

DRSAR/SA/N-73

SYSTEMS ANALYSIS DIRECTORATE

ACTIVITIES SUMMARY

SEPTEMBER 1977

(VOLUME I)

**TECHNICAL
LIBRARY**

OCTOBER 1977

Approved for public release; distribution unlimited.



US ARMY ARMAMENT MATERIEL READINESS COMMAND

SYSTEMS ANALYSIS DIRECTORATE

ROCK ISLAND, ILLINOIS 61201

DISPOSITION

Destroy this report when no longer needed. Do not return it to the originator.

DISCLAIMER

The findings in this report are not to be construed as an official Department of the Army position.

WARNING

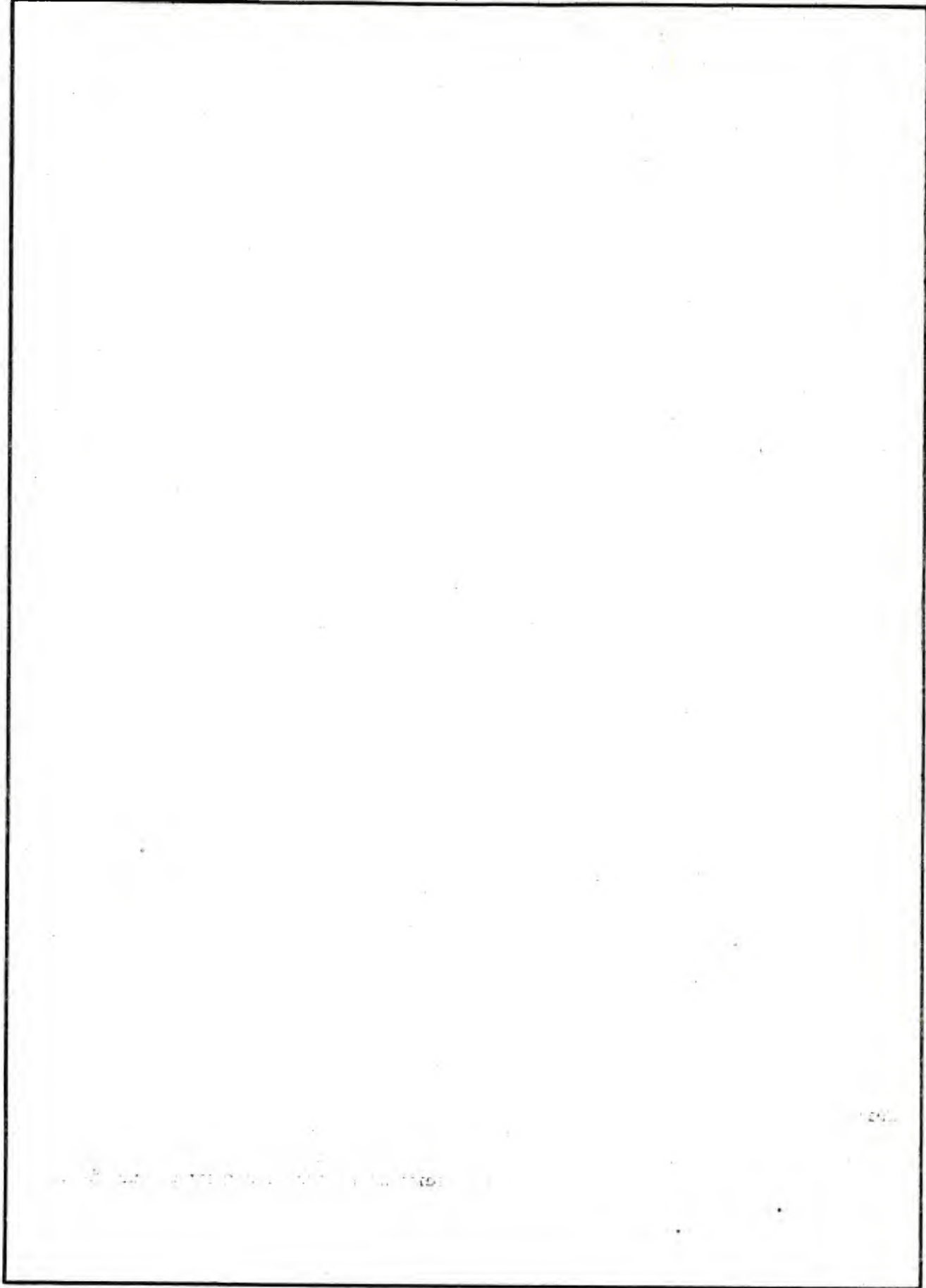
Information and data contained in this document are based on input available at the time of preparation. Because the results may be subject to change, this document should not be construed to represent the official position of the US Army Development & Readiness Command unless so stated.

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER DRSAR/SA/N-73	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) SYSTEMS ANALYSIS DIRECTORATE ACTIVITIES SUMMARY - SEPTEMBER 1977 (VOLUME I)		5. TYPE OF REPORT & PERIOD COVERED Note - Final
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s)	8. CONTRACT OR GRANT NUMBER(s)	
9. PERFORMING ORGANIZATION NAME AND ADDRESS US Army Armament Materiel Readiness Command Systems Analysis Directorate (DRSAR-SA) Rock Island, IL 61201		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS US Army Armament Materiel Readiness Command Systems Analysis Directorate (DRSAR-SA) Rock Island, IL 61201		12. REPORT DATE October 1977
		13. NUMBER OF PAGES
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES Additions or deletions of addresses to/from the DISTRIBUTION LIST are invited and should be forwarded to the address below. Inquiries pertinent to specific items of interest may be forwarded to Commander, US Army Armament Materiel Readiness Command, ATTN: DRSAR-SA, Rock Island, IL 61201 (AUTOVON 793-4483/4628)		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Chemical agent Censor criteria Purity of the agent Statistical samples		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This monthly publication contains Memoranda for Record (MFR's) and other technical information that summarize the activities of the Systems Analysis Directorate, US Army Armament Materiel Readiness Command, Rock Island, IL. (The most significant MFR's and other data will be published as notes or reports at a later date.) Volume I (UNCL) deals with determination of the serviceability category of chemical agent lots. Volume II (CONF) contains an analysis fo the operational capability as the 105mm M101A1 and M102 Howitzers.		

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)



SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

CONTENTS

	<u>Page</u>
Procedure for Determining the Serviceability Category of Chemical Agent Lots	5
User's Guide to the Computer Programs for Determining the Serviceability Category of Chemical Agent Lots	23
DISTRIBUTION LIST	54

Next page is blank.

PROCEDURE FOR DETERMINING THE SERVICEABILITY
CATEGORY OF CHEMICAL AGENT LOTS

1. Introduction.

Serviceability categories for chemical agents or munitions are assigned on the basis of the purity of an entire lot of agent or munition. The purity of a lot is the average purity of the agent in all the containers comprising the lot; it is the purity one would measure if it were possible to mix all the agent together in one large vat. Since sampling from a portion of the lot gives only an estimate of the purity of the lot, statistical methods are employed to draw an inference about the true purity of the lot.

The statistical method described in the following includes criteria for censoring bad data and establishes a lower bound for the value of lot purity, with given confidence, based upon the Student-t distribution.

2. Sampling Methodology.

A pair of samples is taken from each of a number n containers from the lot, each container having been selected independently and at random. The agent in each container (ideally) is mixed well before sampling. Each sample is analyzed for percent purity of agent.

3. Statistical Procedure.

a. Fill in Part 1 of the Lot Purity Estimation Worksheet (example worksheets are attached) through column C. In case of a missing member of a pair, leave column A or B blank, as appropriate, and leave column C blank.

b. If a criterion for pair differences has been previously established, go to step e. Otherwise, continue to step c.

c. Repeat step a for each lot under consideration. Then fill in the Censor Criterion Worksheet (example worksheets are attached) by tallying the occurrences of values from column C of all the Estimation worksheets.

d. Judgementally select a value of pair difference which is larger than the body of occurrences, but which is smaller than extreme outlying occurrences, if any. This value, the censor criterion, should generally be such as to reject less than 5% of the sample pairs. An example of censor criterion selection is attached.

e. On the Estimation Worksheet, censor (line out) any sample pairs for which the pair difference is larger than the censor criterion. Now complete columns D (for a missing member of a pair, enter in D the value for the present member) and E.

f. On Part 2 of the Estimation Worksheet (examples attached), complete the indicated computations through the computation of s.

g. If there were no missing members of sample pairs, go to step h.
h. If there was a missing member, check the value in column D against all the other values in that column. If this value is either the largest or the smallest number in the column, calculate the required entry in column F for this sample. If the entry in column F is greater than 3.00 in absolute value, censor the sample and go back to step f. Otherwise, continue to step h.

h. Now complete the remaining calculations.* The value LCL is compared with values in the table of Purity requirements for serviceability categories, establishing the condition code for the lot.

Repeat the process for each lot.

4. Comments.

Two portions of the above procedure deserve further discussion: the rationales for the chemical sample censoring scheme, and the rationale for the constitution of the statistical sample** which is used in calculating the confidence interval for true lot purity. The following paragraphs discuss these points.

First, the chemical sample censoring scheme is based primarily upon the size of pair differences, where both members of a pair are present, and secondarily upon the value of purity relative to the values of other samples, where one member of a pair is absent (due to breakage, for example). Since sample pairs are drawn from a container which is supposed to have been agitated to mix the agent well, one expects the purity of the pair of samples to be identical, with only a small error in the chemical analysis giving rise to different values. However, it is recognized that the mixing is less than perfect in practice; hence, a second source of difference. It is hypothesized that pairs of purity values which are "close" represent good mixing and a valid sample, and that widely separated pair values represent poor mixing and an invalid sample.

*A table of the t-distribution, required for these calculations, is attached. This table is also to be found in most statistical texts and handbooks.

**The term "chemical sample", or simply "sample" used in that context, refers to the contents of a bottle of agent which has been drawn from a storage container or munition for purposes of surveillance testing. The term "statistical sample", or simply "sample" used in that context, refers to the collection of numbers entered in column D of the Estimation Worksheet as a group.

Second, the statistical sample is composed not of the individual purities of valid chemical samples, but of the arithmetic averages of the purities of pairs of valid samples. This is done because the members of a pair can not be considered to be statistically independent of each other under the assumptions previously stated, and because the two members of a valid pair have equal weight. In statistical language, this approach provides the correct number of "degrees of freedom."

5. Summary.

The procedure delineated above consists of a judgemental scheme for censoring bad data and the computation of a lower confidence bound for true lot purity based upon the t-statistic. This procedure is readily amenable to computerization.

6. Any questions should be directed to Mr. Richard Heider, DRSAR-SAM, extension 3167.

ATTACHMENTS

BLANK SPECIMEN WORKSHEETS

PERCENTAGE POINTS OF THE t DISTRIBUTION

WORKED EXAMPLES

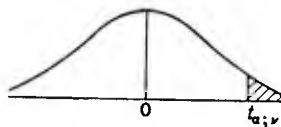
Next page is blank.

TITLE:		BY:			DATE:	
LOT PURITY ESTIMATION, PART 2						
FORMULA	AGENT LOT #			CONTAINER TYPE		
						RESULT
$n =$ number of uncensored lines on part 1						$n =$
$a =$ total of column D from part 1						$a =$
$b =$ total of column E from part 1						$b =$
$\bar{x} = a \div n$						$\bar{x} =$
$c = \bar{x} \times a$						$c =$
$d = b - c$						$d =$
$e = d \div (n-1)$						$e =$
$s = \sqrt{e}$						$s =$
$\alpha =$ confidence level; the probability that the true purity of the lot is less than the lower confidence limit LCL, below. (Value is set by a policy decision, normally in the range 0.100 to 0.001)						$\alpha =$
$t_{\alpha;n-1} =$ percentage point obtained from tables of the t - distribution						$t_{\alpha;n-1} =$
$f = t_{\alpha;n-1} \times s$						$f =$
$g = f \div \sqrt{n}$						$g =$
$LCL = \bar{x} - g$						$LCL =$
"It can be stated with $[100 \times (1-\alpha)]$ percent confidence that the purity of this lot is no less than [LCL]."						
"It can be stated with _____ percent confidence that the purity of this lot is no less than _____."						
Condition code criteria for this item are / / percent.						
The condition code for purity of this lot is CC-						12

TITLE:			BY:				DATE:	
CENSOR CRITERION WORKSHEET								
ABSOLUTE VALUE OF PAIR DIFFERENCE between			AGENT LOT #				CONTAINER TYPE	
0.00	-	0.99						
1.00		1.99						
2.00		2.99						
3.00		3.99						
4.00		4.99						
5.00	-	5.99						
6.00		6.99						
7.00		7.99						
8.00		8.99						
9.00		9.99						
10.00	-	10.99						
11.00		11.99						
12.00		12.99						
13.00		13.99						
14.00		14.99						
15.00	-	15.99						
16.00		16.99						
17.00		17.99						
18.00		18.99						
19.00		19.99						
20.00	-	20.99						
21.00		21.99						
22.00		22.99						
23.00		23.99						
24.00		24.99						
25.00	-	25.99						
26.00		26.99						
27.00		27.99						
28.00		28.99						
29.00		29.99						
30.00	-	30.99						
31.00		31.99						
32.00		32.99						
33.00		33.99						
34.00		34.99						
35.00	-	35.99						
36.00		36.99						
37.00		37.99						
38.00		38.99						
39.00		39.99						
40.00	-	40.99						
41.00		41.99						
42.00		42.99						
43.00		43.99						
44.00		44.99						
45.00	-	45.99						
46.00		46.99						
47.00		47.99						
48.00		48.99						
49.00		49.99						
50.00	-	100.00						

Next page is blank.

Percentage Points of the t Distribution*
 Table of $t_{\alpha; \nu}$ —the 100 α percentage point of the t distribution
 for ν degrees of freedom



ν	α	0.40	0.25	0.10	0.05	0.025	0.01	0.005	0.0025	0.001	0.0005
1	0.325	1.000	3.078	6.314	12.706	31.821	63.657	127.32	318.31	636.62	
2	.289	0.816	1.886	2.920	4.303	6.965	9.925	14.089	23.326	31.598	
3	.277	.765	1.638	2.353	3.182	4.541	5.841	7.453	10.213	12.924	
4	.271	.741	1.533	2.132	2.776	3.747	4.604	5.598	7.173	8.610	
5	0.267	0.727	1.476	2.015	2.571	3.365	4.032	4.773	5.893	6.869	
6	.265	.718	1.440	1.943	2.447	3.143	3.707	4.317	5.208	5.959	
7	.263	.711	1.415	1.895	2.365	2.998	3.499	4.029	4.785	5.408	
8	.262	.706	1.397	1.860	2.306	2.896	3.355	3.833	4.501	5.041	
9	.261	.703	1.383	1.833	2.262	2.821	3.250	3.690	4.297	4.781	
10	0.260	0.700	1.372	1.812	2.228	2.764	3.169	3.581	4.144	4.587	
11	.260	.697	1.363	1.796	2.201	2.718	3.106	3.497	4.025	4.437	
12	.259	.695	1.356	1.782	2.179	2.681	3.055	3.428	3.930	4.318	
13	.259	.694	1.350	1.771	2.160	2.650	3.012	3.372	3.852	4.221	
14	.258	.692	1.345	1.761	2.145	2.624	2.977	3.326	3.787	4.140	
15	0.258	0.691	1.341	1.753	2.131	2.602	2.947	3.286	3.733	4.073	
16	.258	.690	1.337	1.746	2.120	2.583	2.921	3.252	3.686	4.015	
17	.257	.689	1.333	1.740	2.110	2.567	2.898	3.222	3.646	3.965	
18	.257	.688	1.330	1.734	2.101	2.552	2.878	3.197	3.610	3.922	
19	.257	.688	1.328	1.729	2.093	2.539	2.861	3.174	3.579	3.883	
20	0.257	0.687	1.325	1.725	2.086	2.528	2.845	3.153	3.552	3.850	
21	.257	.686	1.323	1.721	2.080	2.518	2.831	3.135	3.527	3.819	
22	.256	.686	1.321	1.717	2.074	2.508	2.819	3.119	3.505	3.792	
23	.256	.685	1.319	1.714	2.069	2.500	2.807	3.104	3.485	3.767	
24	.256	.685	1.318	1.711	2.064	2.492	2.797	3.091	3.467	3.745	
25	0.256	0.684	1.316	1.708	2.060	2.485	2.787	3.078	3.450	3.725	
26	.256	.684	1.315	1.706	2.056	2.479	2.779	3.067	3.435	3.707	
27	.256	.684	1.314	1.703	2.052	2.473	2.771	3.057	3.421	3.690	
28	.256	.683	1.313	1.701	2.048	2.467	2.763	3.047	3.408	3.674	
29	.256	.683	1.311	1.699	2.045	2.462	2.756	3.038	3.396	3.659	
30	0.256	0.683	1.310	1.697	2.042	2.457	2.750	3.030	3.385	3.646	
40	.255	.681	1.303	1.684	2.021	2.423	2.704	2.971	3.307	3.551	
60	.254	.679	1.296	1.671	2.000	2.390	2.660	2.915	3.232	3.460	
120	.254	.677	1.289	1.658	1.980	2.357	2.617	2.860	3.160	3.373	
∞	.253	.674	1.282	1.645	1.960	2.326	2.576	2.807	3.090	3.291	

*This table is reproduced from Table 12 of *Biometrika Tables for Statisticians*, Volume 1, 1962, by permission of the Biometrika Trustees.

FORMULA	AGENT LOT #	CONTAINER TYPE	RESULT
	6251-200	155 mm	
$n =$ number of uncensored lines on part 1			$n = 13$
$a =$ total of column D from part 1			$a = 1161.45$
$b =$ total of column E from part 1			$b = 103789.8375$
$\bar{x} = a \div n$			$\bar{x} = 89.3423$
$c = \bar{x} \times a$			$c = 103766.6233$
$d = b - c$			$d = 23.2142$
$e = d \div (n-1)$			$e = 1.9345$
$s = \sqrt{e}$			$s = 1.391$
$\alpha =$ confidence level; the probability that the true purity of the lot is less than the lower confidence limit LCL, below. (Value is set by a policy decision, normally in the range 0.100 to 0.001)			$\alpha = 0.01$
$t_{\alpha;n-1} =$ percentage point obtained from tables of the t - distribution			$t_{\alpha;n-1} = 2.681$
$f = t_{\alpha;n-1} \times s$			$f = 3.7293$
$g = f \div \sqrt{n}$			$g = 1.034$
$LCL = \bar{x} - g$			$LCL = 88.308$
"It can be stated with $[100 \times (1-\alpha)]$ percent confidence that the purity of this lot is no less than [LCL]."			
"It can be stated with 99 percent confidence that the purity of this lot is no less than 88.308."			
Condition code criteria for this item are 55/35/20 percent.			
18			
The condition code for purity of this lot is CC-A.			

SAMPLE NO.	LAB (A)	NO'S. (B)	AGENT LOT # RM 76039-323		CONTAINER TYPE 105 mm		
			Ⓐ % Pur (A)	Ⓑ % Pur (B)	Ⓒ 1-B	Ⓓ Δ+B	Ⓔ D-R
1	620	621	74.6	73.7	0.9	74.15	5498.225
2	622	623	76.6	76.2	0.4	76.4	5836.96
3	624	625	76.6	76.6	0.0	76.6	5867.56
4	626	627	78.1	76.6	1.5	77.35	5983.0225
5	628	629		69.8		69.8	4872.04
6	630	631	70.7	63.0	7.7	66.85	4468.9225
7	632	633	70.5	68.2	2.3	69.35	4809.4225
8	634	635	70.1			70.1	4914.01
9	636	637	78.2	77.0	1.2	77.6	6021.76
10	638	639	77.1	75.3	1.8	76.2	5806.44
11	640	641	76.0	76.7	-0.7	76.35	5829.3225
12	642	643	76.2	76.1	0.1	76.15	5798.8225
13	644	645	76.1	76.3	-0.2	76.2	5806.44

NOTE: NO CENSOR DUE TO PAIR DIFFERENCE

NO CENSOR DUE TO SIZE OF SINGLE MEMBER

FORMULA	AGENT LOT #	CONTAINER TYPE	RESULT
	RM 76039-323	105 mm	
$n =$ number of uncensored lines on part 1			$n = 13$
$a =$ total of column D from part 1			$a = 963.1$
$b =$ total of column E from part 1			$b = 71512.945$
$\bar{x} = a \div n$			$\bar{x} = 74.0846$
$c = \bar{x} \times a$			$c = 71350.89307$
$d = b - c$			$d = 162.05193$
$e = d \div (n-1)$			$e = 13.5043$
$s = \sqrt{e}$			$s = 3.6748$
$\alpha =$ confidence level; the probability that the true purity of the lot is less than the lower confidence limit LCL, below. (Value is set by a policy decision, normally in the range 0.100 to 0.001)			$\alpha = 0.01$
$t_{\alpha;n-1} =$ percentage point obtained from tables of the t - distribution			$t_{\alpha;n-1} = 2.681$
$f = t_{\alpha;n-1} \times s$			$f = 9.8522$
$g = f \div \sqrt{n}$			$g = 2.7325$
$LCL = \bar{x} - g$			$LCL = 71.352$
"It can be stated with $[100 \times (1-\alpha)]$ percent confidence that the purity of this lot is no less than [LCL]."			
"It can be stated with <u>99</u> percent confidence that the purity of this lot is no less than <u>71.352</u> ."			
Condition code criteria for this item are <u>75/60/45</u> percent.			
22			
The condition code for purity of this lot is <u>CC-B</u> .			

USER'S GUIDE TO THE COMPUTER PROGRAMS FOR
DETERMINING THE SERVICEABILITY CATEGORY OF CHEMICAL
AGENT LOTS

1. General.

This guide describes two FORTRAN programs for use in assigning condition codes to chemical agent lots on the basis of chemical purity.

The first of these programs, the Censor Criterion Histogram program, is for use only when it is necessary to examine data from chemical sample pairs for selection of a censor criterion for pair differences. It is not to be used when a censor criterion has already been established, or when the data are unpaired (only one chemical sample is taken from each container tested).

The second program, the Lot Purity Estimation program, accepts paired data, unpaired data, or a combination thereof, and assigns a condition code to each lot analyzed.

2. Input Data Requirements.

Both programs require the same input data, in identical format, except for the first card, which contains program control data. The description of this first card is:

Card Columns	Format	Data Description
1-5	I5	number of agent lots to be processed.
5-10	I5	read by histogram program only; enter a 1 in column 10 if a printout of the data is desired; otherwise leave blank.
21-30	F10.0	read by purity estimation program only; enter the censor criterion.
41-50	F10.0	read by purity estimation program only; enter the alpha-level.

Card columns not listed are not read by either program and may be left blank or contain any information the user wishes.

Each set of data representing one lot of agent is punched on a deck of cards consisting of a header card identifying the lot and one card of data for each container tested. The descriptions of these cards are as follows:

Header Card			
Card Column	Format	Data Description	
1-20	5A4	Alpha numeric data identifying the lot	
26-30	I5	Number of data cards following (no. of containers tested)	
41-50	F10.0	Level of purity separating CC-A from CC-B	
51-60	F10.0	Level of purity separating CC-B from CC-C	
61-70	F10.0	Level of purity separating CC-C from CC-H	
Data Card			
Card Column	Format	Data Description	
1-5	I5	Sample number	
11-15	I5	Laboratory number for the "A" sample	
16-20	I5	Laboratory number for the "B" sample	
31-40	F10.0	Purity of the "A" sample	
41-50	F10.0	Purity of the "B" sample	

The complete data deck for either program consists of the first card, followed by header card and then data cards for the first lot, header and data cards for the next lot, and so on for all lots being processed.

3. Output.

Output of each program is designed to be similar to the worksheet formats of the manual procedure. The histogram program gives as an output a tentative, or proposed, censor criterion. The user may accept or override this selected value (the user must subsequently punch a value onto the first card, before running the lot purity program).

4. Unpaired Data.

If it is desired to analyze data from tests in which only one sample was made from each container tested, the user must decide whether to permit censoring of extreme values. If censoring is to be permitted, the purity data should be entered as an "A" sample, with the "B" sample left blank. If censoring is not to be permitted, the purity data should be punched as identical values for both "A" and "B" samples, and the user must make certain that a censor criterion greater than (not equal to) zero is provided.

5. Any questions should be directed to Mr. Richard Heider, DRSAR-SAM, extension 3167.

EXAMPLE OF RESULTS FROM THE
CENSOR CRITERION HISTOGRAM PROGRAM

Next page is blank.

PROGRAM FOR CENSOR CRITERION
DATA BASE CONSISTS OF 13 LOTS

THE 1TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 76039-323 105 GB

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE
1	1	620	621	74.60	73.70	0.90
2	2	622	623	76.60	76.20	0.40
3	3	624	625	76.60	76.60	0.0
4	4	626	627	78.10	76.60	1.50
5	5	628	629		69.80	
6	6	630	631	70.70	63.00	7.70
7	7	632	633	70.50	68.20	2.30
8	8	634	635	70.10		
9	9	636	637	78.20	77.00	1.20
10	10	638	639	77.10	75.30	1.80
11	11	640	641	76.00	76.70	0.70
12	12	642	643	76.20	76.10	0.10
13	13	644	645	76.10	76.30	0.20

THE 2TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 5661-122 155 GB

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE
1	1	801	802	83.70	83.70	0.0
2	2	803	804	87.50	86.70	0.80
3	3	805	806	87.90	87.30	0.60
4	4	807	808	84.40	89.30	4.90
5	5	809	810	81.40	85.60	4.20
6	6	811	812	85.10	79.60	5.50
7	7	813	814	85.40	87.40	2.00
8	8	815	816	85.70	89.10	3.40
9	9	817	818	81.20	78.40	2.80
10	10	819	820	82.40	79.40	3.00
11	11	821	822	80.20	80.50	0.30
12	12	823	824	80.90	82.50	1.60
13	13	825	826	73.90	78.30	4.40

THE 3TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 6651-200 155 GB

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE
1	1	705	706	92.30	90.30	2.00
2	2	707	708	90.80	90.70	0.10
3	3	709	710	91.20	91.40	0.20
4	4	711	712	90.10	88.10	2.00
5	5	713	714	88.70	87.40	1.30
6	6	715	716	86.80	91.40	4.60
7	7	717	718	88.90	86.30	2.60
8	8	719	720	90.00	91.20	1.20
9	9	721	722	90.20	89.20	1.00
10	10	723	724	89.00	90.20	1.20
11	11	725	726	88.40	89.00	0.60
12	12	727	728	84.90	88.70	3.80
13	13	729	730	89.90	88.00	1.90

THE 4TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 5651-129 155 GB

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE
1		674	675	86.90	75.60	11.30
2		676	677	83.00	80.00	3.00
3		678	679	84.20	85.40	1.20
4		680	681	82.50	81.50	1.00
5		682	683	75.60	83.90	8.30
6		684	685	88.30	73.60	14.70
7		686	687	86.10	87.70	1.60
8		688	689	88.40	88.80	0.40
9		690	691	86.20	84.20	2.00
10		692	693	80.80	80.70	0.10
11		694	695	47.50	82.20	34.70
12		696	697	86.50	83.90	2.60
13		698	699	82.60	82.40	0.20

THE 5TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 86039-423 BULK GB

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE
1	9	185	185	83.20	83.80	0.60
2	10	186	186	88.40	87.20	1.20
3	11	187	187	86.20	84.50	1.70
4	12	188	188	81.50	82.20	0.70
5	13	189	189	84.70	85.00	0.30
6	1	219	220	80.10	78.80	1.30
7	2	221	222	80.70	79.90	0.80
8	3	223	224	79.40	84.00	4.60
9	4	225	226	80.90	82.40	1.50
10	5	227	228	83.20	83.80	0.60
11	6	229	230	81.60	81.50	0.10
12	7	231	232	81.30	81.40	0.10
13	8	233	234	80.70	81.50	0.80

THE 6TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 5651-92 155 GB

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE
1	9	196	197	85.40	84.20	1.20
2	10	198	199	86.20	86.40	0.20
3	11	200	201	85.50	86.90	1.40
4	12	202	203	88.20	87.50	0.70
5	13	204	205	86.50	87.00	0.50
6	1	254	255	85.70	87.70	2.00
7	2	256	257	87.80	81.80	6.00
8	3	258	259	86.80	86.20	0.60
9	4	260	261	87.80	86.30	1.50
10	5	262	263	88.40	85.90	2.50
11	6	264	265	86.10	85.20	0.90
12	7	266	267	85.20	86.40	1.20
13	8	268	269	82.50	85.70	3.20

THE 7TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 6651-238 105 GB

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE
1	1	270	271	82.40	78.30	4.10
2	2	272	273	79.20	82.20	3.00
3	3	274	275	86.70	82.10	4.60
4	4	276	277	81.70	82.00	0.30

5	5	278	279	89.30	89.30	0.0
6	6	280	281	82.10	87.00	4.90
7	7	282	283	86.90	87.30	0.40
8	8	284	285	87.50	88.90	1.40
9	9	319	320	88.80	89.70	0.90
10	10	321	322	89.50	89.20	0.30
11	11	323	324	89.40	89.10	0.30
12	12	325	326	89.60	89.10	0.50
13	13	327	328	89.60	90.00	0.40

THE 8TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 6651-234 155 GB

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE
1	1	329	330	88.40	87.80	0.60
2	2	331	332	87.40	87.00	0.40
3	3	333	334	86.80	87.20	0.40
4	4	335	336	87.40	87.30	0.10
5	5	341	342	87.40	84.40	3.00
6	6	343	344	86.70	86.30	0.40
7	7	348	349	85.40	85.30	0.10
8	8	350	351	84.60	84.20	0.40
9	9	352	353	72.10	83.10	11.00
10	10	354	355	84.40	82.70	1.70
11	11	356	357	84.60	84.40	0.20
12	12	358	359	83.50	84.30	0.80
13	13	360	361	81.90	86.00	4.10

THE 9TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 76039-391 105 GB

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE
1	1	382	383	82.20	81.80	0.40
2	2	384	385	81.30	82.80	1.50
3	3	386	387	83.50	83.30	0.20
4	4	388	389	83.10	84.00	0.90
5	5	390	391	84.60	84.50	0.10
6	6	392	393	83.60	82.10	1.50
7	7	394	395	82.00	82.90	0.90
8	8	396	397	82.70	82.20	0.50
9	9	398	399	84.60	83.10	1.50
10	10	400	401	82.50	83.60	1.10
11	11	402	403	83.40	82.20	1.20
12	12	404	405	83.20	83.60	0.40
13	13	406	407	83.70	83.90	0.20

THE 10TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 86039-428 155 GB

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE
1	1	446	447	83.90	83.20	0.70
2	2	448	449	83.20	81.30	1.90
3	3	450	451	81.90	83.90	2.00
4	4	452	453	81.60	81.70	0.10
5	5	454	455	83.30	83.00	0.30
6	6	456	457	82.60	79.60	3.00
7	7	458	459	43.10	71.90	28.80
8	8	460	461	81.90	82.30	0.40
9	9	462	463	83.20	82.20	1.00
10	10	464	465	82.10	81.70	0.40

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE
11	11	466	467	83.20	79.20	4.00
12	12	468	469	82.00	82.80	0.80
13	13	470	471	82.10	81.80	0.30

THE 11TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 68039-409 155 GB

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE
1	1	420	421	79.20	78.10	1.10
2	2	422	423	79.50	79.30	0.20
3	3	424	425	77.80	79.30	1.50
4	4	426	427	76.60	78.80	2.20
5	5	428	429	75.90	78.00	2.10
6	6	430	431	78.10	77.40	0.70
7	7	432	433	77.60	77.80	0.20
8	8	434	435	79.30	79.70	0.40
9	9	436	437	78.70	80.00	1.30
10	10	438	439	78.40	78.70	0.30
11	11	440	441	77.30	78.80	1.50
12	12	442	443	78.90	78.70	0.20
13	13	444	445	80.10	80.20	0.10

THE 12TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 6651-262 BULK GB

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE
1	1	472	473	9.72	42.10	32.38
2	2	474	475	2.73	37.00	34.27
3	3	476	477	74.60	74.80	0.20
4	4	478	479	69.10	71.60	2.50
5	5	480	481	70.50	76.90	6.40
6	6	482	483	75.30	76.60	1.30
7	7	484	485	76.50	79.40	2.90
8	8	486	487	81.60	80.60	1.00
9	9	488	489	68.10	79.70	11.60
10	10	490	491	78.70	79.80	1.10
11	11	492	493	74.80	80.80	6.00
12	12	494	495	82.00	82.30	0.30
13	13	496	497	80.40	81.70	1.30

THE 13TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 6651-310 155 GB

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE
1	1	648	649	77.40	75.60	1.80
2	2	650	651	76.50	77.30	0.80
3	3	652	653	79.20	75.00	4.20
4	4	654	655	74.20	73.40	0.80
5	5	656	657	76.80	68.10	8.70
6	6	658	659	73.70	75.90	2.20
7	7	660	661	77.40	74.00	3.40
8	8	662	663	71.30	73.50	2.20
9	9	664	665	70.70	71.80	1.10
10	10	666	667	74.40	72.90	1.50
11	11	668	669	73.70	67.90	5.80
12	12	670	671	72.70	75.20	2.50
13	13	672	673	73.40	74.80	1.40

CENSOR CRITERION HISTOGRAM--THE NUMBER OF SAMPLE PAIRS EXPECTED WAS 169, AND THE NUMBER PRESENT IS 167.

RANGE	TALLY
0.0 - 0.99	*****
1.00 - 1.99	*****
2.00 - 2.99	*****
3.00 - 3.99	*****
4.00 - 4.99	*****
5.00 - 5.99	**
6.00 - 6.99	***
7.00 - 7.99	*
8.00 - 8.99	**
9.00 - 9.99	*****
10.00 - 10.99	*****
11.00 - 11.99	***
12.00 - 12.99	*****
13.00 - 13.99	*****
14.00 - 14.99	*
15.00 - 15.99	*****
16.00 - 16.99	*****
17.00 - 17.99	*****
18.00 - 18.99	*****
19.00 - 19.99	*****
20.00 - 20.99	*****
21.00 - 21.99	*****
22.00 - 22.99	*****
23.00 - 23.99	*****
24.00 - 24.99	*****
25.00 - 25.99	*****
26.00 - 26.99	*****
27.00 - 27.99	*****
28.00 - 28.99	*
29.00 - 29.99	*****
30.00 - 30.99	*****
31.00 - 31.99	*****
32.00 - 32.99	*
33.00 - 33.99	*****
34.00 - 34.99	**
35.00 - 35.99	*****
36.00 - 36.99	*****
37.00 - 37.99	*****
38.00 - 38.99	*****
39.00 - 39.99	*****
40.00 - 40.99	*****
41.00 - 41.99	*****
42.00 - 42.99	*****
43.00 - 43.99	*****
44.00 - 44.99	*****
45.00 - 45.99	*****
46.00 - 46.99	*****
47.00 - 47.99	*****
48.00 - 48.99	*****
49.00 - 49.99	*****
50.00 - 100.00	*****

***** TENTATIVE CRITERION CENSORS ALL SAMPLES HAVING PAIR DIFFERENCES BEYOND HERE. *****

THE TENTATIVE CENSOR CRITERION IS 9.00, CENSORING 8 SAMPLE PAIRS (4.8% OF THE PAIRS PRESENT, 4.7% OF THE PAIRS EXPECTED).

EXAMPLES OF RESULTS FROM
THE LOT PURITY ESTIMATION PROGRAM

Next page is blank.

PROGRAM FOR LOT PURITY ESTIMATION

THIS RUN WILL CONSIDER 13 LOTS, USING A CENSOR CRITERION OF 10.00, AND AN ALPHA-LEVEL OF 0.0100

THE 1TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 76039-323 105 GB
CONDITION CODE CRITERIA ARE 75.0/60.0/45.0 PERCENT PURITY

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE	PAIR AVERAGE
1		620	621	74.60	73.70	0.90	74.15
2		622	623	76.60	76.20	0.40	76.40
3		624	625	76.60	76.60	0.0	76.60
4		626	627	78.10	76.60	1.50	77.35
5		628	629		69.80		69.80
6		630	631	70.70	63.00	7.70	66.85
7		632	633	70.50	68.20	2.30	69.35
8		634	635	70.10	70.10		70.10
9		636	637	78.20	77.00	1.20	77.60
10		638	639	77.10	75.30	1.80	76.20
11		640	641	76.00	76.70	0.70	76.35
12		642	643	76.20	76.10	0.10	76.15
13		644	645	76.10	76.30	0.20	76.20

SAMPLE MEAN XBAR = 74.085
SAMPLE STD. DEV. S = 3.675
SAMPLE SIZE N = 13

$$\hat{T}(\text{ALPHA}, N-1) = T(0.0100, 12) = 2.681$$

CONFIDENCE LIMIT LCL = 71.352

IT CAN BE STATED WITH 99.0000% CONFIDENCE THAT THE PURITY OF THIS LOT IS NO LESS THAN 71.352

THE CONDITION CODE FOR PURITY OF THIS LOT IS CC-B

THE 2TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 5661-122 155 GB
CONDITION CODE CRITERIA ARE 55.0/35.0/20.0 PERCENT PURITY

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE	PAIR AVERAGE
1		801	802	83.70	83.70	0.0	83.70
2		803	804	87.50	86.70	0.80	87.10
3		805	806	87.90	87.30	0.60	87.60
4		807	808	84.40	89.30	4.90	86.85
5		809	810	81.40	85.60	4.20	83.50
6		811	812	85.10	79.60	5.50	82.35
7		813	814	85.40	87.40	2.00	86.40
8		815	816	85.70	89.10	3.40	87.40
9		817	818	81.20	78.40	2.80	79.80
10		819	820	82.40	79.40	3.00	80.90
11		821	822	80.20	80.50	0.30	80.35
12		823	824	80.90	82.50	1.60	81.70
13		825	826	73.90	78.30	4.40	76.10

SAMPLE MEAN XBAR = 83.365
SAMPLE STD. DEV. S = 3.584

SAMPLE SIZE N = 13

T(ALPHA,N-1) = T(0.0100, 12) = 2.681

CONFIDENCE LIMIT LCL = 80.701

IT CAN BE STATED WITH 99.0000% CONFIDENCE THAT THE PURITY OF THIS LOT IS NO LESS THAN 80.701

THE CONDITION CODE FOR PURITY OF THIS LOT IS CC-A

THE 3TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 6651-200 155 GB
CONDITION CODE CRITERIA ARE 55.0/35.0/20.0 PERCENT PURITY

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE	PAIR AVERAGE
1		705	706	92.30	90.30	2.00	91.30
2		707	708	90.80	90.70	0.10	90.75
3		709	710	91.20	91.40	0.20	91.30
4		711	712	90.10	88.10	2.00	89.10
5		713	714	88.70	87.40	1.30	88.05
6		715	716	86.80	91.40	4.60	89.10
7		717	718	88.90	86.30	2.60	87.60
8		719	720	90.00	91.20	1.20	90.60
9		721	722	90.20	89.20	1.00	89.70
10		723	724	89.00	90.20	1.20	89.60
11		725	726	88.40	89.00	0.60	88.70
12		727	728	84.90	88.70	3.80	86.80
13		729	730	89.90	88.00	1.90	88.95

SAMPLE MEAN XBAR = 89.350
SAMPLE STD. DEV. S = 1.393
SAMPLE SIZE N = 13

T(ALPHA,N-1) = T(0.0100, 12) = 2.681

CONFIDENCE LIMIT LCL = 88.314

IT CAN BE STATED WITH 99.0000% CONFIDENCE THAT THE PURITY OF THIS LOT IS NO LESS THAN 88.314

THE CONDITION CODE FOR PURITY OF THIS LOT IS CC-A

THE 4TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 5651-129 155 GB
CONDITION CODE CRITERIA ARE 55.0/35.0/20.0 PERCENT PURITY

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE	PAIR AVERAGE	PAIR DIFF
1		674	675	86.90	78.60	8.30	82.75	8.30
2		676	677	83.00	80.00	3.00	81.50	3.00
3		678	679	84.20	85.40	1.20	84.80	1.20
4		680	681	82.50	81.50	1.00	82.00	1.00
5		682	683	75.60	83.90	8.30	79.75	8.30
6		684	685	86.90	72.60	14.30	79.75	14.30
7		686	687	86.10	87.70	1.60	86.90	1.60
8		688	689	88.40	88.80	0.40	88.60	0.40
9		690	691	86.20	84.20	2.00	85.20	2.00
10		692	693	80.80	80.70	0.10	80.75	0.10

5	204	86.50	87.00	86.75
6	254	85.70	87.70	86.70
7	257	87.80	81.80	84.80
8	258	86.80	86.20	86.50
9	261	87.80	86.30	87.05
10	262	88.40	85.90	87.15
11	264	86.10	85.20	85.65
12	266	85.20	86.40	85.80
13	268	82.50	85.70	84.10

SAMPLE MEAN XBAR = 86.127
 SAMPLE STD. DEV. S = 1.069
 SAMPLE SIZE N = 13

$T(\text{ALPHA}, N-1) = T(0.0100, 12) = 2.681$

CONFIDENCE LIMIT LCL = 85.332

IT CAN BE STATED WITH 99.0000% CONFIDENCE THAT THE PURITY OF THIS LOT IS NO LESS THAN 85.332

THE CONDITION CODE FOR PURITY OF THIS LOT IS CC-A

THE 7TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 6651-238 105 GB
 CONDITION CODE CRITERIA ARE 75.0/60.0/45.0 PERCENT PURITY

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE	PAIR AVERAGE
1	1	270	271	82.40	78.30	4.10	80.35
2	2	272	273	79.20	82.20	3.00	80.70
3	3	274	275	86.70	82.10	4.60	84.40
4	4	276	277	81.70	82.00	0.30	81.85
5	5	278	279	89.30	89.30	0.0	89.30
6	6	280	281	82.10	87.00	4.90	84.55
7	7	282	283	86.90	87.30	0.40	87.10
8	8	284	285	87.50	88.90	1.40	88.20
9	9	319	320	88.80	89.70	0.90	89.25
10	10	321	322	89.50	89.20	0.30	89.35
11	11	323	324	89.40	89.10	0.30	89.25
12	12	325	326	89.60	89.10	0.50	89.35
13	13	327	328	89.60	90.00	0.40	89.80

SAMPLE MEAN XBAR = 86.419
 SAMPLE STD. DEV. S = 3.589
 SAMPLE SIZE N = 13

$T(\text{ALPHA}, N-1) = T(0.0100, 12) = 2.681$

CONFIDENCE LIMIT LCL = 83.751

IT CAN BE STATED WITH 99.0000% CONFIDENCE THAT THE PURITY OF THIS LOT IS NO LESS THAN 83.751

THE CONDITION CODE FOR PURITY OF THIS LOT IS CC-A

THE 8TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 6651-234 155 GB
 CONDITION CODE CRITERIA ARE 55.0/35.0/20.0 PERCENT PURITY

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE	PAIR AVERAGE
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
41							
42							
43							
44							
45							
46							
47							
48							
49							
50							
51							
52							
53							
54							
55							
56							
57							
58							
59							
60							
61							
62							
63							
64							
65							
66							
67							
68							
69							
70							
71							
72							
73							
74							
75							
76							
77							
78							
79							
80							
81							
82							
83							
84							
85							
86							
87							
88							
89							
90							
91							
92							
93							
94							
95							
96							
97							
98							
99							
100							
101							
102							
103							
104							
105							
106							
107							
108							
109							
110							
111							
112							
113							
114							
115							
116							
117							
118							
119							
120							
121							
122							
123							
124							
125							
126							
127							
128							
129							
130							
131							
132							
133							
134							
135							
136							
137							
138							
139							
140							
141							
142							
143							
144							
145							
146							
147							
148							
149							
150							
151							
152							
153							
154							
155							
156							
157							
158							
159							
160							
161							
162							
163							
164							
165							
166							
167							
168							
169							
170							
171							
172							
173							
174							
175							
176							
177							
178							
179							
180							
181							
182							
183							
184							
185							
186							
187							
188							
189							
190							
191							
192							
193							
194							
195							
196							
197							
198							
199							
200							
201							
202							
203							
204							
205							
206							
207							
208							
209							
210							
211							
212							
213							
214							
215							
216							
217							
218							
219							
220							
221							
222							
223							
224							
225							
226							
227							
228							
229							
230							
231							
232							
233							
234							
235							
236							
237							
238							
239							
240							
241							
242							
243							
244							
245							
246							
247							
248							
249							
250							
251							
252							
253							
254							
255							
256							
257							
258							
259							
260							
261							
262							
263							
264							
265							
266							
267							
268							
269							
270							
271							
272							
273							
274							
275							
276							
277							
278							
279							
280							
281							
282							
283							
284							
285							
286							
287							
288							
289							
290							
291							
292							
293							
294							
295							
296							
297							
298							
299							
300							
301							
302				</			

THE 10TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 86039-428 155 GB
 CONDITION CODE CRITERIA ARE 55.0/35.0/20.0 PERCENT PURITY

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE	PAIR AVERAGE
1		446	447	83.90	83.20	0.70	83.55
2		448	449	83.20	81.30	1.90	82.25
3		450	451	81.90	83.90	2.00	82.90
4		452	453	81.60	81.70	0.10	81.65
5		454	455	83.30	83.00	0.30	83.15
6		456	457	82.60	79.60	3.00	81.10
7		458	459	83.10	82.40	0.70	82.75
8		460	461	81.90	82.30	0.40	82.10
9		462	463	83.20	82.20	1.00	82.70
10		464	465	82.10	81.70	0.40	81.90
11		466	467	83.20	79.20	4.00	81.20
12		468	469	82.00	82.80	0.80	82.40
13		470	471	82.10	81.80	0.30	81.95

SAMPLE MEAN XBAR = 82.237
 SAMPLE STD. DEV. S = 0.749
 SAMPLE SIZE N = 12
 T(ALPHA,N-1) = T(0.0100, 11) = 2.718
 CONFIDENCE LIMIT LCL = 81.650

IT CAN BE STATED WITH 99.0000% CONFIDENCE THAT THE PURITY OF THIS LOT IS NO LESS THAN 81.650
 THE CONDITION CODE FOR PURITY OF THIS LOT IS CC-A

THE 11TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 68039-409 155 GB
 CONDITION CODE CRITERIA ARE 55.0/35.0/20.0 PERCENT PURITY

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE	PAIR AVERAGE
1		420	421	79.20	78.10	1.10	78.65
2		422	423	79.50	79.30	0.20	79.40
3		424	425	77.80	79.30	1.50	78.55
4		426	427	76.60	78.80	2.20	77.70
5		428	429	75.90	78.00	2.10	76.95
6		430	431	78.10	77.40	0.70	77.75
7		432	433	77.60	77.80	0.20	77.70
8		434	435	79.30	79.70	0.40	79.50
9		436	437	78.70	80.00	1.30	79.35
10		438	439	78.40	78.70	0.30	78.55
11		440	441	77.30	78.80	1.50	78.05
12		442	443	78.90	78.70	0.20	78.80
13		444	445	80.10	80.20	0.10	80.15

SAMPLE MEAN XBAR = 78.546
 SAMPLE STD. DEV. S = 0.903
 SAMPLE SIZE N = 13
 T(ALPHA,N-1) = T(0.0100, 12) = 2.681

CONFIDENCE LIMIT LCL = 77.874

IT CAN BE STATED WITH 99.0000% CONFIDENCE THAT THE PURITY OF THIS LOT IS NO LESS THAN 77.874

THE CONDITION CODE FOR PURITY OF THIS LOT IS CC-A

THE 12TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 6651-262 BULK GB
CONDITION CODE CRITERIA ARE 75.0/60.0/45.0 PERCENT PURITY

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE	PAIR AVERAGE
3	3	476	477	74.60	74.80	0.20	74.70
4	4	478	479	69.10	71.60	2.50	70.35
5	5	480	481	70.50	76.90	6.40	73.70
6	6	482	483	75.30	76.60	1.30	75.95
7	7	484	485	76.50	79.40	2.90	77.95
8	8	486	487	81.60	80.60	1.00	81.10
9	9	488	489	88.10	79.70	8.40	83.90
10	10	490	491	78.70	79.80	1.10	79.25
11	11	492	493	74.80	80.80	6.00	77.80
12	12	494	495	82.00	82.30	0.30	82.15
13	13	496	497	80.40	81.70	1.30	81.05

SAMPLE MEAN XBAR = 77.400
SAMPLE STD. DEV. S = 3.745
SAMPLE SIZE N = 10

T(ALPHA, N-1) = T(0.0100, 9) = 2.821

CONFIDENCE LIMIT LCL = 74.059

IT CAN BE STATED WITH 99.0000% CONFIDENCE THAT THE PURITY OF THIS LOT IS NO LESS THAN 74.059

THE CONDITION CODE FOR PURITY OF THIS LOT IS CC-B

THE 13TH TO BE PROCESSED CONSISTS OF 13 SAMPLE PAIRS AND IS IDENTIFIED AS LOT RM 6651-310 155 GB
CONDITION CODE CRITERIA ARE 55.0/35.0/20.0 PERCENT PURITY

SEQUENCE NO.	SAMPLE NO.	LAB NO. (A)	LAB NO. (B)	PURITY (A)	PURITY (B)	PAIR DIFFERENCE	PAIR AVERAGE
1	1	648	649	77.40	75.60	1.80	76.50
2	2	650	651	76.50	77.30	0.80	76.90
3	3	652	653	79.20	75.00	4.20	77.10
4	4	654	655	74.20	73.40	0.80	73.80
5	5	656	657	76.80	68.10	8.70	72.45
6	6	658	659	73.70	75.90	2.20	74.80
7	7	660	661	77.40	74.00	3.40	75.70
8	8	662	663	71.30	73.50	2.20	72.40
9	9	664	665	70.70	71.80	1.10	71.25
10	10	666	667	74.40	72.90	1.50	73.65
11	11	668	669	73.70	67.90	5.80	70.80
12	12	670	671	72.70	75.20	2.50	73.95
13	13	672	673	73.40	74.80	1.40	74.10

SAMPLE MEAN XBAR = 74.108
SAMPLE STD. DEV. S = 2.053
SAMPLE SIZE N = 13

T(ALPHA,N-1) = T(0.0100, 12) = 2.681

CONFIDENCE LIMIT LCL = 72.581

IT CAN BE STATED WITH 99.0000% CONFIDENCE THAT THE PURITY OF THIS LOT IS NO LESS THAN 72.581

THE CONDITION CODE FOR PURITY OF THIS LOT IS CC-A

LISTINGS OF SOURCE PROGRAMS
AND EXAMPLE DATA

Next page is blank.


```

130 PAIRAV(I) = PURB(I)
140 CONTINUE
145 NK1 = 0
    SUM = 0.0
    DO 150 I = 1, NPAIRS
      IF (KCLASS(I).NE.1) GO TO 150
      SUM = SUM + PAIRAV(I)
      NK1 = NK1 + 1
150 CONTINUE
    XBAR = SUM/FLOAT(NK1)
    SUM = 0.0
    DO 160 I = 1, NPAIRS
      IF (KCLASS(I).EQ.1) SUM = SUM + (PAIRAV(I) - XBAR)**2
160 CONTINUE
    IF (NK1.LE.1) GO TO 210
    S = SQRT( SUM/FLOAT(NK1-1) )
    PAMAX = 0.0
    PAMIN = 100.0
    DO 180 I = 1, NPAIRS
      IF (KCLASS(I).NE.1) GO TO 180
      IF (PAIRAV(I).LE.PAMAX) GO TO 170
      PAMAX = PAIRAV(I)
      MAX = I
170 CONTINUE
      IF (PAIRAV(I).GE.PAMIN) GO TO 180
      PAMIN = PAIRAV(I)
      MIN = I
180 CONTINUE
    ZMAX = (PAMAX-XBAR)/S
    ZMIN = (PAMIN-XBAR)/S
    IF (ZMAX.LE.3.0) GO TO 190
    IF ((PURA(MAX).GT.0.0).AND.(PURB(MAX).GT.0.0)) GO TO 190
    KCLASS(MAX) = 4
    GO TO 145
190 CONTINUE
    IF (ZMIN.GE.-3.0) GO TO 200
    IF ((PURA(MIN).GT.0.0).AND.(PURB(MIN).GT.0.0)) GO TO 200
    KCLASS(MIN) = 4
    GO TO 145
200 NU = NK1-1
    T = .TSTAT(ALPHA,NU)
    PURLCL = XBAR - T*S/SQRT(FLOAT(NK1))
    CONF = 100.0*(1.0 - ALPHA)
210 CONTINUE
    DO 270 I = 1, NPAIRS
      IF (PURA(I).GT.0.0) GO TO 240
      IF (PURB(I).GT.0.0) GO TO 220
      WRITE (6,7) I, NSAMP(I), LABNOA(I), LABNOB(I)
      WRITE (6,11)
      GO TO 270
220 WRITE (6,9) I, NSAMP(I), LABNOA(I), LABNOB(I), PURB(I), PAIRAV(I)
230 CONTINUE
      IF (KCLASS(I).EQ.1) GO TO 270
      WRITE (6,12)
      GO TO 270
240 CONTINUE
      IF (PURB(I).GT.0.0) GO TO 250
      WRITE (6,8) I, NSAMP(I), LABNOA(I), LABNOB(I), PURA(I), PAIRAV(I)
      GO TO 230
250 CONTINUE

```


* 2.845,2.831,2.819,2.807,2.797,2.787,2.779,2.771,2.763,2.756,2.750
 * 2.704,2.660,2.617,2.576 /
 DATA T0025 / 127.32,14.089,7.453,5.598,4.773,4.317,4.029,3.833,
 * 3.690,3.581,3.497,3.428,3.372,3.326,3.286,3.252,3.222,3.197,
 * 3.174,3.153,3.135,3.119,3.104,3.091,3.078,3.067,3.057,3.047,3.038
 * 3.030,2.971,2.915,2.860,2.807 /
 DATA T001 / 318.31,23.326,10.213,7.173,5.893,5.208,4.785,4.501,
 * 4.297,4.144,4.025,3.930,3.852,3.787,3.733,3.686,3.646,3.610,
 * 3.579,3.552,3.527,3.505,3.485,3.467,3.450,3.435,3.421,3.408,
 * 3.396,3.385,3.307,3.232,3.160,3.090 /
 DATA T0005 / 636.62,31.598,12.924,8.610,6.869,5.959,5.408,5.041,
 * 4.781,4.587,4.437,4.318,4.221,4.140,4.073,4.015,3.965,3.922,
 * 3.883, 3.850,3.819,3.792,3.767,3.745,3.725,3.707,3.690,3.674,
 * 3.659,3.646,3.551,3.460,3.373,3.291 /
 DATA VALPHA / .0005,.001,.0025,.005,.01,.025,.05,.10,.25,.40,.50 /
 DATA VNU / 1.,2.,3.,4.,5.,6.,7.,8.,9.,10.,11.,12.,13.,14.,15.,16.,
 * 17.,18.,19.,20.,21.,22.,23.,24.,25.,26.,27.,28.,29.,30.,40.,60.,
 * 120.,1000. /
 END

13	1	105 GB	10.	0.01	60.	45.	323
RM 76039-323	13	620	621	74.6	75.	73.7	323
1	622	623	76.6	76.6	76.6	76.6	323
2	624	625	76.6	76.6	76.6	76.6	323
3	626	627	78.1	76.6	69.8	63.0	323
4	628	629	70.7	68.2	77.0	75.3	323
5	630	631	70.5	70.1	76.7	76.1	323
6	632	633	78.2	77.1	76.3	55.5	323
7	634	635	70.1	77.0	83.7	86.7	323
8	636	637	78.2	75.3	87.5	87.3	323
9	638	639	77.1	76.0	87.9	89.3	323
10	640	641	76.0	76.2	84.4	85.6	323
11	642	643	76.2	76.1	81.4	81.4	323
12	644	645	76.1	76.3	85.1	79.6	323
13	155 GB	13	83.7	55.5	87.4	87.4	323
RM 5661-122	1	801	802	83.7	83.7	83.7	122
1	803	804	87.5	86.7	86.7	86.7	122
2	805	806	87.9	87.3	87.3	87.3	122
3	807	808	84.4	89.3	89.3	89.3	122
4	809	810	81.4	85.6	85.6	85.6	122
5	811	812	85.1	79.6	79.6	79.6	122
6	813	814	85.4	87.4	87.4	87.4	122
7	815	816	85.7	89.1	89.1	89.1	122
8	817	818	81.2	78.4	78.4	78.4	122
9	819	820	82.4	79.4	79.4	79.4	122
10	821	822	80.2	80.5	80.5	80.5	122
11	823	824	80.9	82.5	82.5	82.5	122
12	825	826	73.9	78.3	78.3	78.3	122
13	155 GB	13	92.3	55.5	35.	20.	200
RM 6651-200	1	705	706	90.3	90.3	90.3	200
1	707	708	90.8	90.7	90.7	90.7	200
2	709	710	91.2	91.4	91.4	91.4	200
3	711	712	90.1	88.1	88.1	88.1	200
4	713	714	88.7	87.4	87.4	87.4	200
5	715	716	86.8	86.8	86.8	86.8	200
6	717	718	88.9	86.3	86.3	86.3	200
7	719	720	90.0	91.2	91.2	91.2	200
8							

9	721	722	90.2	89.2	200
10	723	724	89.0	90.2	200
11	725	726	88.4	89.0	200
12	727	728	84.9	88.7	200
13	729	730	89.9	88.0	200
RM 5651-129	155	GB	13	55.	129
1	674	675	86.9	75.6	129
2	676	677	83.0	80.0	129
3	678	679	84.2	85.4	129
4	680	681	82.5	81.5	129
5	682	683	75.6	83.9	129
6	684	685	88.3	73.6	129
7	686	687	86.1	87.7	129
8	688	689	88.4	88.8	129
9	690	691	86.2	84.2	129
10	692	693	80.8	80.7	129
11	694	695	47.5	82.2	129
12	696	697	86.5	83.9	129
13	698	699	82.6	82.4	129
RM 86039-423	BULK	GB	13	75.	423
9	185	185	83.2	83.8	423
10	186	186	88.4	87.2	423
11	187	187	86.2	84.5	423
12	188	188	81.5	82.2	423
13	189	189	84.7	85.0	423
1	219	220	80.1	78.8	423
2	221	222	80.7	79.9	423
3	223	224	79.4	84.0	423
4	225	226	80.9	82.4	423
5	227	228	83.2	83.8	423
6	229	230	81.6	81.5	423
7	231	232	81.3	81.4	423
8	233	234	80.7	81.5	423
RM 5651-92	155	GB	13	55.	92
9	196	197	85.4	84.2	92
10	198	199	86.2	86.4	92
11	200	201	85.5	86.9	92
12	202	203	88.2	87.5	92
13	204	205	86.5	87.0	92
1	254	255	85.7	87.7	92
2	256	257	87.8	81.8	92
3	258	259	86.8	86.2	92
4	260	261	87.8	86.3	92
5	262	263	88.4	85.9	92
6	264	265	86.1	85.2	92
7	266	267	85.2	86.4	92
8	268	269	82.5	85.7	92
RM 6651-238	105	GB	13	75.	238
1	270	271	82.4	78.3	238
2	272	273	79.2	82.2	238
3	274	275	86.7	82.1	238
4	276	277	81.7	82.0	238
5	278	279	89.3	89.3	238
6	280	281	82.1	87.0	238
7	282	283	86.9	87.3	238
8	284	285	87.5	88.9	238
9	319	320	88.8	89.7	238
10	321	322	89.5	89.2	238
11	323	324	89.4	89.1	238
12	325	326	89.6	89.1	238

90.2	89.2	200
90.2	90.2	200
89.0	89.0	200
88.4	88.7	200
84.9	88.0	200
89.9	55.	129
13	75.6	129
86.9	80.0	129
83.0	85.4	129
84.2	81.5	129
82.5	83.9	129
75.6	73.6	129
88.3	87.7	129
86.1	88.8	129
88.4	84.2	129
86.2	80.7	129
80.8	82.2	129
47.5	83.9	129
86.5	82.4	129
82.6	75.	423
13	83.8	423
83.2	87.2	423
88.4	84.5	423
86.2	82.2	423
81.5	85.0	423
84.7	80.1	423
80.1	78.8	423
80.7	79.9	423
79.4	84.0	423
80.9	82.4	423
83.2	83.8	423
81.6	81.5	423
81.3	81.4	423
80.7	81.5	423
13	55.	92
85.4	84.2	92
86.2	86.4	92
85.5	86.9	92
88.2	87.5	92
86.5	87.0	92
85.7	87.7	92
87.8	81.8	92
86.8	86.2	92
87.8	86.3	92
88.4	85.9	92
86.1	85.2	92
85.2	86.4	92
82.5	85.7	92
13	75.	238
82.4	78.3	238
79.2	82.2	238
86.7	82.1	238
81.7	82.0	238
89.3	89.3	238
82.1	87.0	238
86.9	87.3	238
87.5	88.9	238
88.8	89.7	238
89.5	89.2	238
89.4	89.1	238
89.6	89.1	238

35. 20.

60. 45.

35. 20.

60. 45.

13	327	328	89.6	90.0	238
RM 6651-234	155	GB	13	55.	234
1	329	330	88.4	87.8	234
2	331	332	87.4	87.0	234
3	333	334	86.8	87.2	234
4	335	336	87.4	87.3	234
5	341	342	87.4	84.4	234
6	343	344	86.7	86.3	234
7	348	349	85.4	85.3	234
8	350	351	84.6	84.2	234
9	352	353	72.1	83.1	234
10	354	355	84.4	82.7	234
11	356	357	84.6	84.4	234
12	358	359	83.5	84.3	234
13	360	361	81.9	86.0	234
RM 76039-391	105	GB	13	75.	391
1	382	383	82.2	81.8	391
2	384	385	81.3	82.8	391
3	386	387	83.5	83.3	391
4	388	389	83.1	84.0	391
5	390	391	84.6	84.5	391
6	392	393	83.6	82.1	391
7	394	395	82.0	82.9	391
8	396	397	82.7	82.2	391
9	398	399	84.6	83.1	391
10	400	401	82.5	83.6	391
11	402	403	83.4	82.2	391
12	404	405	83.2	83.6	391
13	406	407	83.7	83.9	391
RM 86039-428	155	GB	13	55.	428
1	446	447	83.9	83.2	428
2	448	449	83.2	81.3	428
3	450	451	81.9	83.9	428
4	452	453	81.6	81.7	428
5	454	455	83.3	83.0	428
6	456	457	82.6	79.6	428
7	458	459	43.1	71.9	428
8	460	461	81.9	82.3	428
9	462	463	83.2	82.2	428
10	464	465	82.1	81.7	428
11	466	467	83.2	79.2	428
12	468	469	82.0	82.8	428
13	470	471	82.1	81.8	428
RM 68039-409	155	GB	13	55.	409
1	420	421	79.2	78.1	409
2	422	423	79.5	79.3	409
3	424	425	77.8	79.3	409
4	426	427	76.6	78.8	409
5	428	429	75.9	78.0	409
6	430	431	78.1	77.4	409
7	432	433	77.6	77.8	409
8	434	435	79.3	79.7	409
9	436	437	78.7	80.0	409
10	438	439	78.4	78.7	409
11	440	441	77.3	78.4	409
12	442	443	78.9	78.7	409
13	444	445	80.1	78.7	409
RM 6651-262	BULK	GB	13	80.2	409
1	472	473	9.72	75.	262
2	474	475	2.73	42.1	262
				37.0	262

3	476	477	74.6	74.8	262
4	478	479	69.1	71.6	262
5	480	481	70.5	76.9	262
6	482	483	75.3	76.6	262
7	484	485	76.5	79.4	262
8	486	487	81.6	80.6	262
9	488	489	68.1	79.7	262
10	490	491	78.7	79.8	262
11	492	493	74.8	80.8	262
12	494	495	82.0	82.3	262
13	496	497	80.4	81.7	262
RM 6651-310	155	GB	13	35.	310
1	648	649	77.4	55.	310
2	650	651	76.5	75.6	310
3	652	653	79.2	77.3	310
4	654	655	74.2	75.0	310
5	656	657	76.8	73.4	310
6	658	659	73.7	68.1	310
7	660	661	77.4	75.9	310
8	662	663	71.3	74.0	310
9	664	665	70.7	73.5	310
10	666	667	74.4	71.8	310
11	668	669	73.7	72.9	310
12	670	671	72.7	67.9	310
13	672	673	73.4	75.2	310
				20.	310

No. of
Copies

DISTRIBUTION LIST

1 Commander
US Army Materiel Development and Readiness Command
ATTN: DRCRE
1 DRCPA-S
5001 Eisenhower Avenue
Alexandria, VA 22333

1 Commander
US Army Armament Materiel Readiness Command
ATTN: DRSAR-CG
1 DRSAR-DCG
1 DRSAR-LC
1 DRSAR-LE
1 DRSAR-LEP (Tech Lib)
1 DRSAR-CP
21 DRSAR-SA
1 DRSAR-PA
1 DRSAR-PC
1 DRSAR-PD
1 DRSAR-IM
1 DRSAR-OP
1 DRSAR-QA
1 DRSAR-IS
1 DRSAR-MM
1 DRSAR-MA
1 DRSAR-AS
1 DRSAR-SF
Rock Island, IL 61201

1 Commander
US Army Armament Research and Development Command
ATTN: DRDAR-SEA
Dover, NJ 07801

1 Commander
US Army Test and Evaluation Command
ATTN: DRSTE-SY
Aberdeen Proving Ground, MD 21005

1 Commander
US Army Electronics Command
ATTN: DRSEL-SA
Fort Monmouth, NJ 07703

1 Commander
US Army Missile Materiel Readiness Command
ATTN: DRSMI-D
Redstone Arsenal, AL 35809

DISTRIBUTION LIST (Cont)

No. of
Copies

- 1 Commander
US Army Missile Research and Development Command
ATTN: DRDMI-DS
Redstone Arsenal, AL 35809
- 1 Commander
US Army Tank-Automotive Materiel and Readiness Command
ATTN: DRSTA-S
Warren, MI 48090
- 1 Commander
US Army Tank-Automotive Research and Development Command
ATTN: DRDTA-V
Warren, MI 48090
- 1 Commander
US Army Troop Support and Aviation Materiel Readiness Command
ATTN: DRDAV-BC
P.O. Box 209
St. Louis, MO 63166
- 1 Commander
US Army Aviation Research and Development Command
ATTN: DRSTS-F
4300 Goodfellow Blvd
St. Louis, MO 63120
- 1 Project Manager for Cannon Artillery Weapons Systems
ATTN: DRCPM-CAWS
Dover, NJ 07801
- 1 Commander
US Army Development and Readiness Command
Office of the Project Manager for Selected Ammunition
ATTN: DRCPM-SA
Dover, NJ 07801
- 1 Project Manager for M110E2
ATTN: DRCPM-M110E2
Rock Island, IL 61201
- 1 Project Manager for Air Defense Gun Systems
ATTN: DRCPM-ADG
Rock Island, IL 61201
- 1 Product Manager for Production Base Modification and Expansion
ATTN: DRCPM-PBM
Dover, NJ 07801

DISTRIBUTION LIST (Cont)

No. of
Copies

- 1 Product Manager for Advanced Attack Helicopter Systems
US Army Aviation Systems Command
St. Louis, MO 63166
- 1 Product Manager for AH-1 Cobra Series Aircraft
US Army Development and Readiness Command
P.O. Box 209
St. Louis, MO 63166
- 1 Commander
Rock Island Arsenal
ATTN: SARRI-CO
Rock Island, IL 61201
- 1 Commander
Watervliet Arsenal
ATTN: SARWV-CO
Watervliet, NY 12189
- 1 Commander
Edgewood Arsenal
ATTN: SAREA-DE-N
Aberdeen Proving Ground, MD 21010
- 1 Commander
Human Engineering Laboratories
ATTN: DRXHE-D
Aberdeen Proving Ground, MD 21005
- 1 Director
US Army Materiel Systems Analysis Activity
ATTN: DRXSY-D
Aberdeen Proving Ground, MD 21005
- 1 Commander
US Army Mobility Equipment Research and Development Command
ATTN: DRDME-O
Fort Belvoir, VA 22060
- 1 Commandant
US Army Field Artillery Center
Fort Sill, OK 73503
- 1 Commandant
US Army Infantry School
Fort Benning, GA 31905
- 1 Commander
US Army Missile and Munitions Center and School
Redstone Arsenal, AL 35809

DISTRIBUTION LIST (Cont)

No. of
Copies

1	Commandant US Army Air Defense School Fort Bliss, TX 79916
1	Director US Army Management Engineering Training Agency ATTN: DRXOM-QA Rock Island, IL 61201
1	Director US Army TRADOC Systems Analysis Activity ATTN: ATAA-SL (Tech Lib) White Sands Missile Range White Sands, NM 88002
1	Director Advanced Research Project Agency 1400 Wilson Boulevard Arlington, VA 22209
1	Commander Defense Logistics Studies Information Exchange Fort Lee, VA 23801
1	Commander US Army Logistics Management Center ATTN: DRXMC-LS Fort Lee, VA 23801
1	Commander US Army Logistics Center ATTN: ATCL-S Fort Lee, VA 23801
12	Defense Documentation Center Cameron Station Alexandria, VA 22314