .206 .235 .347 .286
10440	FE-2	.195	.201	.250	.345 .334 .217 .208 .262 .387 .330
10450	CON-1	.184	.181	.197	.318 .257 .141 .139 .195 .313 .272
10460	CON-2	.223	.220	.243	.354 .351 .252 .228 .241 .369 .338
10470	CON-3	.222	.221	.228	.322 .316 .210 .215 .224 .315 .309
10500	101				
10510	ST#1	.212	.241	.253	.460 .394 .221 .219 .263 .459 .374
10520	ST#2	.215	.221	.253	.349 .312 .223 .210 .262 .336 .311
10530	ST#3	.190	.190	.251	.343 .306 .193 .205 .250 .353 .277
10540	ST#4	.222	.221	.314	.446 .432 .302 .296 .312 .445 .440
10550	ST#5	.346	.337	.374	.480 .458 .345 .343 .360 .474 .444
10560	ST#6	.144	.147	.154	.281 .243 .155 .162 .187 .267 .241
10570	ST#7	.178	.173	.230	.322 .288 .169 .178 .229 .304 .305
10580	ST#8	.204	.203	.213	.371 .338 .219 .210 .230 .378 .328
10590	2JMB	.244	.255	.251	.423 .365 .236 .270 .307 .415 .375
10600	94P01	2.269	3.481	4.271	5.794 5.485 3.576 3.265 4.070 5.408 5.311
10610	94P02	1.324	1.418	1.335	1.481 .431 .281 .421 .345 .489 .452
10620	94P03	1.493	1.464	1.125	1.623 1.386 .961 1.014 1.105 1.571 1.613
10630	94P04	2.466	2.478	2.547	3.730 3.588 2.137 2.186 2.547 3.828 3.708
10640	95F01	1.444	1.445	2.340	3.254 3.055 1.859 1.886 2.375 3.135 3.186
10650	9CH02	.476	.473	.512	.657 .625 .472 .457 .502 .736 .659
10660	9CH01	.391	.394	.405	.564 .519 .369 .367 .429 .551 .501
10670	9PE02	.993	.983	1.249	1.663 1.548 1.041 1.069 1.227 1.717 1.713
10680	9CR01	1.104	1.273	1.452	9.410 7.767 1.338 1.299 1.428 9.379 7.501
10690	9P001	1.404	1.455	1.650	2.248 2.190 1.291 1.305 1.502 2.248 2.133
10700	7401	.323	.323	.366	.522 .449 .329 .332 .375 .540 .477
10710	STR01	.210	.215	.254	.354 .318 .212 .208 .247 .360 .300
10720	STR02	.207	.221	.251	.352 .310 .223 .226 .267 .360 .301
10730	STR03	.163	.163	.166	.222 .218 .150 .148 .170 .240 .226
10740	STR04	.205	.202	.217	.354 .335 .208 .184 .237 .330 .323
10750	9F01	.217	.224	.253	.357 .320 .224 .218 .261 .360 .335
10760	9F02	.213	.220	.262	.361 .301 .224 .222 .259 .355 .311
10770	9F03	.230	.230	.281	.404 .342 .216 .217 .265 .414 .337
10780	9F04	.231	.213	.255	.357 .307 .195 .213 .241 .365 .289
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	INPUT DATA FOR CWD PROGRAM										
10790	9505	.215	.224	.239	.363	.336	.206	.220	.245	.366	.313
10800	9506	.210	.221	.271	.414	.349	.228	.220	.284	.410	.354
10810	9507	.203	.243	.275	.385	.349	.225	.245	.264	.384	.359
10820	9508	.205	.215	.286	.333	.343	.230	.236	.277	.392	.342
10830	9509	.201	.207	.282	.338	.307	.217	.201	.255	.346	.309
10840	9510	.241	.218	.294	.343	.329	.221	.206	.253	.334	.326
10850	9202	.215	.217	.286	.358	.294	.207	.213	.251	.365	.315
10860	9203	.215	.238	.284	.348	.319	.214	.219	.257	.356	.338
10870	9204	.201	.223	.282	.361	.323	.211	.220	.262	.359	.288
10880	9205	.219	.218	.293	.344	.321	.222	.211	.246	.365	.310
10890	9206	.217	.215	.282	.347	.323	.204	.222	.264	.370	.304
10900	9209	.218	.204	.287	.366	.329	.213	.220	.252	.358	.287
10910	9209	.210	.207	.282	.338	.326	.202	.211	.261	.381	.335
10920	9210	.210	.212	.282	.404	.330	.217	.217	.225	.396	.335
10930	9001	.212	.208	.285	.380	.319	.200	.212	.247	.363	.301
10940	9002	.213	.228	.282	.356	.318	.214	.206	.247	.346	.307
10950	9003	.219	.238	.270	.402	.360	.225	.234	.259	.412	.340
10960	9004	.212	.214	.284	.354	.323	.209	.199	.253	.362	.312
10970	9005	.212	.213	.284	.357	.314	.213	.218	.246	.351	.316
10980	9006	.212	.244	.289	.351	.319	.204	.222	.274	.374	.316
10990	9007	.211	.203	.286	.357	.349	.239	.237	.274	.360	.372
11000	9204	.232	.244	.272	.357	.345	.248	.263	.280	.361	.338
11010	9209	.213	.214	.278	.358	.289	.220	.227	.262	.391	.339
11020	9010	.214	.225	.285	.384	.335	.217	.234	.252	.362	.332
11030	9101	.213	.215	.277	.369	.318	.216	.225	.281	.375	.326
11040	9102	.227	.238	.273	.332	.322	.237	.239	.253	.367	.313
11050	9103	.215	.228	.283	.332	.313	.220	.200	.263	.319	.300
11060	9104	.220	.213	.273	.366	.338	.227	.226	.271	.326	.319
11070	9105	.213	.217	.287	.360	.321	.225	.226	.262	.360	.339
11080	9106	.213	.207	.281	.327	.315	.204	.199	.280	.344	.305
11090	9107	.209	.231	.279	.389	.360	.224	.237	.263	.393	.365
11100	9108	.211	.228	.283	.356	.323	.220	.213	.270	.355	.345
11110	9109	.217	.245	.282	.373	.319	.207	.241	.289	.388	.336
11120	9110	.222	.242	.285	.376	.337	.228	.213	.250	.368	.324
11130	9501	.217	.218	.286	.387	.339	.225	.232	.258	.368	.340
11140	9502	.208	.221	.274	.386	.326	.214	.222	.264	.356	.315
11150	9503	.235	.243	.279	.412	.362	.229	.239	.286	.436	.383
11160	9504	.224	.229	.280	.407	.344	.229	.228	.249	.442	.341
11170	9505	.224	.228	.273	.371	.336	.234	.230	.267	.370	.338
11180	9506	.229	.222	.271	.375	.345	.222	.217	.283	.361	.332
11190	9507	.215	.217	.279	.387	.322	.220	.225	.252	.345	.325
11200	9508	.219	.220	.286	.357	.341	.220	.209	.245	.388	.330
11210	9509	.246	.233	.281	.391	.329	.228	.259	.271	.383	.335
11220	9510	.222	.258	.288	.396	.333	.221	.257	.280	.398	.342
11230	9501	.217	.241	.273	.354	.340	.239	.242	.261	.380	.316
11240	9502	.237	.205	.283	.375	.321	.224	.212	.250	.373	.326
11250	9503	.245	.229	.283	.405	.358	.227	.242	.309	.398	.347

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11730	3-2	.222	.240	.270	.411 .350 .244 .261 .257 .403 .360
11740	3-3	.255	.234	.262	.397 .364 .240 .221 .258 .415 .348
11750	4-2	.251	.241	.219	.439 .399 .280 .282 .318 .465 .403
11750	4-3	.293	.240	.242	.478 .442 .305 .311 .327 .494 .429
11770	4-4	.252	.248	.213	.403 .411 .269 .266 .297 .432 .372
11780	4-5	.240	.244	.247	.423 .395 .254 .268 .301 .459 .391
11790	J-1	.214	.245	.242	.436 .402 .262 .270 .291 .400 .402
11800	J-2	.271	.272	.243	.436 .406 .267 .243 .291 .439 .388
11810	K-1	.211	.415	.217	.573 .547 .413 .411 .439 .613 .512
11820	K-2	.247	.243	.211	.416 .368 .242 .244 .274 .408 .362
11830	K-3	.240	.214	.211	.483 .433 .302 .297 .330 .490 .443
11840	K-4	.250	.249	.243	.448 .385 .259 .267 .282 .434 .341
11850	L-1	.455	.458	.271	.680 .612 .454 .445 .473 .686 .628
11860	L-2	.211	.244	.275	.524 .434 .310 .336 .378 .523 .438
11870	L-3	.237	.237	.275	.425 .392 .236 .278 .279 .417 .403
11880	L-4	.213	.242	.248	.505 .419 .298 .282 .314 .497 .426
11890	L-5	.234	.242	.240	.445 .377 .244 .255 .283 .384 .373
11900	J-5	.255	.215	.220	.483 .429 .289 .303 .322 .452 .425
11910	M-1	.222	.210	.246	.479 .465 .291 .313 .313 .499 .449
11920	M-2	.275	.267	.214	.465 .411 .277 .261 .321 .474 .415
11930	M-3	.257	.230	.241	.431 .353 .249 .251 .269 .429 .355
11940	M-4	.213	.242	.245	.475 .441 .296 .293 .347 .455 .441
11950	M-5	.213	.273	.218	.444 .399 .267 .260 .304 .443 .421
11960	P-2	.257	.271	.243	.439 .401 .269 .260 .307 .442 .405
11970	R-1	.543	.542	.535	.815 .755 .588 .554 .586 .799 .771
11980	R-2	.211	.217	.239	.503 .444 .302 .300 .342 .515 .471
11990	S-1	.251	.247	.244	.420 .380 .259 .271 .306 .419 .413
12000	S-2	.241	.245	.242	.455 .336 .231 .258 .285 .434 .337
12010	S-3	.207	.211	.245	.356 .314 .200 .218 .258 .367 .314
12020	S-4	.255	.240	.275	.531 .489 .338 .349 .374 .525 .486
12030	M-1	.273	.272	.275	.414 .397 .272 .272 .285 .448 .377
12040	M-2	.245	.228	.229	.477 .443 .287 .281 .333 .468 .377
12050	305-1	1.407	1.300	1.450	1.992 1.916 1.530 1.462 1.441 1.971 1.955
12060	307-1	3.749	3.545	3.459	10.3 8.052 3.826 3.517 3.397 10.8 8.196
12070	510-1	1.265	1.129	1.164	1.516 1.442 1.152 1.194 1.207 1.555 1.433
12080	516-1	12.4	13.4	12.7	95.5 60.5 12.1 13.0 12.7 93.8 52.9
12090	518-1	3.354	3.294	3.278	5.949 5.604 3.190 3.269 3.030 6.036 6.071
12100	519-1	.698	.472	.744	1.031 .975 .689 .701 .791 1.016 .962
12110	520-1	4.711	4.285	4.497	6.184 6.124 4.577 4.618 4.502 6.015 5.686
12120	509-1	1.978	2.043	2.015	2.690 2.735 1.907 1.989 1.977 2.593 2.615
12130	515-1	3.324	3.255	3.176	4.325 4.454 3.325 3.328 3.190 4.453 4.389
12140	543-1	.752	.714	.714	1.036 .942 .667 .648 .680 .997 .924
12150	545-1	.854	.810	.844	1.157 1.206 .899 .804 .885 1.122 1.140
12160	545-1	1.530	1.537	1.492	2.052 2.076 1.607 1.426 1.445 1.983 1.938
12170	FLD-1	1.230	.247	.260	.781 .347 .211 .239 .275 .372 .341
12180	CO-1	.249	.219	.244	.376 .319 .201 .204 .261 .356 .313
12190	CO-2	.241	.212	.258	.365 .343 .207 .207 .242 .384 .346

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12200	CH-1	.245	.252	.281	.438 .366 .243 .257 .270 .420 .378
12210	CH-2	.231	.232	.240	.416 .335 .225 .243 .270 .439 .350
12220	CNTL	.257	.230	.246	.600 .517 .361 .360 .384 .618 .586
12230	CNTL	.194	.217	.273	.378 .327 .212 .203 .234 .363 .320
12240	CNTL	.207	.213	.245	.381 .329 .196 .209 .257 .354 .322
12250	CNTL	.205	.210	.251	.378 .339 .216 .211 .257 .379 .339

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11260	9E04	.217	.242	.275	.352	.312	.222	.255	.268	.358	.332
11270	9E05	.214	.241	.273	.344	.353	.216	.230	.272	.379	.356
11280	9E06	.213	.219	.253	.370	.324	.233	.227	.263	.363	.334
11290	9E07	.212	.255	.282	.351	.341	.216	.223	.247	.360	.327
11300	9E08	.212	.228	.255	.371	.335	.216	.229	.259	.367	.330
11310	9E09	.212	.214	.251	.350	.323	.218	.213	.261	.363	.308
11320	9E10	.215	.205	.271	.356	.312	.220	.216	.257	.361	.295
11330	9C01	.215	.231	.257	.339	.327	.218	.222	.259	.354	.312
11340	9C02	.210	.210	.254	.344	.305	.213	.211	.254	.350	.300
11350	9C03	.214	.221	.251	.347	.278	.197	.227	.244	.390	.322
11360	9C04	.202	.221	.255	.357	.333	.214	.228	.270	.355	.333
11370	9C05	.214	.203	.229	.340	.304	.205	.166	.232	.226	.280
11380	9C06	.215	.210	.251	.370	.299	.216	.222	.272	.343	.325
11390	9C07	.213	.225	.273	.234	.304	.212	.223	.244	.346	.307
11400	9C08	.215	.212	.255	.304	.200	.219	.252	.348	.290	
11410	9C09	.203	.225	.255	.349	.332	.221	.222	.264	.248	.317
11420	9C10	.205	.195	.243	.334	.297	.192	.192	.238	.359	.308
11430	9401	.235	.235	.253	.350	.339	.246	.245	.275	.365	.340
11440	9402	.234	.243	.256	.353	.340	.244	.281	.302	.378	.328
11450	9403	.233	.221	.235	.343	.366	.237	.257	.277	.399	.360
11460	9404	.231	.211	.233	.444	.422	.304	.338	.337	.477	.435
11470	9405	.214	.237	.242	.352	.343	.217	.233	.258	.368	.315
11480	9406	.221	.225	.254	.355	.287	.200	.219	.270	.332	.327
11490	9408	.213	.212	.254	.335	.296	.202	.220	.260	.355	.301
11500	9409	.202	.222	.222	.401	.338	.234	.245	.318	.399	.331
11510	9410	.231	.225	.257	.353	.309	.223	.219	.250	.370	.326
11540	71										
11550	4-1	.242	.278	.341	.445	.426	.273	.283	.340	.445	.447
11560	3-1	.273	.241	.313	.459	.416	.284	.268	.309	.471	.413
11570	3-2	.213	.228	.274	.416	.375	.230	.226	.263	.427	.341
11580	3-4	.234	.217	.274	.335	.367	.233	.243	.270	.354	.349
11590	3-5	.254	.274	.305	.472	.435	.260	.291	.309	.480	.421
11600	3-6	.252	.274	.297	.443	.379	.248	.276	.287	.374	.333
11610	0-1	.260	.262	.305	.448	.380	.241	.273	.297	.454	.396
11620	0-2	.254	.258	.284	.468	.409	.279	.285	.317	.467	.390
11630	0-3	.234	.205	.260	.501	.456	.291	.307	.341	.494	.452
11640	0-4	.254	.274	.287	.408	.385	.264	.256	.303	.428	.377
11650	0-1	.231	.244	.257	.402	.370	.227	.242	.277	.417	.349
11660	0-2	.230	.245	.261	.435	.378	.267	.271	.290	.447	.362
11670	0-3	.474	.464	.518	.720	.672	.464	.536	.574	.771	

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	INPUT DATA FOR CWD PROGRAM			
12670	7501	.255	.255	.248
12680	7502	.254	.254	.245
12690	7503	.251	.251	.244
12700	7504	.250	.250	.245
12710	7505	.247	.247	.240
12720	7506	.237	.237	.232
12730	7507	.233	.233	.231
12740	7508	.234	.234	.231
12750	7509	.235	.235	.231
12760	7510	.237	.237	.233
12770	7511	.241	.241	.236
12780	7512	.247	.247	.243
12790	7513	.249	.249	.243
12800	7514	.250	.250	.243
12810	7515	.250	.250	.243
12820	7516	.251	.251	.243
12830	7517	.251	.251	.243
12840	7518	.251	.251	.243
12850	7519	.251	.251	.243
12860	7520	.251	.251	.243
12870	7521	.251	.251	.243
12880	7522	.251	.251	.243
12890	7523	.251	.251	.243
12900	7524	.251	.251	.243
12910	7525	.251	.251	.243
12920	7526	.251	.251	.243
12930	7527	.251	.251	.243
12940	7528	.251	.251	.243
12950	7529	.251	.251	.243
12960	7530	.251	.251	.243
12970	7531	.251	.251	.243
12980	7532	.251	.251	.243
12990	7533	.251	.251	.243
13000	7534	.251	.251	.243
13010	7535	.251	.251	.243
13020	7536	.251	.251	.243
13030	7537	.251	.251	.243
13040	7538	.251	.251	.243
13050	7539	.251	.251	.243
13060	7540	.251	.251	.243
13070	7541	.251	.251	.243
13080	7542	.251	.251	.243
13090	7543	.251	.251	.243
13100	7544	.251	.251	.243
13110	7545	.251	.251	.243
13120	7546	.251	.251	.243
13130	7547	.251	.251	.243

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13140	7504	.250	.245	.305	.370	.330	.239	.255	.302	.399	.326
13150	7509	.252	.254	.303	.404	.342	.243	.285	.280	.406	.335
13160	7510	.254	.255	.305	.396	.355	.275	.258	.303	.379	.343
13170	7501	.255	.255	.307	.379	.337	.250	.263	.286	.390	.358
13180	7502	.257	.245	.308	.381	.333	.248	.248	.287	.380	.349
13190	7505	.259	.245	.307	.367	.325	.255	.262	.293	.376	.312
13200	7504	.255	.240	.304	.360	.319	.236	.253	.271	.346	.317
13210	7505	.252	.251	.305	.349	.332	.260	.251	.278	.378	.336
13220	7505	.254	.255	.303	.389	.362	.251	.263	.285	.383	.325
13230	7507	.254	.255	.305	.355	.330	.253	.256	.272	.343	.314
13240	7505	.253	.247	.304	.351	.346	.241	.253	.305	.395	.350
13250	7504	.255	.245	.307	.376	.325	.243	.234	.290	.370	.336
13250	7510	.257	.251	.304	.370	.320	.248	.241	.281	.380	.324
13270	5001	.258	.255	.307	.354	.310	.234	.226	.268	.346	.310
13280	5002	.258	.255	.305	.322	.295	.222	.232	.265	.338	.313
13290	7003	.258	.255	.305	.341	.318	.231	.231	.269	.381	.325
13300	7004	.257	.245	.305	.334	.304	.221	.276	.265	.359	.306
13310	7005	.257	.225	.291	.343	.308	.229	.258	.272	.325	.323
13320	7005	.254	.244	.294	.365	.334	.242	.237	.276	.369	.333
13330	7004	.254	.255	.300	.353	.324	.230	.251	.283	.375	.320
13340	7005	.254	.255	.305	.357	.344	.241	.231	.285	.359	.335
13350	7010	.255	.251	.291	.346	.330	.255	.235	.267	.369	.312
13360	7402	.254	.255	.293	.340	.345	.251	.274	.300	.368	.342
13370	7403	.255	.255	.293	.365	.342	.255	.240	.286	.370	.334
13380	7404	.254	.254	.294	.353	.335	.262	.258	.300	.391	.339
13390	7405	.255	.247	.294	.353	.318	.232	.242	.276	.356	.314
13400	7406	.255	.245	.293	.364	.318	.236	.251	.267	.365	.307
13410	7407	.255	.217	.281	.352	.294	.244	.254	.275	.347	.309
13420	7404	.252	.232	.295	.334	.319	.229	.249	.259	.362	.317
13430	7410	.252	.255	.302	.368	.333	.249	.244	.306	.343	.341
13460	30										
13470	002-6	.371	.411	.457	.588	.600	.385	.386	.440	.629	.578
13480	003-6	.293	.289	.354	.517	.472	.299	.293	.355	.521	.509
13490	004-6	.313	.324	.363	.499	.481	.322	.319	.363	.536	.508
13500	005-6	.332	.353	.391	.591	.533	.338	.502	.369	.612	.544
13510	006-6	.350	.417	.417	.660	.542	.331	.358	.404	.616	.537
13520	007-6	.259	.255	.323	.542	.458	.284	.304	.338	.504	.470
13530	008-6	.315	.353	.380	.576	.514	.348	.337	.388	.629	.526
13540	009-6	.250	.254	.297	.465	.352	.269	.251	.295	.486	.397
13550	010-6	.289	.287	.329	.477	.488	.303	.289	.320	.559	.470
13560	012-6	.248	.301	.352	.573	.497	.303	.324	.345	.577	.492
13570	013-6	.306	.297	.364	.594	.502	.288	.290	.346	.558	.497
13580	014-6	.259	.255	.325	.518	.484	.300	.321	.333	.490	.456
13590	015-6	.317	.295	.324	.523	.478	.284	.301	.344	.502	.478
13600	016-6	.327	.317	.374	.537	.495	.310	.341	.345	.522	.480

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13610	017-6	.320	.254	.378	.547	.491	.318	.334	.350	.577	.491
13620	018-6	.327	.255	.374	.593	.549	.337	.331	.420	.635	.543
13630	020-6	.320	.305	.394	.533	.536	.327	.331	.387	.547	.551
13640	021-6	.353	.340	.365	.602	.518	.336	.352	.401	.586	.545
13650	022-6	.345	.355	.384	.638	.581	.359	.353	.372	.618	.547
13660	023-6	.351	.295	.345	.573	.443	.295	.269	.321	.509	.450
13670	024-6	.317	.303	.334	.579	.506	.323	.331	.342	.594	.503
13680	025-6	.305	.272	.322	.463	.371	.275	.286	.296	.491	.376
13690	026-6	.344	.305	.352	.542	.488	.304	.292	.343	.544	.512
13700	027-6	.354	.305	.364	.618	.540	.338	.334	.397	.606	.510
13710	028-6	.356	.305	.375	.592	.493	.349	.361	.405	.574	.510
13720	029-6	.357	.255	.315	.512	.428	.254	.284	.321	.505	.446
13730	030-6	.355	.255	.312	.502	.448	.278	.276	.347	.513	.464
13740	343-6	.351	.255	.315	.588	.531	.326	.321	.375	.547	.510
13750	343-6	.356	.255	.321	.591	.514	.246	.247	.298	.390	.310
13760	343-6	.353	.255	.323	.535	.357	.246	.255	.249	.338	.314

13790	51400	1.05	1.10	1.15	.333	.298	.166	.159	.206	.351	.271
13800	51400	1.07	1.12	1.17	.275	.228	.145	.134	.172	.289	.245
13810	51400	1.08	1.13	1.18	.417	.344	.263	.267	.279	.400	.362
13820	51400	1.09	1.14	1.19	.360	.312	.215	.205	.218	.375	.218
13830	55501	1.119	1.181	1.240	2.100	2.051	1.111	1.137	1.394	2.001	1.949
13840	59001	1.164	1.256	1.432	2.130	2.062	1.165	1.187	1.448	2.204	2.032
13850	54201	1.627	1.674	2.296	3.158	3.385	1.903	1.964	2.517	3.356	3.558
13860	54202	1.234	1.271	1.305	.421	.375	.238	.226	.271	.402	.370
13870	59201	2.218	1.677	2.193	3.587	3.390	2.107	1.962	2.406	3.665	3.781
13880	59202	1.654	1.713	2.173	2.935	2.890	1.832	1.606	2.045	2.964	2.864
13890	54201	2.465	2.473	2.791	4.700	4.576	2.449	2.730	3.054	4.973	4.851
13910	54202	1.641	1.611	1.552	.988	.978	.605	.575	.668	1.037	.940
13920	50401	1.653	1.542	1.547	.894	.877	.549	.566	.555	.641	.739
13930	50402	1.321	1.411	1.510	.811	.708	.496	.488	.509	.728	.697
13940	59101	1.113	1.115	1.157	.253	.195	.114	.115	.145	.248	.202
13950	59102	1.112	1.112	1.154	.231	.196	.110	.118	.139	.257	.196
13960	54511	1.146	1.149	1.192	.304	.247	.151	.162	.188	.035	.272
13970	54512	1.153	1.171	1.205	.325	.274	.165	.177	.194	.319	.283
13980	51400	1.100	1.100	1.100	.305	.259	.176	.171	.181	.305	.273
13990	5901	1.152	1.146	1.181	.266	.261	.159	.158	.185	.305	.261
14000	5902	1.171	1.153	1.186	.301	.253	.148	.158	.184	.304	.266
14010	5903	1.196	1.154	1.197	.306	.261	.168	.165	.201	.308	.256
14020	5904	1.144	1.144	1.192	.293	.252	.140	.164	.171	.300	.244
14030	5905	1.155	1.152	1.190	.299	.247	.151	.159	.194	.280	.263
14040	5906	1.166	1.157	1.189	.305	.243	.152	.171	.195	.288	.245
14050	5907	1.189	1.183	1.187	.279	.236	.145	.164	.197	.309	.260
14060	5908	1.169	1.163	1.177	.303	.251	.158	.165	.181	.316	.243
14070	5909	1.157	1.157	1.194	.292	.262	.165	.156	.201	.284	.260

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14090	5201	.155	.150	.154	.310	.275	.160	.166	.195	.304	.255
14090	5201	.154	.150	.154	.295	.231	.163	.158	.191	.296	.254
14100	5202	.157	.152	.153	.312	.247	.147	.155	.196	.291	.275
14110	5203	.158	.150	.152	.292	.234	.163	.180	.202	.326	.263
14120	5204	.154	.153	.157	.288	.251	.150	.149	.198	.288	.267
14130	5205	.157	.149	.153	.290	.253	.148	.155	.179	.293	.265
14140	5206	.153	.151	.150	.285	.266	.147	.155	.181	.294	.252
14150	5207	.159	.147	.154	.285	.245	.138	.140	.177	.279	.239
14160	5208	.153	.152	.152	.287	.249	.151	.154	.196	.283	.258
14170	5209	.154	.152	.154	.294	.246	.141	.153	.181	.298	.248
14180	5210	.155	.152	.152	.302	.264	.161	.163	.203	.304	.241
14190	5001	.151	.150	.150	.208	.249	.149	.159	.192	.299	.257
14200	5002	.149	.150	.153	.290	.253	.154	.174	.187	.301	.237
14210	5003	.153	.151	.153	.291	.261	.145	.163	.192	.302	.252
14220	5004	.150	.150	.154	.302	.242	.146	.146	.188	.302	.251
14230	5005	.151	.150	.151	.236	.254	.144	.147	.177	.294	.256
14240	5205	.153	.154	.157	.261	.241	.145	.148	.194	.276	.244
14250	5007	.152	.152	.155	.276	.250	.153	.141	.192	.294	.252
14260	5008	.157	.157	.155	.290	.241	.163	.150	.199	.300	.252
14270	5009	.155	.150	.156	.303	.246	.157	.143	.180	.290	.238
14280	5010	.157	.150	.154	.272	.274	.152	.150	.180	.302	.245
14290	5101	.155	.157	.155	.304	.267	.162	.160	.187	.300	.270
14300	5102	.152	.152	.154	.300	.244	.154	.171	.206	.312	.251
14310	5103	.155	.152	.158	.299	.252	.157	.161	.200	.305	.257
14320	5104	.155	.154	.154	.317	.263	.163	.163	.203	.302	.272
14330	5105	.153	.153	.152	.323	.273	.156	.146	.296	.313	.256
14340	5106	.152	.150	.150	.302	.250	.153	.160	.199	.297	.261
14350	5107	.153	.177	.125	.317	.262	.175	.175	.204	.293	.264
14360	5108	.157	.173	.125	.312	.267	.162	.167	.197	.325	.273
14370	5109	.152	.177	.125	.332	.271	.165	.167	.198	.313	.273
14380	5110	.145	.154	.157	.298	.267	.170	.174	.209	.309	.252
14390	5501	.152	.150	.151	.310	.248	.157	.164	.192	.298	.252
14400	5502	.154	.155	.153	.287	.262	.159	.161	.191	.297	.273
14410	5504	.152	.156	.156	.317	.257	.161	.169	.219	.318	.251
14420	5505	.147	.176	.135	.294	.270	.159	.164	.205	.285	.276
14430	5506	.145	.167	.194	.276	.237	.148	.161	.189	.314	.268
14440	5507	.150	.153	.150	.275	.255	.156	.176	.190	.332	.287
14450	5508	.152	.154	.152	.320	.269	.159	.175	.199	.305	.265
14460	5509	.157	.154	.154	.327	.270	.169	.154	.193	.285	.269
14470	5510	.150	.157	.154	.317	.257	.159	.158	.183	.308	.272
14480	5501	.155	.157	.151	.287	.241	.156	.168	.189	.289	.263
14490	5502	.151	.145	.155	.280	.201	.153	.146	.173	.233	.241
14500	5503	.153	.147	.171	.258	.249	.141	.133	.166	.284	.229
14510	5504	.151	.147	.163	.268	.247	.138	.138	.167	.281	.246
14520	5505	.153	.150	.150	.263	.229	.139	.142	.167	.281	.246
14530	5506	.154	.150	.153	.290	.246	.146	.144	.194	.266	.248
14540	5507	.157	.150	.157	.298	.235	.148	.146	.163	.274	.235

14550	5C04	.142	.146	.170	.260	.229	.142	.143	.175	.284	.248
14560	5C09	.134	.128	.165	.242	.232	.145	.138	.168	.262	.228
14570	5E10	.147	.148	.161	.255	.227	.150	.151	.180	.256	.241
14580	5C01	.150	.163	.178	.295	.266	.158	.174	.206	.312	.270
14590	5C02	.155	.164	.174	.308	.246	.165	.164	.188	.308	.254
14600	5C03	.158	.164	.204	.309	.267	.160	.150	.217	.326	.266
14610	5C04	.164	.165	.176	.281	.261	.163	.164	.203	.311	.247
14620	5C05	.166	.157	.174	.301	.244	.146	.168	.173	.292	.261
14630	5C06	.162	.165	.206	.306	.296	.143	.165	.211	.325	.290
14640	5C07	.163	.164	.183	.276	.265	.154	.164	.213	.304	.262
14650	5C08	.163	.166	.176	.341	.308	.270	.287	.208	.312	.310
14660	5C09	.165	.166	.183	.292	.273	.155	.166	.187	.317	.257
14670	5C10	.165	.187	.187	.300	.255	.165	.160	.187	.309	.248
14680	5M01	.163	.174	.204	.325	.278	.161	.164	.194	.321	.271
14690	5M02	.164	.174	.187	.317	.277	.155	.167	.185	.299	.268
14700	5M03	.164	.165	.182	.283	.266	.169	.165	.194	.319	.286
14710	5M04	.164	.164	.186	.292	.265	.156	.160	.193	.300	.259
14720	5M05	.167	.188	.191	.303	.268	.158	.166	.185	.316	.242
14730	5M06	.163	.185	.149	.286	.270	.171	.167	.199	.325	.278
14740	5M07	.160	.172	.140	.313	.263	.166	.172	.199	.333	.278
14750	5M08	.160	.178	.174	.290	.260	.175	.169	.194	.294	.261
14760	5M09	.163	.171	.182	.308	.266	.171	.159	.185	.314	.259
14770	5M10	.164	.164	.184	.306	.262	.155	.176	.197	.366	.248
14780	2K5	.210	.210	.210	.371	.335	.198	.233	.254	.369	.344

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15020	3-2	.517	.562	.582	.753	.762	.540	.538	.552	.743	.703
15030	3-3	.271	.262	.282	.447	.391	.285	.266	.297	.424	.399
15040	4-1	.227	.237	.257	.406	.420	.265	.262	.311	.444	.388
15050	4-2	.322	.308	.341	.444	.467	.312	.304	.325	.519	.396
15060	4-3	.273	.244	.257	.452	.474	.308	.314	.336	.492	.446
15070	4-4	.273	.249	.242	.450	.402	.270	.275	.296	.463	.415
15080	J-1	.244	.245	.312	.443	.380	.274	.269	.292	.423	.371
15090	J-2	.271	.244	.313	.444	.407	.280	.284	.309	.477	.440
15100	K-1	.315	.245	.313	.542	.510	.348	.338	.343	.558	.468
15110	K-2	.271	.244	.313	.429	.442	.278	.284	.310	.434	.406
15120	K-3	.314	.327	.313	.503	.473	.309	.322	.342	.522	.470
15130	K-4	.273	.277	.254	.452	.410	.267	.281	.297	.464	.385
15140	L-5	.353	.306	.356	.520	.475	.314	.312	.338	.515	.461
15150	L-1	.271	.671	.649	.948	.913	.693	.643	.635	.961	.930
15160	L-2	.311	.227	.365	.398	.499	.336	.336	.341	.499	.461
15170	L-3	.271	.225	.313	.340	.347	.228	.234	.249	.373	.328
15180	L-4	.311	.244	.311	.457	.415	.291	.294	.368	.497	.438
15190	L-5	.271	.242	.313	.425	.385	.266	.268	.303	.431	.359
15200	M-1	.343	.375	.397	.524	.507	.351	.344	.390	.559	.489
15210	M-2	.343	.357	.387	.501	.451	.314	.317	.336	.492	.442
15220	M-3	.271	.244	.313	.445	.401	.320	.297	.302	.441	.397
15230	M-4	.271	.218	.242	.429	.333	.245	.247	.284	.416	.377
15240	P-1	.311	.507	.425	.729	.749	.492	.515	.563	.765	.746
15250	P-2	.244	.274	.313	.429	.407	.261	.267	.312	.454	.413
15260	P-3	.271	.242	.313	.351	.335	.236	.232	.242	.356	.336
15270	R-1	.271	.313	.313	1.201	1.095	.764	.745	.744	1.088	1.153
15280	R-2	.313	.321	.329	.540	.464	.329	.356	.348	.513	.477
15290	S-1	.313	.313	.313	.513	.463	.319	.326	.351	.512	.461
15300	S-2	.271	.264	.313	.419	.393	.276	.270	.342	.426	.401
15310	S-3	.271	.215	.244	.359	.334	.206	.225	.242	.350	.333
15320	T-1	.313	.317	.342	.554	.553	.383	.403	.400	.545	.520
15330	T-2	.313	.354	.342	.538	.522	.365	.342	.366	.560	.505
15340	M-1	.271	.244	.313	.461	.372	.274	.289	.317	.448	.414
15350	M-2	.271	.244	.313	.447	.431	.278	.289	.303	.479	.397
15360	505-1	.244	.221	.212	1.186	1.265	.968	.866	.925	1.382	1.359
15370	507-1	.277	1.113	2.137	32.600	24.100	1.974	2.034	2.152	40.600	25.000
15380	510-1	.510	.529	.529	.643	.711	.523	.505	.512	.775	.700
15390	513-1	.244	.244	.244	2.314	60.000	37.500	2.399	2.412	2.483	61.000
15400	519-1	.356	.356	.356	.383	.328	.566	.543	.601	.890	.860
15410	509-1	.244	.2								

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15490	20-1	.277	.203	.235	.376	.341	.217	.231	.267	.359	.310
15500	20-2	.275	.222	.224	.345	.332	.210	.209	.261	.381	.347
15510	24-1	.242	.222	.225	.372	.341	.214	.221	.249	.327	.340
15520	24-2	.218	.227	.225	.388	.318	.205	.222	.249	.355	.316
15530	Z-01	.177	.177	.215	.351	.312	.194	.193	.234	.344	.314
15540	Z-02	.144	.144	.224	.296	.321	.187	.195	.230	.344	.304
15550	Z-03	.102	.102	.222	.298	.298	.188	.188	.221	.363	.293
15560	Z-04	.101	.101	.220	.348	.320	.191	.187	.231	.347	.333
15570	Z-1	.427	.474	.480	8.344	5.616	.527	.519	.548	8.984	5.303
15580	Z-2	.443	.467	.467	8.035	5.723	.428	.448	.504	9.246	5.350
15590	Z-3	.420	.434	.430	8.792	5.465	.523	.564	.544	9.222	5.908
15600	Z-4	1.467	1.275	1.251	107.700	58.400	1.314	1.237	1.418	108.800	61.100
15610	Z-5	.435	.461	.463	8.680	5.279	.501	.488	.508	8.409	5.324
15620	Z-6	.273	.220	.224	.474	.426	.297	.262	.325	.434	.435
15630	Z-7	.247	.247	.250	7.400	4.961	.459	.456	.508	9.056	5.727
15640	Z-8	.274	.288	.288	7.374	5.356	.457	.513	.508	8.397	5.465
15650	Z-9	.255	.255	.257	7.713	5.659	.544	.518	.589	9.190	5.795
15660	Z-10	.213	.208	.202	9.181	8.542	.553	.523	.541	9.282	9.190
15670	Z-11	1.276	1.241	1.427	109.500	56.400	1.255	1.229	1.454	106.00	56.000
15680											
15690	518	1.47	1.281	1.250	5.892	4.845	1.337	1.359	1.318	6.368	4.674
15700											

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1020	21										
1030	#1	.315	.235	.315	.383	2.310					
1040	#2	.340	.340	.340	.392	2.616					
1050	#3	.320	.320	.320	.393	2.273					
1060	#4	3.353	3.537	2.835	3.826	25.3					
1070	#5	.295	.364	.312	.344	2.117					
1080	#7	.213	.248	.244	.478	3.053					
1090	#8	.273	.351	.230	.337	2.158					
1100	#9	.272	.344	.203	.337	1.986					
1110	#10	.37	.438	.310	.475	2.898					
1120	#11	.353	.375	.375	.494	2.253					
1130	#12	.267	.314	.340	.331	2.043					
1140	#13	.294	.376	.311	.376	2.241					
1150	#14	.274	.355	.292	.338	2.031					
1160	#15	.273	.347	.294	.348	2.115					
1170	#16	.323	.400	.327	.379	2.403					
1180	#17	.255	.372	.309	.359	2.112					
1190	#18	.315	.401	.321	.393	2.412					
1200	#19	.241	.307	.283	.306	1.791					
1210	#20	.303	.363	.294	.363	2.130					
1220	#75	.304	.407	.206	.346	2.082					
1230	#81	.514	.628	.571	.697	4.745					
1260	22										
1270	#3	3.95	4.393	3.488	4.436	321.020					
1280	#4	.230	.216	.212	.215	1.435					
1290	#5	.231	.247	.229	.245	1.753					
1300	#6	.225	.236	.223	.244	1.621					
1310	#7	.225	.219	.219	.221	1.751					

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INPUT DATA FOR CWD PROGRAM							
1320	#8	.212 .233 .234 .242	1.875				
1330	#9	.230 .242 .255 .253	2.009				
1340	#10	.228 .244 .243 .243	2.018				
1350	#11	.433 .463 .473 .456	3.746				
1360	#12	.233 .255 .254 .259	2.076				
1370	#13	1.341 1.467 1.376 1.290	12.500				
1380	#14	.309 .234 .233 .343	2.785				
1390	#15	.233 .273 .262 .261	2.161				
1400	#16	.233 .250 .261 .278	2.413				
1410	#17	.233 .246 .253 .310	2.644				
1420	#18	.233 .245 .272 .277	2.354				
1430	#19	.233 .269 .236 .249	1.876				
1440	#20	.233 .254 .253 .253	2.010				
1450	#21	.233 .249 .243 .240	1.974				
1460	#CON1	.223 .253 .252 .250	2.086				
1470	#CON2	.233 .248 .233 .257	1.971				
1480	#CON3	.237 .257 .245 .246	1.967				
1510	21						
1520	#1	.304 .370 .276 .352	2.124				
1530	#2	.275 .276 .241 .243	1.934				
1540	#3	.195 .212 .213 .246	2.899				
1550	#4	.180 .211 .212 .214	1.503				
1560	#5	.235 .253 .233 .277	2.044				
1570	#6	.240 .240 .233 .278	1.749				
1580	#7	.195 .223 .217 .249	1.512				
1590	#8	.207 .211 .212 .229	1.615				
1600	#9	.211 .231 .215 .235	1.678				
1610	#10	.205 .234 .212 .240	1.732				
1620	#11	.415 .445 .447 .453	2.751				
1630	#13	.415 .442 .231 .370	2.396				
1640	#14	.521 .725 .254 .540	4.372				
1650	#144	1.131 1.147 1.222 1.359	9.583				
1660	#154	.455 .943 .952 1.056	7.900				
1670	#164	1.074 1.203 .906 .991	7.971				
1680	#174	.249 .293 1.266 1.122	8.720				
1690	#184	.232 .223 .253 .908	7.004				
1700	#194	.458 .453 .433 .523	3.740				
1710	#CON1	.232 .253 .242 .258	1.742				
1720	#CON2	.231 .245 .237 .257	1.846				
1750	24						
1760	STA41	.433 .442 .445 .441	3.683				
1770	STA44	.430 .340 .390 .352	3.607				
1780	STA45	4.204 4.135 4.430 4.293	38.300				

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INPUT DATA FOR CWD PROGRAM							
1790	STA45	.501 .514 .517 .507	4.293				
1800	STA48	.470 .442 .508 .489	4.017				
1810	STA49	1.500 1.500 9.594 9.120	90.500				
1820	STA410	.235 .231 .326 .307	2.372				
1830	STA411	.441 .423 .428 .447	3.269				
1840	STA412	.198 .207 .223 .221	1.421				
1850	STA413	.445 .444 .489 .485	3.726				
1860	STA414	31.300 32.400 35.100 35.200	295.000				
1870	STA415	.340 .343 .353 .356	2.749				
1880	STA416	.271 .277 .282 .293	2.184				
1890	STA417	.277 .277 .276 .292	2.089				
1900	STA418	1.605 2.145 1.334 1.824	11.600				
1910	STA420	.338 .344 .352 .341	2.930				
1920	STA421	.927 1.145 .423 1.015	6.612				
1930	STA422	11.700 12.100 12.700 12.700	94.200				
1940	STA423	18.600 17.400 23.000 20.300	184.400				
1950	STA424	.243 .244 .259 .290	2.187				
1960	STA425	.302 .311 .323 .354	2.159				
1970	STA426	.447 .475 .445 .442	3.335				
1980	STA427	.288 .297 .305 .253	2.344				
1990	STA428	.541 .540 .551 .534	4.008				

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AMYIN	PAGE	4	11/09/77	18:10	PAGE	4	AMYIN
INPUT DATA FOR CWD PROGRAM							
2320	24						
2330	#1	.439 .483 .314 .425	3.389				
2340	#2	.277 .392 .337 .315	3.097				
2350	#3	.131 .272 .251 .272	2.597				
2360	#4	.222 .263 .224 .227	2.165				
2370	#5	.255 .305 .273 .257	2.496				
2380	#6	.231 .210 .242 .307	2.488				
2390	#7	.225 .274 .237 .268	2.008				
2400	#8	.221 .255 .221 .242	1.913				
2410	#9	.211 .274 .232 .250	2.116				
2420	#10	.220 .277 .236 .257	2.223				
2430	#11	.334 .346 .247 .448	3.894				
2440	#12	.247 .221 .270 .277	2.214				
2450	#12	.258 .221 .267 .269	2.144				
2460	#14	.334 .497 .355 .413	3.258				
2470	#15	.515 .526 .330 .616	5.562				
2480	#15	1.342 1.222 1.226 1.471	12.700				
2490	#17	1.460 2.273 1.951 1.991	17.520				
2500	#18	.745 .876 .731 .760	7.073				
2510	#19	.521 .575 .424 .540	3.711				
2520	#15	.941 1.141 1.095 1.224	9.561				
2530	#14	.836 1.274 1.123 1.222	9.621				
2540	#13	.753 1.073 .977 1.111	6.549				
2550	CON1	.220 .221 .201 .218	1.753				
2560	CON1	.260 .241 .210 .222	1.720				

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INPUT DATA FOR CWD PROGRAM							
2820	21						
2830	1720	.172 .171 .156 .197	1.438				
2840	0520	.147 .144 .145 .198	1.505				
2850	0270	.101 .222 .310 .293	2.349				
2860	0740	.144 .144 .155 .171	1.201				
2870	0240	.103 .103 .120 .212	1.708				
2880	1340	.144 .144 .145 .203	1.549				
2890	1240	.144 .144 .145 .178	1.389				
2900	0340	.144 .144 .145 .140	2.976	25.520			
2910	0740	.144 .144 .145 .277	2.156				
2920	0240	.144 .144 .145 .167	1.321				
2930	0240	.144 .144 .145 .190	1.367				
2940	0030	.144 .144 .145 .313	3.237				
2950	1710	.144 .144 .145 .417	4.436	38.900			
2960	0540	.144 .144 .145 .213	1.608				
2970	1730	.144 .144 .145 .191	1.453				
2980	0020	.144 .144 .145 .206	1.620				
2990	0240	.144 .144 .145 .177	1.397				
3000	0540	.144 .144 .145 .184	1.431				
3010	0320	.144 .144 .145 .196	1.651				
3020	0530	.172 .144 .141 .196	1.357				
3030	0550	.177 .141 .149 .193	1.360				

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INPUT DATA FOR CWD PROGRAM

3200	
3210	25
3220	078 .242 .429 .244 .405 2.472
3230	161 .235 .277 .257 .311 2.132
3240	101 .135 .240 .223 .250 1.800
3250	191 .242 .232 .244 .246 1.729
3260	194 .239 .241 .242 .235 2.046
3270	195 .228 .244 .245 .335 1.932
3280	199 .215 .244 .244 .248 1.660
3290	130 .195 .227 .240 .241 1.573
3300	195 .215 .212 .212 .248 1.671
3310	182 .212 .249 .223 .261 1.670
3320	192 .315 .315 .312 .442 2.282
3330	154 .210 .261 .248 .275 1.768
3340	135 .210 .261 .244 .263 1.701
3350	188 .435 .439 .442 .428 3.477
3360	155 .322 .433 .447 .427 3.251
3370	179 .723 .747 .777 .745 6.357
3380	194 .421 1.054 .717 .952 7.244
3390	109 2.132 2.124 2.135 2.220 20.400
3400	107 .745 .855 .757 .832 7.007
3410	102 .442 .567 .734 .565 3.658
3420	189 .415 .424 .420 1.035 7.958
3430	193 .419 1.008 .858 1.094 8.518
3440	225 .747 1.162 .711 1.132 6.649
3450	197 .241 .240 .249 .249 2.219
3460	106 .199 .234 .219 .248 1.786
3490	23
3500	STA#2 .370 .437 .353 .388 3.422
3510	STA#3 .317 .323 .277 .309 2.647
3520	STA#4 .317 .351 .333 .368 2.909
3530	STA#5 1.656 1.750 1.776 1.792 16.2
3540	STA#6 .329 .353 .315 .348 2.898
3550	STA#8 .434 .423 .412 .427 3.691
3560	STA#4 .595 .671 .629 .676 6.279
3570	STA#10 .265 .259 .252 .281 2.280
3580	STA#11 .183 .146 .177 .204 1.561
3590	STA#12 .257 .247 .252 .270 2.346
3600	STA#13 .374 .346 .346 .434 3.554
3610	STA#14 23.4 23.4 24.5 25.3 237.0
3620	STA#15 .292 .334 .297 .321 2.601
3630	STA#15 .225 .242 .216 .249 1.951
3640	STA#17 .230 .252 .230 .238 1.977
3650	STA#18 .269 .242 .253 .301 2.263
3660	STA#20 .287 .331 .320 .344 2.628

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INPUT DATA FOR CWD PROGRAM

3670	STA#21 1.372 1.750 1.246 1.566 11.5
3680	STA#22 11.9 11.2 12.6 12.0 97.1
3690	STA#23 .475 .511 .512 .422 4.332
3700	STA#24 .519 .509 .509 .478 4.404
3710	STA#25 .413 .417 .401 3.455
3720	STA#27 .344 .357 .347 3.272

3900	21
3910	#58 .234 .222 .226 .232 1.617
3920	#55 .215 .233 .242 .239 1.684
3930	#58 .194 .250 .246 .380 2.992
3940	#59 .167 .158 .193 .181 1.399
3950	#95 .245 .240 .342 .345 2.084
3960	#79 .147 .199 .205 .217 1.561
3970	#92 .228 .195 .247 .206 1.634
3980	#87 3.405 3.240 3.563 3.546 28.5
3990	#90 .334 .535 .538 .481 4.290
4000	#95 .145 .179 .167 .143 1.381
4010	#37 .140 .143 .205 .201 1.415
4020	#102 .311 .311 .331 .336 2.686
4030	#134 6.532 6.417 6.359 6.575 53.9
4040	#170 .252 .240 .280 .268 1.936
4050	#171 .235 .210 .220 .207 1.456
4060	#173 .219 .210 .250 .238 1.619
4070	#175 .195 .140 .210 .214 1.630
4080	#201 .232 .220 .225 .223 1.815
4090	#77 .227 .215 .208 .220 1.486
4100	#38 .205 .215 .242 .219 1.500
4110	#52 .223 .212 .230 .225 1.472
4120	
4130	

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INPUT DATA FOR CWD PROGRAM

4140	8
4150	351 .273 1.205 .314 1.171 2.687
4160	130 1.253 3.341 1.208 2.871 13.6
4170	181 1.441 2.855 1.632 2.684 17.1
4180	124 .533 3.620 .539 3.302 5.822
4190	186 .515 3.725 .553 3.157 5.751
4200	183 1.454 2.771 1.559 2.616 16.5
4210	112 .255 .734 .245 .740 2.457
4400	22
4410	STA#1 .262 .275 .253 .295 2.425
4420	STA#3 .252 .261 .264 .262 2.356
4430	STA#4 2.060 1.841 1.992 1.964 18.9
4440	STA#5 .221 .230 .231 .237 2.144
4450	STA#6 .240 .248 .275 .258 2.197
4460	STA#7 .342 .341 .374 .379 3.328
4470	STA#9 .191 .207 .201 .209 1.795
4480	STA#10 .367 .424 .378 .387 3.438
4490	STA#12 .211 .237 .227 .233 2.010
4500	STA#13 .210 .225 .218 .231 2.045
4510	STA#14 .214 .231 .224 .234 1.998
4520	STA#15 .201 .210 .208 .225 1.921
4530	STA#16 .254 .255 .249 .245 2.344
4540	STA#17 .225 .223 .233 .271 2.244
4550	STA#18 .251 .271 .250 .248 2.324
4560	STA#19 .325 .373 .343 .369 3.095
4570	STA#20 .223 .242 .247 .249 2.191
4580	STA#21 .219 .230 .227 .235 2.140
4590	STA#22 .196 .222 .211 .215 1.915
4600	STA#23 .161 .197 .159 .237 1.612

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INPUT DATA FOR CWD PROGRAM

4610	STA#24 .222 .230 .242 .254 2.303
4620	INUSFD .179 .220 .148 .242 1.771

4650	24
4660	STA#2 .252 .324 .265 .314 2.966
4670	STA#3 .241 .265 .265 .269 2.444
4680	STA#4 .238 .265 .261 .279 2.754
4690	STA#5 .221 .241 .254 .252 2.581
4700	STA#6 .194 .214 .214 .224 2.274
4710	STA#7 .310 .310 .330 .328 3.470
4720	STA#8 .446 .516 .484 .494 6.173
4730	STA#10 .197 .200 .204 .224 2.265
4740	STA#11 .292 .375 .315 .314 3.337
4750	STA#12 .144 .144 .144 .169 1.595
4760	STA#13 .284 .332 .332 .361 3.892
4770	STA#14 .437 1.1 10.0 10.0 124.6
4780	STA#15 .227 .252 .243 .252 2.757
4790	STA#16 .174 .200 .166 .203 1.945
4800	STA#17 .180 .192 .202 .203 2.030
4810	STA#18 .114 .144 .248 .239 2.467
4820	STA#19 .646 3.15 1.473 2.243 21.3
4830	STA#20 .227 .271 .235 .259 2.899
4840	STA#21 .027 1.502 .456 1.121 12.5
4850	STA#22 .116 1.105 1.182 1.213 15.3
4860	STA#23 .369 .500 .545 .615 7.564
4870	STA#24 .193 .217 .206 .218 2.279
4880	STA#25 .296 .310 .274 .316 3.537
4890	STA#26 .418 .440 .319 .328 3.552
4920	21
4930	#58 .210 .273 .241 .266 2.680
4940	#65 .238 .270 .244 .253 2.651
4950	#58 .258 .374 .344 .346 3.857
4960	#69 .102 .229 .216 .226 2.217
4970	#75 .269 .287 .276 .271 2.834
4980	#77 .219 .271 .228 .236 2.500
4990	#79 .222 .274 .223 .242 2.477
5000	#32 .208 .242 .224 .232 2.464
5010	#97 .1342 2.125 1.940 1.921 24.6
5020	#90 .341 .396 .321 .326 3.875
5030	#95 .242 .293 .245 .263 2.928
5040	#95 .313 .344 .252 .263 3.038
5050	#47 .231 .274 .241 .227 2.516
5060	#103 .443 .553 .490 .493 6.232
5070	#134 5.752 6.279 6.654 7.235 92.5

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INPUT DATA FOR CWD PROGRAM

5080	#170 .243 .291 .254 .276 3.050
5090	#171 .221 .263 .233 .249 2.632
5100	#173 .275 .312 .277 .285 3.014
5110	#175 .277 .285 .257 .249 2.888
5120	#38 .277 .277 .277 .271 2.795
5130	#52 .277 .277 .277 .257 2.610
5140	
5150	
5160	17
5170	1-174 .227 .277 .307 .694 4.941
5180	2-174 .322 .544 .339 .582 3.846
5190	3-174 .251 .505 .280 .517 3.715
5200	4-174 .270 .502 .292 .513 3.775
5210	5-174 .300 .502 .313 .537 3.862
5220	6-174 .332 .502 .304 .545 3.661
5230	7-174 .273 .502 .293 .526 3.698
5240	8-174 .330 .502 .294 .471 3.170
5250	9-174 .279 .502 .294 .504 3.409
5260	10-174 .248 .502 .277 .485 3.499
5270	11-174 .470 .502 .466 .755 5.913
5280	12-174 .269 .466 .505 .652 3.506
5290	13-174 .264 .466 .449 .649 4.044
5300	14-174 .530 .466 .558 .649 4.792
5310	15-174 .705 .466 .649 .649 4.283
5320	C-156 .138 .723 .150 .6720 1.655
5330	C-156 .140 .544 .170 .682 1.700
5340	
5350	

5360	23
5370	ST4#2 .125 .345 .347 .401 4.184
5380	ST4#3 .333 .332 .322 .353 3.820
5390	ST4#5 .514 .628 .654 .658 8.075
5400	ST4#6 .284 .277 .250 .288 3.012
5410	ST4#8 .372 .401 .415 .440 5.039
5420	ST4#9 .354 .371 .375 .407 4.736
5430	ST4#10 .259 .301 .273 .309 3.271
5440	ST4#11 .211 .233 .248 .266 2.622
5450	ST4#12 .335 .345 .382 .425 4.573
5460	ST4#13 .382 .430 .409 .473 5.200
5470	ST4#14 5.821 7.424 6.249 7.168 85.0
5480	ST4#15 .242 .257 .259 .290 3.166
5490	ST4#17 .255 .277 .250 .252 3.117
5500	ST4#18 .232 .241 .273 .279 3.146
5510	ST4#19 2.108 3.440 1.577 2.695 26.5
5520	ST4#20 1.781 1.882 1.003 1.413 14.8
5530	ST4#22 1.065 1.103 1.152 1.268 15.6
5540	ST4#23 .410 .431 .435 .521 5.873

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INPUT DATA FOR CWD PROGRAM

5550	ST4#24 .304 .401 .352 .378 4.397
5560	ST4#25 .400 .248 .342 .337 4.003
5590	12
5600	ST4#1 .346 .525 .507 .541 5.590
5610	ST4#15 .525 .532 .533 .591 5.380
5620	ST4#1 .312 4.133 4.061 4.135 45.1
5630	ST4#3 .505 .517 .501 .507 6.085
5640	ST4#5 .505 .505 .501 .507 6.482
5650	ST4#17 .519 .527 .494 .497 4.998
5660	ST4#14 .430 .507 .485 .498 5.171
5670	ST4#10 .577 .775 .579 .794 7.674
5680	ST4#7 .558 .573 .593 .739 7.127
5690	ST4#13 .334 .341 .370 .398 3.868
5700	ST4#19 .274 .277 .252 .274 2.729
5710	ST4#23 .243 .261 .263 .281 2.652
5740	25
5750	ST4#2 .254 .287 .213 .266 2.527
5760	ST4#3 .154 .212 .195 .208 2.251
5770	ST4# .174 .205 .191 .203 2.252
5780	ST4#7 .347 .347 .402 .508 5.422
5790	ST4#5 .164 .187 .174 .196 2.099
5800	ST4#5 .244 .283 .240 .360 3.750
5810	ST4#5 .225 .240 .245 .262 2.872
5820	ST4#7 .152 .170 .147 .189 1.981
5830	ST4#11 .210 .208 .227 .262 2.672
5840	ST4#12 .121 .117 .121 .151 1.478
5850	ST4#12 .214 .254 .248 .279 2.771
5860	ST4#14 3.080 4.234 4.558 4.738 51.8
5870	ST4#15 .164 .145 .109 .216 2.213
5880	ST4#15 .149 .140 .154 .174 1.815
5890	ST4#17 .149 .172 .154 .174 1.880
5900	ST4#15 .164 .147 .155 .199 1.861
5910	ST4#19 1.326 1.387 1.002 1.511 13.0
5920	ST4#10 .232 .245 .145 .211 1.930
5930	ST4#11 .511 .517 .535 .779 7.374
5940	ST4#26 2.315 2.432 2.704 2.721 31.5
5950	ST4#25 .280 .140 .181 .355 3.64
5960	ST4#24 .147 .147 .155 .247 2.039
5970	ST4#25 .201 .139 .196 .210 2.333
5980	3K3#17 .213 .235 .235 .254 2.665
5990	3K3#40 .211 .235 .235 .260 2.523
6000	
6010	

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INPUT DATA FOR CWD PROGRAM

6020	23						
6030	E-120024	.197	.222	.201	.222	2.375	
6040	E-120024	.215	.229	.215	.232	2.437	
6050	E-120024	.253	.253	.215	.237	2.586	
6060	E-115012	.227	.220	.200	.224	2.472	
6070	E-115012	.251	.239	.333	.258	2.711	
6080	E-135153	.195	.213	.198	.227	2.393	
6090	E-131154	.415	.435	.425	.447	5.554	
6100	E-112057	.222	.227	.221	.240	2.682	
6110	E-121151	.311	.335	.325	.342	3.933	
6120	E-112051	.224	.232	.217	.247	2.729	
6130	E-115012	.479	.517	.951	1.034	12.6	
6140	E-115012	.197	.224	.202	.224	2.444	
6150	E-120024	.231	.252	.232	.261	2.676	
6160	E-120024	.217	.234	.211	.228	2.687	
6170	E-120024	.215	.237	.211	.241	2.468	
6180	E-120024	.216	.234	.207	.245	2.728	
6190	E-120024	.368	.332	.355	.417	4.900	
6200	E-124151	.405	.405	.422	.449	5.652	
6210	E-112051	.215	.237	.221	.255	2.687	
6220	E-120024	.220	.233	.213	.254	2.543	
6230	E-120024	.252	.240	.219	.239	2.541	
6240	E-125011	.231	.230	.207	.227	2.622	
6250	E-125011	.225	.244	.215	.241	2.640	
6260	0 0 0 0 0 0						

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04-19-77

34.4% CHARACTERIZATION - ARKANSAS NUCLEAR ONE - RUN 1

CARD INPUT, FREL FORMAT

LOG CALCOMP PLOT. LENGTH=30. UNITS PER INCH= 25. MLT= 0

LOG PRINTER GRAPH

LISTING OF INPUT SPECTRUM

	1	2	3	4	5	6	7	8	9	
0 +	6200	0	0	1	55	1732	9849	17886	19793	23709
1 +	23557	32777	34136	35447	35385	35218	34543	32975	31129	29072
2 +	27403	29397	28517	22421	20693	19562	18345	17374	15812	15048
3 +	14193	13226	12371	11429	11148	10416	9047	8661	8144	7464
4 +	7177	6711	6017	5127	5342	5531	5392	4736	4998	4565
5 +	4336	4253	4049	3867	3731	3618	3417	3310	3221	3082
6 +	3198	2952	2749	2705	2617	2534	2532	2415	2336	2366
7 +	2297	2168	2111	2021	2026	2082	2018	1913	1819	1672
8 +	1710	1675	1618	1654	1661	1636	1556	1465	1455	1525
9 +	1852	1843	1811	1226	1109	1095	1023	969	1306	1662
10 +	1015	941	821	877	781	787	836	734	811	786
11 +	706	716	712	771	766	792	650	591	666	890
12 +	1018	1093	1076	476	484	683	555	414	482	481
13 +	447	348	450	555	413	398	463	497	394	414
14 +	429	430	370	385	368	394	416	330	327	326
15 +	324	342	314	322	299	301	306	260	291	286
16 +	283	299	299	279	296	293	300	277	332	296
17 +	254	281	206	211	233	308	704	717	226	196
18 +	201	198	190	191	169	145	186	163	152	132
19 +	123	114	130	133	119	114	115	112	103	189
20 +	543	650	130	60	55	31	78	35	111	82
21 +	63	71	63	41	51	71	45	55	82	236
22 +	537	172	67	43	47	38	47	60	41	29
23 +	33	39	46	28	34	31	28	25	37	46
24 +	34	46	24	29	32	41	24	28	16	19
25 +	30	23	16	29	25	21	34	23	21	21
26 +	24	30	11	29	29	42	56	47	20	18
27 +	18	23	10	24	24	23	22	16	30	23
28 +	18	22	13	19	21	17	21	24	22	19
29 +	13	20	11	20	16	15	22	22	14	14
30 +	14	17	15	16	22	11	13	20	19	15
31 +	21	11	15	14	24	12	16	18	30	16
32 +	18	16	15	14	12	15	20	14	22	16
33 +	14	24	19	31	17	19	15	20	20	19
34 +	15	25	17	22	25	13	19	18	17	19
35 +	16	17	17	20	18	26	22	13	22	13
36 +	12	14	14	9	17	7	8	16	14	9
37 +	14	13	14	15	13	8	5	7	7	6
38 +	3	6	3	5	5	3	2	4	5	1
39 +	3	3	6	18	43	72	66	14	1	1
40 +	2	2	4	1	6	3	4	1	1	3
41 +	2	1	1	0	0	0	3	3	4	3
42 +	4	3	3	2	2	3	2	1	5	3
43 +	3	4	5	4	3	1	1	6	4	3
44 +	3	3	3	2	3	2	3	3	2	4
45 +	2	4	2	4	3	3	2	1	2	2
46 +	1	0	1	1	1	1	1	2	0	0
47 +	4	4	0	1	3	2	0	2	0	2
48 +	2	2	2	3	2	3	4	1	3	3
49 +	3	1	1	2	2	4	1	6	7	1
50 +	2	5	2	3	4	2	1	6	1	1
51 +	3	5	1	2	3	4	0	3	4	2

Gamma Characterization - Arkansas Nuclear One - Run 1 (Cont'd)

Listing of Input Spectrum

[illegible]

64-1177 GAMMA CHARACTERIZATION

	1.16	3.16	11.6	31.6	101.6	316.6	1010	3.162E+03	1.300E+04	3.162E+04	1.000E+05	3.162E+05
1.15E-05-X	.	.	.	X	.	.	X	.	.	X	.	.
	.	.	.	.	.	.	.	.	.	X	.	.
	.	.	.	.	.	.	.	.	.	XXX XXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
50.	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
1.00E+02-	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
1.50E+02-	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
2.00E+02-	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
2.50E+02-	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
3.00E+02-	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
3.50E+02-	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
4.00E+02-X	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
4.50E+02-	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
5.00E+02-X	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
5.50E+02-X	.	.	.	.	.	.	.	.	.	XXXXXX	.	.
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J4-20-77

GAMMA CHARACTERIZATION

CARD INPUT, FREE FORMAT

LOG CALCOMP PLOT. LPSIZE=3. UNITS PER INCH= 25. MLT= 0

LOG PRINTER GRAPH

LISTING OF INPUT SPECTRUM

	1	2	3	4	5	6	7	8	9
0 + 50000	0	0	5	284	12739	74929	149610	163374	192566
1 + 243752	1077.1	1147.0	291354	292981	289715	284501	274881	258831	241436
2 + 227584	1121.8	1146.3	185085	1735.7	162431	153193	143113	134016	125779
3 + 118322	1191.02	1131.74	45163	9.567	88592	77686	71931	67572	63744
4 + 55315	1089.2	1046.1	51959	49234	45802	43817	41648	40398	38226
5 + 37571	1037.1	1071.41	32555	31946	29812	28949	27659	27006	26111
6 + 25363	1464.2	1013.1	22831	22234	21402	21097	20335	19977	19636
7 + 18733	13575	17610	17173	16951	17162	23441	16860	14523	14443
8 + 14186	13914	10718	13335	13790	13321	12843	14219	12523	12335
9 + 14385	10971	11167	9787	9674	9162	8846	8578	11166	14385
10 + 4817	7271	7198	7072	6830	6648	6973	6225	5548	6621
11 + 5897	5865	5871	6100	6449	6977	5598	5428	5545	7851
12 + 7893	10735	11116	4343	3959	5531	4509	3563	3628	3673
13 + 3588	5571	5882	4728	3553	3413	3758	4412	3351	3295
14 + 36.7	3895	3324	3281	3214	3597	3376	2775	2719	2715
15 + 27.2	2671	2619	2589	2626	2644	2521	2532	2488	2389
16 + 2472	2461	1741	2357	2410	2442	2451	2443	2677	2632
17 + 2139	1974	1935	1964	2006	2468	5525	6521	1775	1611
18 + 1550	1548	1531	1525	1536	1482	1623	1475	1197	1149
19 + 1190	1124	1122	1060	1026	965	947	949	987	1419
20 + 4064	6117	1112	559	550	622	621	644	987	879
21 + 487	523	461	501	429	423	444	549	697	1724
22 + 5019	2466	462	346	284	334	438	568	412	287
23 + 3.2	292	319	271	263	244	250	238	302	386
24 + 5.2	346	144	237	238	263	281	229	204	254
25 + 192	224	156	293	221	264	195	186	196	217
26 + 220	267	149	167	197	296	613	435	159	187
27 + 175	145	162	164	157	166	166	146	201	231
28 + 2.4	146	163	171	155	173	142	138	159	157
29 + 170	123	146	151	147	157	147	155	175	130
30 + 154	171	162	134	153	126	140	128	138	138
31 + 141	134	145	129	143	159	156	223	244	189
32 + 170	135	126	148	150	135	161	135	148	129
33 + 144	147	193	267	214	146	123	108	148	138
34 + 137	143	141	142	148	146	168	170	126	151
35 + 113	159	170	153	124	151	153	168	181	176
36 + 139	118	110	102	93	104	112	39	88	130
37 + 125	101	96	84	82	56	59	57	32	49
38 + 41	47	32	42	46	41	32	42	41	40
39 + 47	50	72	125	282	641	615	138	31	19
40 + 24	24	9	23	25	31	21	17	30	13
41 + 25	18	24	27	16	26	20	28	20	19
42 + 21	13	22	15	18	22	21	18	19	15
43 + 28	19	31	14	23	19	18	22	12	15
44 + 23	24	18	16	23	24	24	25	17	21
45 + 26	23	19	26	27	19	21	23	17	18
46 + 22	24	16	19	16	22	28	15	15	27
47 + 17	15	13	26	18	16	17	14	15	22
48 + 17	25	18	20	24	19	13	17	25	20
49 + 22	13	21	15	18	23	18	15	19	12
50 + 12	23	22	19	17	13	29	11	22	25
51 + 27	24	21	15	15	17	14	16	16	17

04-20-77

Gamma Characterization (Cont'd)

Listing of Input Spectrum

	0	1	2	3	4	5	6	7	8	9
52 +	17	20	23	17	14	18	13	12	21	15
53 +	11	15	18	24	15	15	15	25	15	22
54 +	20	16	18	22	11	14	14	14	21	20
55 +	22	17	21	13	16	19	22	15	21	16
56 +	15	27	19	22	22	18	16	11	25	12
57 +	16	19	8	20	15	21	12	10	13	17
58 +	18	15	19	17	17	13	21	17	19	20
59 +	10	14	22	14	17	20	16	11	18	22
60 +	12	17	12	21	17	11	16	17	8	16
61 +	19	19	14	15	16	19	14	21	13	12
62 +	22	14	14	13	16	14	6	16	18	19
63 +	21	21	12	15	17	14	16	14	16	14
64 +	13	12	10	19	13	22	19	9	17	21
65 +	14	14	16	19	20	8	14	15	14	13
66 +	12	17	18	11	17	14	16	13	11	18
67 +	18	22	17	24	20	18	12	19	14	7
68 +	20	14	18	19	8	13	11	8	9	14
69 +	15	8	15	9	11	6	13	17	15	8
70 +	17	12	22	10	15	19	14	21	19	24
71 +	15	17	12	10	23	19	10	12	7	14
72 +	12	14	11	14	6	11	12	6	23	16
73 +	16	7	16	8	13	16	13	15	16	15
74 +	13	5	16	17	13	20	12	12	20	20
75 +	7	13	8	13	13	19	14	16	14	10
76 +	13	12	8	11	11	12	12	16	17	10
77 +	10	11	11	15	22	13	9	12	10	13
78 +	11	14	11	15	11	15	15	12	15	16
79 +	12	7	11	5	11	19	12	13	18	14
80 +	13	10	12	17	9	17	14	12	11	12
81 +	12	12	14	7	18	18	11	8	12	15
82 +	8	17	16	15	10	19	14	11	3	10
83 +	13	11	11	9	12	15	14	16	22	9
84 +	7	17	13	10	12	15	15	13	14	10
85 +	19	8	12	21	11	19	14	9	14	9
86 +	10	8	11	12	14	20	15	7	18	14
87 +	11	12	12	13	7	11	8	9	8	9
88 +	12	7	6	11	9	14	8	14	17	15
89 +	13	9	8	7	20	11	9	14	7	10
90 +	20	9	11	11	11	13	13	18	13	13
91 +	9	12	8	12	5	18	5	8	8	12
92 +	16	6	11	7	13	8	10	14	7	13
93 +	9	9	8	6	8	12	9	10	17	11
94 +	7	8	9	14	8	13	13	6	8	9
95 +	8	10	14	12	10	7	8	13	13	13
96 +	13	9	16	14	11	11	4	6	15	12
97 +	13	9	7	10	8	10	15	5	11	10
98 +	13	4	8	12	7	10	6	11	10	8
99 +	11	6	10	10	6	12	3	5	5	11
100 +	15	15	6	11	21	18	16	9	5	11
101 +	6	10	10	16	11	7	7	10	7	9
102 +	14	16	9	7						

14-00000-77 GAMMA CHARACTERIZATION

[illegible]

APPENDIX C

FY 1977 COSTS

APPENDIX C

FY-77 Costs

Costs incurred from October 1, 1976 to July 31, 1977 are summarized below.

Man-Hours	3095
Labor.....	\$39,842
Department Management.....	11,602
Materials.....	6,138
Travel.....	6,784
Equipment.....	948
ERDA-RL Assessment.....	3,757
Services.....	1,700
Overhead.....	25,892
Total.....	<u>\$99,758</u>

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