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**NUCLEAR
DIVISION**

**UNION
CARBIDE**

**Analytical Chemistry Division's
Sample Transaction System**

J. S. Stanton
P. A. Tilson

MASTER

OPERATED BY
UNION CARBIDE CORPORATION
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

Contract No. W-7405-eng-26

ANALYTICAL CHEMISTRY DIVISION'S
SAMPLE TRANSACTION SYSTEM

J. S. Stanton
P. A. Tilson

Sponsor: W. D. Shults

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COMPUTER SCIENCES DIVISION
at
Oak Ridge National Laboratory
Post Office Box X
Oak Ridge, Tennessee 37830

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ANALYTICAL CHEMISTRY DIVISION'S
SAMPLE TRANSACTION SYSTEM

J. S. Stanton

ABSTRACT

This document describes the features and operating characteristics of many of the computer programs used by the Analytical Chemistry Division and its customers. The programs described in this manual all execute on the DECsystem-10 computer at the Oak Ridge National Laboratory.

The Analytical Chemistry Division uses the DECsystem-10 computer for a wide range of tasks. The functions performed include sample management, timekeeping, quality assurance, and data calculation. This document describes the features and operating characteristics of many of the computer programs used by the Division. The descriptions are divided into chapters which cover all of the information about one aspect of the Analytical Chemistry Division's computer processing.

The chapter which is titled Sample Management describes the methods used to log, track, and report customer requests for work. The Sample Management Chapter shows how a work request is assigned to a laboratory, the ways a laboratory is informed of pending work requests, and the means by which results are returned to a customer. This section describes the interactive file maintenance and information retrieval programs provided for sample management. In addition, the batch programs used for some maintenance and reporting functions are covered.

The Customer Access Chapter explains the means by which customers are given access to the Analytical Chemistry Division's online data files. The interactive Work Request Submission and Enquiry programs are described. This section also references the batch report and maintenance programs available to Division customers.

Labor cost accounting and billing are covered in the Timekeeping Chapter. The Analytical Timekeeping Work Sheet, the interactive data entry program, the batch file maintenance programs, and the interactive report programs available for interrogation of the Timekeeping data base are all described in this section.

The Quality Assurance Chapter describes the computer methods used to ensure the correctness of analytical results. This section covers the creation of the control, dictionary, and transaction files used by the Quality Assurance system. The interactive and batch report programs are also covered here.

The programs used to compute partial and final analytical results are described in the Data Calculation Chapter.

CHAPTER 1

SAMPLE MANAGEMENT

1.1 INTRODUCTION

The Sample Management System is used to post, track, and report customer requests for analyses. The Analytical Chemistry Division receives customer work requests either on special printed forms or over a computer communications link described in the next chapter of this manual. The customer requests are logged to one or more laboratories pending work lists. After a work request is logged, the assigned laboratories will receive both batch and interactive notices that specific types and quantities of work are pending. When analytical results are obtained, an interactive program is used to enter the results in the sample management system files. While a work request is being processed, a wide variety of status and result reports are available to users of the sample management system. After all of the processing for a work request has been completed, a report of results is generated by the system. Approximately two weeks after the final report of results is printed, a copy of the work request data is made available on both microfiche and computer-readable media, at which time the data is then removed from the active files.

1.2 STORING INFORMATION ON THE COMPUTER

1.2.1 Posting Work Requests

1.2.1.1 General Description

The first computer processing performed on any work request involves assigning the work to a laboratory. The FILEUP program performs all of the processing required to assign customer work requests. The work requests are submitted either on a special printed form or over the customer computer communications link.

In general, a work request is composed of the following elements: customer identification data, a list of sample identifiers, and a list of analyses to be performed on the samples. The basic steps involved in posting a customer work request are: a work request record is created, one or more sample records are associated with the work request, and the requested analyses are assigned to each sample record.

1.2.1.2 Requests Submitted On Paper

When a work request is submitted on a printed form, the FILEUP program provides several commands for creating the work request record. The Add a Request (AR) command is used when all of the customer identification data must be entered from the terminal. The Copy a Customer (CC) command is used when some or all of the customer identification data has been saved in the customer catalog (described later in this section). The Copy All (CA) or the copy and Stop for Identification (SI) commands may be used when a work request exists in the system which contains all of the necessary customer identification data and the samples in the new request match those assigned to the old request in both quantity and type of analyses.

After a work request record has been created with either the AR or CC command, sample records must be associated with the work request. The FILEUP program has a number of sample assignment commands. The Add a Sample (AS) command should be used when the laboratory's sample identifier for a group of samples doesn't have a sequence number as the rightmost part of the identifier. The Add with Customer code (AC) command may be used when the laboratory's sample identifier is a sequential number which does not match the customer's sample identifier. The Add Multiple Samples (AM) command is provided for those cases when the laboratory's sample identifier and the customer's sample identifier match and the rightmost portion is a sequence number. The Add Pilot plant samples (AP) command is a special feature provided to speed processing of Pilot Plant samples in the Radioactive Materials laboratory.

1.2.1.2.1 Using Master Analysis Codes

Occasionally a lab will process samples that contain a large number of analyses, and the lab will continue to process more samples in the future that contain these same analyses. To reduce the amount of effort required to enter these repetitive analyses for many samples over a period of time, the lab can use the Master Analysis Table File to automatically generate a set of analyses for a sample when needed. The ANALUP program is used to create a table file which can contain up to 100 analyses for each master analysis code entered into the file (see Section 1.3.6). Then as the lab is entering new samples, the master analysis Code can be entered and the FILEUP Program will automatically read the Master Analysis Table File, and replace the master code with the group of analyses associated with that master.

1.2.1.3 Requests Submitted Via The Computer

The FILEUP program allows customers of the Division to submit work requests from a computer terminal. A wide variety of commands is provided to support this feature. The commands all copy sample records from a customer's area and permit the laboratory copying the samples to accept or reject each type of analysis requested. In addition, by selecting the proper command, a laboratory can assign the copied sample to a new work request or to an existing work request, use a sequential number as the laboratory sample identifier or use the customer's sample identifier, and accept or reject each sample or automatically accept all samples. The characteristics of the commands are defined in the following table.

COMMAND	WORK REQUEST NEW/APPEND	SAMPLE IDENTIFIER CUST'S/SEQUENCE	SAMPLE ACCEPTANCE CHOICE/AUTOMATIC
CI	NEW	CUSTOMER'S	AUTOMATIC
SN	NEW	SEQUENCE	AUTOMATIC
IA	NEW	CUSTOMER'S	CHOICE
SA	NEW	SEQUENCE	CHOICE
MI	APPEND	CUSTOMER'S	AUTOMATIC
MS	APPEND	SEQUENCE	AUTOMATIC
AI	APPEND	CUSTOMER'S	CHOICE
SI	APPEND	SEQUENCE	CHOICE

1.2.1.4 Examples

The following sequence shows the use of the AR and AS commands. The computer's output is underlined.

```

RUN ;
PROGRAM ID:F
USING THE FILE FOR LAB NUMBER:5
UPDATE CLASS:AR
ASSIGNED WORK REQUEST NUMBER:50501
CUSTOMER NAME:
SMITH, J.
CUSTOMER ADDRESS:
45.00
CUSTOMER PHONE:
3-1071
ASSIGNED TO LAB:           :S-147
REPORT FORMAT:1:2
DATE RECEIVED:08/30/78:
CHARGE NUMBER:           :X111Y222
CUSTOMER SERIES:         :C-S-1
DEADLINE:
9/15/78 FOR ALL A-1 ANALYSES.
COMMENTS:
THIS IS A TEST COMMENT.
COMMENTS-2:

UPDATE CLASS:AS
WORK REQUEST NUMBER:50501:
LAB. SERIES:           :2
LAB. SAMPLE NUMBER:00000:11
CUSTOMER SERIES:C-S-1
CUSTOMER SAMPLE ID:           :CSID-1
SAMPLE COMMENT:

ANALYSES:A-2,B-1,A-1
3:ANALYSTS REQUESTS HAVE BEEN ACCEPTED.
MORE SAMPLES?Y
LAB. SERIES:2           :1
LAB. SAMPLE NUMBER:00012:15
CUSTOMER SERIES:C-S-1
CUSTOMER SAMPLE ID:CSID-1       :11111B
SAMPLE COMMENT:
THIS IS A TEST.
ANALYSES:0,B-4
4:ANALYSIS REQUESTS HAVE BEEN ACCEPTED.
MORE SAMPLES?N
UPDATE CLASS:

```

This sequence is an example of the CC and AM commands. The computer's output is underlined.

```

UPDATE CLASS:CC
CUSTOMER NUMBER TO COPY:2
ASSIGNED WORK REQUEST NUMBER:50504
LAING, W.
2026
3-3333
ASSIGNED TO LAB:           :S-222
REPORT FORMAT:4:
DATE RECEIVED:08/30/78:9/1/78
CHARGE NUMBER:A1238456 :
CUSTOMER SERIES:         :C-S-3
DEADLINE:

COMMENTS:
COMMENTS-2:

UPDATE CLASS:AM
WORK REQUEST NUMBER:50504:504
LAB. SERIES:           :3
LAB. SAMPLE RANGE (X-Y):22-30

```

ANALYSES:A-4,A-1
2:ANALYSIS REQUESTS HAVE BEEN ACCEPTED.
00009:SAMPLES WERE ADDED TO THE FILE.
UPDATE CLASS:

The CA command is illustrated below. The computer's output is underlined.

UPDATE CLASS:CA
COPY WORK REQUEST NUMBER:50000:501
ASSIGNED WORK REQUEST NUMBER:50507
LAB. SERIES: :5
STARTING LAB. SAMPLE NUMBER:00000:201
SAMPLE:1 00015 COPIED TO:5 00201
SAMPLE:2 00011 COPIED TO:5 00202
2:SAMPLES COPIED.
UPDATE CLASS:

The following example shows the use of the SI command. The computer's output is underlined.

UPDATE CLASS:SI
COPY WORK REQUEST NUMBER:0:504
ASSIGNED WORK REQUEST NUMBER:10505
SAMPLE:TEST-3 :21A
SAMPLE SERIES: :EX-22
SAMPLE NUMBER: :AB-1
SAMPLE:TEST-3 21A COPIED TO:EX-22 AB-1
SAMPLE:TEST-3B1 :21A
SAMPLE SERIES:EX-22 :USB
SAMPLE NUMBER:AB-1 :XX
SAMPLE:TEST-3B1 21A COPIED TO:USB XX
SAMPLE:TEST-3C0 :21A
SAMPLE SERIES:USB :TEST-BB
SAMPLE NUMBER:XX :ABC-1
SAMPLE:TEST-3C0 21A COPIED TO:TEST-BB ABC-1
3:SAMPLES COPIED.
UPDATE CLASS:

The AR and AC commands are used in the following example. The computer's output is underlined.

UPDATE CLASS:AR
ASSIGNED WORK REQUEST NUMBER:50508
CUSTOMERS NAME:
LAST, I.
CUSTOMERS ADDRESS:
ADDR 1.
CUSTOMERS PHONE:
5-3332
ASSIGNED TO LAB: :LAB-1
REPORT FORMAT:1
DATE RECEIVED:08/30/78:
CHARGE NUMBER: :Z2228111
CUSTOMERS SERIES: :C-S-7
DEADLINE:
10/1/78
COMMENTS:
THIS IS A TEST.
COMMENTS-2:
THIS IS ALSO A TEST.
UPDATE CLASS:AC
WORK REQUEST NUMBER:50508:
LAB. SERIES: :8
LAB. SAMPLE RANGE (X-Y):911-912
ANALYSES:B-2,A-1,B-4
3:ANALYSIS REQUESTS HAVE BEEN ACCEPTED.
SAMPLE:8 -00911
CUSTOMER SERIES:C-S-7
CUSTOMERS SAMPLE ID: :C-S-ID-1
SAMPLE:8 -00912
CUSTOMER SERIES:C-S-7
CUSTOMERS SAMPLE ID:C-S-ID-1 :C-S-ID-A
00002:SAMPLES WERE ADDED TO THE FILE.
UPDATE CLASS:

This example shows the CC and AP commands. The computer's output is underlined.

UPDATE CLASS:CC
 CUSTOMER NUMBER TO COPY:2
 ASSIGNED WORK REQUEST NUMBER:50510
 LAING, W.
 2026
 3-3333
 ASSIGNED TO LAB: :LAB-5
 REPORT FORMAT:4:3
 DATE RECEIVED:08/30/78:
 CHARGE NUMBER:A123B456 :
 CUSTOMERS SERIES: :C-S-10
 DEADLINE:

COMMENTS:
 TEST COMMENT LINE.
 COMMENTS-2:
 SECOND TEST COMMENT LINE.
 UPDATE CLASS:AP
 WORK REQUEST NUMBER:50510:
 SAMPLE CODE PREFIX: :PRE-ABC
 LAB. SAMPLE NUMBER:00000:3
 ANALYSES:B-1,A-2
 2:ANALYSIS REQUESTS HAVE BEEN ACCEPTED.
 MORE SAMPLES:Y
 SAMPLE CODE PREFIX:PRE-ABC :
 LAB. SAMPLE NUMBER:00000:
 ANALYSES:0,A-1
 3:ANALYSIS REQUESTS HAVE BEEN ACCEPTED.
 MORE SAMPLES:N
 UPDATE CLASS:US
 REQUEST OR SAMPLE (R OR S):R
 WORK REQUEST NUMBER.50510:
 REQUEST:50510 -SAMPLES:2 CUST. LAING, W.
 SAMPLE:PRE-ABC -00003
 SAMPLE FUNCTION:LI

*LAB. SERIES:PRE-ABC *LAB. SAMPLE:00003
 *CUST SERIES:C-S-10 *CUST. SAMPLE ID:PRE-ABC -00003
 *ACD REQ :50510 *SAMPLE STATUS:I
 *SAMPLE COMPLETION DATE:
 *COMMENT:
 *NUMBER OF ANALYSES TO PERFORM:2
 *ANALYSIS:B-1 *STATUS:I
 *RESULTS:
 *ANALYSIS:A-2 *STATUS:I
 *RESULTS:
 SAMPLE FUNCTION:ST
 UPDATE CLASS:

The CI command is shown in this example. The computer's output is underlined.

UPDATE CLASS:CI
 CUSTOMER NUMBER:1
 CUSTOMER WORK REQUEST:508
 ASSIGNED WORK REQUEST NUMBER:50504
 *REQUEST:50504
 JONES, S.
 2026
 3-0111
 *ASSIGNED LAB:
 *CHARGE NUMBER:00000000 *SERIES:
 *RECEIVED:09/05/78 *COMPLETED:
 *FORMAT:2 *OLD FORMAT:
 *NUMBER OF SAMPLES:0 *COMPLETED:0
 *DEADLINE:
 *COMMENTS:THIS IS A CUSTOMER'S COMMENT.
 ASSIGNED TO LAB: :LAB-1

COMMENTS:THIS IS A CUSTOMER'S COMMENT.
 THIS IS A TEST OF THE CI COMMAND.
 COMMENTS-2:

ACCEPT/REJECT ANALYSIS:A-1 :S
 ACCEPT/REJECT ANALYSIS:A-2 :R

*REQUEST:50504
 JONES, S.
 2026
 3-0:11
 *ASSIGNED LAB:LAB-1
 *CHARGE NUMBER:00000000 *SERIES:
 *RECEIVED:09/05/78 *COMPLETED:
 *FORMAT:2 *OLD FORMAT:
 *NUMBER OF SAMPLES:2 *COMPLETED:0
 *DEADLINE:
 *COMMENTS:THIS IS A TEST OF THE CI COMMAND.

LAB. ID.:8	-00001	CUST. ID.:8	-00001
ANALYSES: A-1			
LAB. ID.:8	-00002	CUST. ID.:8	-00002

ANALYSES: A-1

The following example illustrates the SN command. The computer's output is underlined.

UPDATE CLASS:SN
 CUSTOMER NUMBER:1
 CUSTOMER WORK REQUEST:507
 ASSIGNED WORK REQUEST NUMBER:50505

*REQUEST:50505
 SMITH, J.
 4507
 3-0000
 *ASSIGNED LAB:
 *CHARGE NUMBER:A111B222 *SERIES:
 *RECEIVED:09/05/78 *COMPLETED:
 *FORMAT:4 *OLD FORMAT:
 *NUMBER OF SAMPLES:0 *COMPLETED:0
 *DEADLINE:
 *COMMENTS:THIS IS A CUSTOMER'S COMMENT.

ASSIGNED TO LAB: :LAB-1
 COMMENTS:THIS IS A CUSTOMER'S COMMENT.
 THIS IS A TEST OF THE SN COMMAND.
 COMMENTS-2:

LAB. SERIES:8 :5
 LAB. SAMPLE NUMBER:00002:21
 ACCEPT/REJECT ANALYSIS:A-3 :R
 ACCEPT/REJECT ANALYSIS:B-1 :A

*REQUEST:50505
 SMITH, J.
 4507
 3-0000
 *ASSIGNED LAB:LAB-1
 *CHARGE NUMBER:A111B222 *SERIES:
 *RECEIVED:09/05/78 *COMPLETED:
 *FORMAT:4 *OLD FORMAT:
 *NUMBER OF SAMPLES:2 *COMPLETED:0
 *DEADLINE:
 *COMMENTS:THIS IS A TEST OF THE SN COMMAND.

LAB. ID.:5	-00021	CUST. ID.:7	-00001
ANALYSES: B-1			
LAB. ID.:5	-00022	CUST. ID.:7	-00002
ANALYSES: B-1			
LAB. ID.:5	-00023	CUST. ID.:7	-00003
ANALYSES: B-1			
UPDATE CLASS:			

The IA command is used in the next example. The computer's output is underlined.

UPDATE CLASS:IA
 CUSTOMER NUMBER:1
 CUSTOMER WORK REQUEST:506
 ASSIGNED WORK REQUEST NUMBER:50535

REQUEST:50535 DATE:10/19/78
 TEST NAME 2
 TEST ADDR 2
 TEST PHONE 2
 CHARGE:3370EFGH ASSIGNED TO:
 COMMENTS:THIS IS A TEST

ASSIGNED TO LAB: ;TEST LAB 2
 COMMENTS:THIS IS A TEST

COMMENTS-2:
 SECOND LINE OF COMMENTS
 ACCEPT/REJECT ANALYSIS:A-1 :A
 ACCEPT/REJECT ANALYSIS:B-2 :R
 ACCEPT/REJECT ANALYSIS:C-23 :A
 ACCEPT OR REJECT (A/R) SAMPLE:AB-U-1-157 :A
 ACCEPT/REJECT ANALYSIS:U-6 :
 ACCEPT/REJECT ANALYSIS:AB-2 :
 ACCEPT OR REJECT (A/R) SAMPLE:E-22-A-1 :A
 ACCEPT OR REJECT (A/R) SAMPLE:QL/10-C37 :R
 DISPLAY THE REQUEST (YES/NO):

REQUEST:50535 DATE:10/19/78
 TEST NAME 2
 TEST ADDR 2
 TEST PHONE 2
 CHARGE:3370EFGH ASSIGNED TO:TEST LAB 2
 COMMENTS:THIS IS A TEST
 SECOND LINE OF COMMENTS

LAB. ID.:AB-U-1 -00167 CUST. ID.:AB-U-1-167
 ANALYSES: A-1 U-23

LAB. ID.:E-22 -A-1 CUST. ID.:E-22-A-1
 ANALYSES: U-6 AB-2

UPDATE CLASS:

The SA command is documented in this example. The computer's output is underlined.

UPDATE CLASS:SA
 CUSTOMER NUMBER:1
 CUSTOMER WORK REQUEST:505
 ASSIGNED WORK REQUEST NUMBER:50534

REQUEST:50534 DATE:10/19/78
 TEST NAME 1
 TEST ADDR 1
 TEST PHONE 1
 CHARGE:3370ABCD ASSIGNED TO:
 DEADLINE:10/31/78
 COMMENTS:THIS IS A TEST.

ASSIGNED TO LAB: ;TEST LAB 1
 COMMENTS:THIS IS A TEST.

COMMENTS-2:
 SECOND LINE OF COMMENTS
 LAB. SERIES: IL-505
 LAB. SAMPLE NUMBER:00300-987
 ACCEPT/REJECT ANALYSIS:A-5 :A
 ACCEPT/REJECT ANALYSIS:B-2 :A
 ACCEPT OR REJECT (A/R) SAMPLE:C-505-56 :
 ACCEPT/REJECT ANALYSIS:A-4 :R
 ACCEPT OR REJECT (A/R) SAMPLE:C-505-57 :
 ACCEPT OR REJECT (A/R) SAMPLE:C-505-58 :R
 ACCEPT OR REJECT (A/R) SAMPLE:C-505-59 :A
 ACCEPT OR REJECT (A/R) SAMPLE:C-505-60 :A
 DISPLAY THE REQUEST (YES/NO):Y

REQUEST:50534 DATE:10/19/78
 TEST NAME 1
 TEST ADDR 1
 TEST PHONE 1
 CHARGE:3377ABCD ASSIGNED TO:TEST LAB 1
 DEADLINE:10/31/78
 COMMENTS:THIS IS A TEST.
 SECOND LINE OF COMMENTS

LAB. ID.:IL-505 -00987 CUST. ID.:C-505-56
 COMMENT:SAMP COMMENT A
 ANALYSES: A-2 B-2

LAB. ID.:IL-505 -00988 CUST. ID.:C-505-57
 ANALYSES: B-2 A-5

LAB. ID.:IL-505 -00989 CUST. ID.:C-505-59
 COMMENT:SAMPLE COMMENT TEST
 ANALYSES: A-5

LAB. ID.:IL-505 -00990 CUST. ID.:C-505-60
 COMMENT:SAMPLE COMMENT TEST
 ANALYSES: A-5

UPDATE CLASS:

The A: command is shown in this example. The computer's output is underlined.

UPDATE CLASS:A:
 CUSTOMER NUMBER:1
 CUSTOMER WORK REQUEST:512

REQUEST-50000 DATE:11/03/78
 TEST NAME 2
 TEST ADDR 2
 TEST PHONE 2
 CHARGE:7770EFGH ASSIGNED TO:
 COMMENTS:THIS IS A TEST

APPEND SAMPLES TO WORK REQUEST NUMBER:50000:504

REQUEST:50534 DATE:08/20/78
 JONES, S.
 2026
 3-0111
 CHARGE:00000000 ASSIGNED TO:LAB-1
 COMMENTS:THIS IS A TEST.

ACCEPT/REJECT ANALYSIS:A-1 :A
 ACCEPT/REJECT ANALYSIS:B-2 :R
 ACCEPT/REJECT ANALYSIS:C-23 :
 ACCEPT OR REJECT (A/R) SAMPLE:C-S-512-34 :
 ACCEPT/REJECT ANALYSIS:U-6 :R
 ACCEPT/REJECT ANALYSIS:AB-2 :A
 ACCEPT OR REJECT (A/R) SAMPLE:C-S-512-35 :R
 ACCEPT OR REJECT (A/R) SAMPLE:C-S-512-36 :A
 DISPLAY THE REQUEST (YES/NO):Y

REQUEST:50534 DATE:08/20/78

JONES, S.
 2026
 7-3177
 CHARGE:00000000 ASSIGNED TO:LAB-1
 COMMENTS:THIS IS A TEST.

LAB. ID.:8 -00001 CUST. ID.:8 -00001
 ANALYSES: A-1 B-1 T-1

LAB. ID.:8 -00002 CUST. ID.:8 -00002
 ANALYSES: A-1 B-1 T-1

LAB. ID.:C-S-512 -00034 CUST. ID.:C-S-512-34
 ANALYSES: A-1 C-23

LAB. ID.:C-S-512 -00036 CUST. ID.:C-S-512-36
 ANALYSES: AB-2

UPDATE CLASS:

The SM command is used in the following example. The computer's output is underlined.

UPDATE CLASS:SM
 CUSTOMER NUMBER:1
 CUSTOMER WORK REQUEST:514

REQUEST:50000 DATE:11/03/78
 TEST NAME 2
 TEST ADDR 2
 TEST PHONE 2
 CHARGE:3370EFGH ASSIGNED TO:
 COMMENTS:THIS IS A TEST.

APPEND SAMPLES TO WORK REQUEST NUMBER:50000:505

REQUEST:50505 DATE:08/22/78
 SMITH, J.
 4507
 3-0000
 CHARGE:A111B222 ASSIGNED TO:LAB-1
 COMMENTS:THIS IS A TEST.

LAB. SERIES: L-S-505
 LAB. SAMPLE NUMBER:00000:289
 ACCEPT/REJECT ANALYSIS: A-1 :A
 ACCEPT/REJECT ANALYSIS C-23 :A
 ACCEPT OR REJECT (A/R. SAMPLE:C-S-514-345) :A
 DISPLAY THE REQUEST (YES/NO):Y

REQUEST:50505 DATE:08/22/78
 SMITH, J.
 4507
 3-0000
 CHARGE:A111B222 ASSIGNED TO:LAB-1
 COMMENTS:THIS IS A TEST.

LAB. ID.:5 -00022 CUST. ID.:7 -00002
 ANALYSES: B-1

LAB. ID.:5 -00023 CUST. ID.:7 -00003
 ANALYSES: B-1

LAB. ID.:C-S-514 -00345 CUST. ID.:C-S-514-345
 ANALYSES: B-2

LAB. ID.:C-S-514 -00346 CUST. ID.:C-S-514-346
 ANALYSES: U-6 AB-2

LAB. ID.:C-S-514 -00347 CUST. ID.:C-S-514-347
 ANALYSES: U-6 AB-2

LAB. ID.:S-505 -00289 CUST. ID.:C-S-514-345
 ANALYSES: A-1 C-23

UPDATE CLASS:

The next example shows the use of the MI command. The computer's output is underlined.

UPDATE CLASS:MI
 CUSTOMER NUMBER:1
 CUSTOMER WORK REQUEST:514

REQUEST:50000 DATE:11/03/78
 TEST NAME 2
 TEST ADDR 2
 TEST PHONE 2
 CHARGE:3370EFGH ASSIGNED TO:
 COMMENTS:THIS IS A TEST

APPEND SAMPLES TO WORK REQUEST NUMBER:50000:505

REQUEST:50505 DATE:08/22/78
 SMITH, J.
 4507
 3-0000
 CHARGE:A111B222 ASSIGNED TO:LAB-1
 COMMENTS:THIS IS A TEST.

ACCEPT/REJECT ANALYSIS:A-1 :R
 ACCEPT/REJECT ANALYSIS:B-2 :A
 ACCEPT/REJECT ANALYSIS:C-23 :R
 ACCEPT/REJECT ANALYSIS:U-6 :A
 ACCEPT/REJECT ANALYSIS:AB-2 :A
 DISPLAY THE REQUEST (YES/NO):Y

REQUEST:50505 DATE:08/22/78
 SMITH, J.
 4507
 3-0000
 CHARGE:A111B222 ASSIGNED TO:LAB-1
 COMMENTS:THIS IS A TEST.

LAB. ID.:5	-00022	CUST. ID.:7	-00002
ANALYSES: B-1			
LAB. ID.:5	-00023	CUST. ID.:7	-00003
ANALYSES: B-1			
LAB. ID.:C-S-514	-00345	CUST. ID.:C-S-514-345	
ANALYSES: B-2			
LAB. ID.:C-S-514	-00346	CUST. ID.:C-S-514-346	
ANALYSES: U-6	AB-2		
LAB. ID.:C-S-514	-00347	CUST. ID.:C-S-514-347	
ANALYSES: U-6	AB-2		

UPDATE CLASS:

The following example shows the MS command. The computer's output is underlined.

UPDATE CLASS:MS
 CUSTOMER NUMBER:1
 CUSTOMER WORK REQUEST:512

REQUEST:50000 DATE:11/03/78
 TEST NAME 2
 TEST ADDR 2
 TEST PHONE 2
 CHARGE:3370EFGH ASSIGNED TO:
 COMMENTS:THIS IS A TEST

APPEND SAMPLES TO WORK REQUEST NUMBER:50000:504

REQUEST:50504 DATE:08/20/78

JONES, S.
2026
3-3111
CHANGE:0000000 ASSIGNED TO:LAB-1
COMMENTS:THIS IS A TEST.

```
LAB. SERIES: :L-S-504
LAB. SAMPLE NUMBER:000756
ACCEPT/REJECT ANALYSIS:J-2
ACCEPT/REJECT ANALYSIS:U-6
ACCEPT/REJECT ANALYSIS:AB-2
DISPLAY THE REQUEST (YES/NO):
```

REQUEST:50504 DATE:08/20/78
JONES, S.
2026
3-0111
CHARGE:COODCOO ASSIGNED TO:LAB-1
COMMENTS:THIS IS A TEST.

<u>LAB. ID.:</u> <u>B</u>	<u>-00001</u>	<u>CUST.</u>	<u>ID.:</u> <u>B</u>	<u>-00001</u>
<u>ANALYSES:</u> <u>A-1</u>	<u>B-4</u>		<u>T-1</u>	
<u>LAB. ID.:</u> <u>B</u>	<u>-00002</u>	<u>CUST.</u>	<u>ID.:</u> <u>B</u>	<u>-00002</u>
<u>ANALYSES:</u> <u>A-1</u>	<u>B-4</u>		<u>T-1</u>	
<u>LAB. ID.:</u> <u>C-S-512</u>	<u>-00034</u>	<u>CUST.</u>	<u>ID.:</u> <u>C-S-512-34</u>	
<u>ANALYSES:</u> <u>A-1</u>	<u>C-23</u>			
<u>LAB. ID.:</u> <u>C-S-512</u>	<u>-00036</u>	<u>CUST.</u>	<u>ID.:</u> <u>C-S-512-36</u>	
<u>ANALYSES:</u> <u>AB-2</u>				
<u>LAB. ID.:</u> <u>L-S-504</u>	<u>-00456</u>	<u>CUST.</u>	<u>ID.:</u> <u>C-S-512-34</u>	
<u>ANALYSES:</u> <u>B-2</u>				
<u>LAB. ID.:</u> <u>L-S-504</u>	<u>-00457</u>	<u>CUST.</u>	<u>ID.:</u> <u>C-S-512-35</u>	
<u>ANALYSES:</u> <u>U-6</u>	<u>AB-2</u>			
<u>LAB. ID.:</u> <u>L-S-504</u>	<u>-00458</u>	<u>CUST.</u>	<u>ID.:</u> <u>C-S-512-36</u>	
<u>ANALYSES:</u> <u>U-6</u>				
<u>UPDATE CLASS:</u>				

1.2.2 Making Corrections

1.2.2.1 General Description

Occasionally the data in a work request record or in a sample record is incorrect. The FILEUP program provides several commands for correcting errors in existing records. The Update a Request (UR) command may be used to correct work request or customer catalog data records. The Update a Sample (US) command is provided for the correction of sample records.

1.2.2.2 Work Request Information

The Update a Request (UR) command of the FILEUP program has many subcommands for the correction of specific data items in a work request record. Each of the data items in a work request is referenced with a subcommand of the UR command. In addition, a number of utility subcommands are provided. A table of subcommands and descriptions follows:

SUBCOMMAND	DESCRIPTION
NA	List and update the name field.
AD	List and update the address field.
PH	List and update the phone number field.
AS	List and update the assigned laboratory field.
DA	List and update the date received field.
CH	List and update the charge number field.
SE	List and update the customer series field.
DE	List and update the deadline field.
CO	List and update the comments field.
C2	List and update the second comments field.
FO	List and update the report format field.
LI	List the current values for all fields.
NE	Display a list of the UR subcommands.
NE	Process the next work request record.
ST	Stop work request subcommand processing.
DL	Delete the current work request record.
SD	Delete the current work request and all associated sample records.

1.2.2.3 Sample Information

The Update a Sample (US) command of the FILEUP program provides a number of subcommands for correction of sample record data items. The fields in a sample record are referenced with US subcommands. A list of the subcommands and their functions follows:

SUBCOMMAND	FUNCTION
ID	List and update the laboratory series and sample number.
AN	List and update the next analysis item in the sample record.
AN/X	List and update analysis item "X".
SA	List and update the customer's sample identifier.
CO	List and update the sample comment field.
LI	Display all of the fields in the current sample record.
NE	Process the next sample record.
DL	Delete the current sample record.
NE	Display a list of the US subcommands.
ST	Stop sample subcommand processing.

1.2.2.4 Examples

The following example shows the UR command and each of its subcommands. The computer's output is underlined.

```

UPDATE CLASS:UR
WORK REQUEST NUMBER:50000;501
REQUEST SHEET FUNCTION:LI

*REQUEST:50501
SMITH, J.
#500W
3-1071
*ASSIGNED LAB:3-147
*CHARGE NUMBER:X111Y222          *SERIES:C-3-1
*RECEIVED:08/30/78 *COMPLETED:
*FORMAT:2 *OLD FORMAT:
*NUMBER OF SAMPLES:5 *COMPLETED:0
*DEADLINE:09/15/78 FOR ALL A-1 ANALYSES.
*COMMENTS:THIS IS A TEST COMMENT.

```

```

REQUEST SHEET FUNCTION:NA
CUSTOMER'S NAME:SMITH, J.
JONES, S.
REQUEST SHEET FUNCTION:AD
CUSTOMER'S ADDRESS:4500H
3019
REQUEST SHEET FUNCTION:PH
CUSTOMER'S PHONE:3-1071
3-3333
CHANGE THE FIELD?Y
REQUEST SHEET FUNCTION:AS
ASSIGNED TO LAB:3-147           :7AB-1
REQUEST SHEET FUNCTION:DA
DATE RECEIVED:08/30/78:9/25/78
CHANGE THE FIELD?Y
REQUEST SHEET FUNCTION:CH
CHANGE NUMBER:X111Y222 :
REQUEST SHEET FUNCTION:SE
CUSTOMER'S SERIES:C-3-1       :1-C-3
REQUEST SHEET FUNCTION:DE
DEADLINE:09/15/78 FOR ALL A-1 ANALYSES.
"//////////NEW DEADLINE COMMENT.
REQUEST SHEET FUNCTION:C2
COMMENTS-2:
TEST COMMENT LINE 2.
REQUEST SHEET FUNCTION:FO
REPORT FORMAT:2:"3
REQUEST SHEET FUNCTION:LI

*REQUEST:50501
JONES, S.
3019
3-3333
*ASSIGNED LAB:LAB-1
*CHARGE NUMBER:X111Y222      *SERIES:1-C-3
*RECEIVED:09/25/78  *COMPLETED:
*FORMAT:3          *OLD FORMAT:
*NUMBER OF SAMPLES:5  *COMPLETED:0
*DEADLINE:09/15/78 NEW DEADLINE COMMENT.
*COMMENTS:THIS IS A TEST COMMENT.
TEST COMMENT LINE 2.

REQUEST SHEET FUNCTION:NE
WORK REQUEST NUMBER:50502:2
REQUEST SHEET FUNCTION:DL
UPDATE CLASS:UR
WORK REQUEST NUMBER:50003:508
REQUEST SHEET FUNCTION:SD
PASSWORD:ARG!!
BOMBS AWAY!!!!!!!!!!!!
SAMPLE:8           :00911 HAS BEEN DELETED.
SAMPLE:8           :00912 HAS BEEN DELETED.
BOOOOOOOOHHHHHHHHHH!!!!!!!!!!!!!!!!!!!!!!
UPDATE CLASS:UR
WORK REQUEST NUMBER:50508:1
REQUEST SHEET FUNCTION:NE
REQUEST SHEET UPDATING.
THIS SECTION OF THE PROGRAM PROVIDES THE FUNCTIONS NECESSARY
TO LIST, AND CHANGE THE FIELDS ASSOCIATED WITH A REQUEST SHEET

TO LIST THE ENTIRE REQUEST ENTER THE WORD 'LIST'.

TO PRINT THE INSTRUCTIONS TYPE 'HELP'.

WHEN ALL UPDATING OF A REQUEST HAS BEEN COMPLETED ENTER 'STOP'.

TO PROCESS THE NEXT REQUEST ENTER 'NEXT'.

TO DELETE A REQUEST ENTER 'DL'.

TO LIST AND THEN CHANGE ANY FIELD TYPE THE NAME OF THE FIELD
(ONLY THE FIRST TWO LETTERS ARE REQUIRED).
THE FIELD NAMES ARE:

```

```

NAME          :CUSTOMERS NAME
ADDRESS       :CUSTOMERS ADDRESS
PHONE        :CUSTOMERS PHONE NUMBER
ASSIGNED LAB  :THE LAB OR ROOM ASSIGNED.
DATE RECEIVED :THE DATE THE REQUEST ARRIVED
CHARGE       :CUSTOMERS CHARGE NUMBER
SERIES       :CUSTOMERS SAMPLE SERIES
DEADLINE     :DEADLINE
COMMENTS     :COMMENTS
C2           :COMMENTS-2
FORMAT       :REPORTING FORMAT NUMBER

```

AFTER THE FIELD HAS BEEN LISTED, IF NO CHANGE IS NEEDED DEPRESS
THE RETURN KEY. IF A CHANGE IS TO BE MADE ENTER THE "Y" KEY
AND THEN ENTER THE NEW VALUE FOR THE FIELD.

```

REQUEST SHEET FUNCTION:ST
UPDATE CLASS:

```

The following example shows the US command and each of its subcommands. The
computer's output is underlined.

```

UPDATE CLASS:US
REQUEST # OR SAMPLE # (R OR S):R
WORK REQUEST NUMBER:50000:511
REQUEST:50511 #SAMPLES:5 CUST. SMITH, J.
SAMPLE:11 -00010
SAMPLE FUNCTION:LI

*LAB. SERIES:11          *LAB. SAMPLE:00010
*CUST. SERIES:1-C-S      *CUST. SAMPLE ID:CSID-B
*ACD REQ:50511          *SAMPLE STATUS:I
*SAMPLE COMPLETION DATE:
*COMMENT:THIS IS A TEST.
*NUMBER OF ANALYSES TO PERFORM:4
*ANALYSIS:A-2           *STATUS:I
*RESULTS:
*ANALYSIS:B-1           *STATUS:I
*RESULTS:
*ANALYSIS:A-1           *STATUS:I
*RESULTS:
*ANALYSIS:B-4           *STATUS:
*RESULTS:

SAMPLE FUNCTION:ID
LAB. SERIES:11          :511
LAB. SAMPLE NUMBER:00010:1
SAMPLE FUNCTION:AN
ANALYSIS CODE:A-2       :A-3
ANALYSIS STATUS:I:C
CHANGE THE FIELD?Y
RESULTS:
R-A-3
SAMPLE FUNCTION:AN/B-4
ANALYSIS CODE:B-4       :
ANALYSIS STATUS:I:"C"
RESULTS:
R-B-4
SAMPLE FUNCTION:SA
CUSTOMER SERIES:1-C-S
CUSTOMERS SAMPLE ID:CSID-B
SAMPLE FUNCTION:CO
SAMPLE COMMENT:THIS IS A TEST.
*ANOTHER TEST COMMENT.
SAMPLE FUNCTION:LI

*LAB. SERIES:511          *LAB. SAMPLE:00001
*CUST. SERIES:1-C-S      *CUST. SAMPLE ID:CSID-U
*ACD REQ:50511          *SAMPLE STATUS:I
*SAMPLE COMPLETION DATE:
*COMMENT:ANOTHER TEST COMMENT.
*NUMBER OF ANALYSES TO PERFORM:4
*ANALYSIS:A-3           *STATUS:C
*RESULTS:A-A-3
*ANALYSIS:A-1           *STATUS:I

```

```

*RESULTS:
*ANALYSIS:A-1          *STATUS:I
*RESULTS:
*ANALYSIS:B-4          *STATUS:C
*RESULTS:B-8-4

```

```

SAMPLE FUNCTION:ST
UPDATE CLASS:US
REQUEST # OR SAMPLE # (R OR S):R
WORK REQUEST NUMBER:50000:511
REQUEST:50511 #SAMPLES:4 CUST. SMITH, J.
SAMPLE:11 -00011
SAMPLE FUNCTION:NE
SAMPLE:11 -00012
SAMPLE FUNCTION:ST
UPDATE CLASS:US
REQUEST # OR SAMPLE # (R OR S):S
LAB. SERIES: 511
LAB. SAMPLE NUMBER:00001:1
SAMPLE FUNCTION:L
PLEASE CONFIRM DELETION OF SAMPLE:511-00001 (YES OR NO):Y
SAMPLE:511 -00001 HAS BEEN DELETED.
SAMPLE FUNCTION:HE
THIS SECTION OF THE PROGRAM PROVIDES THE FUNCTIONS NEEDED
TO LIST AND/OR UPDATE A SAMPLE RECORD.

```

TO LIST THE ENTIRE SAMPLE ENTER THE WORD 'LIST'.

TO PRINT THE INSTRUCTIONS TYPE 'HELP'.

TO RETURN TO THE MAIN SEGMENT OF THE PROGRAM TYPE 'STOP'.

TO PROCESS THE NEXT SAMPLE TYPE 'NEXT'.

TO DELETE A SAMPLE ENTER 'DL'.

TO UPDATE THE FIELDS OF A SAMPLE RECORD, ENTER THE FOLLOWING

```

CODES:
ID          :LAB. SERIES AND/OR SAMPLE NUMBER.
SAMPLE      :CUSTOMER'S SAMPLE ID.
COMMENT     :SAMPLE COMMENT FIELD.
ANALYSIS    :THE NEXT ANALYSIS FIELD IN THE CURRENT RECORD.
AN/X       :THE ANALYSIS 'X', WHERE X IS THE ANALYSIS CODE.

```

```

SAMPLE FUNCTION:ST
UPDATE CLASS:

```

1.2.3 Processing Analytical Results

1.2.3.1 General Description

The FILEUP program will process analysis data items in many different ways. Analysis items may be added, deleted, expanded, updated, or placed in a result table. All of the sample addition commands (AS, AC, AM, AP) request a list of analyses to be assigned to the sample records being created. The Add an Analysis (AA) command is used to associate extra analyses with existing samples. The Delete an Analysis (DA) command is used to remove analyses from sample records. When a single analysis request results in many answers, the Expand an Analysis (EA) command may be used to provide the additional space needed for the answers. To assign results to analysis requests, the Update an Analysis (UA) command is used. If one analysis request results in a table of results, the Analysis Table (AT) command will accept and store the answers in such a way that the customer's report will be in a tabular format. The Save Result (SR) command assigns the same answer to an analysis in a group of samples. When entering analyses with the (AS, AM, AP or AA) commands, each analysis is checked against the "Master Analysis Code File" (see Section 1.3.6). If the analysis is found in the master file, it will be replaced by all of the analyses found in the master record.

1.2.3.2 Assigning Additional Analysis Requests

This example illustrates how analysis items are added to samples. The computer's output is underlined.

```

UPDATE CLASS:AA
REQUEST # OR SAMPLE RANGE (R OR S):S
LAB. SERIES:13
LAB. SAMPLE RANGE (X-Y):22
ANALYSES:B-4
SAMPLE:13 -00022
ANALYSIS:B-4 HAS BEEN ADDED.
UPDATE CLASS:AA
REQUEST # OR SAMPLE RANGE (R OR S):R
WORK REQUEST NUMBER:50513:513
ANALYSES:B-5,A-3,A-1
SAMPLE:13 -00021
ANALYSIS:B-5 HAS BEEN ADDED.
ANALYSIS:A-3 HAS BEEN ADDED.
ANALYSIS:A-1 WAS ALREADY REQUESTED.
SAMPLE:13 -00022
ANALYSIS:B-5 HAS BEEN ADDED.
ANALYSIS:A-3 HAS BEEN ADDED.
ANALYSIS:A-1 WAS ALREADY REQUESTED.
UPDATE CLASS:

```

1.2.3.3 Deleting Analysis Requests

Analysis requests are deleted using the techniques shown in the following example. The computer's output is underlined.

```

UPDATE CLASS:DA
REQUEST # OR SAMPLE RANGE (R OR S):R
WORK REQUEST NUMBER:50000:513
ANALYSES:B-1,A-3
SAMPLE:13 -00021
ANALYSIS:B-1 HAS BEEN DELETED.
ANALYSIS:A-3 HAS BEEN DELETED.
SAMPLE:13 -00022
ANALYSIS:B-1 HAS BEEN DELETED.
ANALYSIS:A-3 HAS BEEN DELETED.
UPDATE CLASS:DA
REQUEST # OR SAMPLE RANGE (R OR S):S
LAB. SERIES:13
LAB. SAMPLE RANGE (X-Y):21
ANALYSES:A-3,Z-1
SAMPLE:13 -00021
ANALYSIS:A-3 HAS BEEN DELETED.
ANALYSIS:Z-1 WAS NOT REQUESTED.
UPDATE CLASS:

```

1.2.3.4 Storing Analytical Results

Analysis results are entered using the UA command. The computer's output is underlined.

```

UPDATE CLASS:UA
REQUEST # OR SAMPLE RANGE (R OR S):S
LAB. SERIES:13
LAB. SAMPLE RANGE (X-Y):21-22
ANALYSES:P-1,B-5
SAMPLE:13 -00021
A-1 :R-1-A-1
B-5 :R-1-B-5
SAMPLE:13 -00022
A-1 :R-2-A-1
B-5 :R-2-B-5
UPDATE CLASS:

```

1.2.3.5 Assigning Multiple Analytical Results

An analysis is expanded by using the following sequence of commands. The computer's output is underlined.

```

UPDATE CLASS:EA
REQUEST # OR SAMPLE RANGE (R OR S):R
WORK REQUEST NUMBER:50000:513
ANALYSIS TO EXPAND:A-2
SAMPLE:13          -00021
ENTER A BLANK LINE TO STOP.
ELEMENT:VALUE E-1:V-1
E-1              :C:V-1
ELEMENT:VALUE E-2:V-2
E-2              :C:V-2
ELEMENT:VALUE E-3:V-3
E-3              :C:V-3
ELEMENT:VALUE
SAMPLE:13          -00022
ENTER A BLANK LINE TO STOP.
ELEMENT:VALUE E-1:V-1
E-1              :C:V-1
ELEMENT:VALUE E-2:V-2
E-2              :C:V-2
ELEMENT:VALUE
UPDATE CLASS:

```

1.2.3.6 Building A Table Of analytical Results

An analysis table is created with the following input. The computer's output is underlined.

```

UPDATE CLASS:AT
REQUEST # OR SAMPLE RANGE (R OR S):S
LAB. SERIES:      :15
LAB. SAMPLE RANGE (X-Y):30-32
COLUMN HEADERS:H2O@25C,H+@25C,TOTAL
ANALYSES:CE-100, RU-106, TOTAL
SAMPLE:15         -00030
CE-H2O@25C:V-1-1
CE-H+@25C :V-1-2
CE-TOTAL  :V-1-3
RU-H2O@25C:V-2-1
RU-H+@25C :V-2-2
RU-TOTAL  :V-2-3
TOTH2O@25C:V-3-1
TOTH+@25C :V-3-2
TOTTTOTAL :V-3-3
SAMPLE:15         -00031
CE-H2O@25C:V-1-1
CE-H+@25C :V-1-2
CE-TOTAL  :V-1-3
RU-H2O@25C:V-2-1
RU-H+@25C :V-2-2
RU-TOTAL  :V-2-3
TOTH2O@25C:V-3-1
TOTH+@25C :V-3-2
TOTTTOTAL :V-3-3
SAMPLE:15         -00032
CE-H2O@25C:V-1-1
CE-H+@25C :V-1-2
CE-TOTAL  :V-1-3
RU-H2O@25C:V-2-1
RU-H+@25C :V-2-2
RU-TOTAL  :V-2-3

```


TOT#20#25C:V-3-1
 TOT#25C :V-3-2
 TOT#TOTAL :V-3-3
 UPDATE CLASS:

The analysis table created by the preceding example is shown below.

ANALYTICAL RESULTS - 08/31/78

PAGE 1

CUSTOMER : STANTON, J.
 ADDRESS : 4500M
 PHONE : 3-1231
 REQUEST : 50515
 RECEIVED : 08/31/78
 COMMENTS : THIS IS A TEST OF THE ANALYSIS TABLE REPORT.
 :

CHARGE : K222Y333
 SERIES : C-S-1A
 COMPLETED : 08/31/78

CUST. SAMPLE ID	LAB	ANALYSIS	H20#25C	H#25C	TOTAL
00030	00030	CE-1A4	V-1-1	V-1-2	V-1-3
		RU-106	V-2-1	V-2-2	V-2-3
		TOTAL	V-3-1	V-3-2	V-3-3
00031	00031	CE-1A4	V-1-1	V-1-2	V-1-3
		RU-106	V-2-1	V-2-2	V-2-3
		TOTAL	V-3-1	V-3-2	V-3-3
00032	00032	CE-1A4	V-1-1	V-1-2	V-1-3
		RU-106	V-2-1	V-2-2	V-2-3
		TOTAL	V-3-1	V-3-2	V-3-3

1.2.3.7 Assigning The Same Result To An Analysis In A Group Of Samples.

If the answer for an analysis is the same over a group of samples, the SR command is used. The computer's output is underlined.

UPDATE CLASS:SR
 REQUEST # OR SAMPLE RANGE (R OR S):R
 WORK REQUEST NUMBER:50000:504
 ANALYSES:A-1
 SAMPLE:8 -00001
 RESULT:9/15/78
 A-1 :C:9/15/78
 SAMPLE:8 -00002
 A-1 :C:9/15/78
 UPDATE CLASS:

1.2.4 Using The Customer Catalog

1.2.4.1 General Description

A catalog of customer identification information is stored and referenced by the FILEUP program. The catalog may be used to reduce the amount of data which must be entered from the terminal, to post a work request from a customer. The catalog will retain a customer's name, address, phone number, preferred report format, and charge number. The Save a Customer (SC) command is provided for entering customers in the catalog. The Copy a Customer (CC) command will reference the saved information and assign it to a work request record. The List Customer Catalog (LCC) command of the LOOKUP program will generate a list of the catalog. The Update a Request (UR) command of the FILEUP program may be used to correct catalog entries.

1.2.4.2 Adding A Customer To The Catalog

This is an example of entering a record in the customer catalog. The computer's output is underlined.

```

UPDATE CLASS:SC
ASSIGNED CUSTOMER NUMBER:50004
CUSTOMERS NAME:
LAING, W.
CUSTOMERS ADDRESS:
2026
CUSTOMERS PHONE:
3-3333
REPORT FORMAT:1:4
CHARGE NUMBER: :A123B756
ANY MORE CUSTOMERS TO CATALOG? (YES/NO):Y
ASSIGNED CUSTOMER NUMBER:50005
CUSTOMERS NAME:
PRICE, C.
CUSTOMERS ADDRESS:
4500
CUSTOMERS PHONE:
3-6112
REPORT FORMAT:1:5
CHARGE NUMBER: :C098D765
ANY MORE CUSTOMERS TO CATALOG? (YES/NO):N
UPDATE CLASS:

```

1.2.4.3 Using The Information Stored In The Catalog

This command copies information from the catalog. The computer's output is underlined.

```

UPDATE CLASS:CC
CUSTOMER NUMBER TO COPY:2
ASSIGNED WORK REQUEST NUMBER:50504
LAING, W.
2026
3-3333
ASSIGNED TO LAB: :S-222
REPORT FORMAT:4:
DATE RECEIVED:08/30/78:9/1/78
CHARGE NUMBER:A123B456 :
CUSTOMERS SERIES: :C-S-3
DEADLINE:
COMMENTS:
COMMENTS-2:
UPDATE CLASS:

```

1.2.4.4 Listing The Contents Of The Catalog

This is the listing created by the LCC command of the LOOKUP program. The computer's output is underlined.

```

.RUN S
PROGRAM ID:L
USING THE FILE FOR LAB NUMBER:5
PLEASE INPUT A COMMAND:LCC
CUSTOMER CATALOG                                08/31/78  PAGE: 1

```

NUMBER	CUSTOMER NAME
50001	R. E. ADAMS
50002	W.D. ARNOLD, JR.
50003	C.E. BAMBERGER
50004	E.E. BEACHAMP
50005	MARY ANNA BOGLE
50006	HAROLD CONNER
50007	S.R. BUXTON
50008	A. J. CAPUTO
50009	R.L. COUNCE
50010	ROBERT BROCKSEN
50011	F.I. CASE
50012	L.S. DICKERSON
50013	C.E. DEVORE
50014	LORI H GRAY
50015	PAUL HAAS
50016	B.A. HANNAFORD
50017	MARILYN HENDRICKS

1.2.5 Special Functions Of The Data Entry Program

The FILEUP program will list usage instructions if the word "HELP" is entered as a response to the "UPDATE CLASS", "SAMPLE FUNCTION", or "REQUEST FUNCTION" prompting messages.

To erase the current input line, hold down the CONTROL key (CONTRL, CNTRL, CTL) and enter the letter "U".

To erase the previous character on the input line, depress the DELETE key (DEL, RUB OUT).

To force the FILEUP program to stop processing and return to the "UPDATE CLASS" prompt message, hold down the CONTROL key and enter the letter U and then type the word "OOPS" and hit the RETURN key.

To list the current input line, hold down the CONTROL key and enter the letter "R".

When updating a field in an existing record, enter the CARET, "^", character and then input the new value for the field.

When the prompting message "ANALYSES" is displayed during an analysis update, an entry of question mark "?" will cause the FILEUP program to list the analyses requested for the first record in the update group. Inputting a pound sign, "#", will cause FILEUP to process all analyses in the specified samples.

When the prompting message "ANALYSES" is displayed during the sample add phase, an entry of pound sign, "#", will cause FILEUP to copy the analyses requested for the previous sample into the current sample.

To instruct FILEUP to copy characters from the beginning of an existing field, enter the letter backslash, "\", as many times as there are characters to duplicate.

1.2.6 Storing Repetitive Analyses In The Master Analysis Code File

1.2.6.1 General Description

The ANALUP program is used to store up to 100 analyses (as a group) under a Master Analysis Code. Then when the FILEUP Program prompts for "ANALYSES" in the Add Sample (AS, AM, AP) and Add Analysis (AA) modes, the Master Analysis Code can be entered, and the program will replace the master code with all of the analyses associated with that master. As many master codes as desired can be placed into the Master Analysis Code File using the ANALUP program. Also when copying samples and analyses from a customer's file with the FILEUP Program, (AI, CI, IA, MI, MS, SA, SM, SN Commands), each analysis copied will be checked against the Master Analysis Code File, and will be replaced if found in the master file. Careful consideration should be used in constructing the master analysis code to eliminate duplication with normal analyses codes. If duplication occurs, a normal analysis will be replaced by the analyses from the master file, as if it were a master code.

1.2.7 ANALUP Program

1.2.7.1 General Description

This program provides the necessary functions for updating the Analytical Chemistry Master Analysis Table File. All of the functions for adding, changing, deleting, and listing records are provided.

The following functions are available:

<u>FUNCTION</u>	<u>DESCRIPTION</u>
AM	<ADD MASTER> - Provides the ability to add new master records to the file.
DM	<DELETE MASTER> - To delete a specified master record and all of the associated analyses for that record.
LM	<LIST MASTER> - To list all of the analyses for a specified master record.
AA	<ADD ANALYSIS> - To add an analysis to an existing specified master record.
CA	<CHANGE ANALYSIS> - To change an analysis in a specified master record.
DA	<DELETE ANALYSIS> - To delete an analysis in a specified master record.
LT	<LIST ON TERMINAL> - To list the entire file on your terminal.
LP	<LIST ON PRINTER> - To list the entire file on the line printer.
ST	<STOP> - To end the session and exit from the program.

1.2.7.2 Features Of The Program

1. "OOPS" Option: If an error is made, entering the word "OOPS" will cause the program to ignore the current activity and will return to the beginning of the current function without updating the file.
2. The maximum number of characters allowed for an analysis or master analysis is ten characters.
3. When entering analyses in add master mode, multiple analyses may be entered on one line, but they must be separated by commas (<,>). A maximum of 80 characters per line can be entered, and any characters over 80 will be dropped. Also a comma <,> cannot be used as part of an analysis code.
4. A maximum of 100 analyses is allowed for each master record.

1.2.7.3 Examples - (The Computer's Output Is Underlined)

```

..RUN ANALUP
ANALYSIS TABLE FILE UPDATE PROGRAM STATING.
DO YOU NEED HELP? ANSWER <Y OR N>:N
ENTER FUNCTION DESIRED, <ST TO STOP>: :AM
ENTER MASTER CODE: :MASTER100
ANALYSES:TEST1,TEST2,TEST3,TEST4
ANY MORE ANALYSES? <Y OR N>:Y
ANALYSES:TEST5,TEST6
ANY MORE ANALYSES? <Y OR N>:N
ANY MORE MASTER RECORDS TO ADD? <Y OR N>:Y
ENTER MASTER CODE:MASTER100 :MASTER200
ANALYSES:TEST1,TEST3
ANY MORE ANALYSES? <Y OR N>:N
ANY MORE MASTER RECORDS TO ADD? <Y OR N>:N
ENTER FUNCTION DESIRED, <ST TO STOP>:AM :AA
ENTER MASTER CODE:MASTER200 :
ENTER ANALYSIS: :TEST4
ANY MORE ANALYSIS TO ADD? ANSWER <Y OR N>:N
ENTER MASTER CODE:MASTER200 :
ENTER ANALYSIS:TEST4 :TEST5
ANY MORE ANALYSIS TO ADD? ANSWER <Y OR N>:N
ENTER FUNCTION DESIRED, <ST TO STOP>:AA :LM
ENTER MASTER CODE:MASTER200 :MASTER100

```

MASTER ANALYSIS CODE: MASTER 100

```

ANALYSIS ANALYSIS ANALYSIS ANALYSIS ANALYSIS ANALYSIS ANALYSIS
TEST1 TEST2 TEST3 TEST4 TEST5 TEST6
ANY MORE TO LIST? <Y OR N>:Y
ENTER MASTER CODE:MASTER100 :MASTER200

```

MASTER ANALYSIS CODE: MASTER200

ANALYSIS ANALYSIS ANALYSIS ANALYSIS ANALYSIS ANALYSIS ANALYSIS

TEST1 TEST3 TEST4 TEST5

ANY MORE TO LIST? (Y OR N):NENTER FUNCTION DESIRED, (ST TO STOP):LM :STEXIT

1.3 RETRIEVING INFORMATION FROM THE COMPUTER

1.3.1 General Description

The Sample Management System generates a large variety of request status and analytical result reports. The reports are created both automatically and upon demand. Computer listings covering pending work requests, partial analytical results, final analytical results, completion deadlines, entries in the customer catalog, counts of complete and/or incomplete analyses, and record dumps are available. The programs which generate sample management reports are LOOKUP, LISTER, BACKLOG, and ENQUIRE. Each of these programs is described in the following subsections.

1.3.2 Interactive Work Status Reports

1.3.2.1 LOOKUP Program

1.3.2.1.1 General Description

The LOOKUP program produces over a dozen different reports. The basic report types list incomplete analyses, complete analyses, both complete and incomplete analyses, completion deadlines, and file listings. Each of the basic report types may be modified with record selection criteria and listing order specifications.

1.3.2.1.2 Command Definitions

LOOKUP program commands are divided into three sections. A report type section is used to define the basic report format. The record range section describes the group of records to be included in the report. The analysis section specifies which analyses are to be reported on. The command sections are separated by the character "!" (exclamation).

1.3.2.1.3 Report Type Specification

The report type section contains a three-character code which defines the report format. The first character describes the data value to be reported, the second character defines the type of range specification used, and the last character specifies the order of the listing.

First-character codes and the resulting report items.

CODE	REPORT ITEMS
I	Incomplete analyses.
C	Complete analyses.
T	Both complete and incomplete analyses.
D	Completion deadlines.
L	Listing of information as it appears on the file.

Second-character codes and the corresponding range types.

CODE	RANGE TYPE
R	Work request numbers are used to specify the range.
S	Sample identifications are used to specify the range.
C	A customer's name is used.

Third-character codes and the associated listing order.

CODE	LISTING
R	By work request number.
S	By sample identification.
T	By file totals.
C	By customer catalog number.

1.3.2.1.4 Record Range Specification

The range section of a command is used to limit the report to a specific group of sample and/or work request records.

If the second character in the report type section is a "C", then the range section is assumed to be a customer's name. Either the entire customer name or a part of the name may be used. If a partial name is coded, end the name with an "@" (at character); examples:

Ralph D. Smith
Smith@

The range section is interpreted as one or more work request numbers if the second report type character is an "R". The range may include a single request, a number of specific requests, a span of requests or all requests. The four formats used are:

Number: results in a report on work request 'number' only.

Number1&number5&number2: this causes a report to be created for work requests number1, number5, and number2 only.

Number3#number9: creates a report for requests number3 through number9 inclusive.

Blank: generates a report for all work requests on file.

If the report type section's second character is an "S", the range is decoded as one or more sample identifications. The sample identifications are coded as a series number where the series is the laboratory's series code for the sample, and the number is the laboratory's sample number for the sample. The '"', (double quote), must be coded between the series and the number. If the series or number is blank, code the double quote anyway. The sample specification also uses four basic forms.

Series=number: causes a report to be generated for the sample 'series-number' only.

Series=number&series2=number2&series3=number3: results in a report covering samples 'series-number', 'series2-number2', and 'series3-number3' only.

Series=number*series2=number2: creates a report for samples 'series-number' through 'series2-number2' inclusive.

Blank: generates a report for all samples on file. If a report covering all file items is desired, the "R" range type will result in a faster response.

1.3.2.1.5 Analysis Specification

The analysis specification section of a command is used to limit a report to one or more analysis codes. The analyses are entered in the same fashion as the work request numbers in the range section of a command; i.e., a single analysis code results in a report on that analysis only, several analysis codes separated by "&" (ampersand characters) cause a report covering the specific analyses entered. Two analysis codes separated by an "*" (asterisk) indicate that all analyses from the left analysis code through the right analysis code are to be included. If the field is blank, all analyses on the file are included.

1.3.2.1.6 Special Characters Used By LOOKUP

! (Exclamation): this character is used to separate the three sections of a command (code, range, and analysis).

Ex. TRT115*171CA&H+

& (Ampersand): means and in the range and analysis fields.

Ex. 12&16&11 means 12 and 16 and 11.

* (Asterisk): used to indicate through in the range and analysis fields.

Ex. a*b means a through b.

" (Double quote): separates the sample series and sample number in the range field of a command.

Ex. series=number means sample id series-number.

@ (At): indicates that only part of a customer's name has been entered.

Ex. Smith@ means all customers with the letters "Smith" in their name.

1.3.2.1.7 Command Examples:

TRT112*14IK: this command results in a report covering work requests 12 through 14. The report lists the number of complete and incomplete analysis "K" items.

CRS15: this example will list all of the completed results on work request 5. The results will be listed by sample and analysis.

LCC: this command will print a copy of the current customer catalog. All cataloged customers will be included.

1.3.2.1.8 Execution Instructions

To run the LOOKUP program:

- 1) Login to the DECsystem-10
- 2) Enter: RUN 5
- 3) The computer will respond: PROGRAM ID: Enter the letter "L".
- 4) The LOOKUP program will respond by listing the current lab number.
- 5) The program will then print "PLEASE INPUT A COMMAND:".
- 6) At this point enter the command associated with the report that is desired. For a list of the command codes and a sample of the resulting report formats, see the end of this section.

To exit from the LOOKUP program, enter the special command "STO". This will cause LOOKUP to return control to the DECsystem-10 monitor. The abbreviations "ST" and "S" will also stop LOOKUP.

The LOOKUP program responds to the following commands:

TRR, TSR, TCR, TRT, TST, ICT, TRS, TSS, TCS, TRR, ISR, ICR, INT, IST, ICT, IRS, ISS, ICS, CRR, CSR, CCR, CRT, CST, COT, CRS, CSS, CCS, LRR, LSR, LCR, LRT, LST, LCT, LRS, LSS, LCS, LCC, LRC, LSC, DCR, DRR, S, ST, STO

1.3.2.1.9 Report Examples

TRR, TSR, TCR REPORT EXAMPLE

PLEASE INPUT A COMMAND:TRR1501*506

ANALYSIS STATUS COUNTS			09/08/78 PAGE: 1		
REQUEST:50501:09/05/78:JONES, S.					
ANALYSIS	COMPLETE	INCOMPLETE	ANALYSIS	COMPLETE	INCOMPLETE
A-1	5	0	B-2	5	0
A-4	5	0	E-1	4	0
E-2	3	0	E-3	2	0
REQUEST:50504:08/20/78:JONES, S.					
ANALYSIS	COMPLETE	INCOMPLETE	ANALYSIS	COMPLETE	INCOMPLETE
A-1	0	2	B-4	0	2
T-1	0	2	A-2	1	0
REQUEST:50505:08/22/78:SMITH, J.					
ANALYSIS	COMPLETE	INCOMPLETE	ANALYSIS	COMPLETE	INCOMPLETE
A-3	3	0	B-1	0	3
REQUEST:50506:09/07/78:SMITH, S.S.					
ANALYSIS	COMPLETE	INCOMPLETE	ANALYSIS	COMPLETE	INCOMPLETE
A-1	0	10	B-2	0	10

ANALYSIS STATUS COUNTS			09/08/78 PAGE: 2		
*** TOTALS ***					
ANALYSIS	COMPLETE	INCOMPLETE	ANALYSIS	COMPLETE	INCOMPLETE
A-1	5	12	B-2	5	10
A-4	5	0	E-1	4	0
E-2	3	0	E-3	2	0
J-4	0	2	T-1	0	2
A-7	1	0	A-3	3	0
B-1	0	3			
TOTAL INCOMPLETE ANALYSES: 29					

TRT, TST, TCT REPORT EXAMPLE

PLEASE INPUT A COMMAND:TRT1501*5071A-1&B-2&B-4&A-2

ANALYSIS STATUS COUNTS

09/08/78 PAGE: 1

*** TOTALS ***

ANALYSIS			COMPLETE	INCOMPLETE	ANALYSIS			COMPLETE	INCOMPLETE
A-1			5	12	B-2		5	10	
B-A			0	6	A-2		1	4	
TOTAL INCOMPLETE ANALYSES:				32					

TRS, TSS, ICS REPORT EXAMPLE

PLEASE INPUT A COMMAND: TRS1501P504

COMPLETE ANALYSIS RESULTS

09/08/78 PAGE: 1

REQUEST: 50501:09/05/78:JONES, S.

SAMPLE ID	EXPANDED	-ID	LABS ID
C-S-1		-ID-1A	-00001
A-1	:EXPANDED		
B-2	:S-1-B-2		
A-A	:S-1-A-A;EXTRA		
E-1	:S-1;V-1		
E-2	:S-1;V-2		

SAMPLE ID	EXPANDED	-ID	LABS ID
C-S-1		-ID-1B	-00002
A-1	:EXPANDED		
B-2	:S-2-B-2 MORE STUFF		
A-A	:S-2-A-A		
E-1	:S-2;V-1		
E-2	:S-2;V-2		
E-3	:S-2;V-3		

SAMPLE ID	EXPANDED	-ID	LABS ID
C-S-1		-ID-2A	-00003
A-1	:EXPANDED		
B-2	:S-3-B-2;EXTRA		
A-A	:S-3-A-A MORE STUFF		
E-1	:S-3;V-1		

SAMPLE ID	EXPANDED	-ID	LABS ID
C-S-1		-ID-2B	-00004
A-1	:EXPANDED		
B-2	:S-4-B-2		
A-A	:S-4-A-A;Extra		
E-3	:S-4;V-3		

SAMPLE ID	EXPANDED	-ID	LABS ID
C-S-1		-ID-CA	-00005
A-1	:EXPANDED		
B-2	:S-5-B-2 MORE STUFF		
A-A	:S-5-A-A		
E-2	:S-5;V-2		
E-1	:S-5;V-1		

INCOMPLETE SAMPLE IDS

09/08/78 PAGE: 1

REQUEST: 50504:08/20/78:JONES, S.

ANALYSIS	INCOMP	INCOMPLETE
A-1		
8	-00001 8	-00002
ANALYSIS	B-A	INCOMPLETE
8	-00001 8	-00002
ANALYSIS	T-1	INCOMPLETE
8	-00001 8	-00002

IRR, ISR, ICR REPORT EXAMPLE

PLEASE INPUT A COMMAND: ISR16*107*99

ANALYSIS STATUS COUNTS

09/08/78 PAGE: 1

REQUEST: 50506:09/07/78:SMITH, S.S.

ANALYSIS	INCOMP	ANALYSIS	INCOMP	ANALYSIS	INCOMP	ANALYSIS	INCOMP
A-1	10	B-2	10				

REQUEST: 50507:09/08/78:WISE, W.W.

ANALYSIS	INCOMP	ANALYSIS	INCOMP	ANALYSIS	INCOMP	ANALYSIS	INCOMP
B-A	4	A-2	4				

ANALYSIS STATUS COUNTS

09/08/78 PAGE: 2

*** TOTALS ***

ANALYSIS	INCOMP	ANALYSIS	INCOMP	ANALYSIS	INCOMP	ANALYSIS	INCOMP
A-1	10	B-2	10	B-4	4	A-2	4

TOTAL INCOMPLETE ANALYSES: 28

IRI, IST, ICT REPORT EXAMPLE

PLEASE INPUT A COMMAND: ICT:SMITH

ANALYSIS STATUS COUNTS

09/08/78 PAGE: 1

*** TOTALS ***

ANALYSIS	INCOMP	ANALYSIS	INCOMP	ANALYSIS	INCOMP	ANALYSIS	INCOMP
B-1	3	A-1	10	B-2	10		

TOTAL INCOMPLETE ANALYSES: 23

IRS, ISS, ICS REPORT EXAMPLE

PLEASE INPUT / COMMAND: IRS:504

INCOMPLETE SAMPLE IDS

09/08/78 PAGE: 1

REQUEST: 50504:08/20/78: JONES, S.
 ANALYSIS: A-1 INCOMPLETE
 8 -00001 8 -00002
 ANALYSIS: B-4 INCOMPLETE
 8 -00001 8 -00002
 ANALYSIS: T-1 INCOMPLETE
 8 -00001 8 -00002

CRR, CSR, CCR REPORT EXAMPLE

PLEASE INPUT A COMMAND: CRR:501*504

ANALYSIS STATUS COUNTS

09/08/78 PAGE: 1

REQUEST: 50501:09/05/78: JONES, S.

ANALYSIS COMPLETE		ANALYSIS COMPLETE	
A-1	5	B-2	5
A-4	5	E-1	4
E-2	3	E-7	2

REQUEST: 50504:08/20/78: JONES, S.

ANALYSIS COMPLETE		ANALYSIS COMPLETE	
A-2	1		

ANALYSIS STATUS COUNTS

09/08/78 PAGE: 2

*** TOTALS ***

ANALYSIS COMPLETE		ANALYSIS COMPLETE	
A-1	5	B-2	5
A-4	5	E-1	4
E-2	3	E-3	2
A-2	1		

CRT, CST, CCT REPORT EXAMPLE

PLEASE INPUT A COMMAND: CRT

ANALYSIS STATUS COUNTS

09/08/78 PAGE: 1

*** TOTALS ***

ANALYSIS COMPLETE		ANALYSIS COMPLETE	
A-1	5	B-2	5
A-4	5	E-1	4
E-2	3	E-3	2
A-2	1	A-3	3

CRS, CSS, CCS REPORT EXAMPLE

PLEASE INPUT A COMMAND:CRS1501

COMPLETE ANALYSIS RESULTS 09/08/78 PAGE: 1
 REQUEST:0501:09/05/78:JONES, S.
 SAMPLE ID:C-S-1 -ID-1A LABS ID: -00001
 A-1 :EXPANDED
 B-2 :S-1-B-2
 A-4 :S-1-A-4;EXTRA
 E-1 :S-1;V-1
 E-2 :S-1;V-2
 SAMPLE ID:C-S-1 -ID-1B LABS ID: -00002
 A-1 :EXPANDED
 B-2 :S-2-B-2 MORE STUFF
 A-4 :S-2-A-4
 E-1 :S-2;V-1
 E-2 :S-2;V-2
 E-3 :S-2;V-3
 SAMPLE ID:C-S-1 -ID-2A LABS ID: -00003
 A-1 :EXPANDED
 B-2 :S-3-B-2;EXTRA
 A-4 :S-3-A-4 MORE STUFF
 E-1 :S-3;V-1
 SAMPLE ID:C-S-1 -ID-2B LABS ID: -00004
 A-1 :EXPANDED
 B-2 :S-4-B-2
 A-4 :S-4-A-4;EXTRA
 E-3 :S-4;V-2
 SAMPLE ID:C-S-1 -ID-CA LABS ID: -00005
 A-1 :EXPANDED
 B-2 :S-5-B-2 MORE STUFF
 A-4 :S-5-A-4
 E-2 :S-5;V-2
 E-1 :S-5;V-1

LRR, LSR, LCR REPORT EXAMPLE

PLEASE INPUT A COMMAND:LRR1504507

LIST OF REQUEST SHEET INFORMATION 09/08/78 PAGE: 1
 REQUEST:50504:08/20/78:JONES, S.
 JONES, S.
 2026
 3-0111
 CHARGE:00000000 SERIES:
 RECEIVED:08/20/78 COMPLETED:NOT-YET
 # OF SAMPLES:00002 #COMPLETED:00000
 COMMENT:THIS IS A TEST OF THE CI COMMAND.
 REQUEST:50507:09/08/78:WISE, W.W.
 WISE, W.W.
 2026
 3-0010
 CHARGE:ADCPFGH SERIES:C-S-7
 RECEIVED:09/08/78 COMPLETED:NOT-YET
 # OF SAMPLES:00004 #COMPLETED:00000
 DEADLINE:09/20/78

LRT, LST, LCT REPORT EXAMPLE

PLEASE INPUT A COMMAND:LRT1505

LIST OF REQUEST AND SAMPLE INFORMATION 09/08/78 PAGE: 1
 REQUEST:50505:08/22/78:SMITH, J.

SMITH, J.
 4507
 3-0000
 CHARGE:A1118222 SERIES:
 RECEIVED:08/22/78 COMPLETED:NOT-YET
 # OF SAMPLES:00003 #COMPLETED:00000
 COMMENT:THIS IS A TEST OF THE SW COMMAND.

SAMPLE ID:-7 -00001 LABS ID:5 -00021
 REQUEST:50505 STATUS:I DATE COMPLETED:NOT YET
 NUMBER OF ANALYSES:00002
 A-3 :D:REJECTED
 B-1 :I:

SAMPLE ID:-7 -00002 LABS ID:5 -00022
 REQUEST:50505 STATUS:I DATE COMPLETED:NOT YET
 NUMBER OF ANALYSES:00002
 A-3 :D:REJECTED
 B-1 :I:

SAMPLE ID:-7 -00003 LABS ID:5 -00023
 REQUEST:50505 STATUS:I DATE COMPLETED:NOT YET
 NUMBER OF ANALYSES:00002
 A-3 :D:REJECTED
 B-1 :I:

LRS, LSS, LCS REPORT EXAMPLE

PLEASE INPUT A COMMAND:LSS:16*1*6*10

LIST OF SAMPLE INFORMATION 09/08/78 PAGE: 1

SAMPLE ID:C-S-6 -00001 LABS ID:6 -00001
 REQUEST:50506 STATUS:I DATE COMPLETED:NOT YET
 NUMBER OF ANALYSES:00002
 A-1 :I:
 B-2 :I:

SAMPLE ID:C-S-6 -00002 LABS ID:6 -00002
 REQUEST:50506 STATUS:I DATE COMPLETED:NOT YET
 NUMBER OF ANALYSES:00002
 A-1 :I:
 B-2 :I:

SAMPLE ID:C-S-6 -00003 LABS ID:6 -00003
 REQUEST:50506 STATUS:I DATE COMPLETED:NOT YET
 NUMBER OF ANALYSES:00002
 A-1 :I:
 B-2 :I:

SAMPLE ID:C-S-6 -00004 LABS ID:6 -00004
 REQUEST:50506 STATUS:I DATE COMPLETED:NOT YET
 NUMBER OF ANALYSES:00002
 A-1 :I:
 B-2 :I:

SAMPLE ID:C-S-6 -00005 LABS ID:6 -00005
 REQUEST:50506 STATUS:I DATE COMPLETED:NOT YET
 NUMBER OF ANALYSES:00002
 A-1 :I:
 B-2 :I:

SAMPLE ID:C-S-6 -00006 LABS ID:6 -00006
 REQUEST:50506 STATUS:I DATE COMPLETED:NOT YET
 NUMBER OF ANALYSES:00002
 A-1 :I:
 B-2 :I:

1-31

SAMPLE ID:C-S-6 -00007 LABS ID:6 -00007
REQUEST:50506 STATUS:I DATE COMPLETED:NOT YET
NUMBER OF ANALYSES:00002
A-1 :I:
B-2 :I:

SAMPLE ID:C-S-6 -00008 LABS ID:6 -00008
REQUEST:50506 STATUS:I DATE COMPLETED:NOT YET
NUMBER OF ANALYSES:00002
A-1 :I:
B-2 :I:

SAMPLE ID:C-S-6 -00009 LABS ID:6 -00009
REQUEST:50506 STATUS:I DATE COMPLETED:NOT YET

LIST OF SAMPLE INFORMATION 09/08/78 PAGE: 2

CONT.
SAMPLE ID:C-S-6 -00009 LABS ID:6 -00009
NUMBER OF ANALYSES:00002
A-1 :I:
B-2 :I:

SAMPLE ID:C-S-6 -00010 LABS ID:6 -00010
REQUEST:50506 STATUS:I DATE COMPLETED:NOT YET
NUMBER OF ANALYSES:00002
A-1 :I:
B-2 :I:

LRC, LSC, LCC REPORT EXAMPLE

PLEASE INPUT A COMMAND:LCC

CUSTOMER CATALOG 09/08/78 PAGE: 1

NUMBER CUSTOMER NAME
50001 JONES, J.J.
50002 SMITH, S.S.
50003 WISE, W.W.

DRR, DCR REPORT EXAMPLE

PLEASE INPUT A COMMAND:DRR

DEADLINE REPORT 09/08/78 PAGE: 1

DEADLINE:09/07/78
REQ. RECEIVED SAMPLES COMPLETE CUSTOMER
50501 09/05/78 5 5 JONES, S.

DEADLINE:09/20/78
REQ. RECEIVED SAMPLES COMPLETE CUSTOMER
50506 09/07/78 10 0 SMITH, S.S.
50507 09/08/78 4 0 WISE, W.W.

ST EXAMPLE

PLEASE INPUT A COMMAND:ST

1.3.2.2 ENQUIRE Program

1.3.2.2.1 General Description

The ENQUIRE program is used to produce interactive sample status reports. The program will scan one or all of the Analytical Chemistry Division's laboratory files to create the desired report. ENQUIRE allows many record selection criteria to be specified so that very specific reports may be developed.

Upon invoking ENQUIRE, the user will be asked for the number of the laboratory file to be processed; providing a specific file number will greatly reduce the amount of time required to produce the status report. The file numbers are:

blank	process all files
3	2026
4	7920
5	4500S
6	1505
7	3019
8	4500S 5154

1.3.2.2.2 Record Selection Options

ENQUIRE will ask for record selection criteria to limit the scope of the report. If a listing of every record on the file is desired, respond with a blank line, otherwise enter one or more of the following values:

- R Request number. (If a request number range is to be used, a '-' should be used to indicate the range.)
Example: R=501-601
 - C Customer name. Either the entire customer name or a part of the name may be used. If a partial name is coded, end the name with a '@'.
Examples: C=P.Q.SMITH
C=SMITH@
 - S Customer sample series.
Example: S=XIXS
 - N Customer sample number.
Example: N=27200
 - D Date received.
Example: D=06/23/78
 - U Charge number. Either all of the charge number or the portion needed to delineate a group of charge numbers may be used. An '@' should be used to indicate that the last portion of the charge number is not given.
Examples: U=337073@
U=33702250
 - A Analysis codes. The analysis codes should be separated by a comma. The number of analyses to be considered in a single report should not exceed 5.
Example: A=U,MC,H
 - L List all of the delimiters which have already been given. This feature also provides the user with an opportunity to correct any erroneous delimiters.
- To exit from the criteria specification stage, enter a blank line.

1.3.2.2.3 Report Example

The remainder of this subsection is an example of an ENQUIRE terminal session.
The computer's output is underlined.

.LUN 5
PROGRAM ID:Z
NOW ENTERING THE ENQUIRE PROGRAM
PLEASE ENTER LAB NUMBER FOR FILE IF KNOWN:5
PLEASE INPUT REPORT DELIMITERS
UG=12300
FC=SMITH0
FA=AL,FE,H+
R=3200-3250
*L
REQUEST NUMBER = 53200 THRU 53250
CUSTOMER NAME = SMITH0
CHARGE NUMBER = 12300
ANALYSES = AL
FE
H+
PLEASE INPUT ANY CORRECTIONS TO THE ABOVE DELIMITERS
0

ANALYTICAL RESULTS = 08/31/78

CUSTOMER	:J.S. SMITH		
ADDRESS	:45003		
PHONE	: 33333	CHARGE	: 12300001
REQUEST	: 53200	SERIES	:
RECEIVED	: 08/21/78	COMPLETED	: 08/29/78

TST-5	AL:5.50 MG/ H+:5.25 MEQ	FE:4.22 MG/
FA-154	AL:6.75 H+:0.561	FE:4.13

ANALYTICAL RESULTS = 08/31/78

CUSTOMER	:R.G. SMITH		
ADDRESS	:2026		
PHONE	: 31031	CHARGE	: 12300001
REQUEST	: 53248	SERIES	:
RECEIVED	: 08/09/78	COMPLETED	: 08/18/78

TST58-A1	FE:45.6 UG/	
TST58-A2	FE:1.01 MG/	
TST58-HA	FE:3.78	AL:513 UG/M
TST58-R	FE:983 UG/M	AL:7.07 MC/

DO YOU HAVE ANY MORE REPORT REQUESTS:0

1.3.3 Final Customer Reports

1.3.3.1 General Description

The LISTER program generates the final customer result reports and the microfiche historical result reports. The program executes once each day and produces a report for every work request completed on that day. The program also executes on Saturday night in conjunction with the PRECLN and CLEUP programs to create the historical result reports.

After a work request has been processed by LISTER, the report format field is changed to the letter "X". If additional customer reports are desired for a work request, use the FILEUP program to change the report format to some value other than 'X' and LISTER will process the request again.

If another copy of the previous day's reports is needed, enter the command "SUBMIT REPT" when a period is displayed as the prompting character.

1.3.3.2 Report Examples

The program has many optional listing types. The report format field of a work request record is used to specify which listing should be produced. The report formats available from the LISTER program are shown in the remainder of this subsection.

LISTER REPORT FORMAT NUMBER 1.

Field size and page width limits:

Customer series: 20 characters.
Customer sample code: 20 characters.
Laboratory series: 10 characters.
Laboratory sample number: 5 characters.
Analysis code: 10 characters.
Analysis result: 35 characters.
Number of results: 34.

ANALYTICAL RESULTS - 09/06/78

PAGE 1

CUSTOMER : JONES, S.
ADDRESS : 4500S
PHONE : 3-0000
REQUEST : 50501
RECEIVED : 09/05/78
COMMENTS : THIS IS A TEST OF REPORT FORMAT 1.
:

CHARGE : 11:10000
SERIES : C-S-1
COMPLETED : 09/06/78

SAMPLE ID : ID-1A
B-2 :S-1-B-2
E-1 :S-1;V-1

LAB ID : - 00001
A-4 :S-1-A-4;EXTRA
E-2 :S-1;V-2

SAMPLE ID : ID-1B
B-2 :S-2-B-2 MORE STUFF
E-1 :S-2;V-1
E-3 :S-2;V-3

LAB ID : - 00002
A-4 :S-2-A-4
E-2 :S-2;V-2

SAMPLE ID : ID-2A
B-2 :S-3-B-2;EXTRA
E-1 :S-3;V-1

LAB ID : - 00003
A-4 :S-3-A-4 MORE STUFF

SAMPLE ID : ID-2B
B-2 :S-4-B-2
E-3 :S-4;V-3

LAB ID : - 00004
A-4 :S-4-A-4;EXTRA

SAMPLE ID : ID-CA
B-2 :S-5-B-2 MORE STUFF
E-2 :S-5;V-2

LAB ID : - 00005
A-4 :S-5-A-4
E-1 :S-5;V-1

LISTER REPORT FORMAT NUMBER 2.

Field size and page width limits:

Customer series: 20 characters.
 Customer sample code: 20 characters.
 Laboratory series: 10 characters.
 Laboratory sample number: 5 characters.
 Analysis code: 10 characters.
 Analysis result: 20 characters.
 Number of results: 11.

ANALYTICAL RESULTS - 09/05/78

PAGE 1

CUSTOMER : JONES, S.
 ADDRESS : 4500S
 PHONE : 3-0000
 REQUEST : 50501
 RECEIVED : 09/05/78
 COMMENTS : THIS IS A TEST OF REPORT FORMAT 2.
 :

CHARGE : 11110000
 SERIES : C-S-1
 COMPLETED : 09/05/78

SAMPLE IDS	B-2	A-4	E-1	E-2	E-3
ID-1A 00001	S-1-B-2	S-1-A-4 EXTRA	S-1 V-1	S-1 V-2	
ID-1B 00002	S-2-B-2 MO RE STUFF	S-2-A-4	S-2 V-1	S-2 V-2	S-2 V-3
ID-2A 00003	S-3-B-2 EXTRA	S-3-A-4 MO RE STUFF	S-3 V-1		
ID-2B 00004	S-4-B-2	S-4-A-4 EXTRA			S-4 V-3
ID-CA 00005	S-5-B-2 MO RE STUFF	S-5-A-4	S-5 V-1	S-5 V-2	

LISTER REPORT FORMAT NUMBER 3.

Field size and page width limits:

Customer series: 20 characters.
 Customer sample code: 14 characters.
 Laboratory series: 0 characters.
 Laboratory sample number: 5 characters.
 Analysis code: 10 characters.
 Analysis result: 12 characters.
 Number of results: 9.

ANALYTICAL RESULTS - 09/05/78

PAGE 1

CUSTOMER : JONES, S.
 ADDRESS : 4500S
 PHONE : 3-0000
 REQUEST : 50501
 RECEIVED : 09/05/78
 COMMENTS : THIS IS A TEST OF REPORT FORMAT 3.
 :

CHARGE : 11110000
 SERIES : C-S-1
 COMPLETED : 09/05/78

SAMPLE NUMBER B-2	A-4	E-1	E-2	E-3
ID-1A	S-1-B-2	S-1-A-4;EXTR	S-1;V-1	S-1;V-2
ID-1B	S-2-B-2 MORE	S-2-A-4	S-2;V-1	S-2;V-2
ID-2A	S-3-B-2;EXTR	S-3-A-4 MORE	S-3;V-1	S-2;V-3
ID-2B	S-4-B-2	S-4-A-4;EXTR		S-4;V-1
ID-CA	S-5-B-2 MORE	S-5-A-4	S-5;V-1	S-5;V-2

LISTER REPORT FORMAT NUMBER 4.

Field size and page width limits:

Customer series: 20 characters.
 Customer sample code: 14 characters.
 Laboratory series: 0 characters.
 Laboratory sample number: 5 characters.
 Analysis code: 10 characters.
 Analysis result: 12 characters.
 Number of results: 8.

ANALYTICAL RESULTS - 09/05/78

PAGE 1

CUSTOMER : JONES, S.
 ADDRESS : #5005
 PHONE : 3-0000
 REQUEST : 50501
 RECEIVED : 09/05/78
 COMMENTS : THIS IS A TEST OF REPORT FORMAT 4.
 :

CHARGE : 11110000
 SERIES : C-S-1
 COMPLETED : 09/05/78

SAMPLE NUMBER	LAB	B-2	A-4	E-1	E-2
ID-1A	00001	S-1-B-2	S-1-A-4;EXTR	S-1;V-1	S-1;V-2
ID-1B	00002	S-2-B-2 MORE	S-2-A-4	S-2;V-1	S-2;V-2
ID-2A	00003	S-3-B-2;EXTR	S-3-A-4 MORE	S-3;V-1	
ID-2B	00004	S-4-B-2	S-4-A-4;EXTR		
ID-CA	00005	S-5-B-2 MORE	S-5-A-4	S-5;V-1	S-5;V-2

LISTER REPORT FORMAT NUMBER 5.

Field size and page width limits:

Customer series: 20 characters.
 Customer sample code: 14 characters.
 Laboratory series: 0 characters.
 Laboratory sample number: 5 characters.
 Analysis code: 10 characters.
 Analysis result: 12 characters.
 Number of results: 8.

ANALYTICAL RESULTS - 09/05/78

PAGE 1

CUSTOMER : JONES, S.
 ADDRESS : #5005
 PHONE : 3-0000
 REQUEST : 50501
 RECEIVED : 09/05/78
 COMMENTS : THIS IS A TEST OF REPORT FORMAT 5.
 :

CHARGE : 11110000
 SERIES : C-S-1
 COMPLETED : 09/05/78

SAMPLE NUMBER	LAB	B-2	A-4	E-1	E-2
ID-1A	00001	S-1-B-2	S-1-A-4;EXTR	S-1;V-1	S-1;V-2
ID-1B	00002	S-2-B-2 MORE	S-2-A-4	S-2;V-1	S-2;V-2
ID-2A	00003	S-3-B-2;EXTR	S-3-A-4 MORE	S-3;V-1	
ID-2B	00004	S-4-B-2	S-4-A-4;EXTR		
ID-CA	00005	S-5-B-2 MORE	S-5-A-4	S-5;V-1	S-5;V-2

LISTER REPORT FORMAT NUMBER 6.

Field size and page width limits:

Customer series: 20 characters.
 Customer sample code: 20 characters.
 Laboratory series: 0 characters.
 Laboratory sample number: 5 characters.
 Analysis code: 10 characters.
 Analysis result: 35 characters.
 Number of results: 32.

ANALYTICAL RESULTS - 09/05/78

PAGE 1

CUSTOMER : JONES, S.
 ADDRESS : 4500S
 PHONE : 3-0000
 REQUEST : 50501
 RECEIVED : 09/05/78
 COMMENTS : THIS IS A TEST OF REPORT FORMAT 6.
 :

CHARGE : 11110000
 SERIES : C-S-1
 COMPLETED : 09/05/78

ID-1A:00001 B-2:S-1-B-2 A-4:S-1-A-4;EXTRA E-1:S-1;V-1 E-2:S-1;V-2
 ID-1B:00002 B-2:S-2-B-2 MORE STUFF A-4:S-2-A-4 E-1:S-2;V-1 E-2:S-2;V-2
 ID-2A:00003 B-2:S-3-B-2;EXTRA A-4:S-3-A-4 MORE STUFF E-1:S-3;V-1
 ID-2B:00004 B-2:S-4-B-2 A-4:S-4-A-4;EXTRA E-3:S-4;V-3
 ID-CA:00005 B-2:S-5-B-2 MORE STUFF A-4:S-5-A-4 E-2:S-5;V-2 E-1:S-5;V-1

LISTER REPORT FORMAT NUMBER 7.

Field size and page width limits:

Customer series: 20 characters.
 Customer sample code: 0 characters.
 Laboratory series: 10 characters.
 Laboratory sample number: 5 characters.
 Analysis code: 10 characters.
 Analysis result: 10 characters.
 Number of results: 10.

ANALYTICAL RESULTS - 09/05/78

PAGE 1

CUSTOMER : JONES, S.
 ADDRESS : 4500S
 PHONE : 3-0000
 REQUEST : 50501
 RECEIVED : 09/05/78
 COMMENTS : THIS IS A TEST OF REPORT FORMAT 7.
 :

CHARGE : 11110000
 SERIES : C-S-1
 COMPLETED : 09/05/78

SAMPLE ID.	B-2	A-4	E-1	E-2	E-3
-00001	S-1-B-2	S-1-A-4;EX	S-1;V-1	S-1;V-2	
-00002	S-2-B-2 MO	S-2-A-4	S-2;V-1	S-2;V-2	S-2;V-3
-00003	S-3-B-2;EX	S-3-A-4 MO	S-3;V-1		
-00004	S-4-B-2	S-4-A-4;EX			S-4;V-3
-00005	S-5-B-2 MO	S-5-A-4	S-5;V-1	S-5;V-2	

LISTER REPORT FORMAT NUMBER 8.

Field size and page width limits:

Customer series: 20 characters.
 Customer sample code: 17 characters.
 Laboratory series: 0 characters.
 Laboratory sample number: 5 characters.
 Analysis code: 10 characters.
 Analysis result: 10 characters.
 Number of results: 8.
 Column header: 7 characters.

ANALYTICAL RESULTS - 08/31/78

PAGE 1

CUSTOMER : STANTON, J.
 ADDRESS : #5008
 PHONE : 3-1231
 REQUEST : 50515
 RECEIVED : 08/31/78
 COMMENTS : THIS IS A TEST OF REPORT FORMAT 8.
 :

CHARGE : X222Y333
 SERIES : C-S-1A
 COMPLETED : 08/31/78

CUST. SAMPLE ID	LAB	ANALYSIS	H2O#25C	H-#25C	TOTAL
00030	00030	CE-144	V-1-1	V-1-2	V-1-3
		RU-106	V-2-1	V-2-2	V-2-3
		TOTAL	V-3-1	V-3-2	V-3-3
00031	00031	CE-144	V-1-1	V-1-2	V-1-3
		RU-106	V-2-1	V-2-2	V-2-3
		TOTAL	V-3-1	V-3-2	V-3-3
00032	00032	CE-144	V-1-1	V-1-2	V-1-3
		RU-106	V-2-1	V-2-2	V-2-3
		TOTAL	V-3-1	V-3-2	V-3-3

1.3.4 Overnight Work Backlog Reports

1.3.4.1 General Description

The BAKLOG program generates the primary pending work report. BAKLOG executes automatically every night and produces a separate report for each laboratory file. The report created lists the date received, work request number, charge number, customer's name, sample range, and the type and number of incomplete analyses for each pending work request. To receive another copy of the BAKLOG report, enter "SUBMIT BAKLOG" when a period, ".", is displayed as the prompt character.

1.3.4.2 Report Example

WORK BACKLOG LIST 09/18/78 PAGE: 1
 RECEIVED#REQ **CHARGE**CUSTOMER'S NAME*FIRST SAMPLE ID.*LAST SAMPLE ID.
 *****PENDING ANALYSES*****

ASSIGNED TO: LAB-1
 08/22/78 50505 A111B222 SMITH, J. 5:00021 5:00023
 B-1:3
 09/08/78 50507 ABCDEFGH WISE, W.W. 7:00003 7:00006
B-4:4 A-2:4

ASSIGNED TO: LAB-2
 09/07/78 50506 11110000 SMITH, S.S. 6:00001 6:00010
A-1:10 B-2:10

TOTAL INCOMPLETE ANALYSES: 31
 ESTIMATED LAB THRU PUT: 0

1.4 PROCESSING HISTORICAL INFORMATION

1.4.1 General Description

The Sample Management system retains historical analytical results on both microfiche and computer-readable media. Work requests are moved from the online files to historical storage approximately two weeks after the last analytical result is input. The data moved to historical storage may be recalled to the online files for approximately two months. After two months, the data is moved to a final computer-readable storage media and retained for one year.

The movement of work requests from online to historical storage is performed by the PRECLN, CLEUP, and LISTER programs. The PRECLN program scans the online files and marks the work requests to be removed. The LISTER program then produces a microfiche report of those work requests marked for movement. Finally, the CLEUP program transfers the selected records to historical storage. This group of programs executes once a week.

The UNCALL program selects and moves data from the recallable historical storage to the final computer-readable storage media. The program is executed once each month.

1.4.2 Restoring Historical Information

1.4.2.1 General Description

Historical data may be returned to the active files with the RECALL program. The program accepts a list of work request numbers to be restored and then transfers the data overnight. RECALL should not be used more than once per day. An example of a RECALL submission follows:

1.4.2.2 RECALL Example

```
.RUN S
PROGRAM ID:R

BATCH SUBMIT STARTING
REQUEST TO RECALL (0 TO STOP):
123

REQUEST TO RECALL (0 TO STOP):
234

REQUEST TO RECALL (0 TO STOP):
0

RECALL SUBMISSION ENDING.
```

STOP

END OF EXECUTION

CPU TIME: 0.24

ELAPSED TIME: 1:18.48

=

1.5 GENERAL PROGRAM EXECUTION INSTRUCTIONS

The interactive programs in the Sample Management system are all executed in a similar manner. The basic entries required are:

.RUN S
PROGRAM ID:x

where x is

F for FILEUP
L for LOOKUP
E for ENCLINE
R for RECALL

To execute the LOOKUP report program in a batch mode, the following procedure should be used.

.DO BLOOK
.SILENCE
START INPUT
@ lookup command (RETURN)
another lookup command (RETURN)
\$EX\$\$
.SUBMIT BLOOK/AFTER:18:00

where: \$ is the ESC or ALTMODE key.

To receive another copy of the BAKLOG report enter:

.SUBMIT BAKLOG

To receive another copy of the previous day's customer reports, enter:

.SUBMIT REPT

The following programs execute automatically and may not be run by users:

LISTER, BAKLOG, PRECLN, CLEUP, and UNCALL.

1.6 DEFINITIONS OF DATA FIELDS

FIELD NAME: Request Number.
DATA RECORD/3: Work Request and Sample.
FORMAT: Five-digit number. The leftmost digit is used as a laboratory identifier.
USES: Work Request: uniquely identifies a work request record.
Sample: associates a sample record with a work request record.

FIELD NAME: Customer Name.
DATA RECORD/3: Work Request.
FORMAT: Up to 80 characters of any kind. Preferred format is last name, initials.
USES: Identifies the submitter of a work request.

FIELD NAME: Customer Address.
 DATA RECORD/S: Work Request.
 FORMAT: Up to 80 characters of any kind.
 USES: Holds the mailing address of the customer.

FIELD NAME: Customer Phone Number.
 DATA RECORD/S: Work Request.
 FORMAT: Up to 30 characters of any kind.
 USES: Contains the customer's phone number.

FIELD NAME: Charge Number.
 DATA RECORD/S: Work Request.
 FORMAT: Up to 10 characters of any kind.
 USES: Identifies the account to be billed for work performed.

FIELD NAME: Assigned Laboratory.
 DATA RECORD/S: Work Request.
 FORMAT: Up to 20 characters of any kind.
 USES: Identifies a specific work area.

FIELD NAME: Date Received.
 DATA RECORD/S: Work Request.
 FORMAT: xx/yy/zz where xx is a month, yy is a day, and zz is the year.
 USES: Identifies the day the work request was posted to the pending work list.

FIELD NAME: Date Complete.
 DATA RECORD/S: Work Request and Sample.
 FORMAT: xx/yy/zz where xx is a month, yy is a day, and zz is a year.
 USES: Work Request: Identifies the date that the final sample associated with the request was completed.
 Sample: Identifies the date that the final requested result was assigned to the sample.

FIELD NAME: Report Format.
 DATA RECORD/S: Work Request.
 FORMAT: A number from 1 through 9 or the letter X.
 USES: Either specifies the customer report format to be used by the LISTER program or shows that LISTER has processed the request.

FIELD NAME: Request Series.
 DATA RECORD/S: Work Request.
 FORMAT: Up to 20 characters of any kind.
 USES: Identifies a group to which all samples associated with a request belong.

FIELD NAME: Deadline.
 DATA RECORD/S: Work Request.
 FORMAT: xx/yy/zz comment where xx is a month, yy is a day, zz is a year, and comment is a string of up to 71 characters.
 USES: Defines a completion deadline date for a work request.

FIELD NAME: Comments.
 DATA RECORD/S: Work Request.
 FORMAT: Up to 80 characters of any kind.
 USES: Holds any comments which relate to the work request.

FIELD NAME: Laboratory series.
 DATA RECORD/S: Sample.
 FORMAT: Up to 10 characters of any kind.
 USES: Part of the identifier used to uniquely specify a sample record.

FIELD NAME: Laboratory Sample Number.
 DATA RECORD/S: Sample.
 FORMAT: Up to 5 characters of any kind. Preferred format is a one- to five-digit sequence number.
 USES: Part of the identifier used to uniquely specify a sample record.

FIELD NAME: Customer's Sample Identifier.
 DATA RECORD/S: Sample.
 FORMAT: Up to 20 characters of any kind.
 USES: Holds the customer's identification for a sample.

FIELD NAME: Sample Status.
 DATA RECORD/S: Sample.
 FORMAT: A one-letter code.
 USES: Indicates if a sample record is complete or incomplete.

FIELD NAME: Sample Comment
DATA RECORD/S: Sample.
FORMAT: Up to 40 characters of any kind.
USES: Holds any comments associated with a sample record. Can be displayed with the FILEUP or LOOKUP programs or with Report Format 1 of the LISTEN program.

FIELD NAME: Analysis Code.
DATA RECORD/S: Sample.
FORMAT: Up to ten characters of any kind.
USES: Identifies a specific type of work to be performed on the sample.

FIELD NAME: Analysis Status.
DATA RECORD/S: Sample.
FORMAT: A one-character code.
USES: Holds the processing status of an analysis request item.

FIELD NAME: Analysis Result.
DATA RECORD/S: Sample.
FORMAT: Up to 35 characters of any kind.
USES: Stores the result of a requested analysis.

CHAPTER 2

CUSTOMER ACCESS TO SAMPLE MANAGEMENT INFORMATION

2.1 INTRODUCTION

Customers of the Analytical Chemistry Division are provided with computer access to the laboratory online data files. Customers may use the computer to submit work requests, display sample status information, and list analytical results. Access to information in the Analytical Chemistry data files is controlled by the charge code of each work request. A customer may examine data only if the first four digits of the work request charge code match the customer's charge code.

2.2 SUBMITTING WORK REQUESTS TO ANALYTICAL CHEMISTRY

The CTFILE program is used to submit work requests to the Analytical Chemistry Division. A work request is composed of the following elements: customer identification data, a group of sample identifiers, and a list of analysis codes to be performed. The basic steps involved in submitting a work request are: a work request record is created, one or more sample records are created and associated with the work request record, the required analyses are assigned to each sample record, and the appropriate analytical laboratory is informed that a request is pending.

2.2.1 Building Work Request Records

2.2.1.1 General Description

A number of commands are provided to create work request records. The Add a Request (AR) command is used when all of the customer identification data must be entered from the terminal. The Copy a Customer (CC) command is used when some or all of the customer identification data has been stored in the catalog (described later in this section). The Copy All (CA) or copy and Stop for Identification (SI) commands may be used when a work request record exists that matches the new work requests customer identification and the sample records associated with the old request match the new samples in both quantity and type of analyses.

After a work request record has been created with either the AR or CC command, sample records must be assigned to the request. The CTFILE program has a number of sample assignment commands. The Add a Sample (AS) command is used when the rightmost part of the sample identifier is not a sequence number or when the desired analyses are not the same for a batch of samples. The Add Multiple (AM) and Add Multiple with Comments (AC) commands are provided for these cases where the rightmost part of the sample identifier is a sequence number and the requested analyses are the same for all samples in the batch.

2.2.1.2 Examples

This is an example of the AR and AS commands.

UPDATE CLASS:AR
 ASSIGNED WORK REQUEST NUMBER:30506
 NAME:
 WEATHER, P.
 ADDRESS:
 P3333
 PHONE:
 3-0000
 REPORT FORMAT:1:
 CHARGE NUMBER: :CCCC3333
 CUSTOMERS SERIES: :R-S-1
 DEADLINE:

COMMENTS:
 THIS IS ALSO A TEST.
 COMMENTS-2:

UPDATE CLASS:AS
 WORK REQUEST NUMBER:506:
 SAMPLE SERIES: :SER-3
 SAMPLE NUMBER:00000:17
 COMMENT: :TEST COM
 ANALYSES:TS-T,A-1
 2:ANALYSIS REQUESTS HAVE BEEN ACCEPTED.
 MORE SAMPLES?
 SAMPLE SERIES:SE-3 :
 SAMPLE NUMBER:00008:21 :
 COMMENT:TEST COM:NEW COM
 ANALYSES:0,B-2
 ANALYSIS:TS- HAS BEEN COPIED.
 ANALYSIS:A-1 HAS BEEN COPIED.
 3:ANALYSIS REQUESTS HAVE BEEN ACCEPTED.
 MORE SAMPLES?
 UPDATE CLASS:

The next example shows the CC and AM commands.

UPDATE CLASS:CC
 CATALOG NUMBER TO COPY:2
 ASSIGNED WORK REQUEST NUMBER:30504
 RAIN, W.
 M1000
 3-0000
 REPORT FORMAT:3:
 CHARGE NUMBER:AAAA1111 :
 CUSTOMERS SERIES: :C-S-1
 DEADLINE:
 9/1/78 DEADLINE COMMENT: TEXT.
 COMMENTS:
 THIS IS A TEST.
 COMMENTS-2:

UPDATE CLASS:AM
 WORK REQUEST NUMBER:504:
 SAMPLE SERIES: :SER-1
 SAMPLE RANGE (X-Y):2-5
 ANALYSES:A-2,B-1,A-1
 3:ANALYSIS REQUESTS HAVE BEEN ACCEPTED.
 00004:SAMPLES WERE ADDED TO THE FILE.
 UPDATE CLASS:

The use of the AR and AC commands are documented below.

UPDATE CLASS:AR
 ASSIGNED WORK REQUEST NUMBER:10508
 NAME:
 SMITH, S.S.
 ADDRESS:
 4500
 PHONE:

3-0000
 REPORT FORMAT:1:5
 CHARGE NUMBER: :ABCD-0000
 CUSTOMERS SERIES: :T-S-C
 DEADLINE:

COMMENTS:
 THIS IS A TEST
 COMMENTS-2:

UPDATE CLASS:AC
 WORK REQUEST NUMBER:508:
 SAMPLE SERIES: :C-S-508
 SAMPLE RANGE (X-Y):2-4
 ANALYSES:B-2,ZZZ
 2:ANALYSIS REQUESTS HAVE BEEN ACCEPTED.
 SAMPLE:C-S-508 -00002
 COMMENT: :SAMPLE COMMENT 1
 SAMPLE:C-S-508 -00003 :SAMPLE COMMENT 2
 COMMENT:SAMPLE COMMENT 1
 SAMPLE:C-S-508 -00004 :ANOTHER COMMENT
 COMMENT:SAMPLE COMMENT 2
 00003:SAMPLES WERE ADDED TO THE FILE.
 UPDATE CLASS:

The CA command is illustrated below.

UPDATE CLASS:CA
 COPY WORK REQUEST NUMBER:504:
 ASSIGNED WORK REQUEST NUMBER:30505
 SAMPLE SERIES:SER-1 :SER-2
 STARTING SAMPLE NUMBER:00000:10

SAMPLE:SER-1	00002	COPIED TO:SER-2	00010
SAMPLE:SER-1	00003	COPIED TO:SER-2	00011
SAMPLE:SER-1	00004	COPIED TO:SER-2	00012
SAMPLE:SER-1	00005	COPIED TO:SER-2	00013

 3:SAMPLES COPIED.
 UPDATE CLASS:

The following example shows the SI command.

UPDATE CLASS:SI
 COPY WORK REQUEST NUMBER:0:504
 ASSIGNED WORK REQUEST NUMBER:10505
 SAMPLE:TEST-3 :21A
 SAMPLE SERIES: :EX-22
 SAMPLE NUMBER: :AB-1

SAMPLE:TEST-3	21A	COPIED TO:EX-22	AB-1
---------------	-----	-----------------	------

 SAMPLE:TEST-3B1 :21A
 SAMPLE SERIES:EX-22 :USB
 SAMPLE NUMBER:AB-1 :XX

SAMPLE:TEST-3B1	21A	COPIED TO:USB	XX
-----------------	-----	---------------	----

 SAMPLE:TEST-3C0 :21A
 SAMPLE SERIES:USB :TEST-BB
 SAMPLE NUMBER:XX :ABC-1

SAMPLE:TEST-3C0	21A	COPIED TO:TEST-BB	ABC-1
-----------------	-----	-------------------	-------

 3:SAMPLES COPIED.
 UPDATE CLASS:

2.2.2 Adding Or Deleting Analysis Requests

2.2.2.1 General Description

The CTFILE program will process analysis data items in several different ways. Analysis items may be added or deleted. The sample addition commands (AS, AM) request a list of analyses to be assigned to the sample records being created. The Add an Analysis (AA) command is used to associate extra analyses with existing samples. The Delete an Analysis (DA) command is used to remove analyses from sample records.

2.2.2.2 Examples

This example illustrates how analysis items are added to samples. The computer's output is underlined.

```

UPDATE CLASS:AA
REQUEST # OR SAMPLE RANGE (R OR S):S
LAB. SERIES:          :13
LAB. SAMPLE RANGE (X-Y):22
ANALYSES:B-4
SAMPLE:13             -00022
ANALYSIS:B-4          HAS BEEN ADDED.
UPDATE CLASS:AA
REQUEST # OR SAMPLE RANGE (R OR S):R
WORK REQUEST NUMBER:50513:513
ANALYSES:B-5,A-3,A-1
SAMPLE:13             90021
ANALYSIS:B-5          HAS BEEN ADDED.
ANALYSIS:A-3          HAS BEEN ADDED.
ANALYSIS:A-1          WAS ALREADY REQUESTED.
SAMPLE:13             -00022
ANALYSIS:B-5          HAS BEEN ADDED.
ANALYSIS:A-3          HAS BEEN ADDED.
ANALYSIS:A-1          WAS ALREADY REQUESTED.
UPDATE CLASS:

```

Analysis requests are deleted using the techniques shown in the following example. The computer's output is underlined.

```

UPDATE CLASS:DA
REQUEST # OR SAMPLE RANGE (R OR S):R
WORK REQUEST NUMBER:50000:513
ANALYSES:B-1,A-1
SAMPLE:13             -00021
ANALYSIS:B-1          HAS BEEN DELETED.
ANALYSIS:A-1          HAS BEEN DELETED.
SAMPLE:13             -00022
ANALYSIS:B-1          HAS BEEN DELETED.

```

2.2.3 Using The Customer Catalog

2.2.3.1 General Description

A catalog of customer identification information is stored and referenced by the CTFILE program. The catalog may be used to reduce the amount of data which must be entered from the terminal to post a work request from a customer. The catalog will retain a customer's name, address, phone number, preferred report format, and charge number. The Save a Customer (SC) command is provided for entering customers in the catalog. The Copy a Customer (CC) command will reference the saved information and assign it to a work request record. The Update a Request (UR) command of the CTFILE program may be used to list and/or correct catalog entries.

2.2.3.2 Adding A Customer To The Catalog

This is an example of entering a record in the customer catalog. The computer's output is underlined.

```

UPDATE CLASS:SC
ASSIGNED CUSTOMER NUMBER:50004
CUSTOMERS NAME:
LAING, W.
CUSTOMERS ADDRESS:
2026
CUSTOMERS PHONE:
3-3333
REPORT FORMAT:1:4
CHARGE NUMBER: :A123B456
ANY MORE CUSTOMERS TO CATALOG? (YES/NO):Y
ASSIGNED CUSTOMER NUMBER:50005
CUSTOMERS NAME:
PRICE, C.
CUSTOMERS ADDRESS:
4500
CUSTOMERS PHONE:
3-6113
REPORT FORMAT:1:5
CHARGE NUMBER: :C098D765
ANY MORE CUSTOMERS TO CATALOG? (YES/NO):N
UPDATE CLASS:

```

2.2.3.3 Using The Information Stored In The Catalog

This command copies information from the catalog. The computer's output is underlined.

```

UPDATE CLASS:CC
CUSTOMER NUMBER TO COPY:2
ASSIGNED WORK REQUEST NUMBER:50504
LAING, W.
2026
3-3333
REPORT FORMAT:4:
CHARGE NUMBER:A123B456 :
CUSTOMERS SERIES: :C-S-3
DEADLINE:

COMMENTS:

COMMENTS-2:

UPDATE CLASS:

```

2.2.4 Making Corrections

2.2.4.1 General Description

Occasionally, the data in a work request or sample record is incorrect. The CTFIL program provides several commands for correcting errors in existing records. The Update a Request (UR) command may be used to correct work request or customer catalog data records. The Update a Sample (US) command is provided for the correction of sample records.

2.2.4.2 Work Request Information

The Update a Request (UR) command of the CTFILE program has many subcommands for the correction of specific data items in a work request record. Each of the data items in a work request is referenced with a subcommand of the UR command. In addition, a number of utility subcommands are provided. A table of subcommands and descriptions follows:

SUBCOMMAND	DESCRIPTION
NA	List and update the name field.
AD	List and update the address field.
PH	List and update the phone number field.
CH	List and update the charge number field.
SE	List and update the request series field.
DE	List and update the deadline field.
CO	List and update the comments field.
C2	List and update the second comments field.
FO	List and update the report format field.
LI	List the current values for all fields.
HE	Display a list of UR subcommands.
NE	Process the next work request record.
ST	Stop work request subcommand processing.
DL	Delete the current work request record.
SD	Delete the current work request record and all associated sample records.

The following example shows the UR command and each of its subcommands. The computer's output is underlined.

```

UPDATE CLASS:UR
WORK REQUEST NUMBER:0:510
REQUEST SHEET FUNCTION:LI

*REQUEST NUMBER:30510      *ACD REQUEST NUMBER:50502
NAME:SMITH, J.
ADDRESS:4507
PHONE:3-0000
*CHARGE NUMBER:A111B222    *SERIES:
*DATE ENTERED:09/08/78     *DATE ACCEPTED:
*REPORT FORMAT:4
*NUMBER OF SAMPLES:3      *COMPLETE SAMPLES:0
*DEADLINE:
*COMMENTS:

REQUEST SHEET FUNCTION:NA
NAME:SMITH, J.
*JONES, S.
REQUEST SHEET FUNCTION:AD
ADDRESS:4507
2026
CHANGE THE FIELD?Y
REQUEST SHEET FUNCTION:PH
PHONE:3-0000
*3-1111
REQUEST SHEET FUNCTION:CH
CHARGE NUMBER:A111B222 :~\\C333
REQUEST SHEET FUNCTION:SE
CUSTOMERS SERIES:          :~SERIES 10
REQUEST SHEET FUNCTION:DE
DEADLINE:
9/21/78 FOR ALL CA.
REQUEST SHEET FUNCTION:CO
COMMENTS:
THIS IS A TEST COMMENT.
REQUEST SHEET FUNCTION:C2
COMMENTS-2:
THIS IS ALSO A TEST COMMENT.
REQUEST SHEET FUNCTION:FO
REPORT FORMAT:4:2
REQUEST SHEET FUNCTION:LI

*REQUEST NUMBER:30510      *ACD REQUEST NUMBER:50502
NAME:JONES, S.
ADDRESS:2026

```

```

REQUEST SHEET FUNCTION:DL
REQUEST CANNOT BE DELETED UNTIL ALL SAMPLES ARE DELETED.
SAMPLES LEFT:3
REQUEST SHEET FUNCTION:SD
PASSWORD:ARGT!
BOMBS AWAY!!!!!!!!!!
SAMPLE:10 :00001 HAS BEEN DELETED.
SAMPLE:10 :00002 HAS BEEN DELETED.
SAMPLE:10 :00003 HAS BEEN DELETED.
BOOOOOOOOOOOOOOOOOOOO!!!!!!!!!!!!!!!!!!
UPDATE CLASS:UR
WORK REQUEST NUMBER:510:502
REQUEST SHEET FUNCTION:ME
WORK REQUEST NUMBER:503:
REQUEST SHEET FUNCTION:ST
UPDATE CLASS:

```

The Update a Sample (US) command of the CTFILE program provides a number of subcommands for the correction of sample record data items. The fields in a sample record are each referenced by a subcommand. In addition, a number of utility subcommands are provided. A list of the subcommands and their descriptions follows:

SUBCOMMAND	DESCRIPTION
ID	List and update the sample series and sample number fields.
AN	List and update the next analysis item in the sample record.
AN/x	List and update analysis item x.
CO	List and update the sample comment.
LI	List the current sample record.
NE	Process the next sample record.
DL	Delete the current sample.
HE	List the AS subcommands.
ST	Stop sample subcommand processing.

```

UPDATE CLASS:US
REQUEST # OR SAMPLE # (R OR S):R
WORK REQUEST NUMBER:0:511
REQUEST:30511 #SAMPLES:3 CUST. SMITH, J.
SAMPLE:11 -00023
SAMPLE FUNCTION:LI

*SERIES:11 *SAMPLE:00023 *REQ#:30511 STATUS:I
ANALYSES: A-3 I B-1 I

SAMPLE FUNCTION:ID
SAMPLE SERIES:11 :01
SAMPLE NUMBER:00023:01
SAMPLE FUNCTION:AN
ANALYSIS:A-3 I B-25
SAMPLE FUNCTION:AN/B-1
ANALYSIS:B-1 I A-76
CHANGE THE FIELD?Y
SAMPLE FUNCTION:LI

*SERIES:01 *SAMPLE:00061 *REQ#:30511 STATUS:I
ANALYSES: B-25 I A-76 I

SAMPLE FUNCTION:NE

```


SAMPLE:!! -00024
 SAMPLE FUNCTION:DL
 PLEASE CONFIRM DELETION OF SAMPLE:!! -00024 (YES OR NO):Y
 SAMPLE:!! -00024 HAS BEEN DELETED.
 SAMPLE FUNCTION:HE
 SAMPLE UPDATING.

THIS SECTION OF THE PROGRAM PROVIDES THE FUNCTIONS NEEDED
 TO LIST AND/OR UPDATE A SAMPLE RECORD.

TO LIST THE ENTIRE SAMPLE ENTER THE WORD 'LIST'.

TO PRINT THE INSTRUCTIONS TYPE 'HELP'.

TO RETURN TO THE MAIN SEGMENT OF THE PROGRAM TYPE 'STOP'.

TO PROCESS THE NEXT SAMPLE TYPE 'NEXT'.

TO DELETE A SAMPLE ENTER 'DL'.

TO CHANGE THE SERIES OR SAMPLE NUMBER ENTER 'ID'.

TO PROCESS THE COMMENT FIELD ENTER 'CO'.

TO UPDATE AN ANALYSIS ENTER 'AN' OR 'AN X'.

'AN' WILL PROCESS THE NEXT ANALYSIS IN THE CURRENT RECORD.

'AN X' WILL UPDATE ANALYSIS 'X'.

SAMPLE FUNCTION:ST

UPDATE CLASS:

2.2.5 Special Functions Of The Data Entry Program

The CTFILE program will list usage instructions if the word "HELP" is entered as a response to the "UPDATE CLASS", "SAMPLE FUNCTION", or "REQUEST FUNCTION" prompting messages.

To erase the current input line, hold down the CONTROL key (CONTRL, CNTRL, CTL) and enter the letter "U".

To erase the previous character on the input line, depress the DELFTE key (DEL, RUB OUT).

To force the CTFILE program to stop processing and return to the "UPDATE CLASS" prompt message, hold down the CONTROL key and enter the letter U and then type the word "OOPS" and hit the RETURN key.

To list the current input line, hold down the CONTROL key and enter the letter "R".

When updating a field in an existing record, enter the CARET, "^", character and then input the new value for the field.

When the prompting message "ANALYSES" is displayed during an analysis update, an entry of question mark "?" will cause the CTFILE program to list the analyses requested for the first record in the update group.

When the prompting message "ANALYSES" is displayed during the sample add phase, an entry of pound sign, "#", will cause CTFILE to copy the analyses request for the previous sample into the current sample.

To instruct CTFILE to copy characters from the beginning of an existing field, enter the letter backslash, "\", as many times as there are characters to duplicate.

2.3 INTERROGATING THE ANALYTICAL CHEMISTRY DATA BASES

2.3.1 General Description

The ENQUIRE program is used to produce interactive sample status reports. The program will scan one or all of the Analytical Chemistry Division's laboratory files to create the desired report. ENQUIRE allows many record selection criteria to be specified so that very specific reports may be developed.

Upon invoking ENQUIRE, the user will be asked for the number of the laboratory file to be processed. Providing a specific file number will greatly reduce the amount of time required to produce the status report. The file numbers are:

blank	process all files
3	2026
4	7920
5	4500S
6	1505
7	3019
8	4500S S154

2.3.2 Record Selection Options

ENQUIRE will ask for record selection criteria to limit the scope of the report. If a listing of every record on the file is desired, respond with a blank line; otherwise enter one or more of the following values:

- R Request number. (If a request number range is to be used, a '-' should be used to indicate the range.)
Example: R=501-601
- C Customer name. Either the entire customer name or a part of the name may be used. If a partial name is coded, end the name with a '@'.
Examples: C=P.Q.SMITH
C=SMITH@
- S Customer sample series.
Example: S=XIXS
- N Customer sample number.
Example: N=27200
- D Date received
Example: D=06/23/73
- U Charge number. Either all of the charge number or the portion needed to delineate a group of charge numbers may be used. An '@' should be used to indicate that the last portion of the charge number is not given.
Examples: U=337073@
U=33702250
- A Analysis codes. The analysis codes should be separated by a comma. The number of analyses to be considered in a single report should not exceed 5.
Example: A=U,MG,H
- L List all of the delimiters which have already been given. This feature also provides the user with an opportunity to correct any erroneous delimiters.

To exit from the criteria specification stage, enter a blank line.

2.3.3 Report Example

The remainder of this subsection is an example of an ENQUIRE terminal session.

_RUN ENQUIR(6137,237)

NOW ENTERING THE ENQUIRE PROGRAM
PLEASE ENTER LAB NUMBER FOR FILE IF KNOWN:5
PLEASE INPUT REPORT DELIMITERS

DU=12300

PC=SMITH

PA=AL,FE,H+

PR=3200-3250

PL

REQUEST NUMBER = 53200 THRU 53250

CUSTOMER NAME = SMITH

CHARGE NUMBER = 12300

ANALYSES = AL

FE

H+

PLEASE INPUT ANY CORRECTIONS TO THE ABOVE DELIMITERS

0

ANALYTICAL RESULTS - 08/31/78

CUSTOMER	: J.S. SMITH		
ADDRESS	: 4500S		
PHONE	: 33333	CHARGE	: 12300001
REQUEST	: 53200	SERIES	:
RECEIVED	: 08/21/78	COMPLETED	: 08/29/78

TST-5	AL:5.50 MG/	FE:4.22 MG/
	H+:5.25 MEQ	

FA-154	AL:6.15	FE:4.13
	H+:0.561	

ANALYTICAL RESULTS - 08/31/78

CUSTOMER	: R.G. SMITH		
ADDRESS	: 2026		
PHONE	: 31031	CHARGE	: 12300001
REQUEST	: 53248	SERIES	:
RECEIVED	: 08/09/73	COMPLETED	: 08/18/78

TST58-A1	FE:45.6 UG/
----------	-------------

TST58-A2	FE:1.01 MG/
----------	-------------

TST58-HA	FE:3.78	AL:513 UG/M
----------	---------	-------------

TST58-R	FE:983 UG/M	AL:7.07 MG/
---------	-------------	-------------

DO YOU HAVE ANY MORE REPORT REQUESTS:0

2.4 OVERNIGHT PENDING WORK REPORTS

2.4.1 General Description

The customer BAKLOG program generates a listing of all of a customer's pending work. BAKLOG executes every night and produces a separate report for each laboratory file. The report lists the date received, work request number, charge number, customer's name, sample range, and the type and number of incomplete analyses for each pending work request.

2.4.2 Sample BACKLOG Report

WORK BACKLOG LIST 09/18/78 PAGE: 1
 RECEIVED*REQ **CHARGE***CUSTOMER'S NAME*FIRST SAMPLE ID.*LAST SAMPLE ID.
 *****PENDING ANALYSES*****

ASSIGNED TO:LAB-1
 08/22/78 50505 A111B222 SMITH, J. 5:00021 5:00023
 B-1:3
 09/08/78 50507 A111EFGH WISE, W.W. 7:00003 7:00006
 B-3:4 A-2:4

ASSIGNED TO:LAB-2
 09/07/78 50506 A1110000 SMITH, S.S. 6:00001 6:00010
 A-1:10 B-2:10

TOTAL INCOMPLETE ANALYSES: 31

2.5 GENERAL PROGRAM EXECUTION INSTRUCTIONS

The interactive programs in the Sample Management system are all executed in a similar manner. The basic entries required are:

.RUN A
PROGRAM ID:x

where x is

C for CTFILE
 E for ENQUIRE

2.6 DEFINITIONS OF DATA FIELDS

FIELD NAME: Request Number.
 DATA RECORD/S: Work Request and Sample.
 FORMAT: Five-digit number. The leftmost digit is always equal to 3.
 USES: Work Request: uniquely identifies a work request record.
 Sample: associates a sample record with a work request record.

FIELD NAME: Customer Name.
 DATA RECORD/S: Work Request.
 FORMAT: Up to 80 characters of any kind. Preferred format is last name, initials.
 USES: Identifies the submitter of a work request.

FIELD NAME: Customer Address.
 DATA RECORD/S: Work Request.
 FORMAT: Up to 80 characters of any kind.
 USES: Holds the mailing address of the customer.

FIELD NAME: Customer Phone Number.
 DATA RECORD/S: Work Request.
 FORMAT: Up to 30 characters of any kind.
 USES: Contains the customer's phone number.

FIELD NAME: Charge Number.
 DATA RECORD/S: Work Request.
 FORMAT: Up to 10 characters of any kind.
 USES: Identifies the account to be billed for work performed.

FIELD NAME: Report Format.
 DATA RECORD/S: Work Request.
 FORMAT: A number from 1 through 8 or the letter X.
 USES: Either specifies the customer report format to be used by the LISTER program or shows that LISTER has processed the request.

FIELD NAME: Request Series.
 DATA RECORD/S: Work Request.
 FORMAT: Up to 20 characters of any kind.
 USES: Identifies a group to which all samples associated with a request belong.

FIELD NAME: Deadline.
 DATA RECORD/S: Work Request.
 FORMAT: xx/yy/zz comment where xx is a month, yy is a day, zz is a year, and comment is a string of up to 71 characters.
 USES: Defines a completion deadline date for a work request.

FIELD NAME: Comments.
 DATA RECORD/S: Work Request.
 FORMAT: Up to 80 characters of any kind.
 USES: Holds any comments which relate to the work request.

FIELD NAME: Sample Series.
 DATA RECORD/S: Sample.
 FORMAT: Up to 10 characters of any kind.
 USES: Part of the identifier used to uniquely specify a sample record.

FIELD NAME: Sample Number.
 DATA RECORD/S: Sample.
 FORMAT: Up to 5 characters of any kind. Preferred format is a one- to five-digit sequence number.
 USES: Part of the identifier used to uniquely specify a sample record.

FIELD NAME: Sample Status.
 DATA RECORD/S: Sample.
 FORMAT: A one-letter code.
 USES: Indicates if a sample record is complete or incomplete.

FIELD NAME: Analysis Code.
 DATA RECORD/S: Sample.
 FORMAT: Up to 10 characters of any kind.
 USES: Identifies a specific type of work to be performed on the sample.

FIELD NAME: Analysis Status.
 DATA RECORD/S: Sample.
 FORMAT: A one-character code.
 USES: Holds the processing status of an analysis request item. The value is "I" if the analysis has not been accepted or a number if an Analytical Chemistry laboratory has accepted the request.

FIELD NAME: Sample Comment.
 DATA RECORD/S: Sample.
 FORMAT: Up to 33 characters of any kind.
 USES: Communicates sample specific information to Analytical Chemistry.

CHAPTER 3
TIMEKEEPING

3.1 INTRODUCTION

The Timekeeping system records and bills out labor costs incurred as a result of customer work request processing. The system records work transactions by capturing the following information: the initials of the technician who performed the work, the date, the type of work, the time spent, the number of units of work completed, and the charge number to be billed. The Analytical Timekeeping Work Sheet is used by the technicians to record work transactions. The transactions may be entered into the master file with either the CARDS data entry program or keypunch services. The work transactions on the master file are examined and reported by the ANALIZE and BILLING programs. The system also maintains and references files of valid charge numbers and expected completion times for certain types of work.

3.2 INPUTTING TIMEKEEPING DATA

3.2.1 Analytical Timekeeping Work Sheet

3.2.1.1 General Description

Technician work transactions are recorded on the Analytical Timekeeping Work Sheet. The values on the work sheet are then entered into the Timekeeping master file. The fields on the form are defined as follows:

FIELD NAME	DATA VALUE
Analyst	The initials of the technician who performed the work.
Mo, Day, Yr	The month, day, and year.
Analysis	A number which identifies the type of work.
Code	A one-digit code which identifies the type of file transaction.
Sequence	A two-digit sequence number which uniquely identifies a record for correction or deletion.
Hrs., Mins.	The time spent performing the type of work identified in the Analysis field.
Number	A count of the units of work performed.
Charge	The charge number the work is to be billed to.

The code and sequence fields are filled out only if the transaction is a deletion or replacement of an existing record. The code field should have a value of "2" for a deletion and "3" for a replacement. The sequence field is used to distinguish between duplicate Analysis entries on a work sheet for deletion or replacement. To have the work sheets keypunched and then entered in the master file, attach the sheets to a Request for Services card and place in the mail to Key punch, Building #500W.

3.2.2 Using The CARDS Data Entry Program

3.2.2.1 General Description

The CARDS program is an interactive data entry tool and functions as a part of the Timekeeping system. The program prompts for information about work completed by the technicians in various laboratories. It eliminates the necessity of the keypunching phase by creating a card image file in a computer-readable format from the accounting information typed in. It then causes this update information to be processed creating a new Timekeeping master file.

CARDS is designed to follow the current data entry sheet. It prompts for input in the same order as the entries on the sheet. The defaults for the analyst and the date are always the previous entry. The default for the update code is '1' (an addition). The default for the number of charge codes for any one analysis is zero. None of the other items have defaults other than blanks. The exception to this is that immediately after rejecting a record, the default values are the values typed in for that record. That allows easy correction of the text in error, leaving the valid information unchanged.

To accept the default value for any prompt, respond with a carriage return. To change or add text, type in the desired text followed by a carriage return. An invalid response causes an error message to be printed and causes that prompt to be repeated until a valid response or a special keyword is typed. The four special words are 'HELP', 'OOPS', 'STOP', and 'QUIT'. 'HELP' causes the instruction prompt to be printed and resumes prompting the beginning of the present record. 'OOPS' causes prompting to start at the beginning of the present record. 'STOP' or 'QUIT' causes the program to start the processing of the update information to create a new Timekeeping master file.

3.2.2.2 Execution Instructions

To run this program, login to the DECsystem-10 under account 6137,246, type .RUN CARDS or .BU CARDS and answer each prompt with a carriage return or text and a carriage return. To end the session and update the master file, type 'STOP' or 'QUIT'. Guidelines for valid responses may be typed out any time during the session by typing 'HELP' and responding affirmatively to the instruction prompt. The field value guidelines are printed below.

To accept default values for prompted questions, depress the return key; otherwise respond with text as described below.

Analyst: The initials of the analyst must be from one to three alphabetic characters.

Date completed: Six-digit date of completion must consist of two month digits, two day digits, and two year digits.

Analysis: The analysis code must consist of three or four numeric digits.

Code: The update code must be one numeric digit between one and four or blank. A one or blank indicates an addition rather than a correction.

Sequence: Two numeric digits show the update sequence to number.

Hours: Minutes: Time may be specified in three ways. A one-digit number signifies hours. A two-digit number indicates minutes. A combination of hours and minutes is indicated by one numeric digit for hours, a colon, and two numeric digits for minutes.

Number of charge codes: The number of different charge codes for this record must be specified by one numeric digit between zero and 4.

Number of units: The units of work must be specified by a one- to three-digit number.

Charge code: The charge code consists of eight alphanumeric characters.

3.2.2.3 Example

..RUN CARDS

TIMEKEEPING INPUT PROGRAM STARTING.

DO YOU WISH TO SEE INSTRUCTIONS? (N/Y) Y

TO ACCEPT VALUES FOR PROMPTED QUESTIONS DEPRESS THE RETURN KEY
OTHERWISE RESPOND WITH TEXT AS DESCRIBED BELOW.

ANALYST:THE INITIALS OF THE ANALYST MUST BE THREE ALPHABETIC CHARACTERS.DATE COMPLETED:SIX DIGIT DATE OF COMPLETION MUST CONSIST OF TWO MONTH
DIGITS, TWO DAY DIGITS, AND TWO YEAR DIGITS.ANALYSIS:THE ANALYSIS CODE MUST CONSIST OF THREE OR FOUR NUMERIC DIGITS.CODE:THE UPDATE CODE MUST BE ONE NUMERIC DIGIT BETWEEN ONE AND FOUR
OR BLANK. A ONE OR BLANK INDICATES AN ADDITION RATHER THAN A
CORRECTION.SEQUENCE:TWO NUMERIC DIGITS SHOW THE UPDATE SEQUENCE.HOURS:MINUTES:TIME MAY BE SPECIFIED IN THREE WAYS. A ONE DIGIT NUMBER
SIGNIFIES HOURS. A TWO DIGIT NUMBER INDICATES MINUTES. A COMBINATION
OF HOURS AND MINUTES IS INDICATED BY ONE NUMERIC DIGIT FOR HOURS,
A COLON, AND TWO NUMERIC DIGITS FOR MINUTES.NUMBER OF CHARGE CODES:THE NUMBER OF DIFFERENT CHARGE CODES FOR THIS
RECORD MUST BE SPECIFIED BY ONE NUMERIC DIGIT BETWEEN ZERO AND FOUR.
NUMBER OF UNITS:THE UNITS OF WORK MUST BE SPECIFIED BY A ONE TO THREE
DIGIT NUMBER.CHARGE CODE:THE CHARGE CODE CONSISTS OF EIGHT ALPHANERIC CHARACTERS.

ANALYST:JIMDATE COMPLETED:093078ANALYSIS:0100CODE:1HOURS:MINUTES:0:04:15NUMBER OF CHARGE CODES FOR THIS ANALYSIS:02NUMBER OF UNITS:020CHARGE CODE:LMN0111NUMBER OF UNITS:02CHARGE CODE:ABCD0000* POSSIBLE INVALID CHARGE NO. ABCD0000 *ANALYST:JIMDATE COMPLETED:093078ANALYSIS:0100CODE:1HOURS:MINUTES:4:15NUMBER OF UNITS:20CHARGE CODE:LMN0111NUMBER OF UNITS:2CHARGE CODE:ABCD0000DO YOU WISH TO ACCEPT OR REJECT THIS RECORD? (A/R)AANALYST:JIMDATE COMPLETED:093078ANALYSIS:0511CODE:1HOURS:MINUTES:0:03:00NUMBER OF CHARGE CODES FOR THIS ANALYSIS:01NUMBER OF UNITS:010CHARGE CODE:EPCH111ANALYST:JIMDATE COMPLETED:093078

ANALYSIS:0511
CODE:1
HOURS:MINUTES:3:0
NUMBER OF UNITS:16
CHARGE CODE:EFCH1111
DO YOU WISH TO ACCEPT OR REJECT THIS RECORD? (A/R)
ANALYST:JIM

DATE COMPLETED:093078

ANALYSIS:0511

CODE:1

HOURS:MINUTES:3:0

3:45

NUMBER OF CHARGE CODES FOR THIS ANALYSIS:1

NUMBER OF UNITS:16

CHARGE CODE:EFCH1111

ANALYST:JIM

DATE COMPLETED:093078

ANALYSIS:0511

CODE:1

HOURS:MINUTES:3:45

NUMBER OF UNITS:10

CHARGE CODE:EFCH1111

DO YOU WISH TO ACCEPT OR REJECT THIS RECORD? (A/R)

ANALYST:JIM

STOP

EXIT

3.3 GENERATING TIMEKEEPING REPORTS

3.3.1 Running The ANLIZE Report Program

3.3.1.1 General Description

The ANLIZE program generates a wide variety of reports from the Timekeeping master file. The reports are printed either on the user's terminal or on the computer's high-speed printer. The commands to the ANLIZE program are divided into program control and report request classes. The program control class of commands is used to change the routing of printed output, stop the program, and to display the date. The report request commands specify the type and coverage of information to be listed.

3.3.1.2 Program Control Commands

The program control commands are:

COMMAND: RP

DESCRIPTION: Route Print allows the user to change the device that ANLIZE reports are listed on.

COMMAND: ST

DESCRIPTION: Stop, causes the ANLIZE program to cease execution.

COMMAND: PD

DESCRIPTION: Print Date, displays the current date on the user's terminal.

3.3.1.3 Report Request Commands

The report request commands of the ANALIZE program are defined below:

COMMAND: AT
 DESCRIPTION: Average Time Report, lists the arithmetic mean of the times required to complete each type of analysis in the requested range.
 FORMAT: AT/AN/DR/TS; where AN, DR, and TS are subcommands described in this section.

COMMAND: EF
 DESCRIPTION: Efficiency Report, displays the productivity ratio for each requested analysis. The ratio is calculated by dividing the average time for an analysis into the expected time for that analysis.
 FORMAT: EF/AN/DR/TS; where AN, DR, and TS are subcommands described later in this section.

COMMAND: GA
 DESCRIPTION: Generate All Report, prints the average time, productivity ratio, total time, and total units completed for each requested analysis.
 FORMAT: GA/AN/DR/TS; where AN, DR, and TS are subcommands described later in this section.

COMMAND: CT
 DESCRIPTION: Charge Total Report, computes and lists the total time billed to the specified charge code.
 FORMAT: CT/CN/AN/DR; where CN, AN, and DR are subcommands described later in this section.

COMMAND: CA
 DESCRIPTION: Charge by Analysis Report, displays the time billed and total units for each analysis requested and billed to the specified charge code.
 FORMAT: CA/CN/AN/DR/TS; where CN, AN, DR, and TS are subcommands described later in this section.

COMMAND: SR
 DESCRIPTION: Specific Record Report, prints the requested detail records from the Timekeeping master file.
 FORMAT: SR/AN/DR/TS; where AN, DR, and TS are subcommands described later in this section.

3.3.1.4 Subcommand Definitions

The report request commands have a number of subcommands which are used to modify the coverage of the report. The subcommands may be used to specify a range of analyses or dates. A specific technician or all technicians may be requested with a subcommand. The subcommands follow the report request command on the input line. The subcommands are:

SUBCOMMAND: AN
 DESCRIPTION: Analysis Range, used to specify the analyses the report is to cover.
 FORMATS: blank, include all analyses in the report.
x, where x is an analysis code. Report on analysis x only.
x-y, where x and y are analysis codes. Report on all analyses between and including x and y.

SUBCOMMAND: DR
 DESCRIPTION: Date Range, specifies the dates to be included in the report.
 FORMATS: blank, include all dates on file in the report.
x.y.z, where x is a month, y is a day, and z is a year. Report on date x/y/z only.
x.y.z - x2.y2.z2, where x and x2 are months, y and y2 are days, and z and z2 are years. Report on all dates between and including x/y/z and x2/y2/z2.

SUBCOMMAND: TS
 DESCRIPTION: Technician Specification, used to request a report listed by the technician performing the work.
 FORMATS: blank, no specific technicians are listed.
t, all technicians are reported individually.
xyz, where "xyz" are the initials of a specific technician. Reports only on technician "xyz".

SUBCOMMAND: CN
 DESCRIPTION: Charge number, specifies the charge code to be reported.
 FORMATS: x, where x is an eight-digit code.
 Report on charge code x.

3.3.1.5 Example

The following is an example of an ANLIZE program terminal session.

.RUN S
PROGRAM ID:A

PLEASE ENTER AN "L" TO ROUTE YOUR PRINT TO THE LINE PRINTER
OR "T" TO ROUTE YOUR PRINT TO THE TERMINAL.
BT

PLEASE INPUT A COMMAND

WPD

TODAY'S DATE IS 9/12/78

PLEASE INPUT A COMMAND

WAT/586-599/8.1.78-8.31.78/T

<u>ANALYSIS</u>	<u>TECH.</u>	<u>TIME/ANL.</u>
<u>5860</u>	<u>PLH</u>	<u>1:00</u>
	<u>RDB</u>	<u>0:15</u>
<u>5860</u>	<u>TOTAL</u>	<u>0:30</u>
<u>5890</u>	<u>BP</u>	<u>0:43</u>
	<u>JHO</u>	<u>1:00</u>
	<u>KIW</u>	<u>0:40</u>
	<u>MGM</u>	<u>2:12</u>
	<u>NFC</u>	<u>1:55</u>
	<u>RDB</u>	<u>0:41</u>
<u>5890</u>	<u>TOTAL</u>	<u>0:58</u>
<u>5950</u>	<u>AHM</u>	<u>0:20</u>
	<u>RDB</u>	<u>0:45</u>
<u>5950</u>	<u>TOTAL</u>	<u>0:37</u>
<u>5970</u>	<u>CRJ</u>	<u>1:00</u>
	<u>JHO</u>	<u>1:00</u>
	<u>RDB</u>	<u>1:00</u>
<u>5970</u>	<u>TOTAL</u>	<u>1:00</u>
<u>5990</u>	<u>PLH</u>	<u>0:10</u>
	<u>RDB</u>	<u>0:05</u>
<u>5990</u>	<u>TOTAL</u>	<u>0:08</u>

PLEASE INPUT A COMMAND

WEF/511-525/8.1.78-8.31.78

<u>ANALYSIS</u>	<u>TECH.</u>	<u>RATIO</u>
<u>5110</u>	<u>TOTAL</u>	<u>1.08</u>
<u>5120</u>	<u>TOTAL</u>	<u>1.89</u>
<u>5150</u>	<u>TOTAL</u>	<u>0.96</u>
<u>5180</u>	<u>TOTAL</u>	<u>0.65</u>
<u>5190</u>	<u>TOTAL</u>	<u>1.53</u>
<u>5210</u>	<u>TOTAL</u>	<u>0.68</u>
<u>5230</u>	<u>TOTAL</u>	<u>1.07</u>
<u>5250</u>	<u>TOTAL</u>	<u>1.27</u>

PLEASE INPUT A COMMAND

WGA/311-313/8.1.78-8.31.78

3-7

ANALYSIS	TECH.	AVG/TIME	RATIO	TOT/TIME	NUMBER
3110	TOTAL	0:14	1.00	28:45	122
3120	TOTAL	0:05	1.40	184:30	2016
3130	TOTAL	0:10	0.90	23:45	141
TOTAL				237:00	2279

PLEASE INPUT A COMMAND
 *CT/33706001/311-331/8.1.78-8.10.78

69:05 HOURS WERE BILLED TO CHARGE NUMBER: 33706001

PLEASE INPUT A COMMAND
 *CA/33706001/311-331/8.1.78-8.10.78/*RAJ

ANALYSIS	TECH	NUMBER	TIME
3120	RAJ	6	0:45
3130	RAJ	1	0:15
3210	RAJ	2	0:15
3310	RAJ	4	1:00
TOTAL	TOTAL	13	2:15

PLEASE INPUT A COMMAND
 *SR/243/7.15.78-7.25.78

ANL	TECH	DATE	SEQ	TIME	TCT	TCH	COUNT/CHARGE	PAIRS
2430	NAT	780715	1	0:10	1	1	33800730	
2430	NAT	780717	1	5:00	1	1	33800730	
2430	NAT	780717	2	0:30	1	1	3380028A	
2430	NAT	780718	1	5:10	7	7	33800730	
2430	NAT	780719	1	2:00	7	7	33800730	
2430	NAT	780719	2	0:30	1	1	3380028A	
2430	NAT	780724	1	1:30	1	1	33800730	
2430	NAT	780725	1	0:40	1	1	33800730	
2430	NAT	780725	2	1:00	1	1	33800730	
2430	PSG	780718	1	5:15	8	8	33800730	
2430	PSG	780719	1	4:45	9	9	33800730	
2430	PSG	780720	1	1:15	2	2	33800730	
2430	PSG	780721	1	6:30	7	7	33800730	
2430	PSG	780722	1	4:15	9	9	33800730	

PLEASE INPUT A COMMAND
 *RP
 PLEASE ENTER AN "L" TO ROUTE YOUR PRINT TO THE LINE PRINTER
 OR "*" TO ROUTE YOUR PRINT TO THE TERMINAL.
 *L

PLEASE INPUT A COMMAND
 *SR/243/7.15.78...25.78

PLEASE INPUT A COMMAND
 *ST
 EXIT
 .TY *.LPT
 ANALYTICAL CHEMISTRY ACCOUNTING AND EFFICIENCY SYSTEM

ANL	TECH	DATE	SEQ	TIME	TCT	TCH	COUNT/CHARGE	PAIRS
2430	NAT	780715	1	0:10	1	1	33800730	
2430	NAT	780717	1	5:00	1	1	33800730	
2430	NAT	780717	2	0:30	1	1	3380028A	
2430	NAT	780718	1	5:10	7	7	33800730	
2430	NAT	780719	1	2:00	7	7	33800730	
2430	NAT	780719	2	0:30	1	1	3380028A	
2430	NAT	780724	1	1:30	1	1	33800730	
2430	NAT	780725	1	0:40	1	1	33800730	
2430	NAT	780725	2	1:00	1	1	33800730	
2430	PSG	780718	1	5:15	8	8	33800730	
2430	PSG	780719	1	4:45	9	9	33800730	
2430	PSG	780720	1	1:15	2	2	33800730	
2430	PSG	780721	1	6:30	7	7	33800730	
2430	PSG	780722	1	4:15	9	9	33800730	

3.3.2 Executing The Monthly BILLING Program

3.3.2.1 General Description

The BILLING program is a part of the Analytical Chemistry Division's Timekeeping system. The primary function of the BILLING program is to assist in the creation of the monthly charge report. The program also creates a number of other reports which are useful for laboratory management.

3.3.2.2 Command Definitions

The BILLING program has three basic commands:

COMMAND: CA
 DESCRIPTION: Charge by Analysis Report, lists the time billed and total units completed for each type of analysis requested under a charge code. Operates on all charge codes in the specified analysis and date ranges.
 FORMAT: CA/AN/DR; where AN, and DR are subcommands described later in this section.

COMMAND: CT
 DESCRIPTION: Charge Totals Report, prints the total time and units billed to each charge code.
 FORMAT: CT/AN/DR; where AN, and DR are subcommands described later in this section.

COMMAND: CR
 DESCRIPTION: Complete Report, displays the information necessary to generate the monthly billing report for a laboratory. This report will distribute overhead costs among a laboratory's customers. In addition, charges may be added or deleted. Specific charge codes may be excluded from the overhead distribution.
 FORMAT: CR/AN/DR; where AN, and DR are subcommands described later in this section.

3.3.2.3 Subcommand Definitions

The subcommands of the BILLING program are:

SUBCOMMAND: AN
 DESCRIPTION: Analysis Range, used to specify the analyses to be included in the report.
 FORMATS: blank, all analyses on file are covered.
x, where x is an analysis code. The report covers analysis x only.
x-y, where x and y are analysis codes. All analyses between x and y are included in the report.

SUBCOMMAND: DR
 DESCRIPTION: Date Range, specifies the range of dates to be covered by the report.
 FORMATS: blank, all dates on file are included in the report.
x.y.z, where x is a month, y is a day, and z is a year. The specific date x/y/z is reported.
x.y.z - x2.y2.z2, where x and x2 are months, y and y2 are days, and z and z2 are years. The report covers all dates between x/y/z and x2/y2/z2.

The BILLING program runs on the DECsystem-10 computer. To execute the program, logon to the DECsystem-10 and enter:

```
.RUN 3
PROGRAM ID:B
```

3.3.2.4 Examples

EXAMPLE OF THE CHARGE BY ANALYSIS REPORT

PLEASE INPUT A COMMAND

*CA/5-6/2.1.78-2.7.78

ENTER 'D' FOR DISPLAY, 'P' FOR PRINTER, 'B' FOR BOTH:D

TIMEKEEPING SYSTEM 03/02/78 PAGE: 1
 CA/5-6/2.1.78-2.7.78

CHARGE	ANALYSIS	NUMBER	TIME
33701328	5180		1.0
33701328	5230		6.5
33701328	5270		4.0
33701328	5690		4.0
33701328	5890		3.0
33701328	5950		1.5
33701328	5970		2.0
33701328	6280		6.0
33701328	6850		3.0
33701328	TOTAL	5	33.0
33701410	5150	3	1.7
33701410	TOTAL	3	1.7
33702030	6420	5	1.5
.....			
G2118PAA	5890	1	0.3
G2118PAA	6860	2	0.5
G2118PAA	TOTAL	3	0.8
G2120PAA	6420	2	2.5
G2120PAA	TOTAL	2	2.5
G2186PAA	5740	8	11.0
G2186PAA	TOTAL	8	11.0
TOTAL	TOTAL	485	284.2

EXAMPLE OF THE CHARGE TOTALS REPORT

PLEASE INPUT A COMMAND

*CT/7-8/2.8.78-2.15.78

ENTER 'D' FOR DISPLAY, 'P' FOR PRINTER, 'B' FOR BOTH:D

TIMEKEEPING SYSTEM 03/02/78 PAGE: 1
 CT/7-8/2.8.78-2.15.78

CHARGE	NUMBER	TIME
33703302	10	2.5
33800103	110	18.0
33800112	6	5.0
33800251	18	6.5
33800255	10	10.0
33800611	35	36.0
33800660	4	1.0
33800670	47	14.0
33800730	14	4.0
33800780	10	2.5
33800810	26	9.0
33800850	313	43.0
33800860	6	1.4
33800890	52	8.5
33900030	16	7.5
33900270	18	6.5
33900412	53	14.6
34700791	5	1.5
36320000	6	1.0
42700108	2	0.5
TOTALS	821	193.0

DESCRIPTION OF THE COMPLETE REPORT LISTING

PLEASE INPUT A COMMAND
 CR/3-4/2.78-2.78

The first output from the "CR" command is a temporary listing of the billing amounts as found on the Timekeeping System master files. This listing is then used in conjunction with the Add, Delete, Exclude, and Total Time features to create the final monthly report.

TIMEKEEPING SYSTEM 03/02/78		PAGE: 1
CHARGE	NUMBER	TIME
33250117	4	8.5
33702800	134	26.8
33702802	393	35.5
33702807	285	60.5
33702902	3	4.0
33702905	42	7.0
33706001	731	144.5
33706001	354	30.5
33706001	14	5.0
33707333	58	35.8
33900315	8	3.5
34200110	223	20.8
36320000	267	21.9
50056300	3	4.0
TOTALS	2519	408.3

The "T" feature is used to specify the total time to be distributed to the laboratory's customers. The time is entered as a number of hours.

ENTER A,D,E,L,T, OR R:T
 TOTAL TIME IN HOURS:500

The "E" feature will exclude a charge code from the overhead time distribution. After entering the "E" option, type in the charge codes to be excluded. Entry of a blank line will cause the program to return to the feature selection phase.

ENTER A,D,E,L,T, OR R:E
 CHARGE TO EXCLUDE:33706001
 CHARGE TO EXCLUDE:

To delete a charge code from the billing report, the "D" feature is used. Inputting a charge code while in the "D" feature will cause that charge code and its time and units to be left out of the final report. Entry of a blank line will cause the program to return to the feature selection phase.

ENTER A,D,E,L,T, OR R:D
 CHARGE TO DELETE:34200110
 CHARGE TO DELETE:

The "A" feature is used to add charge codes to the final billing report. With the "A" option a charge code and its units and time may be inserted in the listing. This option in conjunction with the "D" option may be used to correct errors in the billing information. The Add option expects a charge code followed by a comma, a number of units followed by a comma, and a time in hours and tenths as input. Entry of a blank line will cause the program to return to the feature selection phase.

ENTER A,D,E,L,T, OR R:A
 ENTER CHANGE,NUMBER,HOURS,TENTHS 12345678.100,10.0
 ENTER CHANGE,NUMBER,HOURS,TENTHS

The "L" feature will list the changes in the final report specified by the "A", "D", and "E" features.

ENTER A,D,E,L,T, OR R:L

ADDITIONS
 12345678 00100 00010.0
 DELETIONS
 34250110
 EXCLUSIONS
 33706001

To cause BILLING to generate the final report the "R" feature is used.

ENTER A,D,E,L,T, OR R:R
 ENTER 'D' FOR DISPLAY, 'P' FOR PRINTER, 'B' FOR BOTH:D

TIMEKEEPING SYSTEM 03/02/78 PAGE: 1
 CR/3-4/2.1.78-2.7.78

CHARGE	NUMBER	TIME
12345678	100	14.1
33250110	4	12.0
33702800	134	37.7
33702802	393	49.9
33702804	285	85.6
33702902	3	5.6
33702905	42	9.8
33706001	737	144.5
33706003	354	47.6
33706110	14	7.0
33707333	58	50.2
33900315	8	4.9
36320000	267	30.8
50056300	3	5.6
TOTALS	2396	500.0

TIMEKEEPING SYSTEM 03/02/78 PAGE: 1
 CR/3-4/2.1.78-2.7.78

CHARGE	NUMBER	TIME
1234	100	14.1
3325	4	12.0
3370	2014	432.7
3390	8	4.9
3632	267	30.8
5005	3	5.6
TOTALS	2396	500.0

CHAPTER 4

QUALITY ASSURANCE

4.1 INTRODUCTION

The Quality Assurance System aids management in verifying the accuracy of analytical tests performed on customer samples. As each customer sample is analyzed, the same analysis is performed simultaneously on a control sample. The test results of the control samples, the determination method used, the technician's initials, and other identifying information are entered into the computer by running the TECHN (or T) program. The Quality Assurance Officer enters the known values of all control samples into the system by either running the CNILIN interactive program or submitting control data sheets to be keypunched and processed in batch mode. The MANINQ program is used by the Quality Assurance Officer to generate daily, monthly, or quarterly statistical reports and graphs showing the comparison of the technician test results and the actual known values. The SUPV (or S) program is used daily by the Lab Supervisors to inform them when test results were entered that exceeded the limit of error. The system accumulates data on a quarterly basis. At the end of each quarter, all data files are removed and stored on a computer-readable media.

4.2 STORING INFORMATION ON THE COMPUTER

4.2.1 Inputting Control Data File Via Computer

4.2.1.1 General Description

The CNILIN program is the interactive program used to store the true values of the control samples. Each record in the control data file contains the following elements:

- (1) method in abbreviated notation
- (2) determination
- (3) control-code
- (4) true value
- (5) units of measurement
- (6) expected limit of error
- (7) date
- (8) method in long form notation

The control data file is a protected file in which only the Quality Assurance Officer has read and write access.

4.2.1.2 Command Definitions

The following commands are provided:

ADD - adds an entry
COR - corrects an entry
DISP - displays a specific entry on your terminal
LIST - prints all entries on your terminal and/or on the line printer
DEL - deletes an entry
STOP - end of execution

Each command will prompt you for the necessary information. If you want to accept the default value or use the previous value inputted, respond with a carriage return. For all questions asked requiring a 'N/Y' response, the default value will be the first operation (I.E.N). If at any time you need to start over on inputting, type a Control-U and 'DOPS'.

4.2.1.3 Execution Instructions

The monitor command used to execute the CNTLIN program in interactive mode is

.DO CNTLIN

4.2.1.4 Examples

This example illustrates the "ADD" command.

QUALITY ASSURANCE: CONTROL FILE INPUT PGM
DO YOU NEED TO SEE OPERATING INSTRUCTIONS? (N/Y) N
GIVE ACTION DESIRED (ADD,COR,DISP,LIST,DEL,STOP): :ADD
INPUT METHOD: :LECO
INPUT DETERMINATION: :CARBON
INPUT CONTROL-CODE: :LCSH-4
INPUT METHOD-LONG FORM: :LECO-CARBON :
INPUT UNITS: :GRAMS
INPUT DATE (MO/DA/YR) : :1/15/79
INPUT RESULT: 0.0000:5.2
INPUT LIMIT OF ERROR: 0.0000:5

METHOD	DETERM	CCODE	RESULT	LOE	DATE	UNITS
LECO	CARBON	LCSH-4	+5.200	+5.00	01/15/79	GRAMS

METHOD ABBREV: LECO LONG-FORM: LECO-CARBON
DO YOU NEED TO MAKE ANY FURTHER CHANGES TO THE RECORD (N/Y) ? N

This example illustrates the "COR" command and the option to have the changes you made to the control data file typed or printed.

GIVE ACTION DESIRED (ADD,COR,DISP,LIST,DEL,STOP): ADD :COR
INPUT METHOD: LECO :LECO
INPUT DETERMINATION: CARBON :CARBON
INPUT CONTROL-CODE: LCSH-4 :LCSH-4
INPUT METHOD-LONG FORM: LECO-CARBON :
INPUT UNITS: GRAMS :
INPUT DATE (MO/DA/YR) : 01/15/79:
INPUT RESULT: 5.2000:5.3
INPUT LIMIT OF ERROR: 5.0000:

METHOD	DETERM	CCODE	RESULT	LOE	DATE	UNITS
LECO	CARBON	LCSH-4	+5.300	+5.00	01/15/79	GRAMS

METHOD ABBREV: LECO LONG-FORM: LECO-CARBON
DO YOU NEED TO MAKE ANY FURTHER CHANGES TO THE RECORD (N/Y) ? N
GIVE ACTION DESIRED (ADD,COR,DISP,LIST,DEL,STOP): COR :STOP
DO YOU WANT THE CORRECTIONS TYPED ON YOUR TTY (N/Y)? Y

TYPE OF ACTION:ADD
METHOD DETERM CCODE RESULT LOE DATE UNITS
LECO CARBON LCSH-4 +5.20 +5.00 01/15/79 GRAMS
METHOD ABBREV:LECO LONG FORM:LECO-CARBON GRAMS
TYPE OF ACTION:COR
METHOD DETERM CCODE RESULT LOE DATE UNITS

```
LECO      CARBON      LESH-4      +5.300 +5.00 01/15/79 GRAMS
METHOD ABREV:LECO      LONG FORM:LECO-CARBON      GRAMS
DO YOU WANT A LINE PRINTER COPY(N/Y)?Y
DONE
```

This example illustrates the "DISP" command.

```
QUALITY ASSURANCE: CONTROL FILE INPUT PGM
DO YOU NEED TO SEE OPERATING INSTRUCTIONS? (N/Y) N
GIVE ACTION DESIRED (ADD,COR,DISP,LIST,DEL,STOP): :DISP
INPUT METHOD: :LECO
INPUT DETERMINATION: :CARBON
INPUT CONTROL-CODE: :LESH-48
METHOD      DETERM      CCODE      RESULT      LOE      DATE      UNITS
LECO      CARBON      LESH-48      +5.200 +5.00 01/15/79 GRAMS
METHOD ABREV: LECO      LONG-FORM: LECO-CARBON
GIVE ACTION DESIRED (ADD,COR,DISP,LIST,DEL,STOP): DISP:STOP
```

This example illustrates the "LIST" command.

```
GIVE ACTION DESIRED (ADD,COR,DISP,LIST,DEL,STOP): DISP:LIST
DO YOU WANT A LINE PRINTER COPY OF CONTROL FILE (N/Y)? Y
DO YOU WANT THE CONTROL FILE TYPED ON YOUR TTY(N/Y)?Y
```

CONTROL FILE LISTING

```
METHOD      DETERM      CCODE      RESULT      LOE      DATE      UNITS
LECO      CARBON      LESH-48      +5.200 +5.00 01/15/79 GRAMS
TECHNICON      MH4+-N      WATER-20      +.269 +3.00 01/15/79 GRAMS
METHOD ABREV: LECO      LONG-FORM: LECO-CARBON
METHOD ABREV: TECHNICON      LONG-FORM: TECHNICON
```

```
GIVE ACTION DESIRED (ADD,COR,DISP,LIST,DEL,STOP): LIST:STOP
```

This example illustrates the "DEL" command.

```
QUALITY ASSURANCE: CONTROL FILE INPUT PGM
DO YOU NEED TO SEE OPERATING INSTRUCTIONS? (N/Y) N
GIVE ACTION DESIRED (ADD,COR,DISP,LIST,DEL,STOP): :DEL
INPUT METHOD: :LECO
INPUT DETERMINATION: :CARBON
INPUT CONTROL-CODE: :LESH-49
METHOD      DETERM      CCODE      RESULT      LOE      DATE      UNITS
LECO      CARBON      LESH-49      +5.500 +6.00 01/14/79 GRAMS
DO YOU WISH TO DELETE THIS RECORD (N/Y) ? Y
GIVE ACTION DESIRED (ADD,COR,DISP,LIST,DEL,STOP): DEL :STOP
DO YOU WANT THE CORRECTIONS TYPED ON YOUR TTY (N/Y)?N
DO YOU WANT A LINE PRINTER COPY(N/Y)?N
DONE
```

4.2.2 Inputting The Control Data File Via Paper

The CNIBAT program is the batch program used to store the true values of the control samples. The same elements are required for each record as stated in 4.2.2.1.

4.2.2.1 Format Of Control Data Sheets

The input for each record is recorded on two card images and has the following format:

CARD IMAGE 1:

method (abbreviated form)	Col 1-15	left justified
determination	Col 16-25	left justified
control-code	Col 26-35	left justified
method (long form)	Col 36-60	left justified

CARD IMAGE 2:

true result	Col 1-9	99999.9999 (decimal assumed)
limit of error	Col 16-23	9999.9999 (decimal assumed)
date	Col 26-33	mo/da/yr
units of measure	Col 36-55	left justified

4.2.2.2 Keypunch Services

To have the control data sheet keypunched and then entered into the control data file, attach the data sheets to Request for Services cards which has been filled out as shown below and place in the mail to Keypunch, BLDG 4500W.

4.2.3 Inputting Technician Test Results Via Computer

4.2.3.1 General Description:

The "TECHN" or "T" program is the interactive program used daily to record the technician's control tests results. Each record in the technician transaction file contains the following elements:

- (1) method (abbreviated form)
- (2) determination
- (3) control-code
- (4) test result
- (5) technician's initials
- (6) request number (5 digits)
- (7) date

4.2.3.2 Command Definitions

The following commands are provided:

ADD - adds an entry to the technician transaction file
STOP - end of execution

Each action will prompt you for the necessary information. If you want to accept the default value or use the previous value inputted, then respond with a carriage return. For all questions asked requiring a 'N/Y' response, the default value will be the first operation (I.E.N). If at any time you need to start over on inputting, type a Control-U and 'OOPS'.

The TECHN provides only the add entry option; if a mistake was entered, notify the Quality Assurance Officer who has the authority to delete an entry by running the MANING program (which is described later).

4.2.3.3 Execution Instructions

The following sequence of commands shows how to run the TECHN program.

```
.RUN S
PROGRAM ID:T
```

4.2.3.4 Examples

This example illustrates the "ADD" command.

QUALITY ASSURANCE: TECHNICIAN FILE INPUT PGM

DO YOU NEED TO SEE OPERATING INSTRUCTIONS? (N/Y) N
 GIVE ACTION DESIRED (ADD,STOP): :ADD
 INPUT DATE (MO/DA/YR) : :1/15/79
 INPUT METHOD: LECO
 INPUT DETERMINATION: CARBON
 INPUT CONTROL CODE: LCSH-48
 INPUT RESULT IN GRAMS :2.0000:5.28
 INPUT REQUEST NO: :12345
 INPUT INITIALS: :KEW

DATE	METHOD	DETERM	CCODE	RESULT	REQNUM	INIT
01/15/79	LECO	CARBON	LCSH-48	+5.2800	12345	KEW

DO YOU WISH TO MAKE A CORRECTION TO THE RECORD (N/Y) ? N
 GIVE ACTION DESIRED (ADD,STOP): ADD :STOP

4.3 RETRIEVING INFORMATION FROM THE COMPUTER

4.3.1 Lab Supervisor Check Of Technician Transaction File

4.3.1.1 General Description

The "SUPV" or "S" program is an interactive program used only by the lab supervisors to tell them if any technician has entered a control test result that was greater than or less than the expected limit of error. This program prompts for a password, which limits its use to only the lab supervisors.

4.3.1.2 Command Definitions

CHEC - checks to see if any technician results are out of bounds
 STOP - end of execution

4.3.1.3 Execution Instructions

The following sequence of commands describes how to execute the SUPV program.

.RUN S
 PROGRAM ID:S

4.3.1.4 Examples

This example illustrates the "CHEC" command.

QUALITY ASSURANCE: SUPERVISOR INQUIRE PROGRAM

INPUT LAB NUMBER(1=3019,3=2026,4=7920,5=45003,6=2024):1
 PASSWORD: PASSWORD
 DO YOU NEED TO SEE OPERATING INSTRUCTIONS? (N/Y) N
 GIVE ACTION DESIRED (CHEC,STOP): :CHEC
 INPUT DATE (MO/DA/YR OR ALL) : ALL
 THERE ARE 1 TRANSACTIONS OUT OF BOUNDS ON DATE : ALL
 GIVE ACTION DESIRED (CHEC,STOP): CHEC:stop

4.3.2 Quality Assurance Officer Inquire Program

4.3.2.1 General Description

The MANINQ program is an interactive program used to generate daily, monthly, or quarterly statistical reports and graphs showing the comparison between the technician test results and the actual known values. In addition, the program provides a "list" command which will generate a listing of all entries in the technician transaction file. A delete command is also provided, which allows the Quality Assurance Officer to delete a specific entry in the technician transaction file. Daily listings are generated showing all technician transactions whose test results were not within the limit of error. The execution of the MANINQ program is restricted to the Quality Assurance Officer.

4.3.2.2 Command Definitions

- LIST - will display on your terminal and/or create a line printer listing of all the technician transactions entered on a specific day or throughout the quarter
- CHEC - will display on your terminal and/or generate a line printer listing of all the technician transactions whose test results were not within the expected limit of error.
- CALC - performs the standard quality assurance statistical calculations for a selected METH:DET:CCODE¹ or all METH:DET:CCODES.
- PLOT - will generate a graph for each meth:det by plotting the percent difference against the data entered. You have the option of generating a graph for a specific meth:det.
- DEL - deletes a specific technician transaction

Each action will prompt you for the necessary information. If you want to accept the default value or use the previous value inputted, then respond with a carriage return. For all questions asked requiring a 'N/Y' response, the default value will be the first operation (I.E.N). If at anytime you need to start over on inputting, type a Control-U and 'OOPS'.

4.3.2.3 Execution Instructions

The monitor command used to execute the MANINQ is

.DO MANINQ

4.3.2.4 Examples

This example illustrates the 'LIST' command.

QUALITY ASSURANCE: MANAGEMENT INQUIRE PROGRAM

DO YOU NEED TO SEE OPERATING INSTRUCTIONS? (N/Y) N

GIVE ACTION DESIRED (LIST,CALC,CHEC,PLOT,DEL,STOP): LIST
 INPUT LAB NUMBER(0=ALL,1=3019,3=2026,4=7920,5=45005,6=2024):1
 DO YOU WANT A LINE PRINTER COPY? (N/Y) Y
 DO YOU WANT THE OUTPUT DISPLAYED ON YOUR TTY? (N/Y) Y
 INPUT DATE (MO/DA/YR OR ALL):ALL

PROCESSING LAB NUMBER: 2019

¹ Meth:det;rcode means method, determination, and control-code

TRANSACTIONS LAB NO: 3019

DATE	METHOD:DETER:CCODE	RESULT	% DIFF	LOE	TECHN	OUT?
01/05/79	LECO:CARBON:LCSH-48:	+5.2800	+1.5384	+5.00	KEW	
01/06/79	LECO:CARBON:LCSH-48:	+5.3400	+2.6923	+5.00	KEW	
01/06/79	LECO:CARBON:LCSH-48:	+5.2400	+0.7692	+5.00	KEW	
01/10/79	LECO:CARBON:LCSH-48:	+5.4800	+5.3846	+5.00	KEW	
01/15/79	LECO:CARBON:LCSH-48:	+5.6200	+8.0769	+5.00	KEW	
01/22/79	LECO:CARBON:LCSH-48:	+5.1000	-1.9230	+5.00	KEW	
01/05/79	TECHNICON:NH4+-N:WATER-2:	+0.2520	-6.3197	+8.00	KEW	
01/07/79	TECHNICON:NH4+-N:WATER-2:	+0.2660	-1.1152	+8.00	KEW	
01/07/79	TECHNICON:NH4+-N:WATER-2:	+0.2640	-1.8587	+8.00	KEW	
01/15/79	TECHNICON:NH4+-N:WATER-2:	+0.2690	+0.0000	+8.00	KEW	
01/26/79	TECHNICON:NH4+-N:WATER-2:	+0.2600	-3.3457	+8.00	KEW	
01/26/79	TECHNICON:NH4+-N:WATER-2:	+0.2730	+1.4869	+8.00	KEW	
01/05/79	LECO:CARBON:LCSH-48:	+5.2800	+1.5384	+5.00	KEW	
01/15/79	LECO:CARBON:LCSH-48:	+5.2800	+1.5384	+5.00	KEW	
01/15/79	LECO:CARBON:LCSH-48:	+5.2800	+1.5384	+5.00	KEW	

GIVE ACTION DESIRED (LIST,CALC,CHEC,PLOT,DEL,STOP): LIST:STOP

This example illustrates the 'CHEC' command.

GIVE ACTION DESIRED (LIST,CALC,CHEC,PLOT,DEL,STOP): LIST:CHEC
 INPUT LAB NUMBER(0=ALL,1=3019,3=2026,4=7920,5=4500S,6=2024):1
 DO YOU WANT A LINE PRINTER COPY? (N/Y) Y
 DO YOU WANT THE OUTPUT DISPLAYED ON YOUR TTY? (N/Y) Y
 INPUT DATE (MM/DD/YY OR ALL):ALL:ALL

PROCESSING LAB NUMBER: 3019

RESULTS OUT OF BOUNDS

DATE	METHOD:DETER:CCODE	RESULT	% DIFF	LOE	INIT	LABNO	OUT
01/10/79	LECO:CARBON:LCSH-48:	+5.4800	+5.3846	+5.00	KEW	03019	*
01/15/79	LECO:CARBON:LCSH-48:	+5.6200	+8.0769	+5.00	KEW	03019	*

ON DATE:ALL TOTAL NUMBER OF TRANSACTIONS OUT OF BOUNDS =2 FOR LAB NO = 3019

GIVE ACTION DESIRED (LIST,CALC,CHEC,PLOT,DEL,STOP): CHEC:stop

This example illustrates the 'CALC' command when processing all the meth:det:ccodes.

GIVE ACTION DESIRED (LIST,CALC,CHEC,PLOT,DEL,STOP): CALC:cal=
 INPUT LAB NUMBER(0=ALL,1=3019,3=2026,4=7920,5=4500S,6=2024):1
 DO YOU WANT A LINE PRINTER COPY? (N/Y) n
 DO YOU WANT THE OUTPUT DISPLAYED ON YOUR TTY? (N/Y) y

PROCESSING LAB NUMBER: 3019

DO YOU WANT ALL RECORDS PROCESSED? (N/Y) y

CONTROL RESULTS FOR JANUARY 1979

METHOD:DETER:CCODE	NUM OF TESTS	LIMIT OF ERROR	2S FOUND	CALC 'T'	% BIAS	NUM. OUT CNTRL	BIAS SIGNIF
LECO:CARBON:LCSH-48:	9	+5.00	+5.502	+2.4639	+2.35	2	YES
TECHNICON:NH4+-N:WAT	6	+8.00	+5.568	-1.6663	-1.85	0	NO

GIVE ACTION DESIRED (LIST,CALC,CHEC,PLOT,DEL,STOP): CALC:stop

This example illustrates the 'CALC' command when selecting a specific method:det:ccode.

QUALITY ASSURANCE: MANAGEMENT INQUIRE PROGRAM

DO YOU NEED TO SEE OPERATING INSTRUCTIONS? (N/Y) n

GIVE ACTION DESIRED (LIST,CALC,CHEC,PLOT,DEL,STOP): calc

INPUT LAB NUMBER(0=ALL,1=3019,3=2026,4=7920,5=45005,6=2024):1

DO YOU WANT A LINE PRINTER COPY: (N/Y)

DO YOU WANT THE OUTPUT DISPLAYED ON YOUR TTY? (N/Y)y

PROCESSING LAB NUMBER: 3019

DO YOU WANT ALL RECORDS PROCESSED? (N/Y)n

INPUT METHOD: :technicon

INPUT DETERMINATION: :nh4--n

INPUT CONTROL CODE: :water-20

CONTROL RESULTS FOR JANUARY 1979

METHOD:DETER:CCODE	HUM OF TESTS	LIMIT OF ERROR	25% FOUND	CALC T	% BIAS	HUM. OUT CNTRL	BIAS SIGNIF
TECHNICON:NH4--N:WAT	6	+8.00	+5.568	-1.6663	-1.85	0	NO

This example illustrates the 'PLOT' command.

QUALITY ASSURANCE: MANAGEMENT INQUIRE PROGRAM

DO YOU NEED TO SEE OPERATING INSTRUCTIONS? (N/Y) n

GIVE ACTION DESIRED (LIST,CALC,CHEC,PLOT,DEL,STOP): plot

INPUT LAB NUMBER(0=ALL,1=3019,3=2026,4=7920,5=45005,6=2024):1

PROCESSING LAB NUMBER: 3019

INPUT BLD NUMBER: 3019

INPUT ROOM NUMBER :

DO YOU WANT ALL RECORDS PROCESSED? (N/Y)y

TOTAL NUMBER OF PLOTS GENERATED =2

GIVE ACTION DESIRED (LIST,CALC,CHEC,PLOT,DEL,STOP): PLOT:stop

YOUR PLOTS ARE IN FILE FOR29.XYI

1SAVED PLOT 1

2SAVED PLOT 2

END OF PLOT FILE

NUMBER OF PLOTS GENERATED= 2

STOP

END OF EXECUTION

CPU TIME: 2.16

ELAPSED TIME: 1:21.82

This example illustrates the 'DEL' command.

QUALITY ASSURANCE: MANAGEMENT INQUIRE PROGRAM

DO YOU NEED TO SEE OPERATING INSTRUCTIONS? (N/Y) n

GIVE ACTION DESIRED (LIST,CALC,CHEC,PLOT,DEL,STOP): del

INPUT LAB NUMBER(0=ALL,1=3019,3=2026,4=7920,5=45005,6=2024):1

PROCESSING LAB NUMBER: 3019

INPUT METHOD: :leco

INPUT DETERMINATION: :carbon

INPUT CONTROL CODE: :lcsn-48

INPUT DATE (MO/DA/YR OR ALL):1/5/79

INPUT RESULT IN :0.0000:5.28

INPUT INITIALS: :kew

DATE	METHOD	DETERM	CCODE	RESULT	REQNUM	INIT
01/05/79	LECO	CARBON	LCSN-48	5.2800	12345	KEW

DO YOU WANT TO DELETE THIS RECORD? (N/Y):y

DO YOU WANT TO DELETE ANY OTHER RECORDS? (N/Y):n

GIVE ACTION DESIRED (LIST,CALC,CHEC,PLOT,DEL,STOP): DEL :stop

CHAPTER 5

DATA CALCULATION

5.1 INTRODUCTION

The Analytical Chemistry Division's data calculation programs are described in this section. The descriptions include program execution instructions and examples.

5.2 SIMULATED PETROLEUM DISTILLATION

5.2.1 General Description

A set of computer programs has been developed to support the Analytical Chemistry Division's simulated petroleum distillation process. The main function of the computer system is to convert the retention times of experimentally observed distillation peaks to boiling points and molecular weights. The system also generates plots of boiling point versus cumulative percent distilled.

The boiling point and molecular weight values are calculated using equations developed by observing the behavior of a sample of known content. The test equipment detects and displays the retention time and peak area of the distillation peaks for the known sample. The observed retention times are then combined with the sample's known boiling points or molecular weights and entered as a curve to be fitted with an equation. A linear least squares routine developed by Stanford University is then used to develop a polynomial which approximates the calibration data. The calculated equations are stored and used to interpret sample observations until another equipment calibration is performed. Plots of the calibration equations may be obtained so that unusual equation behavior may be detected and corrected.

5.2.2 DISTILL Program

5.2.2.1 General Description

Most of the computer processing required for simulated distillation is performed by the DISTILL program. The program calculates and stores the calibration equations, inputs the sample data, and calculates and displays boiling point and molecular weight values.

To execute the DISTILL program, logon the DECsystem-10 computer under account 6476,21 and enter:

_RUN D

5.2.2.2 Entering Calibration Data

To enter new calibration data, respond to the "CLEAR CALIBRATION DATA" question with the letter "Y". DISTILL will then ask for the distillation peaks: boiling point, molecular weight, and observed retention time. Enter the three values on the same line separated by spaces or tabs. To exit from the peak specification phase, enter the letter "E" for the boiling point value. The program will then enter the calibration data correction phase.

5.2.2.3 Correcting Calibration Data

To correct the calibration data or equations, respond to the "CORRECT CALIBRATION DATA OR FIT" question with the letter "Y". The program will respond with a list of correction options. The options are:

OPTION	DESCRIPTION
A	Insert additional calibration peaks.
C	Correct a peak.
D	Delete a peak.
L	List the calibration data.
E	Exit from the correction phase and enter the fit phase.

5.2.2.4 Calibration Curve Fitting

The calibration curve fitting routine is entered through the calibration data correction phase. When the correction phase ends the fitting routine begins. The first equation calculated is the boiling point versus retention time curve. The program requests the degree of polynomial to be used and then lists the calculated coefficients of the equation with the total and individual residuals. The program then asks if the fit is good enough. A reply of "No" causes DISTILL to return to the polynomial degree question. A reply of "Yes" prompts DISTILL to move to the molecular weight versus retention time fit. The most desirable fit is one where both the polynomial degree and the residuals are low.

5.2.2.5 Inputting Sample Data

After the calibration section has been completed or skipped, the DISTILL program enters the sample data processing section. This part of the program inputs the information required to calculate and/or plot the boiling points, molecular weights and percent distilled of the sample peaks. The program requests the thermometric scale to be used, the run number of the plot, and the customer's sample identifier. The program then inputs the retention time and peak area of each sample peak. Entering the letter "E" as the retention time causes DISTILL to begin the sample data correction phase.

The correction phase has a number of processing options including:

OPTION	DESCRIPTION
A	Add a sample peak.
C	Correct a peak.
D	Delete a peak.
L	List the peaks.
S	Sort the peaks in retention time order.
T	Print the total peak area.
E	Exit from the correction phase.

5.2.2.6 Data Calculation And Plotting

When the sample data correction phase has been completed, the program calculates and displays the percent distilled, boiling point, and molecular weight for each sample peak. In addition, the initial boiling point, final boiling point, average boiling point, average molecular weight, and total peak area are displayed. DISTIL then asks if the sample should be corrected, plotted, or skipped. Finally, the program asks if any more samples are to be processed.

5.2.2.7 Obtaining A Plot Of The Calibration Equations

To generate a plot of the calibration equations, enter the following command sequence. The computer's output is underlined.

```

.RUN P
STOP
END OF EXECUTION
CPU TIME: 3.26 ELAPSED TIME: 1.1.00
EXIT
.R SUBMIT
@PLOT.JCL
JOB QUEUED FOR THE 360/91

```