**DISCRETE EVENT SIMULATION OF THE DEFENSE WASTE
PROCESSING FACILITY (DWPF) ANALYTICAL LAB (U)**

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(U)**

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Abstract

A discrete event simulation of the Savannah River Site (SRS) Defense Waste Processing Facility (DWPF) analytical laboratory has been constructed in the GPSS language. It was used to estimate laboratory analysis times at process analytical hold points and to study the effect of sample number on those times. Typical results are presented for three different simulations representing increasing levels of complexity, and for different sampling schemes. Example equipment utilization time plots are also included. SRS DWPF laboratory management and chemists found the simulations very useful for resource and schedule planning.

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Introduction

The Defense Waste Processing Facility (DWPF) of the Savannah River Site (SRS) has been constructed to encapsulate high level radioactive waste generated during the thirty-eight years of SRS operations in highly durable glass. The glass canisters will eventually be shipped to a permanent waste repository for final storage. The actual processing strategies for the glass preparation are still under development, but the overall plan calls for a batch process with hold points at several places. Each hold point will necessitate the collection of analytical data on the batch.

Current operational plans require the use of Statistical Process Control (SPC) in controlling the process. Variance based SPC methods require periodic characterization of variance components. Typically this involves analysis of 30 or more samples on at least a quarterly basis. The original plan required the determination of the variance components as part of the normal process operations. However, the current analytical methods were complex and contained long sample preparation steps. This led the DWPF Analytical Laboratory management to request a study of turnaround times and resource utilization, so that the laboratory's effect on overall batch cycle times could be estimated.

In a manufacturing organization, this type of study would be a typical application of the industrial engineering technique of discrete event simulation (DES). Many different DES software packages exist for most types of computer platforms. However, most chemists are never exposed to this type of computer modeling and as such are unaware of the benefits that can be obtained by the application of industrial engineering technology to the chemical laboratory. One group that has applied this technology to the analytical laboratory is that of Vandeginste and Kateman (1).

This paper describes the application of the DES language GPSS (General Purpose Simulation System) (2,3) in building a model of the DWPF Analytical Laboratory Facility. A description of the process used to construct and validate the model is included, and results from two different operating scenarios are presented.

Background

The DWPF process has four major subprocesses. They are: cesium precipitation with tetraphenylborate, waste slurry receipt with composition/property adjustment, slurry mix preparation, and melter feeding. Herein these subprocesses will be referred to as the PR, SRAT, SME, and MF processes, respectively. The product of the PR process is called the Precipitate Hydrolysis Aqueous or PHA, and this acronym is used in some places in this report and model. The MF process occurs in the Melter Feed Tank or MFT and this acronym is also used herein. (Acronyms are defined in the Glossary.)

The DWPF was not designed to allow materials to be returned to a tank once they have been transferred. Therefore, several process control hold points have been defined to avoid such situations. The PR process has four analytical hold points, the SRAT has two, the SME one, and the MFT has no hold points. However the MFT process does require a parallel analysis of vessel contents. In addition, many of the process steps involve evaporation and condensation, and all condensate collection tanks must be analyzed before their contents can be transferred elsewhere.

The DWPF has plans to run for about 1 1/2 years with nonradioactive feeds before beginning processing of radioactive waste. These cold runs will allow process operations to be fine tuned and any problems to be identified. Once radioactive material is introduced into the system, the facility must be operated remotely. Process vessel modifications become very difficult at that point.

The process chemical analyses will be performed in a small analytical laboratory located in the main process building. Because of the highly radioactive nature of the samples, most of the sample collection and preparation will be done remotely, using master-slave manipulators mounted in shielded cells. The analytical facility has three sample cells where samples from various process vessels are collected. In typical operation one vessel can be sampled from only one point in a single cell. Samples are then passed to the first of a set of three chemical cells where sample preparation and some analyses are conducted. As the samples are sequentially diluted and aliquoted to reduce the total radioactivity in the actual analysis sample, they are moved into the

second and then third cells for further preparation and analysis. In many cases, the samples are diluted enough that they can be removed from the cells via a glovebox for analysis on contained instruments mounted in hoods.

The process samples are usually slurries of radioactive waste and glass-forming silica, but some samples from water condensation equipment are also submitted to the laboratory. The samples are usually filtered and dried, sometimes vitrified, and dissolved with sodium peroxide or acid matrices. Multiple dissolution techniques using microwave and conventional furnaces are employed.

A wide range of analytical techniques are employed to obtain compositional information on the samples. The techniques used include: Inductively Coupled Plasma Emission Spectroscopy (ICPES), Atomic Absorption Spectroscopy (AA), Ion Chromatography (IC), Gas Chromatography (GC), Liquid Chromatography (LC), ultra-violet/visible spectrophotometry (UVVIS), Total Inorganic and Organic Carbon analysis (TIC/TOC), pH measurement, and density measurement. The laboratory is equipped with one of each type of instrument.

Initially the laboratory was requested to collect and analyze sufficient samples to establish the process' statistical characteristics. Collection and analysis of 32 samples in duplicate for elemental composition and weight percent solids was required. Other analytical information needed was derived from single samples analyzed in duplicate. Each major feed composition change was to require an equivalent set of analytical results. The possibility of having to repeat the 32 samples on one additional batch per feed type was also recognized. This formed the basis of the first simulation scenario.

Simulation of the first scenario, herein abbreviated as the '32x2 case', showed an unacceptable batch cycle time extension due to slow laboratory turnaround times. Therefore a second scenario was investigated where only four samples were collected and each analyzed in duplicate, referred to herein as the '4x2 case'. This scenario was found to be the maximum process load the laboratory could have without significantly impacting batch cycle times. (The statistical information will be acquired by an alternate approach.)

Model construction consisted of defining the various operational steps associated with each particular analytical method into a chain of events. The chains were then appropriately combined into blocks with multiple parallel paths representing a major analytical set. Sampling operations were added to simulate sample collection and distribution. The analytical sets were then combined with simple time delay blocks representing the process steps into the full process model.

The initial model had many simplifying assumptions embedded in it. For example, the previously mentioned condensate analyses were not initially considered. Also, technicians were considered to be fully interchangeable. Other known simplifications included: no breaks, vacations, etc. for technicians; no waste removal operations included; no equipment down-time. The effect of most of these simplifications was estimated by flat-rate increases in calculated turnaround times.

Simulations were run at two levels. Small models representing each analytical set were used to study equipment and/or technician loading during the analyses and to obtain turnaround time values. The full process model was then run to simulate the interactions produced when all major subprocesses were in operation. Comparisons of analytical set turnaround times were then made to assess any potential slowdown.

Experimental

The software used in this project was GPSS/PC(tm) by Minuteman Software, Stow, Massachusetts. Two versions were used. The first runs on any IBM PC or fully compatible computer under the DOS operating system. The second version utilizes expanded memory to increase the size of the useable model and thus requires an IBM compatible computer with expanded memory capabilities. Both versions have several interactive graphics windows which were useful in debugging the program and understanding what was happening during the simulation.

Two different computers were used. The first was an Jameco Electronics 20 MHz 286 machine with 8 Mbytes of memory. This machine came with its own expanded memory manager, and is capable of partitioning the 8 Mbytes between expanded and extended memory in 1/2 Mbyte segments. The second machine used was a CSS Laboratories 33 MHz 486 machine with 4 Mbyte

extended memory. This machine used Quarterdeck's QEMM memory manager.

The full DWPF model required the use of expanded memory to run while using DOS 4.0, but a system using only DOS 5.0 had enough standard memory to run the model if it was stripped down by excluding programming statements aimed at studying queuing. The model itself is approximately 2000 lines long and a listing is included in Appendix 1.

Both computers would not run the expanded memory version of GPSS/PC successfully in some cases. The problem appeared to be related to the operating system version and/or the expanded memory manager software. For example, the 286 machine would not run the expanded memory version under IBM-DOS 4.0, but would under 5.0 and the 486 machine would not run it under DR-DOS 6.0 or MS-DOS 5.0 (unless the hard disk was disabled).

Matrices containing resource utilization data were printed to an ASCII file, transferred to a MicroVAX computer, and incorporated into the RS/1 software package for analysis and presentation. The GPSS software also produces some statistical information on resource utilization which was also examined. Example output of this type is shown in Appendix 2.

Results and Discussion

At the time of model construction, the DWPF laboratory was not yet fully functional. Time estimates for operational steps requiring the use of manipulators were supplied by C. E. Taylor, DWPF Technical, who observed similar operations in other area laboratories conducting remote sample preparation. Instrumental analysis times were estimated from operating experience based on nonradioactive sample analysis on the same or similar equipment installed in SRL laboratories. R. E. Beck, C. E. Taylor, and R. B. Spencer, all of DWPF Technical, constructed sequence diagrams for each method and supplied time estimates of the individual steps.

The full model included blocks of time for simulation of the actual process chemical operations. Times for these steps were obtained as best estimates from the cognizant process engineers. Table 1 lists the basic sequential steps to the DWPF process. The chemical processing step times as supplied by the process engineers are

included. Times shown for the analytical steps are simulation results for the simple analysis set, without any other activities occurring, for the 4 samples in duplicate scenario. In the more complex analytical sets, the sample arrival to the different analytical method/preparation chains is randomized, so differing times can be obtained. The numbers presented in Table 1 are an average of five simulations. The standard deviations are shown in parentheses after the average.

Table 1. DWPF Process Steps (Overview Level)

<u>Description (Acronym)</u>	<u>Time</u>
PR Process Step 1	90
Analytical Set 1 (PRL1)	239(0)
PR Process Step 2	180
Analytical Set 2 (PRL2)	231(0)
PR Process Step 3	270
Analytical Set 3 (PRL3)	111(0)
PR Process Step 4	840
Analytical Set 4 (PRL4)	496(19)
PR Process Step 5	60
SRAT Process Step 1	60
Analytical Set 6 (SRAT1)	846(15)
SRAT Process Step 2	2058
Analytical Set 7 (SRAT2)	858(11)
SRAT Process Step 3	60
SME Process Step 1	2880
Analytical Set 8 (SME)	1485(17)
SME Process Step 2	60
MF Process Step	5160
Analytical Set 8 (MFT) *	1504(35)

Total Time	15984

* The MFT Analytical Set is conducted in parallel to the process step.

During construction of the model, weekly review meetings were held with all concerned laboratory personnel to validate any modeling assumptions. Approximately two man-weeks of time were spent in developing the original simulation. Subsequent revision for the second scenario was accomplished more quickly, but an equal time investment was spent in evaluating the impact of sample numbers.

Table 2 presents results for three cases of the latest simulation version. The 'Partial - 1 Batch' case represents one batch processing through the core DWPF processes only. The 'Partial - 10 Batches' case represents ten batches processing

through the core processes. Thus each subprocess of the DWPF process could potentially be running at the same time.

The 'Full - 10 Batches' case represents the addition of some independent instrument quality control samples on periodic bases and four short analytical chains arising from overheads condensation processes. (The overheads are collected in the Recycle Collection Tank (RCT), the Slurry Mix Evaporator Condensate Tank (SMECT), and the Off-Gas Condensate Tank (OGCT). The RCT is normally sampled twice, before and after pH adjustment.) All results are for the '4x2' case.

Table 2. Simulation Results

Process	Partial - 1 Batch	Partial - 10 Batches	Full - 10 Batches
PR	1097(12)	1242(6)	1415(16)
SRAT	1711(30)	1773(3)	1992(16)
SME	1469(11)	1634(7)	1794(31)
MF	1597(5)	1782(15)	1882(23)

Numbers shown are time in minutes for the analytical sections of the subprocesses. A minimum of three and a maximum of five runs were used to derive this data. The standard deviation is shown in parentheses. Variation arises because sample distribution amongst the different analytical sequences was randomized with respect to when a sample was pulled.

Relevant model limitations are: technicians are completely equivalent, no lab waste handling operations are included, no technician breaks or vacations included, and no equipment downtime was simulated. Simulation of these factors may be done at a later date. For now, flat-rate increases of the calculated times are used for planning purposes.

The primary effect illustrated by Table 2 is the interaction of various samples. When multiple batches are processed, each subprocess can potentially be running at the same time. This could lead to multiple sets of samples arriving at the lab at the same time. This is further complicated by the addition of more samples from quality control and condensate process operations. Each additional set of samples causes the overall

process times to extend due to conflicting requests for the same resources. In some situations, extensive delays could be experienced.

This interaction is illustrated in Figure 1 for the RCT process for the '32x2' case. The RCT process represents the analytical requirements arising from one overheads condensation process. The RCT process should be tied directly to the major process processing conditions. However, process engineers did not have a good way to estimate when the tank would need analysis. Therefore in the simulation the RCT samples were submitted on a fixed periodic basis.

Figure 1 is a sequence plot spanning the full, 10 batch simulation for the '32x2' case. Plotted sequentially is the amount of time each RCT analytical set required to be processed. The minimum time was 110 minutes, which is also the fastest allowable time. The maximum time observed was 2471 minutes, representing more than a twenty fold increase in processing time.

The maximum time observed was 2471 minutes or approximately 41 hours, which is unacceptably long. The pattern noted in the Figure reflects the overall cyclic nature of the process. Major delays are probably indicative of where the major process loads were occurring in the laboratory. A prioritization scheme that would allow the RCT (and/or any other) samples to be analyzed first can be built into the simulation to resolve this problem.

By adding time for the omitted operations, laboratory managers were able to estimate turnaround times for lab analyses. These estimates were then used to estimate the laboratory's impact on the overall process schedule.

Resource utilization was examined for each analytical subset as well as for the overall simulation. For unique resources a line plot showing when the resource was in use was prepared and combined into one graph. Figure 2 shows one such graph of this data for a center cut of the full 10-batch simulation. (The center cut was triggered by the beginning of the fifth batch's processing.)

For multiple resources (such as technicians), a multivalued graph was constructed, showing how many were in use at a given time. Figure 3 shows that

plot for the technicians (TECHS) and Laboratory Information Management System terminals (LIMS). Laboratory managers can examine this plot to determine if enough time was available for waste removal activities, for example.

The GPSS/PC software also reports overall resource utility numbers. Examples of this output are discussed more fully in Appendix 2. Between the standard and custom utility numbers and plots, laboratory managers were able to get a relatively clear picture of where bottlenecks were occurring. (The data used to construct the Figures were obtained via custom programming.) Almost any desired piece of performance information could be obtained via the standard GPSS entities or via custom programming.

Model refinement continues with limitations being addressed and alternate operating scenarios postulated. Timings are being verified by actual experience as the Laboratory comes on-line. Incorporation of random error noted in these studies will occur in a major model revision. Because of the ease with which a model can be changed, it will serve as the basis for future off-line "what-if" testing. This will serve as a guide to future equipment and procedure changes.

In conclusion, discrete event simulation has shown itself to be a valuable tool. It allows reasonable technical estimates of facility performance to be made. It simplifies the task of performance improvement by showing synergistic effects on the computer, before equipment is purchased or replaced and/or procedures are altered. A refined, current laboratory model represents a cost-effective planning tool.

References

1. Klaessens, J.; Vandeginste, B.; Kateman, G. Anal. Chim. Acta. **1989**, 223, 205-221, and references therein.
2. Schriber, Thomas J. Simulation Using GPSS; John Wiley & Sons: New York, 1974
3. Dunning, Kenneth A. Getting Started in GPSS; Engineering Press, Inc.: San Jose, 1985

Glossary

<u>Acronym</u>	<u>Definition</u>
AA	- Atomic Absorption (Spectrophotometer)
ASCII	- American Standard for Computer Information Interchange
AVC	- Automated Volatility Computer
CEM	- Microwave Furnace
DES	- Discrete Event Simulation
DOS	- Disk Operating System
DR	- Digital Research(tm)
DWPF	- Defense Waste Processing Facility
FURND	- Muffle Furnace for Drying
FURNF	- Muffle Furnace for Fusion
FURNV	- Muffle Furnace for Vitrification
GC	- Gas Chromatograph
GLOVEBOX	- Glovebox
GPSS	- General Purpose Simulation System
GRINDER	- Sample Grinder
HOTP	- Hot Plate
IBM	- International Business Machines
IC	- Ion Chromatograph
ICP (ES)	- Inductively Coupled Plasma (Emission Spectrometer)
LC	- Liquid Chromatograph
LIMS	- Laboratory Information Management System terminals
MF	- Melter Feed (process)
MFT	- Melter Feed Tank
MS	- MicroSoft(tm)
MSMS	- Master-Slave Manipulator in Sample Cell
MSM1	- Master-Slave Manipulator in cell 1
MSM2	- Master-Slave Manipulator in cell 2
MSM3	- Master-Slave Manipulator in cell 3
OGCT	- Off-Gas Condensate Tank
OVEN	- Sample Drying Oven
PC	- Personal Computer
PHA	- Precipitate Hydrolysis Aqueous (product)
PR	- Precipitate Reactor
RCT	- Recycle Condensate Tank
SME	- Slurry Mix Evaporater
SMECT	- Slurry Mix Evaporater Condensate Tank
SPC	- Statistical Process Control
SRAT	- Slurry Receipt and Adjustment Tank
SRS	- Savannah River Site
TECHS	- Technicians
TICTOC	- Total Inorganic Carbon/Total Organic Carbon (Analyzer)
UVVIS	- UltraViolet-Visible (Absorbtion Spectrophotometer)

Figure 1. Time Required to Complete RCT Sample Analyses
During a 10 Batch Simulation ('32x2' Case)

Figure 2. Equipment Utilization for a Center Cut
of the Full 10 Batch '32x2' Simulation

Figure 3. Technician and LIMS System Utilization for
a Center Cut of the Full 10 Batch '32x2' Simulation

Elapsed Minutes ($t(0)=76187$)

APPENDIX 1. GPSS Source Code for the '32x2' Case

Attached is the GPSS source code used to generate the results presented in this report. For the '4x2' case the appropriate sampling operations were modified for the reduced number of samples.

The code is divided into sections. Each section is represented by the first digits of the line number. The remaining digits are used to sequentially order the statements. A key is presented in table A1-1.

At the end of the GPSS code listing is a short FORTRAN subroutine that can be used as the GPSS help block to print data to a file. The GPSS source code section 21 uses this subroutine.

Following the source code listings are logic diagrams that map out the logic of each analytical subset. Operational steps are represented by acronyms with an associated number. The number is the time in minutes required to complete the operation. All acronyms assume that both the piece of equipment and a technician are needed to complete the operation. Any exceptions to this will be noted. Also noted are identifying and explanatory comments.

Table A1-1. Code Section Definitions

<u>Section Number</u>	<u>Code Definition</u>
0.xxx	Initialization and setup
1.xxx	PR Analytical set 1
2.xxx	PR Analytical set 2
3.xxx	PR Analytical set 3
4.xxx	PR Analytical set 4
5.xxx	SRAT Analytical set 1
6.xxx	SRAT Analytical set 2
7.xxx	SME Analytical set
8.xxx	MFT Analytical set
13.xxx	Quality Control for the TIC/TOC, IC, and UVVIS
15.xxx	Code used to trigger data dumping
20.1xx	RCT Analytical set 1
20.2xx	RCT Analytical set 2
20.3xx	OGCT Analytical set
20.4xx	SMECT Analytical set
21.xxx	Code used to dump results to data files (HELP block links to FORTRAN subroutine)

**GPSS Source Code for '32x2' Simulation
(with data output to File)**

```

0.01 MSMS      STORAGE      1
0.011 MSM3     STORAGE      1
0.012 MSM2     STORAGE      1
0.013 MSM1     STORAGE      1
0.015 FURND    STORAGE      1
0.016 FURNV    STORAGE      1
0.017 FURNF    STORAGE      1
0.018 CEM      STORAGE      1
0.019 GLOVEBOX STORAGE      1
0.020 TECHS    STORAGE      5
0.021 LIMS     STORAGE      5
0.022 ICP      STORAGE      1
0.023 AVC      STORAGE      1
0.024 GRINDER  STORAGE      1
0.025 HOTP     STORAGE      1
0.026 OVEN     STORAGE      1
0.027 TICTOC   STORAGE      1
0.028 IC       STORAGE      1
0.029 LC       STORAGE      1
0.030 GC       STORAGE      1
0.031 UVVIS    STORAGE      1
0.032 AA       STORAGE      1
0.08          INITIAL      X$IN8,0
0.101         bbb variable cl-p$a
0.102         times      matrix      ,350,5
0.399         RMULT      7777
0.41 LAB1      FUNCTION      P$INSTR,L7
1,ICP41/2,HAN41/3,LIQ41/4,VO41/5,NVO41/6,DEN41/7,SOL41
0.42 LAB2      FUNCTION      P$INSTR2,L7
1,ICP42/2,HAN42/3,LIQ42/4,VO42/5,NVO42/6,DEN42/7,SOL42
0.51 LAB51     FUNCTION      P$ILAB51,L5
1,ICP51A/2,ICP51B/3,FIC51/4,DEN51/5,SOL51
0.52 LAB52     FUNCTION      P$ILAB52,L5
1,ICP52A/2,ICP52B/3,FIC52/4,DEN52/5,SOL52
0.61 LAB61     FUNCTION      P$ILAB61,L4
1,ICP61A/2,ICP61B/3,DEN61/4,SOL61
0.62 LAB62     FUNCTION      P$ILAB62,L4
1,ICP62A/2,ICP62B/3,DEN62/4,SOL62
0.71 EMSLAB1   FUNCTION      P$EMSL1,L4
1,ICP71/2,LIQ71/3,DEN71/4,SOL71
0.72 EMSLAB2   FUNCTION      P$EMSL2,L4
1,ICP72/2,LIQ72/3,DEN72/4,SOL72
0.81 MFTLAB1   FUNCTION      P$MFTL1,L3
1,ICP81/2,SOL81/3,DEN81
0.82 MFTLAB2   FUNCTION      P$MFTL2,L3
1,ICP82/2,SOL82/3,DEN82
0.9           INITIAL      X$AHPI,0
0.91          INITIAL      X$ESRTI,0
0.92          INITIAL      X$EMSI,0
0.93          INITIAL      X$MFTI,0
0.94          GENERATE      1,,10

```

```

0.95      savevalue abc+,1
0.96      assign    10,x$abc
0.97      LINK      BIGCHAIN,FIFO,BEGIN
1.001 BEGIN test ne p10,5,matset ;to section 15
1.0011    beg2 SPLIT      1
1.0015    queue          ipha
1.002     SEIZE          AHP
1.003     SAVEVALUE     AHPI,0
1.004     SPLIT         1,NPR1
1.005     TEST E        X$AHPI,1
1.0055    TEST E        F$ESRAT,0
1.006     RELEASE       AHP
1.0065    depart        ipha
1.007     TRANSFER      ,COMPAR1
1.01 NPR1 ADVANCE       90
1.0101    queue          ipha1
1.0102    assign        a,c1
1.0103    savevalue     mrl+,1
1.0105    ADVANCE       30 ;SAMPLE LINE FLUSH
1.011     QUEUE        MSM_S
1.012     ENTER        MSMS
1.013 MSMS_ ENTER        TECHS
1.014     DEPART       MSM_S
1.015     ADVANCE      15
1.016     LEAVE        MSMS
1.017     LEAVE        TECHS
1.018     SPLIT        1,CON1
1.019 ICP1_ QUEUE       MSM_1
1.020     ENTER        MSM1
1.021 MSM1_ ENTER       TECHS
1.022     DEPART       MSM_1
1.023     ADVANCE      15
1.024     LEAVE        MSM1
1.025     LEAVE        TECHS
1.026     QUEUE        OVENS
1.027 OVEN_ ENTER       OVEN
1.028     DEPART       OVENS
1.029     ADVANCE      60
1.030     LEAVE        OVEN
1.031     QUEUE        MSM_1
1.032     ENTER        MSM1
1.033 MSM1_ ENTER       TECHS
1.034     DEPART       MSM_1
1.035     ADVANCE      5
1.036     LEAVE        MSM1
1.037     LEAVE        TECHS
1.038 COOL ADVANCE      30
1.039     QUEUE        MSM_1
1.040     ENTER        MSM1
1.041 MSM1_ ENTER       TECHS
1.042     DEPART       MSM_1
1.043     ADVANCE      5
1.044     LEAVE        MSM1
1.045     LEAVE        TECHS

```

1.046		QUEUE	MSM 2
1.047		ENTER	MSM2
1.048	MSM2	ENTER	TECHS
1.049		DEPART	MSM 2
1.050		ADVANCE	23
1.051		LEAVE	MSM2
1.052		LEAVE	TECHS
1.053		QUEUE	MSM 3
1.054		ENTER	MSM3
1.055	MSM3	ENTER	TECHS
1.056		DEPART	MSM 3
1.057		ADVANCE	5
1.058		LEAVE	MSM3
1.059		LEAVE	TECHS
1.060		QUEUE	GLOVE
1.061		ENTER	GLOVEBOX
1.062	GLOV	ENTER	TECHS
1.063		DEPART	GLOVE
1.064		ADVANCE	5
1.065		LEAVE	GLOVEBOX
1.066		LEAVE	TECHS
1.067		QUEUE	ICPES
1.068		ENTER	ICP
1.069	ICP	ENTER	TECHS
1.070		DEPART	ICPES
1.071		ADVANCE	30
1.072		LEAVE	ICP
1.073		LEAVE	TECHS
1.074		QUEUE	LIM
1.075		ENTER	LIMS
1.076	LIMS	ENTER	TECHS
1.077		DEPART	LIM
1.078		ADVANCE	15
1.079		LEAVE	LIMS
1.080		LEAVE	TECHS
1.081		TRANSFER	, CON2
1.0815	CON1	QUEUE	MSM 2
1.082		ENTER	MSM2
1.083	MSM2	ENTER	TECHS
1.084		DEPART	MSM 2
1.085		ADVANCE	64
1.086		LEAVE	MSM2
1.087		LEAVE	TECHS
1.088		QUEUE	MSM 3
1.089		ENTER	MSM3
1.090	MSM3	ENTER	TECHS
1.091		DEPART	MSM 3
1.092		ADVANCE	5
1.093		LEAVE	MSM3
1.094		LEAVE	TECHS
1.095		SPLIT	1, CON3
1.096		QUEUE	MSM 3
1.097		ENTER	MSM3
1.098	MSM3	ENTER	TECHS

1.099		DEPART	MSM_3
1.100		ADVANCE	60
1.101		LEAVE	MSM3
1.102		LEAVE	TECHS
1.103		QUEUE	LIM
1.104		ENTER	LIMS
1.105	LIMS_	ENTER	TECHS
1.106		DEPART	LIM
1.107		ADVANCE	15
1.108		LEAVE	LIMS
1.109		LEAVE	TECHS
1.110		TRANSFER	,CON4
1.111	CON3	QUEUE	GLOVE
1.112		ENTER	GLOVEBOX
1.113	GLOV	ENTER	TECHS
1.114		DEPART	GLOVE
1.115		ADVANCE	5
1.116		LEAVE	GLOVEBOX
1.117		LEAVE	TECHS
1.118		SPLIT	1,CON5
1.119		QUEUE	TIC_TOC
1.120		ENTER	TICTOC
1.121	TIC	ENTER	TECHS
1.122		DEPART	TIC_TOC
1.123		ADVANCE	32
1.124		LEAVE	TICTOC
1.125		LEAVE	TECHS
1.126		QUEUE	LIM
1.127		ENTER	LIMS
1.128	LIMS_	ENTER	TECHS
1.129		DEPART	LIM
1.130		ADVANCE	15
1.131		LEAVE	LIMS
1.132		LEAVE	TECHS
1.133		TRANSFER	,CON6
1.138	CON5	QUEUE	I_C
1.139		ENTER	I_C
1.14	IC_	ENTER	TECHS
1.141		DEPART	I_C
1.142		ADVANCE	60
1.143		LEAVE	IC
1.144		LEAVE	TECHS
1.145		QUEUE	LIM
1.146		ENTER	LIMS
1.147	LIMS_	ENTER	TECHS
1.148		DEPART	LIM
1.149		ADVANCE	15
1.15		LEAVE	LIMS
1.151		LEAVE	TECHS
1.152	CON6	ASSEMBLE	2
1.153	CON4	ASSEMBLE	2
1.154	CON2	ASSEMBLE	2
1.1545		depart	ipha1
1.155		savevalue	aaa,v\$bbb

1.156		msavevalue	times,x\$mr1,1,x\$aaa	
2.010	NPR2	ADVANCE	180	
2.0101		queue	ipha2	
2.0102		assign	a,c1	
2.0103		savevalue	mr2+,1	
2.055		ADVANCE	30	; SAMPLE LINE FLUSH
2.056		QUEUE	MSM_S	
2.057		ENTER	MSMS	
2.058	MSMS_	ENTER	TECHS	
2.059		DEPART	MSM_S	
2.06		ADVANCE	10	
2.061		LEAVE	MSMS	
2.062		LEAVE	TECHS	
2.063		SPLIT	1,CON11	
2.064		QUEUE	MSM_1	
2.065		ENTER	MSM1	
2.066	MSM1_	ENTER	TECHS	
2.067		DEPART	MSM_1	
2.068		ADVANCE	10	
2.069		LEAVE	MSM1	
2.07		LEAVE	TECHS	
2.071		QUEUE	MSM_3	
2.072		ENTER	MSM3	
2.073	MSM3_	ENTER	TECHS	
2.074		DEPART	MSM_3	
2.075		ADVANCE	5	
2.076		LEAVE	MSM3	
2.077		LEAVE	TECHS	
2.078		SPLIT	1,CON21	
2.079		QUEUE	GLOVE	
2.08		ENTER	GLOVEBOX	
2.081	GLOV	ENTER	TECHS	
2.082		DEPART	GLOVE	
2.083		ADVANCE	5	
2.084		LEAVE	GLOVEBOX	
2.085		LEAVE	TECHS	
2.086		QUEUE	A_A	
2.087		ENTER	AA	
2.088	AA_	ENTER	TECHS	
2.089		DEPART	A_A	
2.09		ADVANCE	25	
2.091		LEAVE	AA	
2.092		LEAVE	TECHS	
2.093		QUEUE	LIM	
2.094		ENTER	LIMS	
2.095	LIMS_	ENTER	TECHS	
2.096		DEPART	LIM	
2.097		ADVANCE	15	
2.098		LEAVE	LIMS	
2.099		LEAVE	TECHS	
2.1		TRANSFER	,CON31	
2.101	CON21	QUEUE	MSM_3	
2.102		ENTER	MSM3	
2.103	MSM3_	ENTER	TECHS	

2.104	DEPART	MSM_3
2.105	ADVANCE	30
2.106	LEAVE	MSM3
2.107	LEAVE	TECHS
2.108	QUEUE	LIM
2.109	ENTER	LIMS
2.11 LIMS_	ENTER	TECHS
2.111	DEPART	LIM
2.112	ADVANCE	15
2.113	LEAVE	LIMS
2.114	LEAVE	TECHS
2.115 CON31	ASSEMBLE	2
2.116	TRANSFER	,CON41
2.117 CON11	QUEUE	MSM_2
2.118	ENTER	MSM2
2.119 MSM2_	ENTER	TECHS
2.12	DEPART	MSM_2
2.121	ADVANCE	30
2.122	LEAVE	MSM2
2.123	LEAVE	TECHS
2.124	QUEUE	MSM_3
2.125	ENTER	MSM3
2.126 MSM3_	ENTER	TECHS
2.127	DEPART	MSM_3
2.128	ADVANCE	5
2.129	LEAVE	MSM3
2.13	LEAVE	TECHS
2.131	SPLIT	1,CON51
2.132	QUEUE	MSM_3
2.133	ENTER	MSM3
2.134 MSM3_	ENTER	TECHS
2.135	DEPART	MSM_3
2.136	ADVANCE	25
2.137	LEAVE	MSM3
2.138	LEAVE	TECHS
2.139	QUEUE	LIM
2.14	ENTER	LIMS
2.141 LIMS_	ENTER	TECHS
2.142	DEPART	LIM
2.143	ADVANCE	15
2.144	LEAVE	LIMS
2.145	LEAVE	TECHS
2.146	TRANSFER	,CON61
2.147 CON51	QUEUE	GLOVE
2.15	ENTER	GLOVEBOX
2.151 GLOV	ENTER	TECHS
2.152	DEPART	GLOVE
2.153	ADVANCE	5
2.154	LEAVE	GLOVEBOX
2.155	LEAVE	TECHS
2.156	QUEUE	I_C
2.157	ENTER	IC
2.158 IC_	ENTER	TECHS
2.159	DEPART	I_C

2.16	ADVANCE	120	
2.161	LEAVE	IC	
2.162	LEAVE	TECHS	
2.163	QUEUE	LIM	
2.164	ENTER	LIMS	
2.165	LIMS_ ENTER	TECHS	
2.166	DEPART	LIM	
2.167	ADVANCE	15	
2.168	LEAVE	LIMS	
2.169	LEAVE	TECHS	
2.17	CON61 ASSEMBLE	2	
2.171	CON41 ASSEMBLE	2	
2.1715	depart	ipha2	
2.172	savevalue	aaa,v\$bbb	
2.173	msavevalue	times,x\$mr2,2,x\$aaa	
3.010	NPR3 ADVANCE	270	
3.0101	queue	ipha3	
3.020	ADVANCE	30	; SAMPLE LINE FLUSH
3.021	QUEUE	MSM_S	
3.022	ENTER	MSMS	
3.023	MSMS_ ENTER	TECHS	
3.024	DEPART	MSM_S	
3.025	ADVANCE	10	
3.026	LEAVE	MSMS	
3.027	LEAVE	TECHS	
3.028	QUEUE	MSM_1	
3.029	ENTER	MSM1	
3.030	MSM1_ ENTER	TECHS	
3.031	DEPART	MSM_1	
3.032	ADVANCE	10	
3.033	LEAVE	MSM1	
3.034	LEAVE	TECHS	
3.035	QUEUE	MSM_2	
3.036	ENTER	MSM2	
3.037	MSM2_ ENTER	TECHS	
3.038	DEPART	MSM_2	
3.039	ADVANCE	10	
3.040	LEAVE	MSM2	
3.041	LEAVE	TECHS	
3.094	QUEUE	MSM_3	
3.095	ENTER	MSM3	
3.096	MSM3_ ENTER	TECHS	
3.097	DEPART	MSM_3	
3.098	ADVANCE	5	
3.099	LEAVE	MSM3	
3.1	LEAVE	TECHS	
3.101	QUEUE	GLOVE	
3.102	ENTER	GLOVEBOX	
3.103	GLOV ENTER	TECHS	
3.104	DEPART	GLOVE	
3.105	ADVANCE	5	
3.106	LEAVE	GLOVEBOX	
3.107	LEAVE	TECHS	
3.108	QUEUE	A_A	

3.109	ENTER	AA
3.11	AA_ ENTER	TECHS
3.111	DEPART	A A
3.112	ADVANCE	25
3.113	LEAVE	AA
3.114	LEAVE	TECHS
3.115	QUEUE	LIM
3.116	ENTER	LIMS
3.117	LIMS_ ENTER	TECHS
3.118	DEPART	LIM
3.119	ADVANCE	15
3.12	LEAVE	LIMS
3.121	LEAVE	TECHS
3.1211	depart	ipha3
3.999	NPR4 ADVANCE	840
4.0001	queue	ipha4
4.002	SPLIT	1,ANAL
4.003	ADVANCE	30
4.004	ENTER	TECHS
4.005	SPLIT	133
4.006	QUEUE	MSM_S
4.007	MSMS_ ENTER	MSMS
4.008	DEPART	MSM_S
4.009	ADVANCE	5
4.010	LEAVE	MSMS
4.011	UNLINK	MYCHAIN, TR4_, 1
4.012	ASSEMBLE	134
4.013	LEAVE	TECHS
4.014	TRANSFER	,ENDPRL4
4.015	ANAL SPLIT	6,, INSTR
4.016	ASSIGN	INSTR2,P\$INSTR
4.017	TRANSFER	FN,LAB1
4.018	ICP41 SPLIT	63
4.019	ASSIGN	MYORD,RN1
4.020	LINK	MYCHAIN,P\$MYORD
4.021	HAN41 ASSIGN	MYORD,RN1
4.022	LINK	MYCHAIN,P\$MYORD
4.023	LIQ41 SPLIT	31
4.024	ASSIGN	MYORD,RN1
4.025	LINK	MYCHAIN,P\$MYORD
4.026	VO41 ASSIGN	MYORD,RN1
4.027	LINK	MYCHAIN,P\$MYORD
4.028	NVO41 ASSIGN	MYORD,RN1
4.029	LINK	MYCHAIN,P\$MYORD
4.030	DEN41 SPLIT	2
4.031	ASSIGN	MYORD,RN1
4.032	LINK	MYCHAIN,P\$MYORD
4.033	SOL41 SPLIT	31
4.034	ASSIGN	MYORD,RN1
4.035	LINK	MYCHAIN,P\$MYORD
4.04	TR4_ TRANSFER	FN,LAB2
4.041	ICP42 ASSEMBLE	4
4.042	QUEUE	MSM_1
4.043	ENTER	MSM1

4.044	MSM1_	ENTER	TECHS
4.045		DEPART	MSM_1
4.046		ADVANCE	30
4.047		LEAVE	MSM1
4.048		LEAVE	TECHS
4.049		QUEUE	OVENS
4.051	OVEN_	ENTER	OVEN
4.052		DEPART	OVENS
4.053		ADVANCE	60
4.054		LEAVE	OVEN
4.056		QUEUE	MSM_1
4.057		ENTER	MSM1
4.058	MSM1_	ENTER	TECHS
4.059		DEPART	MSM_1
4.06		ADVANCE	5
4.061		LEAVE	MSM1
4.062		LEAVE	TECHS
4.063		ADVANCE	30
4.064		QUEUE	MSM_2
4.065		ENTER	MSM2
4.066	MSM2_	ENTER	TECHS
4.067		DEPART	MSM_2
4.068		ADVANCE	45
4.069		LEAVE	MSM2
4.07		LEAVE	TECHS
4.071		QUEUE	MSM_3
4.072		ENTER	MSM3
4.073	MSM3_	ENTER	TECHS
4.074		DEPART	MSM_3
4.075		ADVANCE	5
4.076		LEAVE	MSM3
4.077		LEAVE	TECHS
4.078		QUEUE	GLOVE
4.079		ENTER	GLOVEBOX
4.08	GLOV	ENTER	TECHS
4.081		DEPART	GLOVE
4.082		ADVANCE	5
4.083		LEAVE	GLOVEBOX
4.084		LEAVE	TECHS
4.085		QUEUE	ICPES
4.086		ENTER	ICP
4.087	ICP_	ENTER	TECHS
4.088		DEPART	ICPES
4.089		ADVANCE	60
4.09		LEAVE	ICP
4.091		LEAVE	TECHS
4.092		QUEUE	LIM
4.093		ENTER	LIMS
4.094	LIMS_	ENTER	TECHS
4.095		DEPART	LIM
4.096		ADVANCE	15
4.097		LEAVE	LIMS
4.098		LEAVE	TECHS
4.099		ASSEMBLE	16

4.1		TRANSFER	, COMBO_4
4.101	HAN42	QUEUE	MSM_2
4.103		ENTER	MSM2
4.104	MSM2_	ENTER	TECHS
4.105		DEPART	MSM_2
4.106		ADVANCE	20
4.107		LEAVE	MSM2
4.108		LEAVE	TECHS
4.109		QUEUE	MSM_3
4.11		ENTER	MSM3
4.111	MSM3_	ENTER	TECHS
4.112		DEPART	MSM_3
4.113		ADVANCE	40
4.114		LEAVE	MSM3
4.115		LEAVE	TECHS
4.116		QUEUE	LIM
4.117		ENTER	LIMS
4.118	LIMS_	ENTER	TECHS
4.119		DEPART	LIM
4.12		ADVANCE	15
4.121		LEAVE	LIMS
4.122		LEAVE	TECHS
4.124		TRANSFER	, COMBO_4
4.125	LIQ42	QUEUE	MSM_2
4.128		ENTER	MSM2
4.129	MSM2_	ENTER	TECHS
4.13		DEPART	MSM_2
4.131		ADVANCE	20
4.132		LEAVE	MSM2
4.133		LEAVE	TECHS
4.135		SPLIT	1, AT4
4.136	CIC4	QUEUE	MSM_3
4.137		ENTER	MSM3
4.138	MSM3_	ENTER	TECHS
4.139		DEPART	MSM_3
4.140		ADVANCE	5
4.141		LEAVE	MSM3
4.142		LEAVE	TECHS
4.143		QUEUE	GLOVE
4.144		ENTER	GLOVEBOX
4.145	GLOV	ENTER	TECHS
4.146		DEPART	GLOVE
4.147		ADVANCE	5
4.148		LEAVE	GLOVEBOX
4.149		LEAVE	TECHS
4.150		QUEUE	I_C
4.151		ENTER	IC
4.152	IC_	ENTER	TECHS
4.153		DEPART	I_C
4.154		ADVANCE	60
4.155		LEAVE	IC
4.156		LEAVE	TECHS
4.157		QUEUE	LIM
4.158		ENTER	LIMS

4.159	LIMS_	ENTER	TECHS
4.160		DEPART	LIM
4.161		ADVANCE	15
4.162		LEAVE	LIMS
4.163		LEAVE	TECHS
4.164		ASSEMBLE	32
4.165		TRANSFER	, LIQCOMB
4.166	VO42	QUEUE	MSM_2
4.167		ENTER	MSM2
4.168	MSM2_	ENTER	TECHS
4.169		DEPART	MSM_2
4.170		ADVANCE	20
4.171		LEAVE	MSM2
4.172		LEAVE	TECHS
4.173		QUEUE	MSM_3
4.174		ENTER	MSM3
4.175	MSM3_	ENTER	TECHS
4.176		DEPART	MSM_3
4.177		ADVANCE	5
4.178		LEAVE	MSM3
4.179		LEAVE	TECHS
4.180		QUEUE	GLOVE
4.181		ENTER	GLOVEBOX
4.182	GLOV	ENTER	TECHS
4.183		DEPART	GLOVE
4.184		ADVANCE	5
4.185		LEAVE	GLOVEBOX
4.186		LEAVE	TECHS
4.187		SPLIT	1, TOC4
4.188		SPLIT	1, IC4
4.189	GC4	QUEUE	G_C
4.190		ENTER	G_C
4.191	GC_	ENTER	TECHS
4.192		DEPART	G_C
4.193		ADVANCE	160
4.194		LEAVE	GC
4.195		LEAVE	TECHS
4.196		QUEUE	LIM
4.197		ENTER	LIMS
4.198	LIMS_	ENTER	TECHS
4.199		DEPART	LIM
4.200		ADVANCE	15
4.201		LEAVE	LIMS
4.202		LEAVE	TECHS
4.203	VOC4	ASSEMBLE	3
4.204		TRANSFER	, COMBO_4
4.205	TOC4	QUEUE	TIC_TOC
4.206		ENTER	TICTOC
4.207	TIC	ENTER	TECHS
4.208		DEPART	TIC_TOC
4.209		ADVANCE	32
4.210		LEAVE	TICTOC
4.211		LEAVE	TECHS
4.212		QUEUE	LIM

4.213		ENTER	LIMS
4.214	LIMS_	ENTER	TECHS
4.215		DEPART	LIM
4.216		ADVANCE	15
4.217		LEAVE	LIMS
4.218		LEAVE	TECHS
4.219		TRANSFER	,VOC4
4.220	IC4	QUEUE	I_C
4.221		ENTER	IC
4.222	IC_	ENTER	TECHS
4.223		DEPART	I_C
4.224		ADVANCE	60
4.225		LEAVE	IC
4.226		LEAVE	TECHS
4.227		QUEUE	LIM
4.228		ENTER	LIMS
4.229	LIMS_	ENTER	TECHS
4.230		DEPART	LIM
4.231		ADVANCE	15
4.232		LEAVE	LIMS
4.233		LEAVE	TECHS
4.234		TRANSFER	,VOC4
4.289	NVO42	QUEUE	MSM_2
4.291		ENTER	MSM2
4.292	MSM2_	ENTER	TECHS
4.293		DEPART	MSM_2
4.294		ADVANCE	20
4.295		LEAVE	MSM2
4.296		LEAVE	TECHS
4.297		QUEUE	MSM_3
4.298		ENTER	MSM3
4.299	MSM3_	ENTER	TECHS
4.3		DEPART	MSM_3
4.301		ADVANCE	5
4.302		LEAVE	MSM3
4.303		LEAVE	TECHS
4.304		QUEUE	GLOVE
4.305		ENTER	GLOVEBOX
4.306	GLOV	ENTER	TECHS
4.307		DEPART	GLOVE
4.308		ADVANCE	5
4.309		LEAVE	GLOVEBOX
4.31		LEAVE	TECHS
4.311		QUEUE	L_C
4.312		ENTER	LC
4.313	LC_	ENTER	TECHS
4.314		DEPART	L_C
4.315		ADVANCE	195
4.316		LEAVE	LC
4.317		LEAVE	TECHS
4.318		QUEUE	LIM
4.319		ENTER	LIMS
4.32	LIMS_	ENTER	TECHS
4.321		DEPART	LIM

4.322	ADVANCE	15
4.323	LEAVE	LIMS
4.324	LEAVE	TECHS
4.326	TRANSFER	, COMBO_4
4.327 AT4	QUEUE	MSM_3
4.335	ENTER	MSM3
4.336 MSM3_	ENTER	TECHS
4.337	DEPART	MSM_3
4.338	ADVANCE	25
4.339	LEAVE	MSM3
4.34	LEAVE	TECHS
4.341	QUEUE	LIM
4.342	ENTER	LIMS
4.343 LIMS_	ENTER	TECHS
4.344	DEPART	LIM
4.345	ADVANCE	15
4.346	LEAVE	LIMS
4.347	LEAVE	TECHS
4.348	ASSEMBLE	32
4.349	TRANSFER	, LIQCOMB
4.35 DEN42	ASSEMBLE	3
4.351	SPLIT	1
4.352	QUEUE	MSM_1
4.353	ENTER	MSM1
4.354 MSM1_	ENTER	TECHS
4.355	DEPART	MSM_1
4.356	ADVANCE	10
4.357	LEAVE	MSM1
4.358	LEAVE	TECHS
4.359	QUEUE	LIM
4.36	ENTER	LIMS
4.361 LIMS_	ENTER	TECHS
4.362	DEPART	LIM
4.363	ADVANCE	15
4.364	LEAVE	LIMS
4.365	LEAVE	TECHS
4.366	ASSEMBLE	2
4.367	TRANSFER	, COMBO_4
4.368 SOL42	SPLIT	1
4.3685	QUEUE	MSM_1
4.369	ENTER	MSM1
4.37 MSM1_	ENTER	TECHS
4.371	DEPART	MSM_1
4.372	ADVANCE	5
4.373	LEAVE	MSM1
4.374	LEAVE	TECHS
4.375	QUEUE	AV_C
4.376	ENTER	AVC
4.377 AVC_	ENTER	TECHS
4.378	DEPART	AV_C
4.379	ADVANCE	5
4.38	LEAVE	AVC
4.381	LEAVE	TECHS
4.382	QUEUE	LIM

4.383	ENTER	LIMS
4.384	LIMS_ ENTER	TECHS
4.385	DEPART	LIM
4.386	ADVANCE	15
4.387	LEAVE	LIMS
4.388	LEAVE	TECHS
4.389	ASSEMBLE	64
4.39	LIQCOMB ASSEMBLE	3
4.391	COMBO 4 ASSEMBLE	6
4.392	ENDPRL4 ASSEMBLE	2
4.3925	depart	ipha4
4.994	NPR5 ADVANCE	60
4.995	SAVEVALUE	AHPI, 1
4.996	COMPAR1 ASSEMBLE	2
4.997	ASSEMBLE	2
4.999	UNLINK	BIGCHAIN, BEGIN, 1
5.0001	queue	israt
5.001	SEIZE	ESRAT
5.003	SAVEVALUE	ESRTI, 0
5.004	SPLIT	1, ESRT1
5.005	TEST E	X\$ESRTI, 1
5.0055	TEST E	F\$EMS, 0
5.0056	depart	israt
5.006	RELEASE	ESRAT
5.007	TRANSFER	, COMPAR6
5.008	ESRT1 ADVANCE	60
5.0081	queue	israt1
5.009	SPLIT	1, SR1ANAL
5.010	ADVANCE	30
5.011	ENTER	TECHS
5.012	SPLIT	68
5.013	QUEUE	MSM_S
5.014	MSMS_ ENTER	MSMS
5.015	DEPART	MSM_S
5.016	ADVANCE	5
5.017	LEAVE	MSMS
5.018	UNLINK	MYCHAIN51, TR51_, 1
5.019	ASSEMBLE	69
5.02	LEAVE	TECHS
5.021	TRANSFER	, ENDESRT1
5.022	SR1ANAL SPLIT	4, , ILAB51
5.023	ASSIGN	ILAB52, P\$ILAB51
5.024	TRANSFER	FN, LAB51
5.025	ICP51A SPLIT	31
5.026	ASSIGN	MYORD, RN1
5.027	LINK	MYCHAIN51, P\$MYORD
5.028	ICP51B ASSIGN	MYORD, RN1
5.03	LINK	MYCHAIN51, P\$MYORD
5.031	FIC51 ASSIGN	MYORD, RN1
5.033	LINK	MYCHAIN51, P\$MYORD
5.034	DEN51 SPLIT	2
5.035	ASSIGN	MYORD, RN1
5.036	LINK	MYCHAIN51, P\$MYORD
5.0362	SOL51 SPLIT	31

5.0364	ASSIGN	MYORD, RN1
5.0366	LINK	MYCHAIN51, P\$MYORD
5.037	TR51 TRANSFER	FN, LAB52
5.038	ICP52A ASSEMBLE	2
5.039	QUEUE	MSM_1
5.04	ENTER	MSM1
5.041	MSM1 ENTER	TECHS
5.042	DEPART	MSM_1
5.043	ADVANCE	20
5.044	LEAVE	MSM1
5.045	LEAVE	TECHS
5.046	QUEUE	FURNAD
5.048	FURND ENTER	FURND
5.049	DEPART	FURNAD
5.05	ADVANCE	240
5.051	LEAVE	FURND
5.053	QUEUE	MSM_1
5.054	ENTER	MSM1
5.055	MSM1 ENTER	TECHS
5.056	DEPART	MSM_1
5.057	ADVANCE	5
5.058	LEAVE	MSM1
5.059	LEAVE	TECHS
5.0592	COOL ADVANCE	10
5.06	QUEUE	MSM_1
5.061	ENTER	MSM1
5.062	MSM1 ENTER	TECHS
5.063	DEPART	MSM_1
5.064	ADVANCE	20
5.065	LEAVE	MSM1
5.066	LEAVE	TECHS
5.067	SPLIT	1
5.068	QUEUE	MSM_1
5.069	ENTER	MSM1
5.070	MSM1 ENTER	TECHS
5.071	DEPART	MSM_1
5.072	ADVANCE	20
5.073	LEAVE	MSM1
5.074	LEAVE	TECHS
5.075	QUEUE	FURNAF
5.076	FURNE ENTER	FURNE
5.077	DEPART	FURNAF
5.078	ADVANCE	20
5.079	LEAVE	FURNE
5.080	QUEUE	MSM_1
5.081	ENTER	MSM1
5.082	MSM1 ENTER	TECHS
5.083	DEPART	MSM_1
5.084	ADVANCE	5
5.085	LEAVE	MSM1
5.086	LEAVE	TECHS
5.087	SPLIT	1
5.088	COOL ADVANCE	10
5.089	QUEUE	MSM_1

5.090		ENTER	MSM1
5.091	MSM1_	ENTER	TECHS
5.092		DEPART	MSM_1
5.093		ADVANCE	10
5.094		LEAVE	MSM1
5.095		LEAVE	TECHS
5.096		QUEUE	HOT_P
5.097	HOT_	ENTER	HOT_P
5.098		DEPART	HOT_P
5.099		ADVANCE	2
5.100		LEAVE	HOT_P
5.101		QUEUE	MSM_1
5.102		ENTER	MSM1
5.103	MSM1_	ENTER	TECHS
5.104		DEPART	MSM_1
5.105		ADVANCE	10
5.106		LEAVE	MSM1
5.107		LEAVE	TECHS
5.108		ASSEMBLE	8
5.109		QUEUE	MSM_3
5.110		ENTER	MSM3
5.111	MSM3_	ENTER	TECHS
5.112		DEPART	MSM_3
5.113		ADVANCE	5
5.114		LEAVE	MSM3
5.115		LEAVE	TECHS
5.116		QUEUE	GLOVE
5.117		ENTER	GLOVEBOX
5.118	GLOV_	ENTER	TECHS
5.119		DEPART	GLOVE
5.120		ADVANCE	5
5.121		LEAVE	GLOVEBOX
5.1212		LEAVE	TECHS
5.1214		QUEUE	ICPES
5.122		ENTER	ICP
5.123	ICP_	ENTER	TECHS
5.124		DEPART	ICPES
5.125		ADVANCE	90
5.126		LEAVE	ICP
5.127		LEAVE	TECHS
5.128		QUEUE	LIM
5.129		ENTER	LIMS
5.13	LIMS_	ENTER	TECHS
5.131		DEPART	LIM
5.132		ADVANCE	15
5.133		LEAVE	LIMS
5.134		LEAVE	TECHS
5.1345		assemble	8
5.135		TRANSFER	,ESRATCOM
5.14	FIC52	QUEUE	MSM_2
5.141		ENTER	MSM2
5.142	MSM2_	ENTER	TECHS
5.143		DEPART	MSM_2
5.144		ADVANCE	10

5.145	LEAVE	MSM2
5.146	LEAVE	TECHS
5.147	QUEUE	MSM_3
5.148	ENTER	MSM3
5.149	MSM3_ ENTER	TECHS
5.15	DEPART	MSM_3
5.151	ADVANCE	5
5.152	LEAVE	MSM3
5.153	LEAVE	TECHS
5.154	QUEUE	GLOVE
5.155	ENTER	GLOVEBOX
5.156	GLOV ENTER	TECHS
5.157	DEPART	GLOVE
5.158	ADVANCE	5
5.159	LEAVE	GLOVEBOX
5.16	LEAVE	TECHS
5.161	QUEUE	I_C
5.162	ENTER	IC
5.163	IC_ ENTER	TECHS
5.164	DEPART	I_C
5.165	ADVANCE	60
5.166	LEAVE	IC
5.167	LEAVE	TECHS
5.168	QUEUE	LIM
5.169	ENTER	LIMS
5.17	LIMS_ ENTER	TECHS
5.171	DEPART	LIM
5.172	ADVANCE	15
5.173	LEAVE	LIMS
5.174	LEAVE	TECHS
5.176	TRANSFER	, ESRATCOM
5.177	DEN52 ASSEMBLE	3
5.178	SPLIT	1
5.179	QUEUE	MSM_1
5.18	ENTER	MSM1
5.181	MSM1_ ENTER	TECHS
5.182	DEPART	MSM_1
5.183	ADVANCE	10
5.184	LEAVE	MSM1
5.185	LEAVE	TECHS
5.186	SPLIT	1, NPH52
5.187	QUEUE	LIM
5.188	ENTER	LIMS
5.189	LIMS_ ENTER	TECHS
5.190	DEPART	LIM
5.191	ADVANCE	15
5.192	LEAVE	LIMS
5.193	LEAVE	TECHS
5.194	ASSEMBLE	2
5.195	TRANSFER	, DENC
5.196	NPH52 ASSEMBLE	2
5.197	QUEUE	MSM_1
5.198	ENTER	MSM1
5.199	MSM1_ ENTER	TECHS

5.200		DEPART	MSM_1
5.201		ADVANCE	20
5.202		LEAVE	MSM1
5.203		LEAVE	TECHS
5.204		QUEUE	MSM_3
5.205		ENTER	MSM3
5.206	MSM3_	ENTER	TECHS
5.207		DEPART	MSM_3
5.208		ADVANCE	25
5.209		LEAVE	MSM3
5.210		LEAVE	TECHS
5.211		QUEUE	LIM
5.212		ENTER	LIMS
5.213	LIMS_	ENTER	TECHS
5.214		DEPART	LIM
5.215		ADVANCE	15
5.216		LEAVE	LIMS
5.217		LEAVE	TECHS
5.218	DENC	ASSEMBLE	2
5.219		TRANSFER	,ESRATCOM
5.220	SOL52	SPLIT	1
5.221		QUEUE	MSM_1
5.222		ENTER	MSM1
5.223	MSM1_	ENTER	TECHS
5.224		DEPART	MSM_1
5.225		ADVANCE	5
5.226		LEAVE	MSM1
5.227		LEAVE	TECHS
5.228		QUEUE	AV_C
5.229	AVC_	ENTER	AVC
5.230		DEPART	AV_C
5.231		ADVANCE	5
5.232		LEAVE	AVC
5.233		QUEUE	LIM
5.234		ENTER	LIMS
5.235	LIMS_	ENTER	TECHS
5.236		DEPART	LIM
5.237		ADVANCE	15
5.238		LEAVE	LIMS
5.239		LEAVE	TECHS
5.240		ASSEMBLE	64
5.241		TRANSFER	,ESRATCOM
5.242	ICP52B	QUEUE	MSM_1
5.243		ENTER	MSM1
5.244	MSM1_	ENTER	TECHS
5.245		DEPART	MSM_1
5.246		ADVANCE	20
5.247		LEAVE	MSM1
5.248		LEAVE	TECHS
5.249		QUEUE	MSM_3
5.250		ENTER	MSM3
5.251	MSM3_	ENTER	TECHS
5.252		DEPART	MSM_3
5.253		ADVANCE	5

5.254	LEAVE	MSM3
5.255	LEAVE	TECHS
5.256	QUEUE	GLOVE
5.257	ENTER	GLOVEBOX
5.258	GLOV_ ENTER	TECHS
5.259	DEPART	GLOVE
5.260	ADVANCE	5
5.261	LEAVE	GLOVEBOX
5.262	LEAVE	TECHS
5.263	QUEUE	ICPES
5.264	ENTER	ICP
5.265	ICP_ ENTER	TECHS
5.266	DEPART	ICPES
5.267	ADVANCE	30
5.268	LEAVE	ICP
5.269	LEAVE	TECHS
5.270	QUEUE	LIM
5.271	ENTER	LIMS
5.272	LIMS_ ENTER	TECHS
5.273	DEPART	LIM
5.274	ADVANCE	15
5.275	LEAVE	LIMS
5.276	LEAVE	TECHS
5.277	ESRATCOM ASSEMBLE	5
5.998	ENDES RAT1 ASSEMBLE	2
5.9982	depart	israt1
5.999	ESRT2 ADVANCE	2058
6.0272	queue	israt2
6.028	SPLIT	1, SR2ANAL
6.029	ADVANCE	30
6.030	ENTER	TECHS
6.031	SPLIT	67
6.032	QUEUE	MSM_S
6.033	MSMS_ ENTER	MSMS
6.034	DEPART	MSM_S
6.035	ADVANCE	5
6.036	LEAVE	MSMS
6.037	UNLINK	MYCHAIN61, TR61_, 1
6.038	ASSEMBLE	68
6.039	LEAVE	TECHS
6.040	TRANSFER	, ENDES RAT2
6.041	SR2ANAL SPLIT	3, , ILAB61
6.042	ASSIGN	ILAB62, P\$ILAB61
6.043	TRANSFER	FN, LAB61
6.044	ICP61A SPLIT	31
6.045	ASSIGN	MYORD, RN1
6.046	LINK	MYCHAIN61, P\$MYORD
6.047	ICP61B ASSIGN	MYORD, RN1
6.048	LINK	MYCHAIN61, P\$MYORD
6.049	DEN61 SPLIT	2
6.050	ASSIGN	MYORD, RN1
6.051	LINK	MYCHAIN61, P\$MYORD
6.052	SOL61 SPLIT	31
6.053	ASSIGN	MYORD, RN1

6.054	LINK	MYCHAIN61,P\$MYORD
6.055	TR61 TRANSFER	FN, LAB62
6.056	ICP62A ASSEMBLE	2
6.057	QUEUE	MSM_1
6.058	ENTER	MSM1
6.059	MSM1 ENTER	TECHS
6.060	DEPART	MSM_1
6.061	ADVANCE	20
6.062	LEAVE	MSM1
6.063	LEAVE	TECHS
6.064	QUEUE	FURNAD
6.065	FURND ENTER	FURND
6.066	DEPART	FURNAD
6.067	ADVANCE	240
6.068	LEAVE	FURND
6.069	QUEUE	MSM_1
6.070	ENTER	MSM1
6.071	MSM1 ENTER	TECHS
6.072	DEPART	MSM_1
6.073	ADVANCE	5
6.074	LEAVE	MSM1
6.075	LEAVE	TECHS
6.076	COOL ADVANCE	10
6.077	QUEUE	MSM_1
6.078	ENTER	MSM1
6.079	MSM1 ENTER	TECHS
6.080	DEPART	MSM_1
6.081	ADVANCE	20
6.082	LEAVE	MSM1
6.083	LEAVE	TECHS
6.084	SPLIT	1
6.085	QUEUE	MSM_1
6.086	ENTER	MSM1
6.087	MSM1 ENTER	TECHS
6.088	DEPART	MSM_1
6.089	ADVANCE	20
6.09	LEAVE	MSM1
6.091	LEAVE	TECHS
6.092	QUEUE	FURNAF
6.094	FURNF ENTER	FURNF
6.095	DEPART	FURNAF
6.096	ADVANCE	20
6.097	LEAVE	FURNF
6.099	QUEUE	MSM_1
6.1	ENTER	MSM1
6.101	MSM1 ENTER	TECHS
6.102	DEPART	MSM_1
6.103	ADVANCE	5
6.104	LEAVE	MSM1
6.105	LEAVE	TECHS
6.106	SPLIT	1
6.107	COOL ADVANCE	10
6.108	QUEUE	MSM_1
6.109	ENTER	MSM1

6.11	MSM1_	ENTER	TECHS
6.111		DEPART	MSM_1
6.112		ADVANCE	10
6.113		LEAVE	MSM1
6.114		LEAVE	TECHS
6.115		QUEUE	HOT_P
6.117	HOT_	ENTER	HOT_P
6.118		DEPART	HOT_P
6.119		ADVANCE	2
6.12		LEAVE	HOT_P
6.122		QUEUE	MSM_1
6.123		ENTER	MSM1
6.124	MSM1_	ENTER	TECHS
6.125		DEPART	MSM_1
6.126		ADVANCE	10
6.127		LEAVE	MSM1
6.128		LEAVE	TECHS
6.129		ASSEMBLE	8
6.13		QUEUE	MSM_3
6.131		ENTER	MSM3
6.132	MSM3_	ENTER	TECHS
6.133		DEPART	MSM_3
6.134		ADVANCE	5
6.135		LEAVE	MSM3
6.136		LEAVE	TECHS
6.137		QUEUE	GLOVE
6.138		ENTER	GLOVEBOX
6.139	GLOV_	ENTER	TECHS
6.14		DEPART	GLOVE
6.141		ADVANCE	5
6.142		LEAVE	GLOVEBOX
6.143		LEAVE	TECHS
6.144		QUEUE	ICPES
6.145		ENTER	ICP
6.146	ICP_	ENTER	TECHS
6.147		DEPART	ICPES
6.148		ADVANCE	90
6.149		LEAVE	ICP
6.15		LEAVE	TECHS
6.151		QUEUE	LIM
6.152		ENTER	LIMS
6.153	LIMS_	ENTER	TECHS
6.154		DEPART	LIM
6.155		ADVANCE	15
6.156		LEAVE	LIMS
6.157		LEAVE	TECHS
6.158		assemble	8
6.159		TRANSFER	,SR2COM
6.16	DEN62	ASSEMBLE	3
6.161		SPLIT	1
6.162		QUEUE	MSM_1
6.163		ENTER	MSM1
6.164	MSM1_	ENTER	TECHS
6.165		DEPART	MSM_1

6.166		ADVANCE	10
6.167		LEAVE	MSM1
6.168		LEAVE	TECHS
6.169		SPLIT	1,NPH62
6.170		QUEUE	LIM
6.171		ENTER	LIMS
6.172	LIMS_	ENTER	TECHS
6.173		DEPART	LIM
6.174		ADVANCE	15
6.175		LEAVE	LIMS
6.176		LEAVE	TECHS
6.177		ASSEMBLE	2
6.178		TRANSFER	,DENC6
6.179	NPH62	ASSEMBLE	2
6.180		QUEUE	MSM_1
6.181		ENTER	MSM1
6.182	MSM1_	ENTER	TECHS
6.183		DEPART	MSM_1
6.184		ADVANCE	20
6.185		LEAVE	MSM1
6.186		LEAVE	TECHS
6.187		QUEUE	MSM_3
6.188		ENTER	MSM3
6.189	MSM3_	ENTER	TECHS
6.190		DEPART	MSM_3
6.191		ADVANCE	25
6.192		LEAVE	MSM3
6.193		LEAVE	TECHS
6.194		QUEUE	LIM
6.195		ENTER	LIMS
6.196	LIMS_	ENTER	TECHS
6.197		DEPART	LIM
6.198		ADVANCE	15
6.199		LEAVE	LIMS
6.200		LEAVE	TECHS
6.201	DENC6	ASSEMBLE	2
6.202		TRANSFER	,SR2COM
6.203	SOL62	SPLIT	1
6.204		QUEUE	MSM_1
6.205		ENTER	MSM1
6.206	MSM1_	ENTER	TECHS
6.207		DEPART	MSM_1
6.208		ADVANCE	5
6.209		LEAVE	MSM1
6.210		LEAVE	TECHS
6.211		QUEUE	AV_C
6.212	AVC_	ENTER	AVC
6.213		DEPART	AV_C
6.214		ADVANCE	5
6.215		LEAVE	AVC
6.216		QUEUE	LIM
6.217		ENTER	LIMS
6.218	LIMS_	ENTER	TECHS
6.219		DEPART	LIM

6.220	ADVANCE	15
6.221	LEAVE	LIMS
6.222	LEAVE	TECHS
6.223	ASSEMBLE	64
6.224	TRANSFER	,SR2COM
6.225	ICP62B QUEUE	MSM 1
6.226	ENTER	MSM1
6.227	MSM1_ ENTER	TECHS
6.228	DEPART	MSM_1
6.229	ADVANCE	20
6.230	LEAVE	MSM1
6.231	LEAVE	TECHS
6.232	QUEUE	MSM 1
6.233	ENTER	MSM3
6.234	MSM3_ ENTER	TECHS
6.235	DEPART	MSM_1
6.236	ADVANCE	5
6.237	LEAVE	MSM3
6.238	LEAVE	TECHS
6.239	QUEUE	GLOVE
6.240	ENTER	GLOVEBOX
6.241	GLOV_ ENTER	TECHS
6.242	DEPART	GLOVE
6.243	ADVANCE	5
6.244	LEAVE	GLOVEBOX
6.245	LEAVE	TECHS
6.246	QUEUE	ICPES
6.247	ENTER	ICP
6.248	ICP_ ENTER	TECHS
6.249	DEPART	ICPES
6.250	ADVANCE	30
6.251	LEAVE	ICP
6.252	LEAVE	TECHS
6.253	QUEUE	LIM
6.254	ENTER	LIMS
6.255	LIMS_ ENTER	TECHS
6.256	DEPART	LIM
6.257	ADVANCE	15
6.258	LEAVE	LIMS
6.259	LEAVE	TECHS
6.260	SR2COM ASSEMBLE	4
6.261	ENDESRAT2 ASSEMBLE	2
6.2612	depart israt2	
6.9	ESRT3 ADVANCE	60
6.901	SAVEVALUE	ESRTI,1
6.902	COMPAR6 ASSEMBLE	2
7.0001	queue	isme
7.001	SEIZE	EMS
7.003	SAVEVALUE	EMSI,0
7.004	SPLIT	1,EMSP1
7.005	TEST E	X\$EMSI,1
7.0055	TEST E	F\$MFT,0
7.0056	depart	isme
7.006	RELEASE	EMS

7.007	TRANSFER	, COMPAR7
7.009	EMSP1 ADVANCE	2880
7.0091	queue	ismel
7.012	SPLIT	1, EMSANAL
7.0122	ADVANCE	30
7.0125	ENTER	TECHS
7.013	SPLIT	163
7.014	QUEUE	MSM_S
7.016	MSMS_ ENTER	MSMS
7.017	DEPART	MSM_S
7.018	ADVANCE	5
7.019	LEAVE	MSMS
7.021	UNLINK	MYCHAIN7, TR7_, 1
7.022	ASSEMBLE	164
7.0225	LEAVE	TECHS
7.023	TRANSFER	, ENDEMS
7.024	EMSANAL SPLIT	3,, EMSL1
7.025	ASSIGN	EMSL2, P\$EMSL1
7.026	TRANSFER	FN, EMSLAB1
7.027	ICP71 SPLIT	127
7.028	ASSIGN	MYORD, RN1
7.029	LINK	MYCHAIN7, P\$MYORD
7.03	LIQ71 ASSIGN	MYORD, RN1
7.032	LINK	MYCHAIN7, P\$MYORD
7.033	DEN71 SPLIT	2
7.034	ASSIGN	MYORD, RN1
7.035	LINK	MYCHAIN7, P\$MYORD
7.0352	SOL71 SPLIT	31
7.0354	ASSIGN	MYORD, RN1
7.0356	LINK	MYCHAIN7, P\$MYORD
7.036	TR7 TRANSFER	FN, EMSLAB2
7.037	ICP72 ASSEMBLE	4
7.0372	QUEUE	MSM_1
7.0374	ENTER	MSM1
7.0376	MSM1_ ENTER	TECHS
7.0378	DEPART	MSM_1
7.0400	ADVANCE	10
7.0402	LEAVE	MSM1
7.0404	LEAVE	TECHS
7.0406	ASSEMBLE	2
7.0408	QUEUE	MSM_1
7.0410	ENTER	MSM1
7.0412	MSM1_ ENTER	TECHS
7.0414	DEPART	MSM_1
7.042	ADVANCE	5
7.043	LEAVE	MSM1
7.044	LEAVE	TECHS
7.045	QUEUE	FURNAD
7.047	FURND_ ENTER	FURND
7.048	DEPART	FURNAD
7.049	ADVANCE	240
7.05	LEAVE	FURND
7.052	QUEUE	MSM_1
7.053	ENTER	MSM1

7.054	MSM1_	ENTER	TECHS
7.055		DEPART	MSM_1
7.056		ADVANCE	10
7.057		LEAVE	MSM1
7.058		LEAVE	TECHS
7.059		QUEUE	MSM_1
7.06		ENTER	MSM1
7.061	MSM1_	ENTER	TECHS
7.062		DEPART	MSM_1
7.063		ADVANCE	5
7.064		LEAVE	MSM1
7.065		LEAVE	TECHS
7.066		QUEUE	FURNAV
7.068	FURNV_	ENTER	FURNV
7.069		DEPART	FURNAV
7.07		ADVANCE	240
7.071		LEAVE	FURNV
7.073		QUEUE	MSM_1
7.074		ENTER	MSM1
7.075	MSM1_	ENTER	TECHS
7.076		DEPART	MSM_1
7.077		ADVANCE	10
7.078		LEAVE	MSM1
7.079		LEAVE	TECHS
7.08	COOL	ADVANCE	30
7.081		SPLIT	1
7.082		QUEUE	MSM_1
7.083		ENTER	MSM1
7.084	MSM1_	ENTER	TECHS
7.085		DEPART	MSM_1
7.086		ADVANCE	10
7.087		LEAVE	MSM1
7.088		LEAVE	TECHS
7.089		QUEUE	GRIN
7.091	GRIN_	ENTER	GRINDER
7.092		DEPART	GRIN
7.093		ADVANCE	15
7.094		LEAVE	GRINDER
7.096		QUEUE	MSM_1
7.097		ENTER	MSM1
7.098	MSM1_	ENTER	TECHS
7.099		DEPART	MSM_1
7.1		ADVANCE	10
7.101		LEAVE	MSM1
7.102		LEAVE	TECHS
7.103		SPLIT	1, FUS
7.104		ASSEMBLE	4
7.105	CEM1	QUEUE	MSM_2
7.106		ENTER	MSM2
7.107	MSM2_	ENTER	TECHS
7.108		DEPART	MSM_2
7.109		ADVANCE	50
7.11		LEAVE	MSM2
7.111		LEAVE	TECHS

7.112		QUEUE	CEMR
7.114	CEM_	ENTER	CEM
7.115		DEPART	CEMR
7.116		ADVANCE	12
7.117		LEAVE	CEM
7.119		QUEUE	MSM_2
7.12		ENTER	MSM2
7.121	MSM2_	ENTER	TECHS
7.122		DEPART	MSM_2
7.123		ADVANCE	5
7.124		LEAVE	MSM2
7.125		LEAVE	TECHS
7.126	COOL	ADVANCE	20
7.127		QUEUE	MSM_2
7.128		ENTER	MSM2
7.129	MSM2_	ENTER	TECHS
7.13		DEPART	MSM_2
7.131		ADVANCE	60
7.132		LEAVE	MSM2
7.133		LEAVE	TECHS
7.134		QUEUE	CEMR
7.136	CEM_	ENTER	CEM
7.137		DEPART	CEMR
7.138		ADVANCE	5
7.139		LEAVE	CEM
7.141		QUEUE	MSM_2
7.142		ENTER	MSM2
7.143	MSM2_	ENTER	TECHS
7.144		DEPART	MSM_2
7.145		ADVANCE	5
7.146		LEAVE	MSM2
7.147		LEAVE	TECHS
7.148	COOL	ADVANCE	20
7.149		QUEUE	MSM_2
7.15		ENTER	MSM2
7.151	MSM2_	ENTER	TECHS
7.152		DEPART	MSM_2
7.153		ADVANCE	60
7.154		LEAVE	MSM2
7.155		LEAVE	TECHS
7.156		QUEUE	CEMR
7.158	CEM_	ENTER	CEM
7.159		DEPART	CEMR
7.16		ADVANCE	5
7.161		LEAVE	CEM
7.163		QUEUE	MSM_2
7.164		ENTER	MSM2
7.165	MSM2_	ENTER	TECHS
7.166		DEPART	MSM_2
7.167		ADVANCE	5
7.168		LEAVE	MSM2
7.169		LEAVE	TECHS
7.17	COOL	ADVANCE	20
7.171		QUEUE	MSM_2

7.172		ENTER	MSM2
7.173	MSM2_	ENTER	TECHS
7.174		DEPART	MSM_2
7.175		ADVANCE	100_
7.176		LEAVE	MSM2
7.177		LEAVE	TECHS
7.178		QUEUE	MSM_3
7.179		ENTER	MSM3
7.18	MSM3_	ENTER	TECHS
7.181		DEPART	MSM_3
7.182		ADVANCE	5
7.183		LEAVE	MSM3
7.184		LEAVE	TECHS
7.185		QUEUE	GLOVE
7.186		ENTER	GLOVEBOX
7.187	GLOV	ENTER	TECHS
7.188		DEPART	GLOVE
7.189		ADVANCE	5
7.19		LEAVE	GLOVEBOX
7.191		LEAVE	TECHS
7.192		QUEUE	ICPES
7.193		ENTER	ICP
7.194	ICP_	ENTER	TECHS
7.195		DEPART	ICPES
7.196		ADVANCE	140
7.197		LEAVE	ICP
7.198		LEAVE	TECHS
7.199		QUEUE	LIM
7.2		ENTER	LIMS
7.201	LIMS_	ENTER	TECHS
7.202		DEPART	LIM
7.203		ADVANCE	15
7.204		LEAVE	LIMS
7.205		LEAVE	TECHS
7.206		assemble	8
7.207		TRANSFER	,BIGCOMBO
7.208	FUS	SPLIT	1,FE23
7.2082		SPLIT	4
7.209		ASSEMBLE	4
7.21		QUEUE	MSM_1
7.211		ENTER	MSM1
7.212	MSM1_	ENTER	TECHS
7.213		DEPART	MSM_1
7.214		ADVANCE	20
7.215		LEAVE	MSM1
7.216		LEAVE	TECHS
7.217		QUEUE	FURNAF
7.219	FURNE_	ENTER	FURNF
7.22		DEPART	FURNAF
7.221		ADVANCE	20
7.222		LEAVE	FURNF
7.224		QUEUE	MSM_1
7.225		ENTER	MSM1
7.226	MSM1_	ENTER	TECHS

7.227		DEPART	MSM_1
7.228		ADVANCE	5
7.229		LEAVE	MSM1
7.23		LEAVE	TECHS
7.231		SPLIT	1
7.232	COOL	ADVANCE	10
7.233		QUEUE	MSM_1
7.234		ENTER	MSM1
7.235	MSM1_	ENTER	TECHS
7.236		DEPART	MSM_1
7.237		ADVANCE	10
7.238		LEAVE	MSM1
7.239		LEAVE	TECHS
7.24		QUEUE	HOT_P
7.242	HOT_	ENTER	HOTP
7.243		DEPART	HOT_P
7.244		ADVANCE	2
7.245		LEAVE	HOTP
7.247		QUEUE	MSM_1
7.248		ENTER	MSM1
7.249	MSM1_	ENTER	TECHS
7.25		DEPART	MSM_1
7.251		ADVANCE	10
7.252		LEAVE	MSM1
7.253		LEAVE	TECHS
7.254		ASSEMBLE	10
7.255		QUEUE	MSM_3
7.256		ENTER	MSM3
7.257	MSM3_	ENTER	TECHS
7.258		DEPART	MSM_3
7.259		ADVANCE	5
7.26		LEAVE	MSM3
7.261		LEAVE	TECHS
7.262	FUS1	QUEUE	GLOVE
7.263		ENTER	GLOVEBOX
7.264	GLOV_	ENTER	TECHS
7.265		DEPART	GLOVE
7.266		ADVANCE	5
7.267		LEAVE	GLOVEBOX
7.268		LEAVE	TECHS
7.269		QUEUE	ICPES
7.27		ENTER	ICP
7.271	ICP_	ENTER	TECHS
7.272		DEPART	ICPES
7.273		ADVANCE	140
7.274		LEAVE	ICP
7.275		LEAVE	TECHS
7.276		QUEUE	LIM
7.277		ENTER	LIMS
7.278	LIMS_	ENTER	TECHS
7.279		DEPART	LIM
7.28		ADVANCE	15
7.281		LEAVE	LIMS
7.282		LEAVE	TECHS

7.283	assemble	8
7.284	TRANSFER	,BIGCOMBO
7.285 FE23	SPLIT	1
7.2852	SPLIT	4
7.2854	ASSEMBLE	4
7.286	QUEUE	MSM_3
7.287	ENTER	MSM3
7.288 MSM3_	ENTER	TECHS
7.289	DEPART	MSM_3
7.29	ADVANCE	5
7.291	LEAVE	MSM3
7.292	LEAVE	TECHS
7.293	QUEUE	UV_VIS
7.295 UVVIS_	ENTER	UVVIS
7.296	DEPART	UV_VIS
7.297	ADVANCE	10
7.298	LEAVE	UVVIS
7.3	QUEUE	MSM_3
7.301	ENTER	MSM3
7.302 MSM3_	ENTER	TECHS
7.303	DEPART	MSM_3
7.304	ADVANCE	10
7.305	LEAVE	MSM3
7.306	LEAVE	TECHS
7.307	QUEUE	LIM
7.308	ENTER	LIMS
7.309 LIMS_	ENTER	TECHS
7.31	DEPART	LIM
7.311	ADVANCE	15
7.312	LEAVE	LIMS
7.313	LEAVE	TECHS
7.314	ASSEMBLE	80
7.315 BIGCOMBO	ASSEMBLE	3
7.316	TRANSFER	,RECOMBO
7.317 LIQ72	SPLIT	1,FIC7
7.319 TOC7	SPLIT	1
7.325	QUEUE	MSM_2
7.326	ENTER	MSM2
7.327 MSM2_	ENTER	TECHS
7.328	DEPART	MSM_2
7.329	ADVANCE	5
7.33	LEAVE	MSM2
7.331	LEAVE	TECHS
7.332	QUEUE	MSM_3
7.333	ENTER	MSM3
7.334 MSM3_	ENTER	TECHS
7.335	DEPART	MSM_3
7.336	ADVANCE	5
7.337	LEAVE	MSM3
7.338	LEAVE	TECHS
7.339	QUEUE	GLOVE
7.34	ENTER	GLOVEBOX
7.341 GLOV	ENTER	TECHS
7.342	DEPART	GLOVE

7.343		ADVANCE	5
7.344		LEAVE	GLOVEBOX
7.345		LEAVE	TECHS
7.346		QUEUE	TIC_TOC
7.347		ENTER	TICTOC
7.348	TIC	ENTER	TECHS
7.349		DEPART	TIC_TOC
7.35		ADVANCE	10
7.351		LEAVE	TICTOC
7.352		LEAVE	TECHS
7.353		QUEUE	LIM
7.354		ENTER	LIMS
7.355	LIMS_	ENTER	TECHS
7.356		DEPART	LIM
7.357		ADVANCE	15
7.358		LEAVE	LIMS
7.359		LEAVE	TECHS
7.36		ASSEMBLE	2
7.362		TRANSFER	, LCOM
7.363	FIC7	QUEUE	MSM_2
7.371		ENTER	MSM2
7.372	MSM2_	ENTER	TECHS
7.373		DEPART	MSM_2
7.374		ADVANCE	10
7.375		LEAVE	MSM2
7.376		LEAVE	TECHS
7.377		QUEUE	MSM_3
7.378		ENTER	MSM3
7.379	MSM3_	ENTER	TECHS
7.38		DEPART	MSM_3
7.381		ADVANCE	5
7.382		LEAVE	MSM3
7.383		LEAVE	TECHS
7.384		QUEUE	GLOVE
7.385		ENTER	GLOVEBOX
7.386	GLOV	ENTER	TECHS
7.387		DEPART	GLOVE
7.388		ADVANCE	5
7.389		LEAVE	GLOVEBOX
7.39		LEAVE	TECHS
7.391		QUEUE	I_C
7.392		ENTER	IC
7.393	IC_	ENTER	TECHS
7.394		DEPART	I_C
7.395		ADVANCE	60
7.396		LEAVE	IC
7.397		LEAVE	TECHS
7.398		QUEUE	LIM
7.399		ENTER	LIMS
7.4	LIMS_	ENTER	TECHS
7.401		DEPART	LIM
7.402		ADVANCE	15
7.403		LEAVE	LIMS
7.404		LEAVE	TECHS

7.407		TRANSFER	, LCOM
7.408	DEN72	ASSEMBLE	3
7.409		SPLIT	1
7.41		QUEUE	MSM_1
7.411		ENTER	MSM1
7.412	MSM1_	ENTER	TECHS
7.413		DEPART	MSM_1
7.414		ADVANCE	10
7.415		LEAVE	MSM1
7.416		LEAVE	TECHS
7.417		SPLIT	1, NPH7
7.418		QUEUE	LIM
7.419		ENTER	LIMS
7.420	LIMS_	ENTER	TECHS
7.421		DEPART	LIM
7.422		ADVANCE	15
7.423		LEAVE	LIMS
7.424		LEAVE	TECHS
7.425		ASSEMBLE	2
7.426		TRANSFER	, DENC7
7.427	NPH7	ASSEMBLE	2
7.4272		QUEUE	MSM_1
7.4274		ENTER	MSM1
7.4276	MSM1_	ENTER	TECHS
7.4278		DEPART	MSM_1
7.4280		ADVANCE	20
7.4282		LEAVE	MSM1
7.4284		LEAVE	TECHS
7.4286		QUEUE	MSM_3
7.4290		ENTER	MSM3
7.4292	MSM3_	ENTER	TECHS
7.4294		DEPART	MSM_3
7.4296		ADVANCE	25
7.4298		LEAVE	MSM3
7.4300		LEAVE	TECHS
7.4302		QUEUE	LIM
7.4304		ENTER	LIMS
7.4306	LIMS_	ENTER	TECHS
7.4308		DEPART	LIM
7.4310		ADVANCE	15
7.4312		LEAVE	LIMS
7.4314		LEAVE	TECHS
7.4316	DENC7	ASSEMBLE	2
7.4318		TRANSFER	, LCOM
7.433	SOL72	SPLIT	1
7.434		QUEUE	MSM_1
7.435		ENTER	MSM1
7.436	MSM1_	ENTER	TECHS
7.437		DEPART	MSM_1
7.438		ADVANCE	5
7.439		LEAVE	MSM1
7.44		LEAVE	TECHS
7.441		QUEUE	AV_C
7.443	AVC_	ENTER	AVC

7.444	DEPART	AV_C
7.445	ADVANCE	5
7.446	LEAVE	AVC
7.448	QUEUE	LIM
7.449	ENTER	LIMS
7.45 LIMS_	ENTER	TECHS
7.451	DEPART	LIM
7.452	ADVANCE	15
7.453	LEAVE	LIMS
7.454	LEAVE	TECHS
7.455	ASSEMBLE	64
7.456 LCOM	ASSEMBLE	4
7.457 RECOMBO	ASSEMBLE	2
7.458 ENDEMS	ASSEMBLE	2
7.4581	depart	ismel
7.9 EMSP2	ADVANCE	60
7.901	SAVEVALUE	EMSI, 1
7.902 COMPAR7	ASSEMBLE	2
8.0001	queue	imft
8.001	SEIZE	MFT
8.003	SAVEVALUE	MFTI, 0
8.004	SPLIT	1, MF1
8.0045 MFTP1	ADVANCE	5160
8.005	TEST E	X\$MFTI, 1
8.0055	depart	imft
8.006	RELEASE	MFT
8.007	TRANSFER	, COMPAR8
8.009 MF1	ADVANCE	120
8.0091	queue	imft1
8.01	SAVEVALUE	IN8, 0
8.012	SPLIT	1, MFTANAL
8.0122	ADVANCE	30
8.0125	ENTER	TECHS
8.013	SPLIT	162
8.014	QUEUE	MSM_S
8.016 MSMS_	ENTER	MSMS
8.017	DEPART	MSM_S
8.018	ADVANCE	5
8.019	LEAVE	MSMS
8.021	UNLINK	MYCHAIN8, TR8_, 1
8.022	ASSEMBLE	163
8.0225	LEAVE	TECHS
8.023	TRANSFER	, ENDMFT
8.024 MFTANAL	SPLIT	2, , MFTL1
8.025	ASSIGN	MFTL2, P\$MFTL1
8.026	TRANSFER	FN, MFTLAB1
8.027 ICP81	SPLIT	127
8.028	ASSIGN	MYORD, RN1
8.029	LINK	MYCHAIN8, P\$MYORD
8.03 SOL81	SPLIT	31
8.031	ASSIGN	MYORD, RN1
8.032	LINK	MYCHAIN8, P\$MYORD
8.033 DEN81	SPLIT	2
8.034	ASSIGN	MYORD, RN1

8.035	LINK	MYCHAIN8,P\$MYORD
8.036	TR8 TRANSFER	FN,MFTLAB2
8.037	ICP82 ASSEMBLE	4
8.0372	QUEUE	MSM_1
8.0374	ENTER	MSM1
8.0376	MSM1 ENTER	TECHS
8.0378	DEPART	MSM_1
8.0400	ADVANCE	10
8.0402	LEAVE	MSM1
8.0404	LEAVE	TECHS
8.0406	ASSEMBLE	2
8.0408	QUEUE	MSM_1
8.0410	ENTER	MSM1
8.0412	MSM1 ENTER	TECHS
8.0414	DEPART	MSM_1
8.042	ADVANCE	5
8.043	LEAVE	MSM1
8.044	LEAVE	TECHS
8.045	QUEUE	FURNAD
8.047	FURND ENTER	FURND
8.048	DEPART	FURNAD
8.049	ADVANCE	240
8.05	LEAVE	FURND
8.052	QUEUE	MSM_1
8.053	ENTER	MSM1
8.054	MSM1 ENTER	TECHS
8.055	DEPART	MSM_1
8.056	ADVANCE	10
8.057	LEAVE	MSM1
8.058	LEAVE	TECHS
8.059	QUEUE	MSM_1
8.06	ENTER	MSM1
8.061	MSM1 ENTER	TECHS
8.062	DEPART	MSM_1
8.063	ADVANCE	5
8.064	LEAVE	MSM1
8.065	LEAVE	TECHS
8.066	QUEUE	FURNAV
8.068	FURNV ENTER	FURNV
8.069	DEPART	FURNAV
8.07	ADVANCE	240
8.071	LEAVE	FURNV
8.073	QUEUE	MSM_1
8.074	ENTER	MSM1
8.075	MSM1 ENTER	TECHS
8.076	DEPART	MSM_1
8.077	ADVANCE	10
8.078	LEAVE	MSM1
8.079	LEAVE	TECHS
8.08	COOL ADVANCE	30
8.081	SPLIT	1
8.082	QUEUE	MSM_1
8.083	ENTER	MSM1
8.084	MSM1 ENTER	TECHS

8.085		DEPART	MSM_1
8.086		ADVANCE	10
8.087		LEAVE	MSM1
8.088		LEAVE	TECHS
8.089		QUEUE	GRIN
8.091	GRIN_	ENTER	GRINDER
8.092		DEPART	GRIN
8.093		ADVANCE	15
8.094		LEAVE	GRINDER
8.096		QUEUE	MSM_1
8.097		ENTER	MSM1
8.098	MSM1_	ENTER	TECHS
8.099		DEPART	MSM_1
8.1		ADVANCE	10
8.101		LEAVE	MSM1
8.102		LEAVE	TECHS
8.103		SPLIT	1,FUS8
8.104		ASSEMBLE	4
8.105	CEM1	QUEUE	MSM_2
8.106		ENTER	MSM2
8.107	MSM2_	ENTER	TECHS
8.108		DEPART	MSM_2
8.109		ADVANCE	50
8.11		LEAVE	MSM2
8.111		LEAVE	TECHS
8.112		QUEUE	CEMR
8.114	CEM_	ENTER	CEM
8.115		DEPART	CEMR
8.116		ADVANCE	12
8.117		LEAVE	CEM
8.119		QUEUE	MSM_2
8.12		ENTER	MSM2
8.121	MSM2_	ENTER	TECHS
8.122		DEPART	MSM_2
8.123		ADVANCE	5
8.124		LEAVE	MSM2
8.125		LEAVE	TECHS
8.126	COOL	ADVANCE	20
8.127		QUEUE	MSM_2
8.128		ENTER	MSM2
8.129	MSM2_	ENTER	TECHS
8.13		DEPART	MSM_2
8.131		ADVANCE	60
8.132		LEAVE	MSM2
8.133		LEAVE	TECHS
8.134		QUEUE	CEMR
8.136	CEM_	ENTER	CEM
8.137		DEPART	CEMR
8.138		ADVANCE	5
8.139		LEAVE	CEM
8.141		QUEUE	MSM_2
8.142		ENTER	MSM2
8.143	MSM2_	ENTER	TECHS
8.144		DEPART	MSM_2

8.145	ADVANCE	5
8.146	LEAVE	MSM2
8.147	LEAVE	TECHS
8.148	COOL ADVANCE	20
8.149	QUEUE	MSM_2
8.15	ENTER	MSM2
8.151	MSM2_ ENTER	TECHS
8.152	DEPART	MSM_2
8.153	ADVANCE	60
8.154	LEAVE	MSM2
8.155	LEAVE	TECHS
8.156	QUEUE	CEMR
8.158	CEM_ ENTER	CEM
8.159	DEPART	CEMR
8.16	ADVANCE	5
8.161	LEAVE	CEM
8.163	QUEUE	MSM_2
8.164	ENTER	MSM2
8.165	MSM2_ ENTER	TECHS
8.166	DEPART	MSM_2
8.167	ADVANCE	5
8.168	LEAVE	MSM2
8.169	LEAVE	TECHS
8.17	COOL ADVANCE	20
8.171	QUEUE	MSM_2
8.172	ENTER	MSM2
8.173	MSM2_ ENTER	TECHS
8.174	DEPART	MSM_2
8.175	ADVANCE	100
8.176	LEAVE	MSM2
8.177	LEAVE	TECHS
8.178	QUEUE	MSM_3
8.179	ENTER	MSM3
8.18	MSM3_ ENTER	TECHS
8.181	DEPART	MSM_3
8.182	ADVANCE	5
8.183	LEAVE	MSM3
8.184	LEAVE	TECHS
8.185	QUEUE	GLOVE
8.186	ENTER	GLOVEBOX
8.187	GLOV ENTER	TECHS
8.188	DEPART	GLOVE
8.189	ADVANCE	5
8.19	LEAVE	GLOVEBOX
8.191	LEAVE	TECHS
8.192	QUEUE	ICPES
8.193	ENTER	ICP
8.194	ICP_ ENTER	TECHS
8.195	DEPART	ICPES
8.196	ADVANCE	140
8.197	LEAVE	ICP
8.198	LEAVE	TECHS
8.199	QUEUE	LIM
9.2	ENTER	LIMS

8.201	LIMS_	ENTER	TECHS
8.202		DEPART	LIM
8.203		ADVANCE	15
8.204		LEAVE	LIMS
8.205		LEAVE	TECHS
8.206		assemble	8
8.207		TRANSFER	,BIGC8
8.208	FUS8	SPLIT	1,FE238
8.2082		SPLIT	4
8.209		ASSEMBLE	4
8.21		QUEUE	MSM_1
8.211		ENTER	MSM1
8.212	MSM1_	ENTER	TECHS
8.213		DEPART	MSM_1
8.214		ADVANCE	20
8.215		LEAVE	MSM1
8.216		LEAVE	TECHS
8.217		QUEUE	FURNAF
8.219	FURNF_	ENTER	FURNF
8.22		DEPART	FURNAF
8.221		ADVANCE	20
8.222		LEAVE	FURNF
8.224		QUEUE	MSM_1
8.225		ENTER	MSM1
8.226	MSM1_	ENTER	TECHS
8.227		DEPART	MSM_1
8.228		ADVANCE	5
8.229		LEAVE	MSM1
8.23		LEAVE	TECHS
8.231		SPLIT	1
8.232	COOL	ADVANCE	10
8.233		QUEUE	MSM_1
8.234		ENTER	MSM1
8.235	MSM1_	ENTER	TECHS
8.236		DEPART	MSM_1
8.237		ADVANCE	10
8.238		LEAVE	MSM1
8.239		LEAVE	TECHS
8.24		QUEUE	HOT_P
8.242	HOT_	ENTER	HOTP
8.243		DEPART	HOT_P
8.244		ADVANCE	2
8.245		LEAVE	HOTP
8.247		QUEUE	MSM_1
8.248		ENTER	MSM1
8.249	MSM1_	ENTER	TECHS
8.25		DEPART	MSM_1
8.251		ADVANCE	10
8.252		LEAVE	MSM1
8.253		LEAVE	TECHS
8.254		ASSEMBLE	10
8.255		QUEUE	MSM_3
8.256		ENTER	MSM3
8.257	MSM3_	ENTER	TECHS

8.258	DEPART	MSM_3
8.259	ADVANCE	5
8.26	LEAVE	MSM3
8.261	LEAVE	TECHS
8.262	FUS18 QUEUE	GLOVE
8.263	ENTER	GLOVEBOX
8.264	GLOV_ ENTER	TECHS
8.265	DEPART	GLOVE
8.266	ADVANCE	5
8.267	LEAVE	GLOVEBOX
8.268	LEAVE	TECHS
8.269	QUEUE	ICPES
8.27	ENTER	ICP
8.271	ICP_ ENTER	TECHS
8.272	DEPART	ICPES
8.273	ADVANCE	140
8.274	LEAVE	ICP
8.275	LEAVE	TECHS
8.276	QUEUE	LIM
8.277	ENTER	LIMS
8.278	LIMS_ ENTER	TECHS
8.279	DEPART	LIM
8.28	ADVANCE	15
8.281	LEAVE	LIMS
8.282	LEAVE	TECHS
8.283	assemble	8
8.284	TRANSFER	,BIGC8
8.285	FE238 TEST LE	X\$IN8,1,FE238C
8.2852	SAVEVALUE	IN8+,1
8.286	QUEUE	MSM_3
8.287	ENTER	MSM3
8.288	MSM3_ ENTER	TECHS
8.289	DEPART	MSM_3
8.29	ADVANCE	5
8.291	LEAVE	MSM3
8.292	LEAVE	TECHS
8.293	QUEUE	UV_VIS
8.295	UVVIS_ ENTER	UVVIS
8.296	DEPART	UV_VIS
8.297	ADVANCE	10
8.298	LEAVE	UVVIS
8.3	QUEUE	MSM_3
8.301	ENTER	MSM3
8.302	MSM3_ ENTER	TECHS
8.303	DEPART	MSM_3
8.304	ADVANCE	10
8.305	LEAVE	MSM3
8.306	LEAVE	TECHS
8.307	QUEUE	LIM
8.308	ENTER	LIMS
8.309	LIMS_ ENTER	TECHS
8.31	DEPART	LIM
8.311	ADVANCE	15
8.312	LEAVE	LIMS

8.313		LEAVE	TECHS
8.314	FE238C	ASSEMBLE	32
8.315	BIGC8	ASSEMBLE	3
8.316		TRANSFER	, RECOM8
8.317	DEN82	ASSEMBLE	3
8.318		SPLIT	1
8.319		QUEUE	MSM_1
8.320		ENTER	MSM1
8.321	MSM1_	ENTER	TECHS
8.322		DEPART	MSM_1
8.323		ADVANCE	10
8.324		LEAVE	MSM1
8.325		LEAVE	TECHS
8.326		SPLIT	1, NPH8
8.327		QUEUE	LIM
8.328		ENTER	LIMS
8.329	LIMS_	ENTER	TECHS
8.330		DEPART	LIM
8.331		ADVANCE	15
8.332		LEAVE	LIMS
8.333		LEAVE	TECHS
8.334		ASSEMBLE	2
8.335		TRANSFER	, DENC8
8.336	NPH8	ASSEMBLE	2
8.41		QUEUE	MSM_1
8.411		ENTER	MSM1
8.412	MSM1_	ENTER	TECHS
8.413		DEPART	MSM_1
8.414		ADVANCE	20
8.415		LEAVE	MSM1
8.416		LEAVE	TECHS
8.417		QUEUE	MSM_3
8.418		ENTER	MSM3
8.419	MSM3_	ENTER	TECHS
8.42		DEPART	MSM_3
8.421		ADVANCE	25
8.422		LEAVE	MSM3
8.423		LEAVE	TECHS
8.424		QUEUE	LIM
8.425		ENTER	LIMS
8.426	LIMS_	ENTER	TECHS
8.427		DEPART	LIM
8.428		ADVANCE	15
8.429		LEAVE	LIMS
8.43		LEAVE	TECHS
8.431	DENC8	ASSEMBLE	2
8.432		TRANSFER	, LCOM8
8.433	SOL82	SPLIT	1
8.434		QUEUE	MSM_1
8.435		ENTER	MSM1
8.436	MSM1_	ENTER	TECHS
8.437		DEPART	MSM_1
8.438		ADVANCE	5
8.439		LEAVE	MSM1

8.44	LEAVE	TECHS	
8.441	QUEUE	AV_C	
8.443	AVC_ ENTER	AVC	
8.444	DEPART	AV_C	
8.445	ADVANCE	5	
8.446	LEAVE	AVC	
8.448	QUEUE	LIM	
8.449	ENTER	LIMS	
8.45	LIMS_ ENTER	TECHS	
8.451	DEPART	LIM	
8.452	ADVANCE	15	
8.453	LEAVE	LIMS	
8.454	LEAVE	TECHS	
8.455	ASSEMBLE	64	
8.456	LCOM8 ASSEMBLE	2	
8.457	RECOM8 ASSEMBLE	2	
8.458	ENDMFT ASSEMBLE	2	
8.4581	depart imft1		
8.9	SAVEVALUE	MFTI,1	
8.903	COMPAR8 ASSEMBLE	2	
10.999	TERMINATE	1	
13.001	QC_ GENERATE	480,,1	
13.002	QUEUE	TIC_TOC	
13.003	TIC_ ENTER	TICTOC	
13.004	ENTER	TECHS	
13.005	DEPART	TIC_TOC	
13.006	ADVANCE	30	;TIC/TOC CALIBRATION
13.007	LEAVE	TECHS	
13.008	LEAVE	TICTOC	
13.009	QUEUE	LIM	
13.010	ENTER	LIMS	
13.011	ENTER	TECHS	
13.012	DEPART	LIM	
13.013	ADVANCE	15	
13.014	LEAVE	LIMS	
13.015	LEAVE	TECHS	
13.016	TERMINATE		
13.017	GENERATE	4320,,1	
13.018	QUEUE	I_C	
13.019	ENTER	IC	
13.020	ENTER	TECHS	
13.021	DEPART	I_C	
13.022	ADVANCE	60	;IC CALIBRATION
13.023	LEAVE	TECHS	
13.024	LEAVE	IC	
13.025	QUEUE	LIM	
13.026	ENTER	LIMS	
13.027	ENTER	TECHS	
13.028	DEPART	LIM	
13.029	ADVANCE	15	
13.030	LEAVE	LIMS	
13.031	LEAVE	TECHS	
13.032	TERMINATE		
13.033	GENERATE	7200,,1	

13.034	QUEUE	MSM_3	
13.035	ENTER	MSM3	
13.036	ENTER	TECHS	
13.037	DEPART	MSM_3	
13.038	ADVANCE	60	;HAN CALIBRATION
13.039	LEAVE	TECHS	
13.040	LEAVE	MSM3	
13.041	QUEUE	LIM	
13.042	ENTER	LIMS	
13.043	ENTER	TECHS	
13.044	DEPART	LIM	
13.045	ADVANCE	15	
13.046	LEAVE	LIMS	
13.047	LEAVE	TECHS	
13.048	TERMINATE		
13.049	GENERATE	480,,1	
13.0495	QUEUE	MSM_1	
13.050	ENTER	MSM1	
13.051	ENTER	TECHS	
13.052	DEPART	MSM_1	
13.053	ADVANCE	2	
13.054	LEAVE	TECHS	
13.055	LEAVE	MSM1	
13.056	QUEUE	MSM_1	
13.057	ENTER	MSM1	
13.058	ENTER	TECHS	
13.059	DEPART	MSM_1	
13.060	ADVANCE	5	
13.061	LEAVE	TECHS	
13.062	LEAVE	MSM1	
13.063	QUEUE	AV_C	
13.064	ENTER	AVC	
13.065	ENTER	TECHS	
13.066	DEPART	AV_C	
13.067	ADVANCE	5	
13.068	LEAVE	TECHS	
13.069	LEAVE	AVC	
13.070	QUEUE	LIM	
13.071	ENTER	LIMS	
13.072	ENTER	TECHS	
13.073	DEPART	LIM	
13.074	ADVANCE	15	
13.075	LEAVE	LIMS	
13.076	LEAVE	TECHS	
13.077	TERMINATE		
15.001	matset	test e	x\$matflag,2,beg2
15.0011		savevalue	strtime,c1
15.002		split	1,matrun
15.003		transfer	,beg2
20.001	INITIAL	X\$RCT1,0	
20.002	INITIAL	X\$RCTPI,0	
20.003	INITIAL	X\$OGCTI,0	
20.080	RCT_ GENERATE	780	
20.0801	queue	irct	

20.0802	assign	a,cl
20.0803	savevalue	mr3+,1
20.081	SAVEVALUE	RCTI,0
20.082	SEIZE	RCT
20.083	SPLIT	1,RCTA
20.084	TEST E	X\$RCTI,1
20.085	RELEASE	RCT
20.086	TRANSFER	,RCTCO
20.102	RCTA QUEUE	MSM_S
20.103	MSMS ENTER	MSMS
20.104	ENTER	TECHS
20.105	DEPART	MSM_S
20.106	ADVANCE	5
20.107	SPLIT	1,RCTICT
20.108	ADVANCE	5
20.109	LEAVE	TECHS
20.110	LEAVE	MSMS
20.111	RCTPH QUEUE	MSM_1
20.112	MSM1 ENTER	MSM1
20.113	ENTER	TECHS
20.114	DEPART	MSM_1
20.115	ADVANCE	20
20.116	LEAVE	TECHS
20.117	LEAVE	MSM1
20.118	QUEUE	MSM_3
20.119	MSM3 ENTER	MSM3
20.120	ENTER	TECHS
20.121	DEPART	MSM_3
20.122	ADVANCE	25
20.123	LEAVE	TECHS
20.124	LEAVE	MSM3
20.125	QUEUE	LIM
20.126	LIMS ENTER	LIMS
20.127	ENTER	TECHS
20.128	DEPART	LIM
20.129	ADVANCE	15
20.130	LEAVE	TECHS
20.131	LEAVE	LIMS
20.132	TRANSFER	,RCTC
20.133	RCTICT QUEUE	MSM_2
20.134	MSM2 ENTER	MSM2
20.135	ENTER	TECHS
20.1355	DEPART	MSM_2
20.136	ADVANCE	20
20.138	LEAVE	TECHS
20.139	LEAVE	MSM2
20.140	SPLIT	1,RCTOH
20.141	RCTIC QUEUE	MSM_3
20.142	MSM3 ENTER	MSM3
20.143	ENTER	TECHS
20.144	DEPART	MSM_3
20.145	ADVANCE	5
20.146	LEAVE	TECHS
20.147	LEAVE	MSM3

20.148	QUEUE	GLOVE
20.149	GLOV_ ENTER	GLOVEBOX
20.150	ENTER	TECHS
20.151	DEPART	GLOVE
20.152	ADVANCE	5
20.153	LEAVE	TECHS
20.154	LEAVE	GLOVEBOX
20.155	QUEUE	I_C
20.156	IC_ ENTER	IC
20.157	ENTER	TECHS
20.158	DEPART	I_C
20.159	ADVANCE	60
20.160	LEAVE	TECHS
20.161	LEAVE	IC
20.162	QUEUE	LIM
20.163	LIMS_ ENTER	LIMS
20.164	ENTER	TECHS
20.165	DEPART	LIM
20.166	ADVANCE	15
20.167	LEAVE	TECHS
20.168	LEAVE	LIMS
20.169	TRANSFER	, RCTC
20.170	RCTOH QUEUE	MSM_3
20.171	MSM3_ ENTER	MSM3
20.172	ENTER	TECHS
20.173	DEPART	MSM_3
20.174	ADVANCE	25
20.175	LEAVE	TECHS
20.176	LEAVE	MSM3
20.177	QUEUE	LIM
20.178	LIMS_ ENTER	LIMS
20.179	ENTER	TECHS
20.180	DEPART	LIM
20.181	ADVANCE	15
20.182	LEAVE	TECHS
20.183	LEAVE	LIMS
20.184	RCTC ASSEMBLE	3
20.1841	SAVEVALUE	RCTI,1
20.1842	RCTCO ASSEMBLE	2
20.1843	depart	irct
20.1844	savevalue	aaa,v\$bbb
20.1845	msavevalue	times,x\$mr3,3,x\$aaa
20.185	TERMINATE	
20.2001	RCTP_ GENERATE	780
20.2002	queue	irctp
20.2003	assign	a,c1
20.2004	savevalue	mr4+,1
20.2012	SAVEVALUE	RCTPI,0
20.2013	SEIZE	RCTP
20.2014	SPLIT	1,RCTPA
20.2015	TEST E	X\$RCTPI,1
20.2016	RELEASE	RCTP
20.2017	TRANSFER	,RCTPCO
20.202	RCTPA QUEUE	MSM_S

20.203	MSMS_	ENTER	MSMS
20.204		ENTER	TECHS
20.205		DEPART	MSM_S
20.206		ADVANCE	5
20.207		SPLIT	1, RCTICTP
20.208		ADVANCE	5
20.209		LEAVE	TECHS
20.210		LEAVE	MSMS
20.211	RCTPHP	QUEUE	MSM 1
20.212	MSM1_	ENTER	MSM1
20.213		ENTER	TECHS
20.214		DEPART	MSM 1
20.215		ADVANCE	20
20.216		LEAVE	TECHS
20.217		LEAVE	MSM1
20.218		QUEUE	MSM 3
20.219	MSM3_	ENTER	MSM3
20.220		ENTER	TECHS
20.221		DEPART	MSM 3
20.222		ADVANCE	25
20.223		LEAVE	TECHS
20.224		LEAVE	MSM3
20.225		QUEUE	LIM
20.226	LIMS_	ENTER	LIMS
20.227		ENTER	TECHS
20.228		DEPART	LIM
20.229		ADVANCE	15
20.230		LEAVE	TECHS
20.231		LEAVE	LIMS
20.232		TRANSFER	, RCTCP
20.233	RCTICTP	QUEUE	MSM 2
20.234	MSM2_	ENTER	MSM2
20.235		ENTER	TECHS
20.2355		DEPART	MSM 2
20.236		ADVANCE	20
20.238		LEAVE	TECHS
20.239		LEAVE	MSM2
20.240		SPLIT	1, RCTOHP
20.241	RCTICP	QUEUE	MSM 3
20.242	MSM3_	ENTER	MSM3
20.243		ENTER	TECHS
20.244		DEPART	MSM 3
20.245		ADVANCE	5
20.246		LEAVE	TECHS
20.247		LEAVE	MSM3
20.248		QUEUE	GLOVE
20.249	GLOV_	ENTER	GLOVEBOX
20.250		ENTER	TECHS
20.251		DEPART	GLOVE
20.252		ADVANCE	5
20.253		LEAVE	TECHS
20.254		LEAVE	GLOVEBOX
20.255		QUEUE	I_C
20.256	IC_	ENTER	IC

20.257	ENTER	TECHS
20.258	DEPART	I_C
20.259	ADVANCE	60
20.260	LEAVE	TECHS
20.261	LEAVE	IC
20.262	QUEUE	LIM
20.263	LIMS ENTER	LIMS
20.264	ENTER	TECHS
20.265	DEPART	LIM
20.266	ADVANCE	15
20.267	LEAVE	TECHS
20.268	LEAVE	LIMS
20.269	TRANSFER	,RCTCP
20.270	RCTOHP QUEUE	MSM_3
20.271	MSM3 ENTER	MSM3
20.272	ENTER	TECHS
20.273	DEPART	MSM_3
20.274	ADVANCE	25
20.275	LEAVE	TECHS
20.276	LEAVE	MSM3
20.277	QUEUE	LIM
20.278	LIMS ENTER	LIMS
20.279	ENTER	TECHS
20.280	DEPART	LIM
20.281	ADVANCE	15
20.282	LEAVE	TECHS
20.283	LEAVE	LIMS
20.284	RCTCP ASSEMBLE	3
20.2841	SAVEVALUE	RCTPI,1
20.2842	RCTPCO ASSEMBLE	2
20.2843	depart	irctp
20.2844	savevalue	aaa,v\$bbb
20.2845	msavevalue	times,x\$mr4,4,x\$aaa
20.285	TERMINATE	
20.30001	OGCT GENERATE	1500
20.30002	queue	logct
20.30003	assign	a,c1
20.30004	savevalue	mr5+,1
20.30012	SEIZE	OGCT
20.30013	SAVEVALUE	OGCTI,0
20.30014	SPLIT	1,OGCTA
20.30015	TEST E	X\$OGCTI,1
20.30016	RELEASE	OGCT
20.30017	TRANSFER	,OGCTCO
20.3002	OGCTA QUEUE	MSM_S
20.3003	MSMS ENTER	MSMS
20.3004	ENTER	TECHS
20.3005	DEPART	MSM_S
20.3006	ADVANCE	5
20.3007	SPLIT	1,OGCTIC
20.3008	ADVANCE	10
20.3009	SPLIT	1,OGCTPH
20.3010	ADVANCE	5
20.3011	SPLIT	1,OGCTSOL

20.3012	ADVANCE	5
20.3013	LEAVE	TECHS
20.3014	LEAVE	MSMS
20.3015	OGCTTOT SPLIT	1
20.3016	QUEUE	MSM_1
20.3017	MSM1 ENTER	MSM1
20.3018	ENTER	TECHS
20.3019	DEPART	MSM_1
20.3020	ADVANCE	5
20.3021	LEAVE	TECHS
20.3022	LEAVE	MSM1
20.3023	QUEUE	AV_C
20.3024	AVC ENTER	AVC
20.3025	ENTER	TECHS
20.3026	DEPART	AV_C
20.3027	ADVANCE	5
20.3028	LEAVE	TECHS
20.3029	LEAVE	AVC
20.3030	QUEUE	LIM
20.3031	LIMS ENTER	LIMS
20.3032	ENTER	TECHS
20.3033	DEPART	LIM
20.3034	ADVANCE	15
20.3035	LEAVE	TECHS
20.3036	LEAVE	LIMS
20.3037	ASSEMBLE	2
20.3038	TRANSFER	,OGCTC
20.3039	OGCTSOL QUEUE	MSM_1
20.3040	MSM1 ENTER	MSM1
20.3041	ENTER	TECHS
20.3042	DEPART	MSM_1
20.3043	ADVANCE	10
20.3044	LEAVE	TECHS
20.3045	LEAVE	MSM1
20.3046	SPLIT	1
20.3047	QUEUE	MSM_1
20.3048	MSM1 ENTER	MSM1
20.3049	ENTER	TECHS
20.3050	DEPART	MSM_1
20.3051	ADVANCE	5
20.3052	LEAVE	TECHS
20.3053	LEAVE	MSM1
20.3054	QUEUE	AV_C
20.3055	AVC ENTER	AVC
20.3056	ENTER	TECHS
20.3057	DEPART	AV_C
20.3058	ADVANCE	5
20.3059	LEAVE	TECHS
20.3060	LEAVE	AVC
20.3061	QUEUE	LIM
20.3062	LIMS ENTER	LIMS
20.3063	ENTER	TECHS
20.3064	DEPART	LIM
20.3065	ADVANCE	15

20.3066	LEAVE	TECHS
20.3067	LEAVE	LIMS
20.3068	ASSEMBLE	2
20.3069	TRANSFER	, OGCTC
20.3070	OGCTPH QUEUE	MSM 1
20.3071	MSM1 ENTER	MSM1
20.3072	ENTER	TECHS
20.3073	DEPART	MSM 1
20.3074	ADVANCE	20
20.3075	LEAVE	TECHS
20.3076	LEAVE	MSM1
20.3077	QUEUE	MSM 3
20.3078	MSM3 ENTER	MSM3
20.3079	ENTER	TECHS
20.3080	DEPART	MSM 3
20.3081	ADVANCE	25
20.3082	LEAVE	TECHS
20.3083	LEAVE	MSM3
20.3084	QUEUE	LIM
20.3085	LIMS ENTER	LIMS
20.3086	ENTER	TECHS
20.3087	DEPART	LIM
20.3088	ADVANCE	15
20.3089	LEAVE	TECHS
20.3090	LEAVE	LIMS
20.3091	TRANSFER	, OGCTC
20.3092	OGCTIC QUEUE	MSM 2
20.3093	MSM2 ENTER	MSM2
20.3094	ENTER	TECHS
20.3095	DEPART	MSM 2
20.3096	ADVANCE	20
20.3097	LEAVE	TECHS
20.3098	LEAVE	MSM2
20.3099	QUEUE	MSM 3
20.3100	MSM3 ENTER	MSM3
20.3101	ENTER	TECHS
20.3102	DEPART	MSM 3
20.3103	ADVANCE	5
20.3104	LEAVE	TECHS
20.3105	LEAVE	MSM3
20.3106	QUEUE	GLOVE
20.3107	GLOV ENTER	GLOVEBOX
20.3108	ENTER	TECHS
20.3109	DEPART	GLOVE
20.3110	ADVANCE	5
20.3111	LEAVE	TECHS
20.3112	LEAVE	GLOVEBOX
20.3113	SPLIT	1, OGCTTIC
20.3114	QUEUE	I C
20.3115	IC ENTER	IC
20.3116	ENTER	TECHS
20.3117	DEPART	I C
20.3118	ADVANCE	60
20.3119	LEAVE	TECHS

20.3120	LEAVE	IC
20.3121	QUEUE	LIM
20.3122	LIMS ENTER	LIMS
20.3123	ENTER	TECHS
20.3124	DEPART	LIM
20.3125	ADVANCE	15
20.3126	LEAVE	TECHS
20.3127	LEAVE	LIMS
20.3128	TRANSFER	,OGCTC
20.3129	OGCTTIC QUEUE	TIC_TOC
20.3130	TIC ENTER	TICTOC
20.3131	ENTER	TECHS
20.3132	DEPART	TIC_TOC
20.3133	ADVANCE	25
20.3134	LEAVE	TECHS
20.3135	LEAVE	TICTOC
20.3136	QUEUE	LIM
20.3137	LIMS ENTER	LIMS
20.3138	ENTER	TECHS
20.3139	DEPART	LIM
20.3140	ADVANCE	15
20.3141	LEAVE	TECHS
20.3142	LEAVE	LIMS
20.3143	OGCTC ASSEMBLE	5
20.3144	SAVEVALUE	OGCTI, 1
20.3145	OGCTCO ASSEMBLE	2
20.3146	depart	ioget
20.3147	savevalue	aaa,v\$bbb
20.3148	msavevalue	times,x\$mr5,5,x\$aaa
20.3149	TERMINATE	
20.401	MECT GENERATE	2640
20.4011	queue	ismect
20.4015	SEIZE	MECT
20.402	MECTA QUEUE	MSM S
20.403	MSMS ENTER	MSMS
20.404	ENTER	TECHS
20.405	DEPART	MSM S
20.406	ADVANCE	5
20.407	LEAVE	TECHS
20.408	LEAVE	MSMS
20.409	QUEUE	MSM 1
20.410	MSM1 ENTER	MSM1
20.411	ENTER	TECHS
20.412	DEPART	MSM 1
20.413	ADVANCE	20
20.414	LEAVE	TECHS
20.415	LEAVE	MSM1
20.416	QUEUE	MSM 3
20.417	MSM3 ENTER	MSM3
20.418	ENTER	TECHS
20.419	DEPART	MSM 3
20.420	ADVANCE	25
20.421	LEAVE	TECHS
20.422	LEAVE	MSM3

20.423	QUEUE	LIM
20.424	LIMS ENTER	LIMS
20.425	ENTER	TECHS
20.426	DEPART	LIM
20.427	ADVANCE	15
20.428	LEAVE	TECHS
20.429	LEAVE	LIMS
20.430	RELEASE	MECT
20.4301	depart	ismect
20.431	TERMINATE	

21.051	generate	1,,,1
21.054	savevalue	matflag,2
21.055	terminate	
21.101	matrun	assign 10,13000
21.102	matrun1	savevalue my1,f\$ahp
21.103		savevalue my2,f\$esrat
21.104		savevalue my3,f\$ems
21.105		savevalue my4,f\$mft
21.106		savevalue my5,\$\$MSMS
21.107		savevalue my6,\$\$MSM1
21.108		savevalue my7,\$\$MSM2
21.109	HELP	MY1,MY2,MY3,MY4,MY5,MY6,MY7
21.110		savevalue my1,s\$msm3
21.111		savevalue my2,s\$furnd
21.112		savevalue my3,s\$furnf
21.113		savevalue my4,s\$furnv
21.114		savevalue my5,\$\$cem
21.115		savevalue my6,\$\$glovebox
21.116		savevalue my7,\$\$icp
21.117	HELP	MY1,MY2,MY3,MY4,MY5,MY6,MY7
21.118		savevalue my1,s\$avc
21.119		savevalue my2,s\$grinder
21.120		savevalue my3,s\$hotp
21.121		savevalue my4,s\$oven
21.122		savevalue my5,\$\$tictoc
21.123		savevalue my6,\$\$ic
21.124		savevalue my7,\$\$lc
21.125	HELP	MY1,MY2,MY3,MY4,MY5,MY6,MY7
21.126		savevalue my1,s\$gc
21.127		savevalue my2,s\$uvvis
21.128		savevalue my3,s\$aa
21.129		savevalue my4,s\$techs
21.130		savevalue my5,\$\$lims
21.131		savevalue my6,f\$rct
21.132		savevalue my7,f\$rctp
21.133	HELP	MY1,MY2,MY3,MY4,MY5,MY6,MY7
21.134		savevalue my1,f\$ogct
21.135		savevalue my2,f\$mect
21.1355		savevalue my3,0
21.136		savevalue my4,0
21.137		savevalue my5,0
21.138		savevalue my6,0
21.139		savevalue my7,0

21.140 HELP MY1,MY2,MY3,MY4,MY5,MY6,MY7
21.142 advance 2
21.143 loop 10,matrun1
21.144 savevalue my1,-1
21.145 help MY1,MY2,MY3,MY4,MY5,MY6,MY7
21.146 terminate

FORTTRAN Source CODE for GPSS HELP Block Subroutine

SUBROUTINE HELP

DOUBLE PRECISION A,B,C,D,E,F,G
INTEGER*2 REPAINT
COMMON A,B,C,D,E,F,G,REPAINT
COMMON IRECNO

IF (IRECNO.EQ.0) OPEN(3,FILE='GPSSDAT.OUT',STATUS='NEW')

IRECNO = IRECNO+1

IF (A.LT.0) THEN
CLOSE(3)
RETURN
ENDIF

1 WRITE(3,1) A,B,C,D,E,F,G
FORMAT(7(1X,D13.6))
RETURN
END

PRL 1

FLUSH TIME 30

MSMS 15 3 VIALS

2 VIALS

1 VIAL

TITANIUM (ICP)

DILUTIONS

OPERATIONS MIN

OPERATIONS MIN

MSM 1 15

MSM 2 64

OVEN 60

MSM 3 5

MSM 1 5

4 ALIQUOTS

4 ALIQUOTS

COOL 30

(2)

TPB/BASE EQUIV

OPERATIONS MIN

MSM 1 5

OPERATIONS MIN

GLOVEBOX 5

MSM 2 23

MSM 3 60

MSM 3 5

LIMS 15

GLOVEBOX 5

(1) ICP 30

OPERATIONS MIN

OPERATIONS MIN

(3) TIC/TOC 32

IC (4) 60

LIMS 15

LIMS 15

LIMS 15

(1) INCLUDES CALB, 2 CK, 2 ANALYSES

(2) INCLUDE pH CALB, 2 CK, 4 ANALYSES ELECTRODE CHANGEOVER

(3) 2 CK, 2 ANALYSES (CALB AT 8 HR INTERVAL)

(4) 1 CK, 2 ANALYSES, (CALB AT 72 HR INTERVAL)

PRL 2

PRL 3

— FLUSH TIME 30

	MSM 1	10
	MSM 2	10
	MSM 3	5
	GLOVEBOX	5
(1)	AA	25
	LIMS	15

(1) CALB, 2 CKS, 2 ANALYSES

PRL4 OVERVIEW

PRL4 (LEVEL 1)

HAN

ICP

2 PASSES

(1) MSM 1 30
OVEN 60
MSM 1 5
COOL 30
MSM 2 45
MSM 3 5
GLOVEBOX 5
ICP 60
LIMS 15

(2) MSM 2 20
MSM 3 40
LIMS 15

DEN

2 PASSES

MSM 1 10
LIMS 15

(1) CALB, 2 CKS, 4 ANALYSES

(2) (CALB 5 DAY) 2 CKS, 2 ANALYSES

PRL 4 (LEVEL 1)

(1) (CALB 72 HRS.) 1 CK, 2 ANALYSES
(2) CALB CK, 2 CKS, 2 ANALYSES

SOLIDS

	8 PASSES
	(2 PER VIAL)
MSM 1	5
AVC	5
LIMS	15

PRL 4 (LEVEL 1)

- (1) (CALB ?) 2 CKS, 2 ANALYSES
- (2) (CALB 8 HRS) 2 CKS, 2 ANALYSES
- (3) (CALB 72 HRS) (1 LEVEL DIL) 1 CK, 2 ANALYSES
- (4) (CALB ?) 1 CK, 2 ANALYSES

SRAT 1 OVERVIEW

SRAT 1 (Level 1)

ICP (A)

	2 PASSES OF 2 VIALS
MSM 1	20
FURNACE D	240
MSM 1	5
COOL	10
MSM 1	20

	4 PASSES
MSM 1	20
FURNACE F	20
MSM 1	5

	8 PASSES
COOL	10
MSM 1	10
HOT PLATE	2
MSM 1	10

	1 PASS
MSM 3	5
GLOVEBOX	5
ICP	90
LIMS	15

ICP B

	1 pass
MSM 1	20
MSM 3	5
GLOVEBOX	5
(1) ICP	30
LIMS	15

(1) CALB, 2 CK, 2 ANALYSES

LIQUIDS

	1 VIAL
MSM 2	20
MSM 3	5
GLOVEBOX	5
(2) IC	30
LIMS	15

(2) CALB INTERVAL 72 HRS.
1 CK, 2 ANALYSES

1 CALB, 4 CKS, 8 ANALYSES

[S] SEIZE SPECIALIST

[R] RELEASE SPECIALIST

SRAT 1 (Level 1)

SOLIDS

4 VIALS
DOUBLE
8 PASSES

(2) MSM 1 5
AVC 5
LIMS 15

(2) CALB INTERVAL 12 HR.

SRAT 2 OVERVIEW

SRAT 2 (Level 1)

ICP (A)

2 PASSES
of 2 VIALS

	MSM 1	20	
	FURNACE D	240	
DRY	MSM 1	5	
	COOL	10	
GRIND	MSM 1	20	
	MEM 1	20	
FUSION	FURNACE F	20	4 passes
	MSM 1	5	fusion
	COOL	10	8 passes
	MSM 1	10	
	HOT PLATE	2	
	MSM 1	10	
	MSM 3	5	
	GLOVEBOX	5	1 pass
	ICP (1)	90	
	LIMS	15	

(1) 1 CALB, 4 CKS, 8 ANALYSES

ICP (B)

1 pass

	MSM 1	20
	MSM 3	5
	GLOVEBOX	5
(2)	ICP	30
	LIMS	15

(2) CALB, 2 CK, 2 ANALYSES

SRAT 2 (Level 1)

SOLIDS

4 VIALS
DOUBLE
8 PASSES

(2) MSM 1 5
AVC 5
LIMS 15

(2) CALB INTERVAL 12 HR.

DEN

(2 PASSES)

MSM 1 10

pH

(1 PASS)

LIMS 15

FILTER MSM 1 20

(1) MSM 3 25

LIMS 15

(1) CALB CKS, 2 CKS, 2 ANALYSES

SME 1 OVERVIEW

SME1 (Level 1)

ICP

(4 passes (4 vials/cruc))

MSM1 10

DRY [MSM 1 5
FURNACE D 240
MSM 1 10 (2 PASSES)

VIT [MSM1 5
FURNACE V 240
MSM 1 10 (2 PASSES)
COOL 30

GRIND [MSM 1 10
GRINDER 15
MSM 1 10 (4 PASSES)

MICROWAVE
SUBCHAIN

FUSION
SUBCHAIN

Fe 2/3
SUBCHAIN

SME 1 (Level 2)

MICROWAVE

	(1 PASS)
MSM 2	50
CEM	12
MSM 2	5
COOL	20
MSM 2	60
CEM	5
MSM 2	5
COOL	20
MSM 2	60
CEM	5
MSM 2	5
COOL	20
MSM 2	100
MSM 3	5
GLOVEBOX	5
ICP	140 (1)
LIMS	15

(1) CAL, 2 CKS, 10 ANALYSES

(2) CALB, 2 CKS, 10 ANALYSES

FUSION

DOUBLE + 2 CKS	
	(5 PASSES)
MSM 1	20
FURNACE F	20
MSM 1	5
	(10 PASSES)
COOL	10
MSM 1	10
HOT PLATE	2
MSM 1	10
	(1 PASS)
MSM 3	5
GLOVEBOX	5
ICP	140
LIMS	15

Fe 2/3

DOUBLE + 2 CKS	
	(10 PASSES)
MSM 3	5
UV/VIS	10
MSM 3	10
LIMS	15

SME 1 (Level 1)

LIQ

(1) CALB 72 HRS, 1 CK, 2 ANALYSES

SME 1 (Level 1)

SOLIDS

8 PASSES
(2 PER VIAL)

(2) MSM 1 5

AVC 5

LIMS 15

(1) CALIB CKS, 2 CKS, 2 ANALYSES

(2) (CAL 3, INTERVAL 8 HRS.)

MFT 1 OVERVIEW

MFT1 (Level 1)

ICP

(4 passes (4 vials/cruc))

MSM1 10

DRY	[	MSM 1	5	(2 PASSES)
		FURNACE D	240	
		MSM 1	10	
VIT	[	MSM1	5	(2 PASSES)
		FURNACE V	240	
		MSM 1	10	
	[	COOL	30	
GRIND		MSM 1	10	(4 PASSES)
[	GRINDER	15		
	MSM 1	10		

MICROWAVE
SUBCHAIN

FUSION
SUBCHAIN

Fe 2/3
SUBCHAIN

MFT 1 (Level 2)

MICROWAVE

	(1 PASS)
MSM 2	50
CEM	12
MSM 2	5
COOL	20
MSM 2	60
CEM	5
MSM 2	5
COOL	20
MSM 2	60
CEM	5
MSM 2	5
COOL	20
MSM 2	100
MSM 3	5
GLOVEBOX	5
ICP	140 (1)
LIMS	15

- (1) CAL, 2 CKS, 10 ANALYSES
 (2) CALB, 2 CKS, 10 ANALYSES

FUSION

DOUBLE + 2 CKS
 (5 PASSES)

MSM 1	20
FURNACE F	20
MSM 1	5
	(10 PASSES)
COOL	10
MSM 1	10
HOT PLATE	2
MSM 1	10

(1 PASS)

MSM 3	5
GLOVEBOX	5
ICP	140
LIMS	15

Fe 2/3

2 passes

MSM 3	5
UV/VIS	10
MSM 3	10
LIMS	15

MFT 1 (Level 1)

SOLIDS

(1) CALB CKS, 2 CKS, 2 ANALYSES

(2) (CALIB. INTERVAL 8 HRS.)

RCT

(1) CALB CK, 2 CKS, 2 ANALYSES
 (2) 1 CK, 2 ANALYSES (CALB AT 72 HR INTERVAL)

OGCT OVERVIEW

OGCT (LEVEL 1)

pH

2 VIALS
1 PASS
MSM 1 20
MSM 3 25
LIMS 15

IC/TOC

1 VIAL
MSM 2 20
4 DILUTIONS
MSM 3 5
GLOVEBOX 5

TOTAL SOLIDS

1 VIAL
(2 PASSES)
MSM 1 5
(3) AVC 5
LIMS 15

IC TOC
(1) IC 60 (2) TIC 25
LIMS 15 LIMS 15

SOLUBLE SOLIDS

- (1) 1 CK, 2 ANALYSES
(CALB INTERVAL 72 HRS)
- (2) 2 CKS, 2 ANALYSES
(CALB INTERVAL 8 HRS)
- (3) (CALIB. INTERVAL 8 HRS.)

1 VIAL
MSM 1 10
(2 PASSES)
MSM 1 5
(3) AVC 5
LIMS 15

SMECT

pH

MSM S 5

2 VIALS
(1 PASS)

FILTER (2)	MSM 1	20
ANALYSIS	MSM 3	25
	LIMS	15

APPENDIX 2. GPSS Statistics

Following are several tables of data supplied by GPSS as standard data output. There are three basic types of data, FACILITY reports, STORAGE reports, and QUEUE reports. The QUEUE reports have been arbitrarily subdivided to reflect expectations. Specifically those tables referring to 'Zero-Entry' queues hold data on queues designed to see how long samples had to wait for resources before proceeding. These queue types can have samples with zero waiting times, in fact, that is the desirable state.

The other type of queues are called 'No Zero-Entry' queues. These queues were designed to determine the length of time required for subsections of code to finish. They should not have any zero time entries, all entries should require some time to process. However, as can be seen in Table A2-4., this is not the case. Unfortunately the programming details of those subsections led to a logical error with respect to the standard GPSS QUEUE statement.

This problem was overcome by using matrices to hold transition times, instead of QUEUES. An alternate method for resolving the problem was proposed by Minuteman Software and can be found in WSRC Technical Notebook Number WSRC-NB-91-208, pages 36 to 38. The numbers referring to zero entry adjustments should be ignored for those QUEUES.

Queue result tables (A2-1,2,3,4.) hold the following information:

- NAME - unique identifying acronym
- MAX. Content - The maximum number of transactions in the queue over the whole simulation
- ENTRIES - Number of transactions passing through the QUEUE
- ENTRIES(-0) - Number of transactions passing through the QUEUE that had no wait
- AVERAGE CONTENT - Time averaged QUEUE content
- AVERAGE TIME - Total time all transactions spent in the QUEUE divided by total entries
- AVERAGE TIME(-0) - Total time all transactions spent in the queue divided by the number of transactions having a non-zero waiting time

The facility result table (A2-5.) holds the following information:

- SUBPROCESS - The relevant DWPF sub-process
- FACILITY - Unique identifying acronym
- ENTRIES - Number of times resources was used
- UTILITY - Fraction of time the resource was used
- AVERAGE TIME - Average length of time of a single use

The storage result table (A2-6.) holds the following information:

STORAGE - Unique identifying acronym
ENTRIES - Number of times the resources was used
UTILITY - Fraction of time the resource was in use

Table A2-7. holds a list of acronyms used in the GPSS code (see Appendix 1) for resources and the related queues.

TABLE A2-1. Zero-Entry Queues - Material Handling Equipment

QUEUE NAME	MAXIMUM CONTENT	ENTRIES (ALL)	ENTRIES (-0)	AVERAGE CONTENT	AVERAGE TIME	AVERAGE TIME (-0)
MSM_S	163	8295	509	9.85	301.31	321.01
MSM_1	125	20388	431	27.99	348.47	356.00
MSM_2	21	3079	1247	0.98	80.76	135.74
MSM_3	40	6450	1663	3.11	122.60	165.19
GLOVE	2	2459	1591	0.03	2.81	7.97
GRIN	1	640	366	0.01	2.10	4.92

TABLE A2-2. Zero-Entry Queues - Heating Equipment

QUEUE NAME	MAXIMUM CONTENT	ENTRIES (ALL)	ENTRIES (-0)	AVERAGE CONTENT	AVERAGE TIME	AVERAGE TIME (-0)
FURNAD	27	640	22	6.44	2555.11	2646.07
FURNAF	1	1440	1440	0.00	0.00	0.00
FURNAV	4	320	77	0.34	267.46	352.21
CEMR	1	480	480	0.00	0.00	0.00
OVENS	2	340	250	0.01	5.81	21.94
HOT_P	1	2880	2880	0.00	0.00	0.00

TABLE A2-3. Zero-Entry Queues - Analytical Equipment

QUEUE NAME	MAXIMUM CONTENT	ENTRIES (ALL)	ENTRIES (-0)	AVERAGE CONTENT	AVERAGE TIME	AVERAGE TIME (-0)
ICPES	8	840	420	0.20	59.30	118.61
LIM	4	11622	8078	0.10	2.22	7.27
TIC_TOC	2	758	484	0.01	3.18	8.79
I_C	12	1598	397	0.94	149.75	199.25
A_A	1	40	38	0.00	0.15	3.00
G_C	1	20	5	0.00	5.35	7.13
L_C	1	20	10	0.00	3.50	7.00
AV_C	3	5045	3937	0.05	2.29	10.42
UV_VIS	3	820	318	0.02	5.56	9.09

TABLE A2-4. No Zero-Entry Queues

QUEUE NAME	MAXIMUM CONTENT	ENTRIES (ALL)	ENTRIES (-0)	AVERAGE CONTENT	AVERAGE TIME	AVERAGE TIME (-0)
IPHA	2	20	0	1.55	19675.70	19675.70
IPHA1	1	20	20	0.05	691.25	0.00
IPHA2	1	20	7	0.02	247.95	381.46
IPHA3	1	20	0	0.01	163.45	163.45
IPHA4	1	20	0	0.25	3161.90	3161.90
ISRAT	1	10	0	0.72	18258.80	18258.80
ISRAT1	1	10	0	0.38	9748.70	9748.70
ISRAT2	1	10	0	0.25	6332.10	6332.10
ISME	1	10	0	0.56	14316.10	14316.10
ISME1	1	10	0	0.45	11376.10	11376.10
IMFT	1	10	0	0.30	7599.30	7599.30
IMFT1	1	1	0	0.29	7479.30	7479.30
IRCT	4	325	248	0.80	622.15	2625.95
IRCTP	4	325	243	0.80	621.20	2462.07
IOGCT	2	169	169	0.56	846.47	0.00
ISMECT	1	96	0	0.19	511.75	511.75

TABLE A2-5. Subprocess Activity Summary

SUBPROCESS	FACILITY	ENTRIES	UTILITY	AVERAGE TIME
PR	AHP	20	0.878	11152.25
SRAT	ESRAT	10	0.719	18258.80
SME	EMS	10	0.563	14316.10
MFT	MFT	10	0.299	7599.30
RCT	RCT	325	0.490	383.50
RCTP	RCTP	325	0.474	370.71
OGCT	OGCT	169	0.493	740.73
SMECT	MECT	96	0.193	511.75

TABLE A2-6. Equipment Utilization Information

<u>STORAGE</u>	<u>ENTRIES</u>	<u>UTILITY</u>
MSMS	8295	0.198
MSM3	6460	0.429
MSM2	3079	0.403
MSM1	20378	0.888
FURND	640	0.605
FURNV	320	0.303
FURNF	1440	0.113
CEM	480	0.014
GLOVEBOX	2459	0.075
TECHS	50794	0.654
LIMS	11622	0.158
ICP	840	0.321
AVC	5045	0.141
GRINDER	640	0.038
HOTP	2880	0.023
OVEN	340	0.080
TICTOC	758	0.093
IC	1598	0.411
LC	20	0.016
GC	20	0.013
UVVIS	820	0.032
AA	40	0.004

Table A2-7. Resource Representations

<u>Resource</u> <u>Acronym</u>	<u>Queue</u> <u>Acronym</u>
AA	A_A
LC	L_C
GC	G_C
IC	I_C
HOTP	HOT_P
UVVIS	UV_VIS
TICTOC	TIC_TOC
GRINDER	GRIN
AVC	AV_C
ICP	ICPES
GLOVEBOX	GLOVE
CEM	CEMR
OVEN	OVENS
FURND	FURNAD
FURNV	FURNAV
FURNF	FURNAF
MSM1	MSM_1
MSM2	MSM_2
MSM3	MSM_3
MSMS	MSM_S
LIMS	LIM
TECHS	(not used)

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