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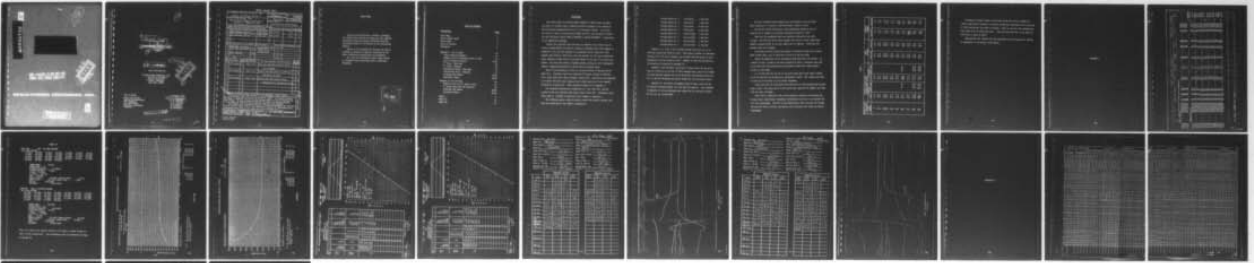
EAGLE-PICHER CO JOPLIN MO COUPLES DEPT  
FINAL TECHNICAL REPORT FOR R. 494 /U, (U)  
NOV 76 D H SPRACKLEN  
4212-T-1176

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DAHC60-72-C-0053  
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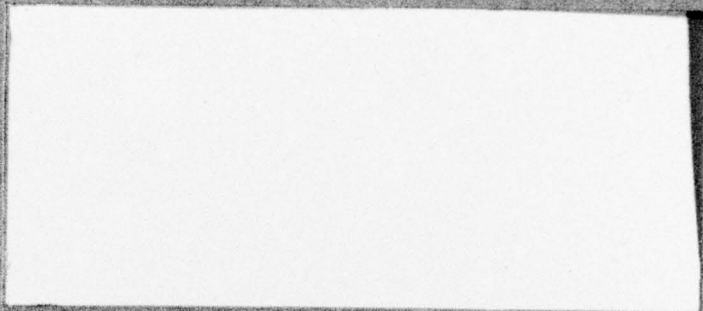
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EAGLE-PICHER INDUSTRIES, INC.



20

Battery Wet Primary, BA 494 /U

6 Final  
 TECHNICAL REPORT  
 FOR  
 BA 494 /U  
 15 ~~CONTRACT NO.~~ DAHC60-72-C-0053  
 4212-T-1176  
 14 (FINAL)

11 12 Nov 1976

Tests Performed by:

EAGLE-PICHER INDUSTRIES, INC.  
 Electronics Division  
 Couples Department  
 Joplin, Missouri  
 Code Ident. 81855

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 16 1977  
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Date of Tests:  
 Report Written by:  
 Engineering Supervisor:  
 Test Engineer:  
 Test Technician:  
 Equipment Supervisor:  
 Inspector:

1 November 1976  
 10 D. H. Spracklen  
 R. E. Barnett  
 P. D. Cantrell  
 Gary Landreth  
 E. Donaldson  
 Ray Moenkhoff

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**REPORT SUMMARY SHEET**

1. COMPONENT PART NAME PER GENETIC CODE <p align="center">Battery, Wet Primary, BA 494 /U</p>		2. PROGRAM OR WEAPON SYSTEM <p align="center">Safeguard</p>		3.			
		5. ORIGINATOR'S REPORT NO. <p align="center">4212-T-1176</p>		DAY	MO. YR.		
4. ORIGINATOR'S REPORT TITLE <p align="center">Final Technical Report for BA 494 /U Contract No. DAHC60-72-C-0053</p>		6. TEST TYPE, ETC <p align="center">Fifty-Four (54) Month Storage</p>		TEST COMPL.	1 11 76		
		REPT COMPL.	12 11 76				
7. THIS TEST (SUPERSEDES) (SUPPLEMENTS) REPORT NO: N/A							
8. ITEM	9A PART TYPE, SIZE, RATING, LOT, ETC	9. VENDOR	10. VENDOR PART NO.	11. IND/GOV. STD. NO.	12. TOTAL TESTED		
1	Dual Section Primary Remote Ag-Zn Battery, Lot 22	Eagle-Picher Ind., Inc.	GAP   4212	N/A	2		
2	Dual Section Primary Remote Ag-Zn Battery, Lot 19	Eagle-Picher Ind., Inc.	GAP   4212	N/A	2		
3							
4							
13. INTERNAL SPECS. REQ'D TO UTILIZE RPT, ENCL.		SENT WITH REPORT NO.		14. MIL. SPECS./STDS. REFERENCED IN ISC			
A	LSATP-308, Lot Acceptance Test Procedures	N/A	Lot Acceptance Test Report No. 1 (16 May 1972)	D	N/A		
B	Spec. 11425737	N/A		E	N/A		
C	N/A			F	N/A		
15A. ITEM	TEST OR ENVIRONMENT	C. PER SPEC.	D. SPEC. PARAGRAPH/METHOD/CONDITION	E. TEST LEVELS, DURATION AND OTHER DETAILS		F. NO. TESTED	G. NO. FAILED
	120°F Bench	A	Para. 8.15	Batteries had been stored at 120°F for 54 months		2	
	110°F Bench	A	Para. 8.15	Battery had been stored at 110°F for 108 months (9 years)		1	0
	110°F Bench	A	Para. 8.15	Battery had been stored at Room Temperature for 108 months (9 yrs)		1	0
16. SUMMARY OF REPORT, NATURE OF FAILURES AND CORRECTIVE ACTION TAKEN: This report covers the testing of two (2) randomly chosen batteries from Lot 22 which have been stored for 54 months at 120°F. The failure of some specimens to maintain 14.0 volts after ground power cut-off is discussed in this report. It also contains Discharge Data Sheets, Activation Traces, curves showing X trends for Rise Time and Capacity, and summaries This report also includes information concerning testing of two (2) batteries stored 9 years; one at room temperature and one at 110°F, along with accumulated data from Lot 19. These batteries performed well.							
17. TESTED BEYOND VENDOR CATALOG YRS SPECIFICATIONS <input type="checkbox"/>		18. VENDOR INFORMED OF TEST RESULTS BY LETTER <input type="checkbox"/> CY OF RPT <input type="checkbox"/> SERIAL <input type="checkbox"/>		19. SIGNED <i>[Signature]</i>		20. CONTRACTOR <input type="checkbox"/> 100 CONTRACTOR <input type="checkbox"/>	

21. RPT NO. 4212-T-1176

ref MIL-STD-881  
28 August 1962

NOTICE PAGE

Copies of specifications, standards, drawings, and publications required in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.

Copies of this standard for Military use may be obtained as indicated in general provisions to the Index of Military Specifications and Standards.

The title and identifying symbol number should be stipulated when requesting copies of Military Standards.

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TABLE OF CONTENTS

<u>Description</u>	<u>Page</u>
Title Page	1
Report Summary Sheet	2
Notice Page	3
Table of Contents	4
Discussion	5
Appendix I (Lot 22 Data)	10
Final Inspection Summary	11
Summary of Lot 22 Discharge Tests to date	12
Copy of Computer Printout	13,14
$\bar{X}$ Trend - Rise Time	15
$\bar{X}$ Trend - Capacity	16
Distribution Curve - Rise Time	17
Distribution Curve - Capacity	18
Discharge Data Sheets	19,21
Activation Traces	20,22
Appendix II (Lot 19 Data)	23
Summary of all Lot 19 tests to date	24
$\bar{X}$ Trends (Rise Time and Capacity)	25
Discharge Data Sheets	26,28
Activation Traces	27,29
Table I	8
Table II	13
Table III	14

## DISCUSSION

This final report on Contract Number DAHC60-72-C-0053, which includes the report of 54-month tests, completes required coverage of the testing of BA 494 batteries manufactured as Lot 22 of the above contract. Lot 22 was the first lot built to Specification Number 11425737, and consisted of forty-six (46) batteries; Serial Numbers 00664E0772 through 00709E0372. Disposition of the samples is as follows:

Fifteen (15) batteries were delivered to SAFSCOM, two of which were returned to Eagle-Picher for destruct testing at eighteen months (See Summary in Appendix I); Six (6) were destruct lot acceptance tests; twenty-five (25) samples were stored at 120°F for a four and one-half (4 1/2) year storage program, eighteen of which were to have been tested at the rate of two every six months. One extra was tested at eighteen months, leaving six (6) undesignated samples, suggested disposition of which will be discussed later.

Most of the fabrication of this lot occurred between 24 February and 23 March 1972. Pre-pilot tests were conducted 27 February through 29 February 1972, block tests from 7 March through 21 March 1972. Fabrication was completed by 31 March 1972 with final inspection and random selection of test samples finished by 23 April 1972. Final Inspection Summary is in Appendix I.

Lot Acceptance Testing was accomplished on 4 and 5 May 1972, and was covered in the Lot Acceptance Test Report dated 16 May 1972. Information from these tests is included in Destructive Test Summary in Appendix I.

The following reports, dated as shown, covered the delayed testing, with data also being used in the Summary in Appendix I.

Storage Report No. 1	(4212-S172)	6 NOV 1972
Storage Report No. 2	(4212-S273)	7 MAY 1973
Storage Report No. 3	(4212-S373)	29 OCT 1973
Storage Report No. 4	(4212-S474)	8 APR 1974
Storage Report No. 5	(4212-S-1074)	9 OCT 1974
Storage Report No. 6	(4212-S-0475)	9 MAY 1975
Storage Report No. 7	(4212-S-1075)	1 OCT 1975
Storage Report No. 8	(4212-S-0476)	14 APR 1975

Reports 1, 3, 5 and 7 also included delayed test data for Lot 19 batteries stored and tested at 110°F. This report includes the 108-month testing of two (2) Lot 19 samples, one of which had been stored at room temperature, but was tested at 110°F. Summary of these and previous Lot 19 batteries is presented in Appendix II.

Appendix I also includes a print-out of latest tests for Lot 22 as well as a print-out of all Lot 22 120°F storage tests, curves of  $\bar{X}$  trends for rise time and capacity for Lot 22 batteries, distribution curves for Lot 22, and the discharge data sheets along with the activation traces.

Appendix II, along with the summary, offers  $\bar{X}$  trend curves for Lot 19 nine-year storage program for rise time and capacity. Also included in Appendix II are the discharge data sheets and the activation traces for the two Lot 19 batteries.

The data presented herein demonstrates the adequacy of the BA 494/U after exposure to 4.5 years at 120°F and after 9 years at 110°F.

One battery stored nine years at room temperature showed no loss in capacity and no change in activation time when activated at 110°F.

There are two parameters which are adversely affected by the 120°F storage. The first was after thirty months; the reverse current (additional demand on ground power) on one test sample was 9.5 amperes. Previously the maximum noted was 5 amperes.

The second was after thirty-six months; the minimum voltage after ground-power cutoff (spec. 14.0 V. min) was 13.3 volts on one test unit.

These two parameters are not necessarily associated with one another. As a matter of fact, a study of the data presented in Table 1 indicates that none of the units with low voltage after ground-power cutoff had a high reverse current or vice versa.

It is noted that all but one of the units which had a rise time in excess of 120 ms also had low voltage after ground-power cutoff. The longest rise time to date was 179 ms which is still within tolerance.

There were four (4) units which were below the 14.0 VDC minimum after ground-power cutoff. The lowest was 9.8 volts which also required the longest rise time (179 ms) after 54 months.

Since this is really the only out-of-tolerance condition noted during the storage tests, Eagle-Picher recommends consideration be given to re-evaluate the 14.0 volt requirement. The data to date demonstrates that even when the voltage was only 9.8 volts at 105 ms, the battery still activated well below the 200 ms requirement.

TABLE I

STORAGE TIME AT 120°F IN MONTHS	MINIMUM VOLTAGE AFTER GROUND POWER CUTOFF		PEAK VOLTAGE		REVERSE CURRENT			
	VOLTS	RISE TIME	POSITIVE VOLTS	NEGATIVE RISE TIME	POSITIVE	NEGATIVE		
6	18.9		18.8		18.9	18.8	1.5	1.5
12	18.9		18.7		18.9	18.9	2.0	2.0
12	18.4		18.7		18.9	18.9	4.0	5.0
18	17.4		18.8		18.6	18.9	2.0	1.5
18	18.6		18.6		18.9	18.9	4.0	2.5
18	18.5		18.9		19.0	19.0	2.0	2.0
24	18.4		18.8		18.9	18.9	2.6	1.6
24	17.6		18.0		19.0	19.0	2.0	4.0
30	17.2		18.25		19.0	18.9	9.5	3.0
30	18.8		17.4		19.1	19.1	4.0	13.0
36	18.3	82 ms	13.3	150 ms	19.0	19.0	6.0	2.0
36	18.3		18.9		19.1	19.2	2.0	1.5
42	17.0		17.1		19.0	19.0	16.0	9.0
42	18.1		17.8		19.0	19.0	8.6	7.5
48	18.8	79 ms	18.6	80 ms	19.1	19.1	8.6	9.0
48	14.13	122 ms	15.78	148 ms	19.0	19.0	7.8	3.4
54	12.1	170 ms	18.4	88 ms	19.0	18.9	3.2	6.0
54	15.5	155 ms	9.8	179 ms	18.7	19.1	16.5	1.75

Although the present report is the final report for Contract DAHC60-72-C-0053, Eagle-Picher proposes to continue storing the remaining six (6) batteries at 120°F, testing one unit every six months. There is one more unit remaining at 110°F which will be tested next year. This will give data out to ten years at 110°F and 7.5 years at 120°F.

Eagle-Picher will transmit the data generated by this extension of testing as supplements to the present final report.

APPENDIX I

BA 400 (HU) (GAP 4212)

SPECIFICATION NO 114-25737

FINAL INSPECTION (Non-Destruct)

CONTRACT NO. DARCO-72-C-0-0-1

LOT NO.	CONTRACT NO.	SERIAL NO.	WORK MARRSHIP	LABELS	MARKING	WEIGHT (LBS)	GENERATOR RESISTANCE (OHMS)	INSULATION RESISTANCE (MΩ)	DIELECTRIC STRENGTH (KV)	LEAKS CHECK	SOFT	TEST
22 (S/N 0066-4E0372 THROUGH S/N 00709E0372)												
4-10-72		00669E0372	OK	OK	OK	5.92	1.01	OK	OK	OK	CLOSED	
4-10-72		00676E0372	OK	OK	OK	5.95	1.01	OK	OK	OK	CLOSED	
4-10-72		00683E0372	OK	OK	OK	5.94	1.02	OK	OK	OK	CLOSED	
4-10-72		00698E0372	OK	OK	OK	5.93	1.02	OK	OK	OK	CLOSED	
4-10-72		00702E0372	OK	OK	OK	5.94	1.00	OK	OK	OK	CLOSED	
4-10-72		00707E0372	OK	OK	OK	5.94	1.01	OK	OK	OK	CLOSED	
(STORAGE SAMPLES)												
4-10-72		00665E0372	OK	OK	OK	5.89	1.03	OK	OK	OK	CLOSED	24 MO *
4-10-72		00667E0372	OK	OK	OK	5.92	1.01	OK	OK	OK	CLOSED	24 MO *
4-10-72		00670E0372	OK	OK	OK	5.90	1.04	OK	OK	OK	CLOSED	24 MO *
4-10-72		00671E0372	OK	OK	OK	5.93	1.01	OK	OK	OK	CLOSED	24 MO *
4-10-72		00673E0372	OK	OK	OK	5.88	1.07	OK	OK	OK	CLOSED	18 MO
4-10-72		00674E0372	OK	OK	OK	5.94	1.02	OK	OK	OK	CLOSED	18 MO
4-10-72		00675E0372	OK	OK	OK	5.93	1.02	OK	OK	OK	CLOSED	18 MO
4-10-72		00677E0372	OK	OK	OK	5.94	1.02	OK	OK	OK	CLOSED	36 MO *
4-10-72		00679E0372	OK	OK	OK	5.95	1.03	OK	OK	OK	CLOSED	36 MO *
4-10-72		00680E0372	OK	OK	OK	5.94	1.02	OK	OK	OK	CLOSED	54 MO
4-10-72		00681E0372	OK	OK	OK	5.94	1.05	OK	OK	OK	CLOSED	30 MO *
4-10-72		00684E0372	OK	OK	OK	5.94	1.02	OK	OK	OK	CLOSED	
4-10-72		00685E0372	OK	OK	OK	5.93	1.05	OK	OK	OK	CLOSED	
4-10-72		00687E0372	OK	OK	OK	5.93	1.02	OK	OK	OK	CLOSED	
4-10-72		00689E0372	OK	OK	OK	5.94	1.04	OK	OK	OK	CLOSED	48 MO
4-10-72		00690E0372	OK	OK	OK	5.93	1.02	OK	OK	OK	CLOSED	6 MO
4-10-72		00693E0372	OK	OK	OK	5.94	1.04	OK	OK	OK	CLOSED	42 MO
4-10-72		00694E0372	OK	OK	OK	5.95	1.01	OK	OK	OK	CLOSED	18 MO
4-10-72		00695E0372	OK	OK	OK	5.95	1.01	OK	OK	OK	CLOSED	36 MO
4-10-72		00697E0372	OK	OK	OK	5.95	1.02	OK	OK	OK	CLOSED	
4-10-72		00700E0372	OK	OK	OK	5.95	1.03	OK	OK	OK	CLOSED	24 MO
4-10-72		00703E0372	OK	OK	OK	5.91	1.00	OK	OK	OK	CLOSED	42 MO
4-10-72		00704E0372	OK	OK	OK	5.94	1.05	OK	OK	OK	CLOSED	48 MO
4-10-72		00705E0372	OK	OK	OK	5.94	1.01	OK	OK	OK	CLOSED	
4-21-72		00708E0372	OK	OK	OK	5.94	1.06	OK	OK	OK	CLOSED	30 MO *

\* STILL STORED AT 12.0°F

CONTRACT NO. DAH160-72-C 0053 SPECIFICATION 11-25737

BA 494 / U (CAP 4212)

LOT 22 (S/N 0066460372 thru\_SIN 007090372)

DESTRUCTIVE TEST SUMMARY

Test Date	Serial Number	Lot No.	Type Test	Temperature (°F)	Storage	Rise time (min)		Time to Peak (sec)		Peak Voltage (volts)		Time to Peak (sec)		Max. Volts at 57 Seconds		Life (secs)		
						Pos (150 ms)	Neg (150 ms)	Pos (10-2 sec)	Neg (10-2 sec)	Pos (20-2 sec)	Neg (20-2 sec)	Pos (10-30 sec)	Neg (10-30 sec)	Min	Max		Min	Max
<b>LOT ACCEPTANCE TESTS (MAY 1972)</b>																		
5-2-72	0070260372		SHOCK	80		88	96	140	140	17.35	18.64	17.69	17.39	17.63	17.32	17.40	17.24	397
5-2-72	0070760372		SHOCK	80		91	84	150	150	17.34	17.96	17.85	17.79	17.90	17.31	17.43	17.60	434
5-2-72	0070760372		VIB.	80		91	93	150	150	17.35	17.35	17.83	18.00	17.98	17.31	17.43	17.60	304
5-2-72	0070760372		VIB.	120		90	83	100	100	18.23	18.20	18.03	18.00	18.06	17.31	17.63	17.93	317
5-2-72	0069300372		ACC.	120		90	83	110	110	18.26	18.30	18.12	18.00	18.06	17.64	17.93	17.93	291
5-2-72	0069300372		ACC.	80		90	90	155	155	18.00	18.00	17.74	17.74	17.67	17.32	17.43	17.67	281
<b>SIX (6) MONTHS STORAGE (OCTOBER 1972)</b>																		
10-11-72	0063560372		BENCH	120		92	92	360	360	18.79	18.81	18.25	18.22	18.22	17.84	17.38	17.75	160
10-11-72	0069600372		BENCH	120		92	90	360	360	18.80	18.82	18.35	18.31	18.19	17.47	18.03	18.03	184
<b>THREE (3) MONTHS STORAGE (APRIL 1973)</b>																		
3-14-73	0057960372		BENCH	120		97	87	370	370	18.50	18.87	18.41	18.10	18.10	17.70	18.00	17.66	178
4-12-73	0062460372		BENCH	120		94	84	360	360	18.88	18.94	18.46	18.22	18.18	17.67	17.98	18.05	150
<b>EIGHT (8) MONTHS STORAGE (OCTOBER 1973)</b>																		
10-2-73	0067360372		BENCH	120		96	85	360	360	18.40	18.94	18.60	18.55	18.17	14.80	17.70	18.00	2
10-9-73	0069300372		BENCH	120		95	70	370	370	18.94	18.94	18.58	18.21	18.21	17.71	17.73	18.00	140
10-9-73	0069300372		BENCH	120		98	74	370	370	18.94	18.94	18.51	18.19	18.11	17.60	17.94	17.16	75
11-28-73	0067260372		BENCH	110		95	62	370	370	18.27	18.20	18.08	18.10	18.01	17.85	17.90	17.90	306
11-28-73	0067260372		BENCH	110		102	67	370	370	18.30	18.35	18.08	18.08	18.01	17.87	17.98	17.98	285
<b>FOUR (4) MONTHS STORAGE (APRIL 1974)</b>																		
3-27-74	0066760372		BENCH	120		95	80	360	360	18.92	18.93	18.62	18.25	18.22	17.62	17.95	17.68	150
3-27-74	0070060372		BENCH	120		101	84	360	360	18.98	18.99	18.57	18.45	18.25	17.65	17.68	17.98	140
<b>THIRTY (30) MONTHS STORAGE (OCTOBER 1974)</b>																		
10-2-74	0073860372		BENCH	120		107	95	370	370	19.16	19.16	18.80	18.32	18.31	17.72	18.05	17.71	171
10-2-74	0069300372		BENCH	120		103	85	370	370	18.98	18.94	18.60	18.20	18.25	17.70	18.00	17.68	133
<b>THIRTY SIX (36) MONTHS STORAGE (APRIL 1975)</b>																		
4-22-75	0067760372		BENCH	120		106	100	370	370	19.04	19.08	18.50	18.70	18.25	17.46	17.70	17.66	143
4-22-75	0069560372		BENCH	120		105	87	370	370	19.10	19.10	18.65	18.77	18.25	17.70	18.00	17.72	124
<b>FORTY TWO (42) MONTHS STORAGE (SEPTEMBER 1975)</b>																		
9-19-75	0069660372		BENCH	120		102	104	360	360	18.98	19.02	18.58	18.61	18.21	17.82	17.66	17.58	104
9-19-75	0070360372		BENCH	120		104	86	360	360	18.97	18.97	18.63	18.44	18.23	17.65	17.99	17.94	150
<b>FORTY EIGHT (48) MONTHS STORAGE (APRIL 1976)</b>																		
4-6-76	0062660372		BENCH	120		101	104	360	360	19.05	19.05	18.38	18.50	18.15	17.62	17.92	17.60	111
4-6-76	0070460372		BENCH	120		101	80	370	370	19.12	19.06	18.78	18.77	18.33	17.73	18.06	17.71	154
<b>FIFTY FOUR (54) MONTHS STORAGE (NOVEMBER 1976)</b>																		
11-17-76	0067160372		BENCH	120		97	100	370	370	19.03	19.03	18.70	18.63	18.18	17.55	17.97	17.92	97
11-17-76	0068860372		BENCH	120		101	105	370	370	18.65	19.10	18.55	18.49	18.18	17.68	17.91	17.63	115
<b>* See entry to circuit drawings (NOTE: COPY DRAWINGS) DATE NOVEMBER 1976</b>																		

TABLE II

RISE TIME SPEC 200 MSEC MAXIMUM  
 RAW DATA LISTING  
 170.0000 88.0000 115.0000 179.0000

SAMPLE MEAN = 138.0000  
 SAMPLE SIZE = 4  
 STANDARD DEVIATION = 43.718799  
 K((AVG-REQ)/SIG) = 1.4182  
 3.\*SIG = 131.1564  
 3.07\*SIG = 134.2167  
 REQ = 200.000  
 MEAN+3.07\*SIG = 272.2167, MEAN-3.07\*SIG = 3.7833  
 MEAN+3.\*SIG = 269.1564, MEAN-3.\*SIG = 6.8436  
 SUM X = 552.00000  
 SUM XSQR = 81980.00006

CAPACITY SPEC 57 SECONDS MIN  
 RAW DATA LISTING  
 110.0000 97.0000 115.0000 128.0000

SAMPLE MEAN = 112.5000  
 SAMPLE SIZE = 4  
 STANDARD DEVIATION = 12.819256  
 K((AVG-REQ)/SIG) = 4.3294  
 3.\*SIG = 38.4578  
 2.07\*SIG = 39.3551  
 REQ = 57.000  
 MEAN+3.07\*SIG = 151.8551, MEAN-3.07\*SIG = 73.1449  
 MEAN+3.\*SIG = 150.9578, MEAN-3.\*SIG = 74.0422  
 SUM X = 450.00000  
 SUM XSQR = 51118.00003

Above is a copy of the computer printout of current Lot 22 Delayed Test.

This information was used in preparation of pages 15 through 18.

TABLE III

RISE TIME SPEC 200 MSEC MAXIMUM

RAW DATA LISTING

79.0000	87.0000	90.0000	84.0000	75.0000	70.0000	76.0000
74.0000	80.0000	71.0000	87.0000	84.0000	78.0000	95.0000
95.0000	80.0000	82.0000	150.0000	63.0000	67.0000	104.0000
101.0000	86.0000	86.0000	148.0000	122.0000	80.0000	79.0000
170.0000	88.0000	115.0000	179.0000			

SAMPLE MEAN = 94.5313  
 SAMPLE SIZE = 32  
 STANDARD DEVIATION = 29.080516  
 K((AVG-REQ)/SIG) = 3.6268  
 3.\*SIG = 87.2415  
 3.07\*SIG = 89.2772  
 REQ = 200.000  
 MEAN+3.07\*SIG = 183.8084, MEAN-3.07\*SIG = 5.2541  
 MEAN+3.\*SIG = 181.7728, MEAN-3.\*SIG = 7.2897  
 SUM X = 3025.00000  
 SUM XSQR = 312173.00036

CAPACITY SPEC 57 SECONDS MINIMUM

RAW DATA LISTING

184.0000	178.0000	150.0000	150.0000	136.0000	150.0000	140.0000
136.0000	171.0000	176.0000	132.0000	133.0000	143.0000	118.0000
124.0000	122.0000	104.0000	111.0000	150.0000	150.0000	138.0000
140.0000	153.0000	75.0000	122.0000	111.0000	154.0000	154.0000
110.0000	97.0000	115.0000	128.0000			

SAMPLE MEAN = 136.0938  
 SAMPLE SIZE = 32  
 STANDARD DEVIATION = 24.413586  
 K((AVG-REQ)/SIG) = 3.2397  
 3.\*SIG = 73.2408  
 3.07\*SIG = 74.9497  
 REQ = 57.000  
 MEAN+3.07\*SIG = 211.0435, MEAN-3.07\*SIG = 61.1440  
 MEAN+3.\*SIG = 209.3345, MEAN-3.\*SIG = 62.8530  
 SUM X = 4355.00000  
 SUM XSQR = 611165.00073

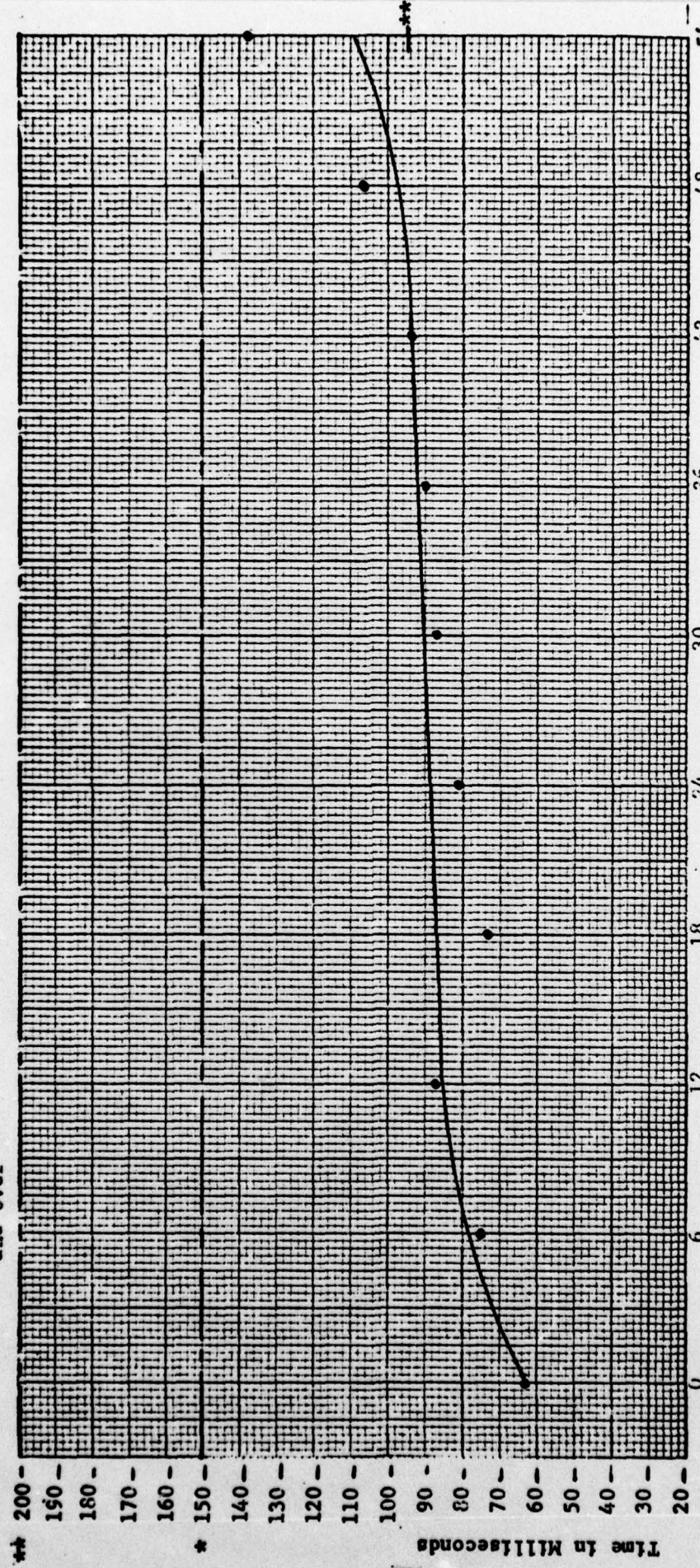
Above is a copy of the computer printout of 12 month or longer storage at  
 120°F of Lot 22 Batteries. This information used in preparation of pages  
 15 through 18.

Batteries Stored and Tested at 120°F.

• =  $\bar{X}$   
 — =  $\bar{X}$  Trend

Specification: \* 150 ms max for New and 6 month batteries

\*\* 200 ms max for 12 month and over



Storage Time in Months

Number of Samples:

Storage Time (Months)	Number of Samples
0	14
6	2
12	10
18	4
24	4
30	30
36	4
42	36
48	4
54	48

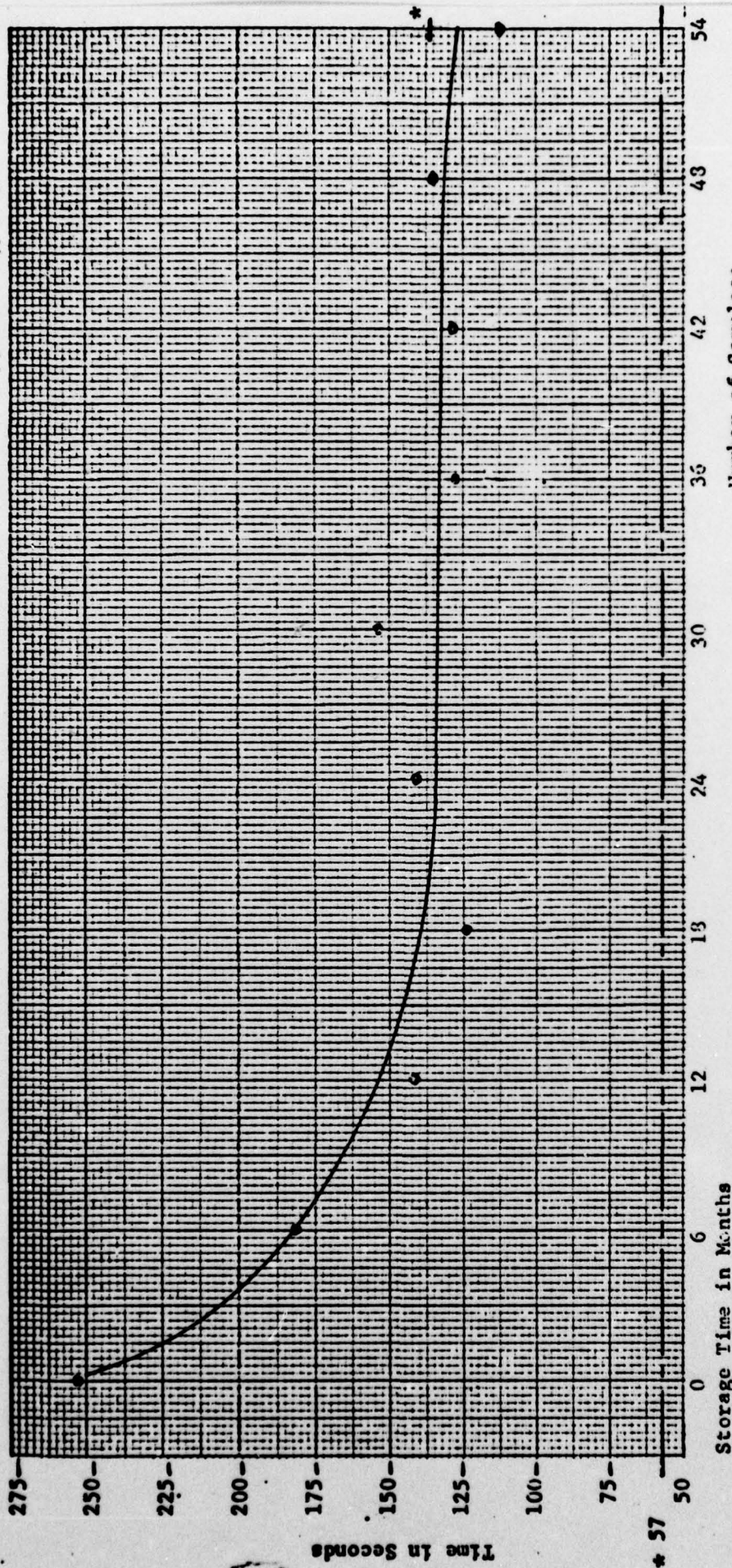
\*\*\*  $\bar{X} = 94.53$  for the 32 twelve month or over batteries on the current contract

RISE TIME

Batteries Stored And Tested at +120°F.

Specification: 57 seconds minimum \*

• =  $\bar{X}$   
 — =  $\bar{X}$  Trend



Storage Time in Months

Number of Samples:
14
2
10
4
4

Number of Samples:
30 months
36 months
42 months
48 months
54 months

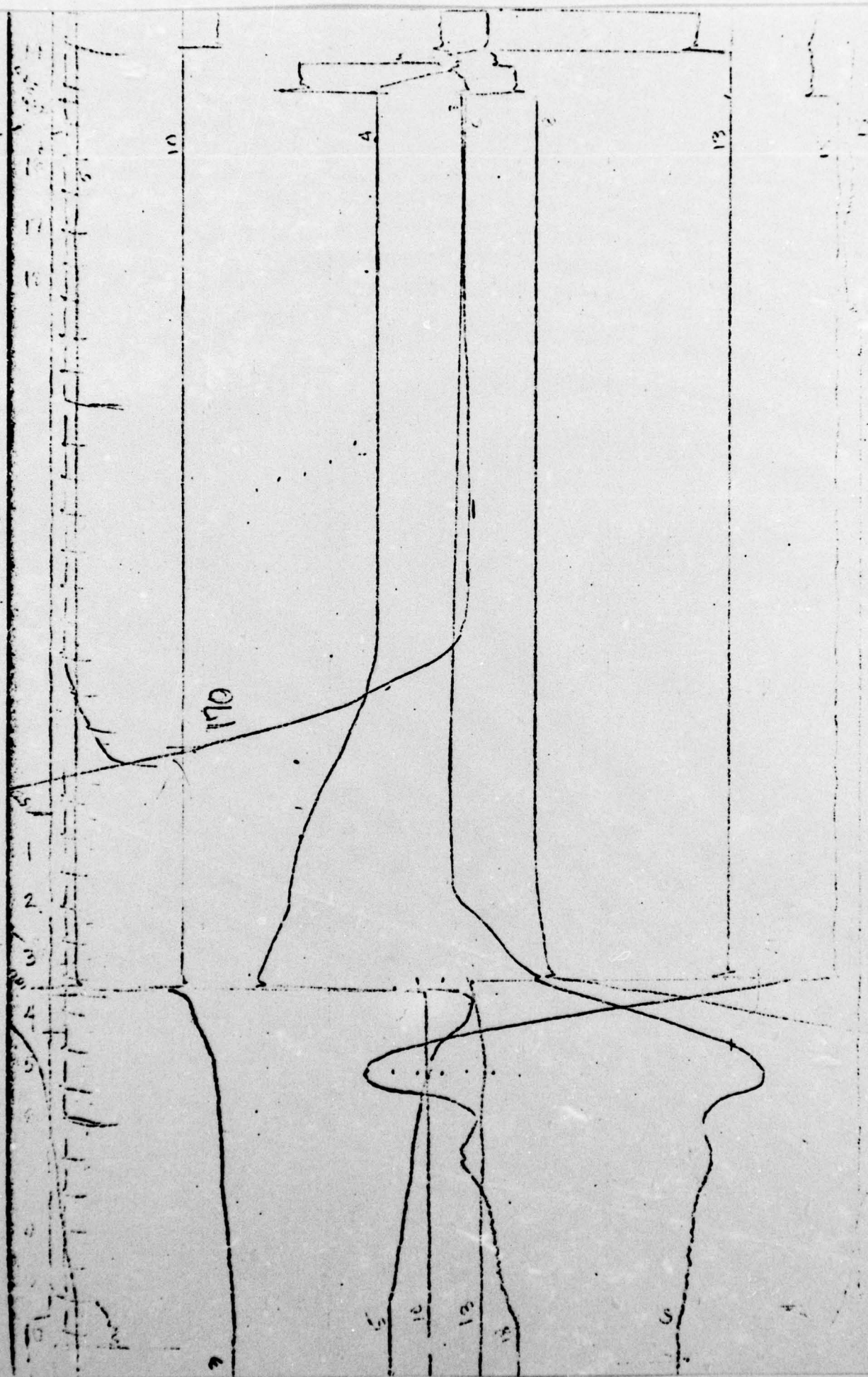
\*\*  $\bar{X}$  = 136.09 for the 32 twelve month or over batteries on current contract

CAPACITY



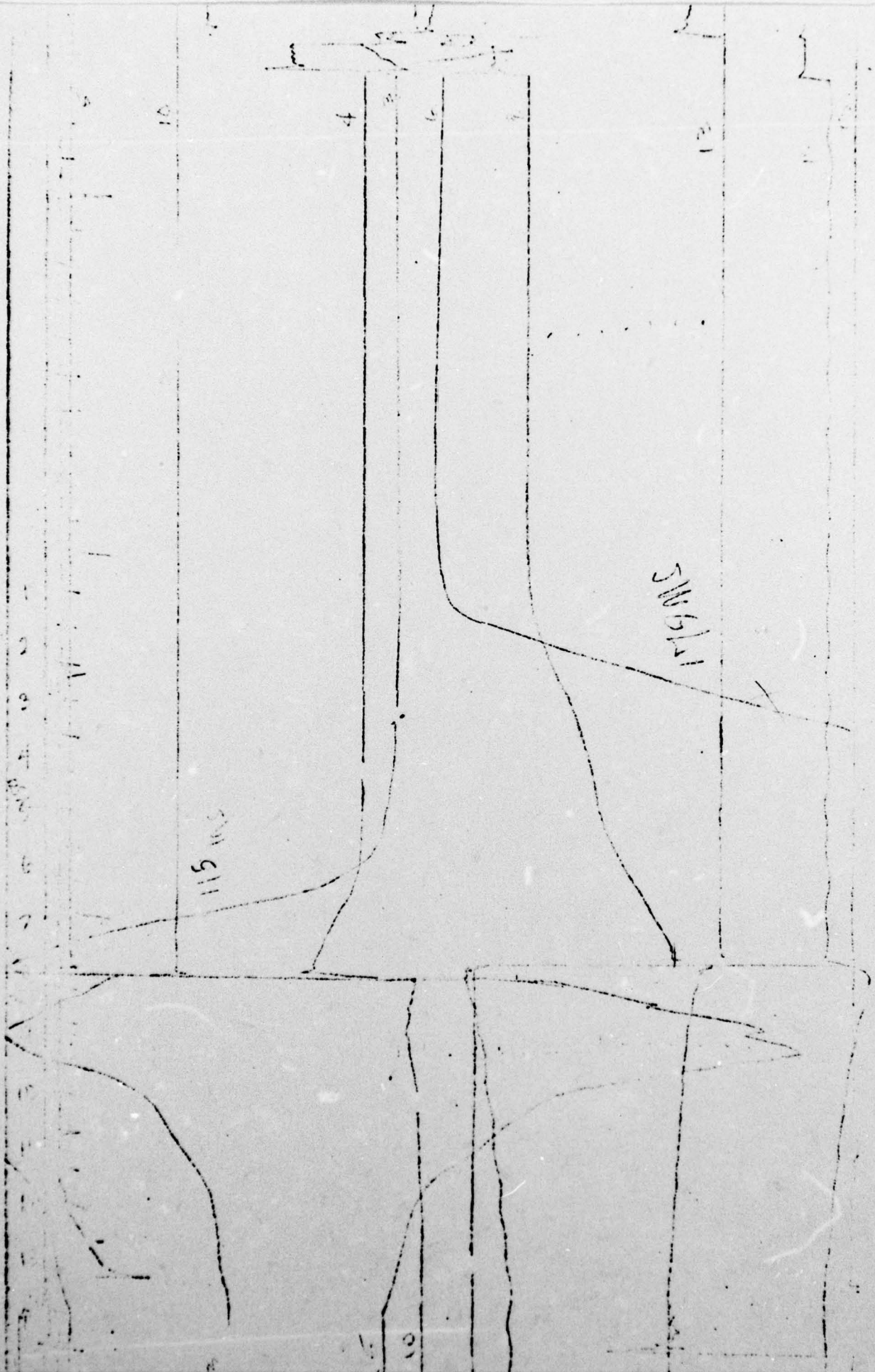






S/N 00071E0372  
LOT 22





S/N 0068060372  
LOT 22

**APPENDIX II**

CONTRACT NO. DAAB07-67-C-0313

BA 494 (1/U)

GAP 4212 (LOT 19)

TEST DATE	SERIAL NUMBER	TYPE TEST	STORAGE TEMP.	TEST TEMP.	RISE TIME (min)		G.P. CUTOFF (mA)		LOW VOLTAGE RATE (mA)		POSITIVE (19.25 MA.)			NEGATIVE (19.25 MA.)			VOLTS AT 112 MS.		VOLTS AT 150 MS.		VOLTS AT 2 SECS.		VOLTS AT 8 SECS.	
					POS.	NEG.	POS.	NEG.	POS.	NEG.	PEAK VOLTS	RATE	TIME TO PEAK VOLTS (min)	PEAK VOLTS	RATE	POS.	NEG.	POS.	NEG.	POS.	NEG.	POS.		NEG.
LOT 19 (LOT ACCEPTANCE TEST RESULTS)																								
9-6-67	00581E0867	ACCEL	N/A	120°	67	60	110	110	N/A	N/A	18.80	15.0	150	18.74	5.3	360	18.75	18.68	18.80	18.67	18.04	18.10	18.00	18.00
9-6-67	00520E0867	ACCEL	N/A	120°	67	60	110	110	N/A	N/A	19.18	15.4	112	19.23	5.5	360	19.18	19.20	19.14	19.15	18.62	18.76	18.11	18.11
9-6-67	00548E0867	ACCEL	N/A	110°	72	74	110	110	N/A	N/A	18.81	7.5	360	18.95	5.5	360	18.70	18.70	18.78	18.82	18.09	19.20	18.13	18.13
9-6-67	00540E0867	ACCEL	N/A	110°	68	75	110	110	N/A	N/A	19.20	7.7	360	19.20	5.6	360	19.15	19.17	19.18	19.19	18.70	18.75	17.80	17.80
9-6-67	00514E0867	ACCEL	N/A	110°	72	70	110	110	N/A	N/A	19.10	7.7	360	19.12	5.5	360	19.05	18.94	19.05	19.08	18.48	18.69	17.23	17.23
9-6-67	00512E0867	SURCH	N/A	110°	73	78	110	110	N/A	N/A	19.15	7.7	360	19.22	5.5	360	18.92	18.63	19.11	19.10	18.46	18.72	18.03	18.03
9-6-67	00587E0867	SURCH	N/A	110°	67	63	110	110	N/A	N/A	18.81	7.5	360	18.78	5.3	360	18.64	18.75	18.70	18.76	18.09	18.20	18.04	18.04
9-6-67	00515E0867	VIB	N/A	120°	62	72	110	110	N/A	N/A	19.20	7.2	360	19.20	5.5	360	19.12	19.10	19.16	19.15	18.60	18.65	18.25	18.25
9-6-67	00544E0867	VIB	N/A	120°	68	61	110	110	N/A	N/A	19.19	7.7	360	19.21	5.6	360	19.15	19.18	19.15	19.17	18.75	18.81	17.92	17.92
9-6-67	00513E0867	VIB	N/A	120°	62	64	110	110	N/A	N/A	19.22	7.3	112	19.23	5.6	360	19.22	19.20	19.19	19.20	18.39	18.71	18.28	18.28
LOT 19 (2 MONTH STORAGE BATTERIES)																								
10-8-68	00537E0867	BENCH	110°	110°	119	100	102	103	16.20	16.75	19.24	7.7	360	19.23	5.6	360	18.60	18.20	18.00	18.85	19.00	19.00	18.40	18.40
10-8-68	00541E0867	BENCH	120°	135°	83	68	100	100	N/A	N/A	19.60	7.8	360	19.54	5.7	360	18.78	19.10	19.46	19.41	18.92	19.00	18.23	18.23
10-8-68	00540E0867	BENCH	120°	120°	90	92	101	101	N/A	N/A	19.23	7.75	360	19.23	5.6	360	18.45	18.28	19.10	19.06	18.45	18.57	17.97	17.97
10-8-68	00545E0867	BENCH	110°	110°	110	110	100	100	16.80	16.93	19.23	7.75	360	19.25	5.6	360	17.55	17.50	18.85	18.93	18.40	18.54	17.44	17.44
10-8-68	00547E0867	BENCH	120°	120°	85	85	100	100	N/A	N/A	19.24	15.4	180	19.45	5.6	360	18.43	19.20	19.21	19.21	18.43	18.13	18.05	18.05
10-8-68	00549E0867	BENCH	110°	110°	100	100	100	100	16.95	16.50	19.20	7.7	360	19.20	5.6	360	17.85	18.85	19.00	18.65	18.64	18.45	18.09	18.09
10-8-68	00521E0867	BENCH	120°	120°	89	92	100	100	N/A	N/A	19.23	7.7	360	19.23	5.6	360	18.40	18.50	19.12	19.02	18.41	18.65	18.69	18.69
LOT 19 (8 MONTH STORAGE BATTERIES)																								
4-1-69	00521E0867	BENCH	110°	110°	113	125	96	96	16.23	15.58	19.49	7.4	360	19.18	7.4	360	18.6	19.05	18.22	17.7	18.22	18.55	18.10	18.10
4-1-69	00547E0867	BENCH	110°	110°	100	112	100	100	16.85	16.31	19.39	7.4	360	19.25	7.4	360	18.25	18.25	18.59	17.71	18.65	18.55	18.10	18.10
4-1-69	00534E0867	BENCH	110°	100°	157	128	102	101	15.85	15.61	19.43	7.4	360	19.31	7.4	360	18.20	18.25	18.61	17.72	18.57	18.80	18.23	18.23
4-1-69	00553E0867	BENCH	110°	100°	147	126	101	100	15.20	15.55	19.31	7.4	360	19.27	7.4	360	19.23	18.21	18.80	17.83	18.61	18.61	18.23	18.23
<p>2 THREE TIMES WERE OBTAINED BY TAKING 9/10 OF THE NEGATIVE CAPACITY TO MAKE THE DATA COMPARABLE WITH THE POSITIVE CAPACITY SECTION RATE AND TWELVE (6) IS APPROXIMATELY THE POSITIVE SECTION RATE IN AMPERES.</p> <p>3 THE POSITIVE AND NEGATIVE SECTIONS ARE NOW DISCHARGED AT THE SAME RATE ELIMINATING THE NEED FOR CHANGE.</p>																								
LOT 19 (24 MONTH STORAGE BATTERIES)																								
10-1-69	00546E0867	BENCH	110°	110°	108	111	95	94	16.45	16.32	19.88	15.50	360	19.00	15.25	360	18.05	16.70	18.25	18.00	18.05	18.85	18.10	18.10
10-1-69	00586E0867	BENCH	110°	110°	107	100	100	100	16.57	16.82	19.18	15.25	360	19.25	15.05	360	17.03	17.41	18.20	18.95	18.32	18.99	17.95	17.95
LOT 19 (30 MONTH STORAGE BATTERIES)																								
4-2-70	00513E0867	BENCH	110°	110°	104	95	92	90	16.37	16.50	19.63	7.7	360	19.62	7.8	360	17.85	17.48	18.82	18.84	19.01	19.00	18.10	18.10
4-2-70	00576E0867	BENCH	110°	110°	125	112	95	92	15.35	16.05	19.16	7.7	360	18.97	7.6	360	18.32	16.63	17.80	18.26	18.60	17.38	17.92	17.92
LOT 19 (42 MONTH STORAGE BATTERIES)																								
4-7-71	00524E0867	BENCH	110°	110°	99	92	92	91	16.30	17.40	19.45	7.8	360	19.50	7.75	360	17.66	18.05	18.81	18.45	18.37	19.00	18.18	18.18
4-7-71	00548E0867	BENCH	110°	110°	110	90	90	90	16.13	17.25	19.54	7.8	360	19.60	7.75	360	16.44	18.15	18.45	18.45	19.00	18.88	18.10	18.10
LOT 19 (48 MONTH STORAGE BATTERIES)																								
10-7-71	00574E0867	BENCH	110°	110°	97	87	96	96	16.43	17.15	19.28	7.8	360	19.12	8.2	360	17.80	18.20	18.95	18.95	18.63	18.61	18.03	18.03
LOT 19 (60 MONTH STORAGE BATTERIES)																								
10-11-72	00525E0867	BENCH	110°	110°	84	74	93	93	17.15	17.6	19.56	8.5	370	19.90	8.5	370	18.45	18.18	19.17	19.05	19.10	19.12	18.34	18.34
LOT 19 (72 MONTH STORAGE BATTERIES)																								
10-5-73	00523E0867	BENCH	110°	110°	90	80	100	102	17.4	18.0	19.85	8.8	370	19.60	8.6	370	17.90	18.33	19.08	19.20	19.18	19.30	18.38	18.38
LOT 19 (84 MONTH STORAGE BATTERY)																								
10-2-74	00517E0867	BENCH	110°	110°	83	68	102	104	17.82	18.1	19.68	8.6	360	19.63	8.6	360	18.4	18.6	19.28	19.31	19.08	19.10	18.35	18.35
LOT 19 (96 MONTH STORAGE BATTERY)																								
3-19-75	00579E0867	BENCH	110°	110°	82	85	98	95	16.25	17.12	19.33	8.7	360	19.20	8.4	360	17.41	17.56	18.6	18.55	18.78	18.82	18.09	18.09
LOT 19 (108 MONTH STORAGE BATTERIES)																								
11-1-76	00514E0872	BENCH	110°	110°	92	83	103	105	17.32	17.60	19.66	8.7	370	19.54	8.7	370	17.67	18.21	19.19	19.10	19.28	19.22	18.42	18.42
11-1-76	00566E0872	BENCH	72°	110°	81	63	103	105	18.10	18.10	19.19	8.5	370	19.25	8.6	370	18.76	18.52	19.05	19.13	18.40	18.67	18.12	18.12

C-0313

BA 494 ( 1/10

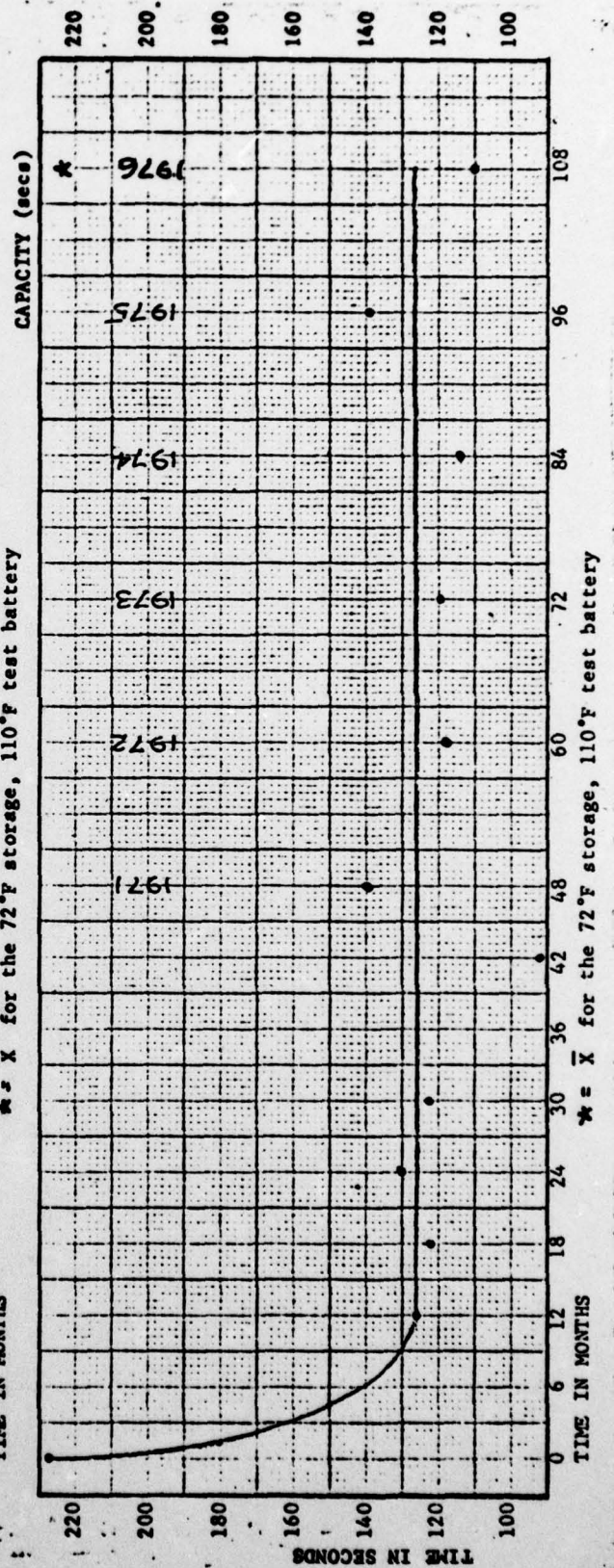
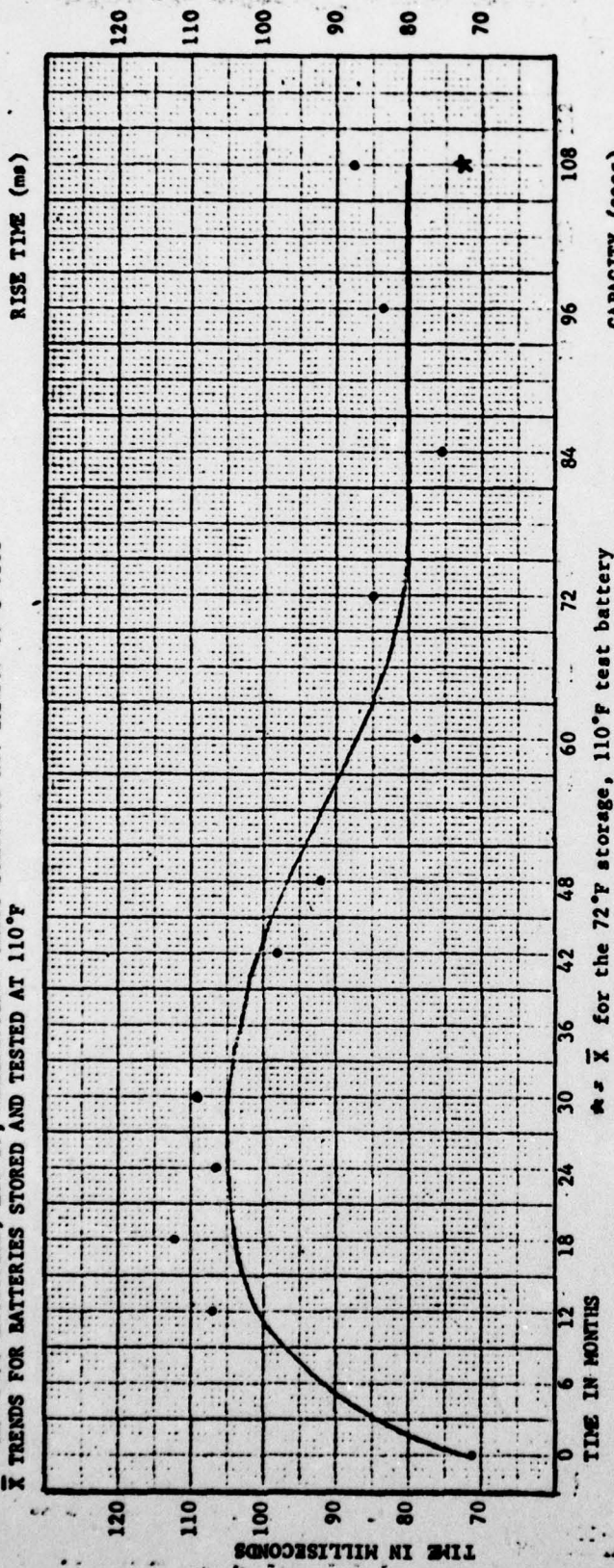
GAP 4212 (LOT 19)

SCL-7773-D

TIME (min)	G.P. CUTOFF (mA)		LOW VOLTAGE APPLIED (V)		POSITIVE (19.25 mA)			NEGATIVE (19.25 mA)			VOLTS AT 112 MS		VOLTS AT 150 MS		VOLTS AT 2 SECS		VOLTS AT 8 SECS		VOLTS AT 10 SECS		VOLTS AT 30 SECS				LIFE (SECS)								
	POS	NEG	POS	NEG	POS	NEG	PEAK VOLTS	RATE	PEAK VOLTS	RATE	POS	NEG	POS	NEG	POS	NEG	POS	NEG	POS	NEG	POS	NEG	MIN	MAX	MIN	MAX	POS	NEG	MIN	MAX			
ST RESULTS																																	
67	60	110	110	N/A	N/A	18.80	15.0	150	18.74	5.3	160	18.75	18.68	18.80	18.67	18.04	18.10	18.02	18.21	18.05	18.20	17.65	18.00	17.84	18.15	267	336	265					
67	60	110	110	N/A	N/A	19.18	15.4	112	19.20	5.5	112	19.18	19.20	19.19	19.15	18.62	18.76	18.11	18.21	18.10	18.19	17.72	18.05	17.81	18.15	211	249	190					
72	75	110	110	N/A	N/A	18.81	7.5	360	18.95	5.5	360	19.15	19.17	19.18	18.82	18.09	18.20	18.13	18.22	18.11	18.21	17.75	18.04	17.84	18.15	266	343	260					
68	75	110	110	N/A	N/A	19.20	7.7	360	19.22	5.5	360	19.15	19.17	19.18	18.78	18.75	17.80	17.86	17.78	17.84	17.74	17.84	17.84	17.84	17.84	17.90	262	146	115				
72	70	110	110	N/A	N/A	19.16	7.7	360	19.22	5.5	360	18.82	18.83	19.11	19.10	18.46	18.63	18.03	18.05	17.91	18.02	17.55	17.95	17.63	18.01	242	295	233					
73	78	110	110	N/A	N/A	19.15	7.7	360	19.22	5.5	360	18.64	18.75	19.70	18.76	18.09	18.20	18.04	18.17	18.02	18.15	17.64	17.95	17.71	18.03	215	296	213					
67	63	110	110	N/A	N/A	18.81	7.5	360	19.20	5.5	360	19.12	19.10	19.16	19.10	18.60	18.65	18.02	18.20	18.03	18.18	17.63	18.00	17.63	18.15	262	326	253					
67	74	110	110	N/A	N/A	19.20	7.7	360	19.21	5.6	360	19.15	19.18	19.15	19.17	18.75	18.81	18.02	18.02	18.01	17.99	17.63	17.90	17.63	17.98	191	249	194					
68	61	110	110	N/A	N/A	19.19	7.7	360	19.21	5.6	360	19.22	19.20	19.19	19.20	18.59	18.71	18.06	18.20	18.06	18.18	17.65	18.01	17.81	18.15	218	215	216					
62	64	110	110	N/A	N/A	19.22	7.5	112	19.23	5.6	360	19.22	19.20	19.19	19.20	18.59	18.71	18.06	18.20	18.06	18.18	17.65	18.01	17.81	18.15	218	215	216					
AGE BATTERIES																																	
113	100	102	102	16.20	16.75	19.24	7.7	360	19.23	5.6	360	18.60	18.70	18.90	18.85	19.00	19.00	18.10	18.15	18.00	18.05	17.40	17.82	17.53	17.88	119	155	123					
81	68	100	100	N/A	N/A	19.60	7.8	360	19.54	5.7	360	18.78	19.10	19.46	19.41	19.92	19.00	18.22	18.30	18.15	18.22	17.60	17.90	17.79	18.25	100	104	98					
90	92	101	101	N/A	N/A	19.23	7.75	360	19.23	5.6	360	18.43	18.28	19.10	19.06	18.45	18.57	17.97	18.05	17.93	18.02	17.51	17.60	17.64	17.98	132	100	124					
110	110	100	100	16.90	16.90	19.23	7.75	360	19.25	5.6	360	17.35	17.60	18.85	18.93	18.45	18.54	17.94	17.98	17.90	17.95	17.45	17.60	17.60	17.72	150	170	141					
85	80	100	100	N/A	N/A	19.24	7.5	160	19.45	5.6	360	18.43	18.20	19.21	19.21	18.63	18.13	18.05	18.30	18.01	18.22	17.50	17.90	17.73	18.05	117	154	119					
100	101	100	100	16.95	16.95	19.20	7.7	360	19.20	5.6	360	17.85	18.85	19.00	18.65	18.64	18.65	18.09	18.21	18.01	18.09	17.43	17.85	17.63	17.95	111	151	118					
89	92	100	100	N/A	N/A	19.23	7.7	360	19.23	5.6	360	18.60	18.50	19.12	19.09	18.41	18.65	18.09	18.20	18.05	18.15	17.57	17.93	17.76	18.00	102	102	102					
AGE BATTERIES																																	
113	125	96	96	16.33	15.58	19.49	7.4	360	19.11	7.4	360	18.6	18.85	18.92	17.7	18.22	18.95	18.10	18.15	17.98	17.90	17.43	17.89	17.41	17.8	125	110						
100	112	100	100	16.85	16.31	19.49	7.4	360	19.11	7.4	360	18.25	18.40	18.99	17.71	18.45	18.25	18.10	17.90	18.02	17.48	17.88	17.43	17.81	121	137							
107	128	102	101	15.05	15.61	19.45	7.4	360	19.11	7.4	360	18.25	18.20	18.25	16.61	17.92	18.57	18.25	18.10	18.13	17.95	17.32	17.77	17.35	17.73	120	107						
107	126	101	100	15.24	15.65	19.31	7.4	360	19.27	7.4	360	18.25	18.25	18.80	17.83	18.61	18.61	18.05	18.00	17.95	17.91	17.57	17.79	17.41	17.79	119	110						
AGE BATTERIES																																	
ED BY TAKING 1/2 OF THE NEGATIVE CAPACITY TO MAKE THE DATA COMPARABLE WITH THE POSITIVE CAPACITY. NINE (9) IS APPROXIMATELY THE NEGATIVE CAPACITY IS APPROXIMATELY THE POSITIVE REACTION RATE IN AMPERES.																																	
IVE SECTIONS ALL NOW DISCHARGE AT THE SAME RATE ELIMINATING THE NEED FOR CHANGE.																																	
AGE BATTERIES																																	
108	111	95	94	16.45	16.32	19.58	7.5	360	19.00	7.5	360	18.05	18.70	18.25	18.50	18.85	18.85	18.10	18.08	18.02	18.00	17.40	17.80	17.45	17.85	114	100						
107	100	100	100	16.51	16.82	19.16	7.5	360	19.25	7.5	360	17.02	17.41	18.00	18.85	18.29	18.39	17.95	17.95	17.92	17.90	17.48	17.88	17.46	17.85	145	172						
AGE BATTERIES																																	
104	95	92	90	16.37	16.50	19.63	7.7	360	19.67	7.8	360	17.85	17.48	18.82	18.86	19.82	19.80	18.10	18.15	17.98	17.97	17.41	17.84	17.46	17.81	112	116						
125	113	95	93	15.35	16.05	19.16	7.7	360	18.97	7.6	360	15.32	16.63	17.80	18.20	18.60	17.38	17.95	17.87	17.90	17.63	17.45	17.87	17.42	17.84	136	135						
AGE BATTERIES																																	
49	92	92	91	16.30	17.10	19.45	7.8	360	19.50	7.75	360	17.66	18.05	18.81	18.41	18.31	19.00	18.18	18.18	18.06	18.06	17.43	17.86	17.42	17.85	94	89						
110	90	90	90	16.12	17.35	19.14	7.8	360	19.60	7.75	360	16.61	18.16	18.45	18.45	19.00	18.88	18.10	18.18	17.92	18.02	17.44	17.88	17.48	17.90	97	89						
AGE BATTERIES																																	
97	87	96	96	16.65	17.10	19.28	7.8	360	19.12	8.3	360	17.80	18.10	18.95	18.95	18.63	18.61	18.03	18.08	17.98	18.00	17.47	17.87	17.54	17.91	132	140						
AGE BATTERIES																																	
81	74	95	95	17.15	17.6	19.56	5.5	370	19.50	5.5	370	18.55	18.18	19.77	19.05	17.10	19.12	18.34	18.32	18.30	18.18	17.60	17.93	17.53	17.90	123	113						
AGE BATTERIES																																	
90	80	100	102	17.4	18.0	19.55	5.5	370	19.60	5.4	370	17.90	18.33	19.00	19.20	17.18	19.30	18.70	18.79	18.21	18.29	17.60	17.92	17.63	17.98	109	131						
AGE BATTERIES																																	
83	68	102	104	17.82	18.1	19.68	5.6	360	19.62	5.6	360	18.4	18.6	19.28	19.31	19.08	17.10	18.35	18.43	18.25	18.3	17.66	17.97	17.71	18.01	110	118						
AGE BATTERIES																																	
82	85	95	95	16.95	17.12	19.35	5.7	360	19.20	5.4	360	17.41	17.66	18.6	18.65	18.72	18.82	18.09	18.12	17.92	17.92	17.53	17.89	17.51	17.88	137	141						
AGE BATTERIES																																	
92	83	103	105	17.32	17.60	19.66	5.7	370	19.54	5.7	370	17.62	18.21	19.19	19.10	19.28	19.22	18.42	18.26	18.37	18.30	17.60	17.97	17.62	17.98	120	110						
81	63	103	105	18.18	18.18	19.19	5.5	370	19.25	5.6	370	18.76	18.82	19.05	19.13	18.70	18.67	18.12	18.13	18.08	18.07	17.66	17.99	17.63	17.97	240	203						

2

BA 494/U Batteries, Lot 19, manufactured under Contract No. DAAB07-67-C-0313  
 $\bar{X}$  TRENDS FOR BATTERIES STORED AND TESTED AT 110°F



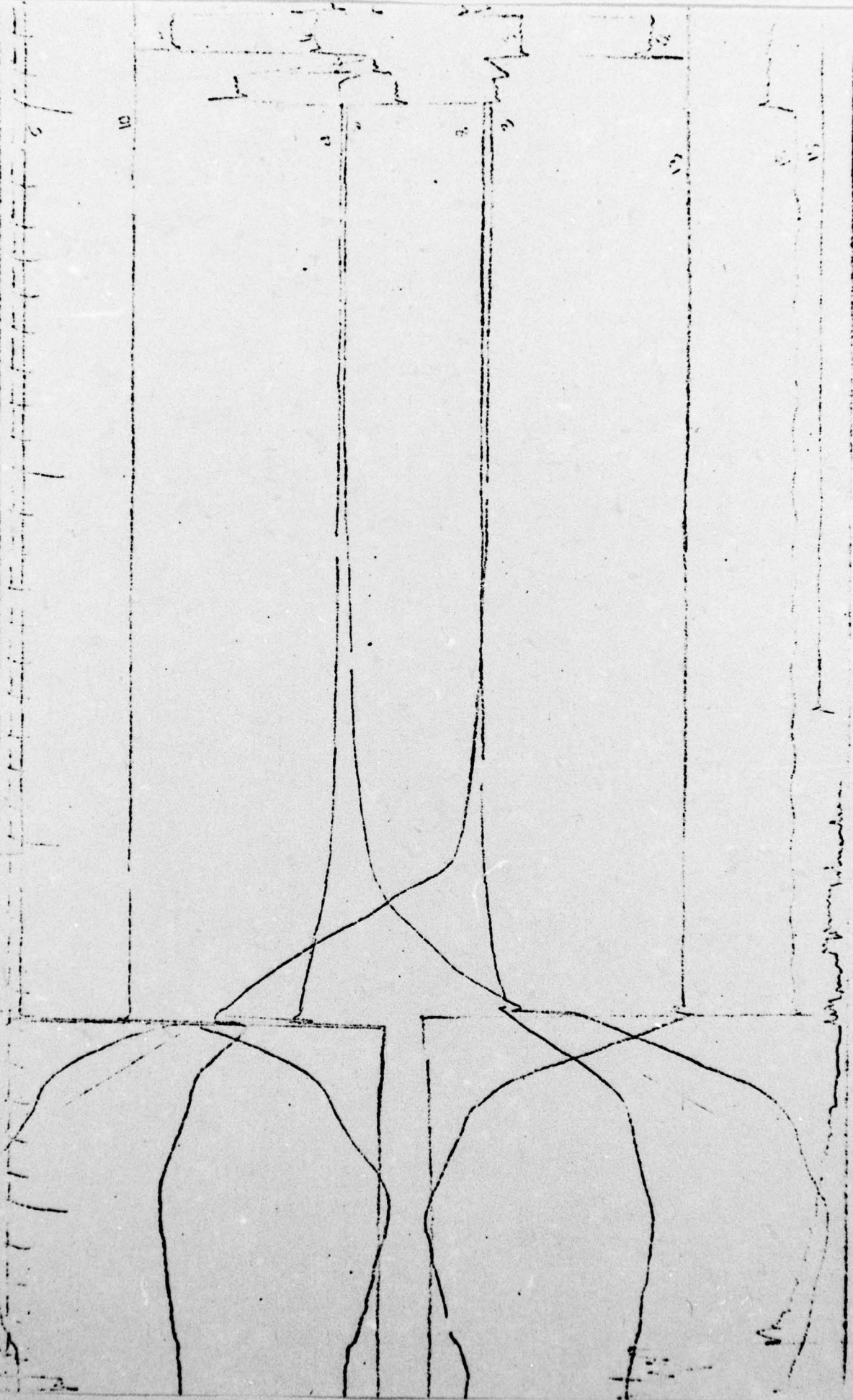
Battery Type BA 494/J  
 Type Test BENCH  
 Time Fired 1050  
 Position LAUNCH  
 First Volt Ind. + 10 ms  
 Rise Time (16.63) + 92 ms  
 Max. Volts + 19.66  
 Time to Max. V. + 370 ms  
 Life to 16.63V + 120 seconds  
 Ground Power Off + 103 ms

Specimen No. 9 YEAR 110°F STORAGE  
 Lot. No. 19  
 S/N 00516E0867  
 Date 1 NOVEMBER 1976  
 Temp. 110°F  
 First Volt In. - 7 ms  
 Rise Time (16.63) - 83 ms  
 Max. Volts - 19.55  
 Time to Max. V - 370 ms  
 Life to 16.63 V - 110 seconds  
 Ground Power off - 105 ms

POSITIVE SECTION				
Time	Min. Volts	Max. Volts	Min. Amps	Max. Amps
105 ms		17.36	10.8	
150 ms		19.19	12.0	
350 ms		19.30	12.3	
370 ms	19.18	19.66	5.7	11.9
2 sec.	18.78	19.28	5.6	17.6
4 sec.	18.31	18.81	5.45	17.2
9.8 sec.	17.83	18.31	5.3	16.7
10 sec.	17.91	18.27	6.4	14.2
30 sec.	17.6	17.97	6.35	13.9
50 sec.	17.55	17.90	6.2	13.8
57 sec.	17.54	17.90	6.2	13.8
100 sec.	17.3	17.64	6.1	13.7
110 sec.	17.1	17.47	6.0	13.5
<del>150 sec.</del>				
120 sec.	16.63	17.02	5.9	13.0
200 sec.				
250 sec.				
300 sec.				
350 sec.				

NEGATIVE SECTION			
Min. Volts	Max. Volts	Min. Amps	Max. Amps
	17.90	11.2	
	19.10	12.1	
	19.41	12.2	
19.10	19.55	5.7	12.1
18.73	19.22	5.6	11.8
18.26	18.80	5.45	17.4
17.72	18.26	5.3	16.8
17.86	18.20	6.4	14.1
17.62	17.98	6.3	14.0
17.57	17.92	6.25	13.9
17.55	17.90	6.3	13.9
17.05	17.41	6.1	13.5
16.63	17.00	5.9	13.0

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S/N 0051650 887  
61 LOT  
N/S

Specimen No. 9 YEAR RT STORAGE

Battery Type BA 494/U

Lot. No. 19 EXTRA

Type Test BENCH

S/N 566 9/67

Time Fired \_\_\_\_\_

Date 1 NOVEMBER

Position LAUNCH

Temp. Test: 110°F

First Volt Ind. + 13 ms

First Volt In. - 13 ms

Rise Time (16.63) + 81 ms

Rise Time (16.63) - 63 ms

Max. Volts + 19.19

Max. Volts - 19.25

Time to Max. V. + 370 ms

Time to Max. V - 370 ms

Life to 16.63V + 240

Life to 16.63 V - 203 sec.

Ground Power Off + 103 ms

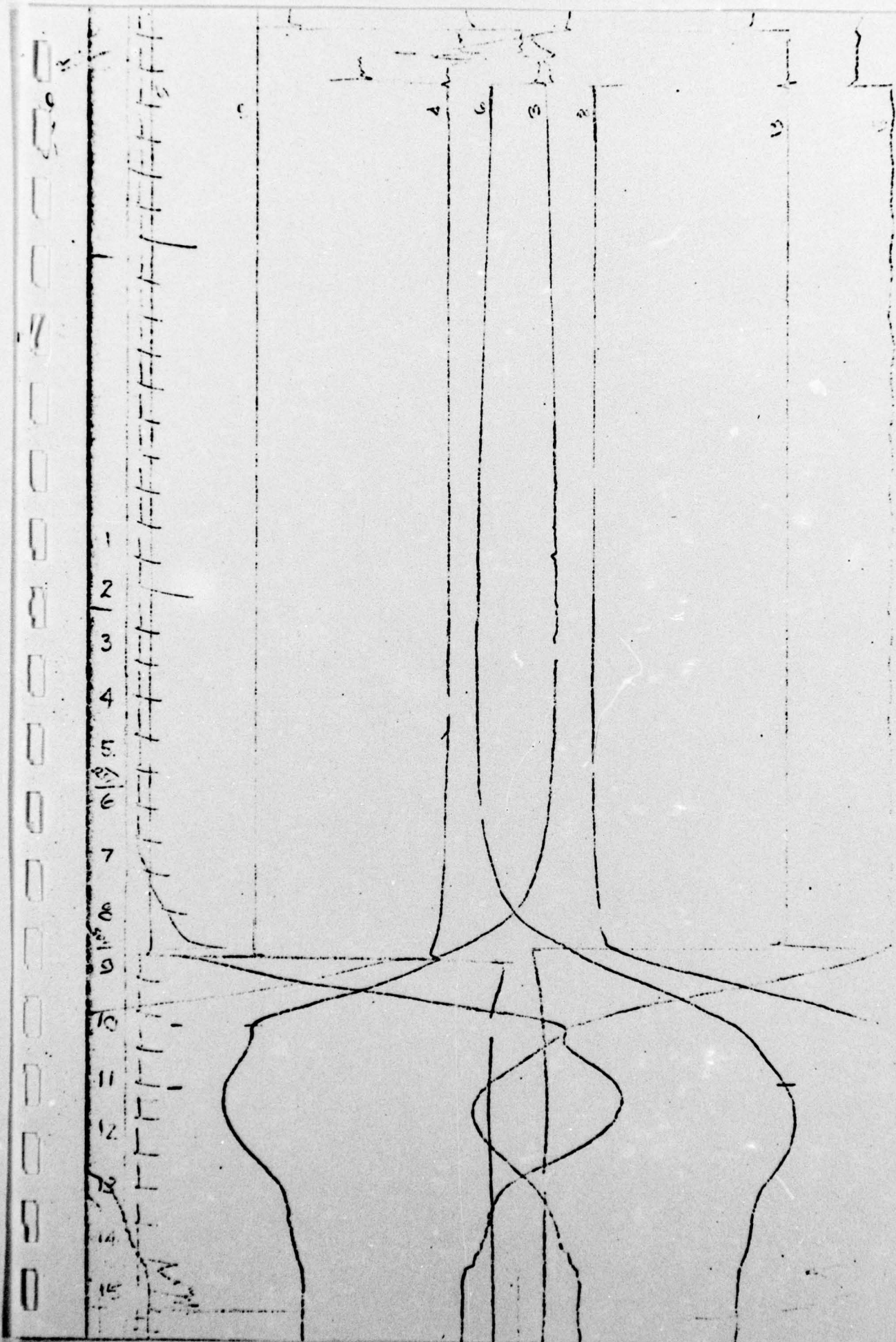
Ground Power off - 105 ms

Reverse Current + 4.2 A

Reverse Current - 1.8 A

POSITIVE SECTION				
Time	Min. Volts	Max. Volts	Min. Amps	Max. Amps
105 ms		18.27	11.5	
150 ms		19.05	12.0	
350 ms		19.00	12.0	
370 ms		19.19	5.55	
2 sec.	18.02	18.46	5.3	16.9
4 sec.	17.75	18.20	5.25	16.8
9.8 sec.	17.65	18.11	5.2	16.6
10 sec.	17.77	18.08	6.4	14.0
30 sec.	17.66	17.99	6.25	14.0
50 sec.	17.64	17.98	6.25	14.0
57 sec.	17.66	17.95	6.25	14.0
100 sec.	17.69	18.0	6.25	14.0
150 sec.	17.64	17.94	6.25	14.0
200 sec.	17.41	17.72	6.2	13.8
203 sec.	17.40	17.70	6.15	13.7
<del>240</del> 250 sec.	16.625	18.93	5.85	13.1
300 sec.				
350 sec.				

NEGATIVE SECTION			
Min. Volts	Max. Volts	Min. Amps	Max. Amps
	18.41	11.5	
	19.13	12.0	
	19.06	12.1	
	19.25	5.6	
18.06	18.57	5.4	17.2
18.00	18.30	5.3	17.0
17.61	18.11	5.3	16.8
17.72	18.07	6.4	13.7
17.63	17.99	6.3	14.0
17.64	18.0	6.25	14.0
17.6	18.0	6.25	14.0
17.68	18.01	6.3	14.0
17.6	17.90	6.3	14.0
16.69	17.00	5.9	13.1
16.625	16.71	5.85	13.0



S/N 00566E0372  
LOT 19