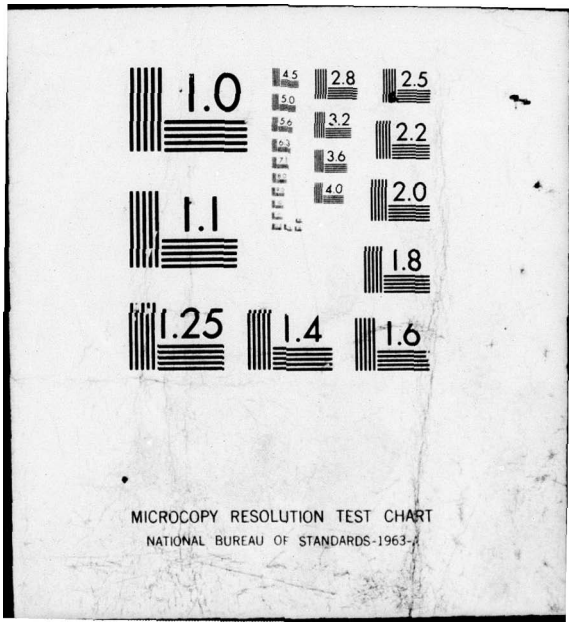
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MANCP REPORT NR 370(77)
MMWRM PROJECT M72632-5MP116P

PROPELLANT SURVEILLANCE REPORT
LGM-30 F & G STAGE I (TP-H1011)

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ABSTRACT

This report contains propellant test results from cartons of TP-H1011 bulk propellant representing LGM-30 F and G First Stage Minuteman Motors. This report uses a statistical approach to analyze the bulk carton propellant data. Testing was accomplished in accordance with MMWRM Project M72632-5MP116P.

The data from this test period are combined with data from previous testing and entered into the G085 computer for storage, analysis and regression analysis. From the statistical analysis of all data tested to date (twelve years for F and G), significant degradation of the propellant does not appear likely for at least two years past the oldest data point.

Each point on the regression plot represents the mean of all samples at that particular age. The number of samples at each point is indicated on the sample size summary sheet on the page accompanying each regression plot or group of regression plots. The data range at any age can be found by suitable inquiry of the G085 system.

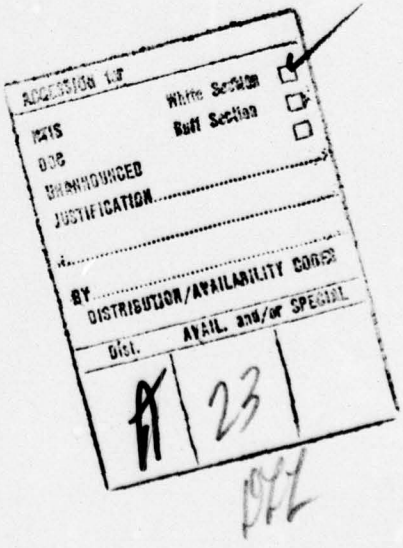


TABLE OF CONTENTS

	Page
Abstract	ii
List of Figures	iv
List of References	ix
Glossary of Terms and Abbreviations	xiii
Introduction	1
Table 1 - Test Program	3
Statistical Approach	4
Test Results	7
Conclusions	11
Distribution List	116
DD 1473	117

LIST OF FIGURES

Figure Nr		Page
	Regression Plot, Very Low Rate Tensile	
1	Strain at Maximum Stress	13
2	Maximum Stress	14
3	Strain at Rupture	15
4	Stress at Rupture	17
5	Modulus	19
	Regression Plot, Low Rate Biaxial Tensile	
6	Strain at Maximum Stress	21
7	Maximum Stress	22
8	Strain at Rupture	23
9	Stress at Rupture	24
10	Modulus	25
	Regression Plot, Low Rate Tensile	
11	Strain at Maximum Stress	27
12	Maximum Stress	28
13	Strain at Rupture	29
14	Stress at Rupture	30
15	Modulus	31
	Regression Plot, High Rate Triaxial Tensile	
16	Strain at Maximum Stress	33
17	Maximum Stress	34
18	Strain at Rupture	35

LIST OF FIGURES (cont)

Figure Nr		Page
19	Stress at Rupture	34
20	Modulus	37
	Regression Plot, High Rate Hydrostatic Tensile	
21	Strain at Maximum Stress	39
22	Maximum Stress	40
23	Strain at Rupture	41
24	Stress at Rupture	42
25	Modulus	43
	Regression Plot, Stress Relaxation .5% Strain, -65°F	
26	Modulus at 10 sec	45
27	Modulus at 50 sec	46
28	Modulus at 100 sec	47
29	Modulus at 1000 sec	48
	Regression Plot, Stress Relaxation .5% Strain, -40°F	
30	Modulus at 10 sec	50
31	Modulus at 50 sec	51
32	Modulus at 100 sec	52
33	Modulus at 1000 sec	53
	Regression Plot, Stress Relaxation 3% Strain, 20°F	
34	Modulus at 10 sec	55
35	Modulus at 50 sec	56

LIST OF FIGURES (cont)

Figure Nr		Page
36	Modulus at 100 sec	57
37	Modulus at 1000 sec	58
	Regression Plot, Stress Relaxation 3% Strain, 77°F	
38	Modulus at 10 sec	60
39	Modulus at 50 sec	61
40	Modulus at 100 sec	62
41	Modulus at 1000 sec	63
	Regression Plot, Stress Relaxation 3% Strain, 100°F	
42	Modulus at 10 sec	65
43	Modulus at 50 sec	66
44	Modulus at 100 sec	67
45	Modulus at 1000 sec	68
	Regression Plot, Stress Relaxation 3% Strain, 140°F	
46	Modulus at 10 sec	70
47	Modulus at 50 sec	71
48	Modulus at 100 sec	72
49	Modulus at 1000 sec	73
	Regression Plot, Stress Relaxation 3% Strain, 180°F	
50	Modulus at 10 sec	75
51	Modulus at 50 sec	76
52	Modulus at 100 sec	77
53	Modulus at 1000 sec	78

LIST OF FIGURES (cont)

Figure Nr		Page
	Regression Plot, Sol Gel	
54	Percent Extractables	80
55	Gel Swell Ratio	81
56	Sol Gel Density	82
57	Cross Link Density	84
58	Regression Plot, Tear Energy	85
59	Regression Plot, Hardness	87
60	Regression Plot, Burning Rate	89
	Regression Plot, Pressure Time	
61	Maximum Pressure	91
62	Time to Maximum Pressure	92
63	Regression Plot, Ignitability	94
	Regression Plot, TCLE	
64	Thermal Coefficient of Linear Expansion Below tg	96
65	Thermal Coefficient of Linear Expansion Above tg	97
	Regression Plot, TGA, 9°C rise/min	
66	Ignition Temperature	99
67	Percent Weight Loss at Ignition	100
68	Percent Weight Loss at 250°C Hold	102
	Regression Plot, DTA, 12°C rise/min	
69	Endotherm	104
70	Exotherm 1	105

LIST OF FIGURES (cont)

Figure Nr		Page
71	Exotherm 2	107
72	Exotherm 3	109
73	Ignition Temperature	111
	Regression Plot, DSC	
74	Endotherm Peak Temperature	113
75	Exotherm 1 Peak Temperature	114
76	Exotherm 2 Peak Temperature	115

LIST OF REFERENCES

Report Nr	Title	Report Date
	LGM-30 First Stage, Wing I Test Reports	
29A	Test Report (Missile in silo)	13 Jan 64
29B	Zero Time Test Results	29 Jan 64
29C	Zero Time Test Results (Supplement 1)	30 Mar 64
29D	Zero Time Test Results (Aft Closure)	9 Jun 64
29E	Zero Time (Aft Closure Supplement 1)	24 Jun 64
29F	ATP Phase I Test Results	30 Mar 65
29G	ATP Phase I Test Results	19 Aug 65
29H	ATP Phase I Test Results	10 Sep 65
32A	Zero Time, Wings II-V Test Results	17 Mar 65
32B	Zero Time, Wings II-V Test Results (Aft Closure)	18 Mar 65
32C	ATP Phase I, Wings II-V Test Results	3 Nov 65
49	ATP Phase I, Wings II-V (First Group)	18 Mar 66
53	ATP Phase I, Wings II-V (Second Group)	22 Apr 66
55	ATP Phase I, Wings II-V (Third Group)	29 Apr 66
58	ATP Phase I, Wings II-V (Fourth Group)	6 May 66
61	ATP Phase I, Wings II-V (Fifth Group)	10 Jun 66
66	ATP Phase I, Wings II-V (Sixth Group)	22 Jul 66
76	ATP Phase II, Wing I Test Results	24 Jan 67
78	Zero Time, Wing VI Test Results	3 Feb 67
104	ATP Phase I, Wing VI (First Group	12 Oct 67
118	ATP Phase II, Wings II-V (First Group)	5 Mar 68

LIST OF REFERENCES (CONT)

Report Nr	Title	Report Date
126	ATP Phase II, Wings II-V (Second Group)	11 Apr 68
130	ATP Phase II, Wings II-V (Third Group)	3 May 68
162	ATP Phase I, Wing VI (Second Group)	30 Sep 69
176	ATP Phase II, Wing VI (First Group)	15 Apr 70
181	ATP Phase III, Wing I	7 May 70
185	ATP Phase I, Wing VI (Third Group)	22 Jun 70
195	ATP Phase III, Wings II-V (Retest)	29 Oct 70
223	Surveillance Report LGM-30 Stage I (TP-H1011)	Sep 71
239	Surveillance Report LGM-30 Stage I (TP-H1011 and TP-H1043)	Apr 72
258	Surveillance Report LGM-30 A & B Stage I (TP-H1011)	Nov 72
268	Surveillance Report LGM-30 A & B Stage I (TP-H1011)	May 73
271	Surveillance Report LGM-30 F & G Stage I Phase A Series II, (TP-H1011)	Jul 73
277	Surveillance Report LGM-30 F & G Stage I Phase A Series III, (TP-H1011)	Oct 73
280	Surveillance Report LGM-30 A & B Stage I (TP-H1011)	Nov 73
288	Propellant Surveillance Report LGM-30 A & B, Stage I, TP-H1043	Mar 74
290	Propellant Surveillance Report LGM-30 F & G, Stage I, Phase B, Series I TP-H1011	Mar 74
300	Minuteman Stage I Motor Reliability Improvement Program Surveillance	May 74

LIST OF REFERENCES (CONT)

Report Nr	Title	Report Date
302	Propellant Surveillance Report LGM-30 A & B Stage 1, TP-H1011	Nov 74
313	Stage 1 Propellant Surveillance Report, Propellant Containing Glacial Acrylic Acid	Oct 74
315	Propellant Surveillance Report LGM-30 F & G Stage 1, TP-H1011	Jan 75
316	Propellant Surveillance Report LGM-30 A & B Stage 1, TP-H1011	Feb 75
319	Propellant Surveillance Report LGM-30 Dissected Motors, Phase VI, TP-H1011	Apr 75
321	Propellant Surveillance Report LGM-30 F & G Stage 1, Phase B, Series II, TP-H1011	Apr 75
325	Propellant Surveillance Report LGM-30 A & B Stage 1, TP-H1011	Jun 75
328	Propellant Surveillance Report LGM-30 A & B Stage 1, TP-H1011	Sep 75
330	Propellant Surveillance Report LGM-30 F & G Stage 1, TP-H1011	Oct 75
335	Stage 1 Motor Reliability Improvement Program	Dec 75
337	Propellant Surveillance Report LGM-30 A & B, Stage 1, TP-H1043	Feb 76
339	Stage 1, New MAPO & ERL-510 Qualification	Mar 76
341	Propellant Surveillance Report LGM-30 Dissected Motors, Phase VII, TP-H1011	Mar 76

Report Nr	Title	Report Date
343	Propellant Surveillance Report LGM-30 A & B, Stage 1, TP-H1011	Jun 76
345	Propellant Surveillance Report LGM-30 F & G, Stage 1 Phase B, Series III, TP-H1011	Jun 76
350	Qualification of a New MAPO Source and ERL-510 Curing Agent for Minuteman, Stage 1, UF-2121 Liner	Sep 76
351	Propellant Surveillance Report LGM-30 A & B, Stage 1, TP-H1011	Sep 76
354	Minuteman Stage 1 Motor Reliability Improvement Program Surveillance	Sep 76
358	Propellant Surveillance Report LGM-30 Dissected Motors, Phase VIII, TP-H1011	Oct 76
360	Propellant Surveillance Report LGM-30 F & G, Stage 1 Phase E, Series III, TP-H1011	Nov 76
367	Propellant Surveillance Report LGM-30 A & B, Stage 1, TP-H1011	Apr 77

GLOSSARY OF TERMS AND ABBREVIATIONS

Aging Trend	A change in properties or performance resulting from aging of material or component
CSA	Cross Sectional Area
DB	Dogbone
Degradation	Gradual deterioration of properties or performance
E	Modulus (psi), defined as stress divided by strain along the initial linear portion of the curve.
EB	End Bonded
EGL	Effective Gage Length
em	Strain at maximum stress
er	Strain at rupture
"F" ratio	The ratio of the variance accounted for by the regression function to the random unexplained variance. The regression function having the most significant "F" ratio is used for plotting data. The ratio is also used in detecting significant changes in random variation between succeeding time points
JANNAF	Joint Army, Navy, NASA, Air Force
MANCP	Propellant Lab Section at Ogden Air Logistics Center
Ogden ALC	Ogden Air Logistics Center, Air Force Logistics Command
r or R	The Correlation Coefficient is a measure of the degree of closeness of the linear relationship between two variables
Regression Equation	The general form of the regression equation is $Y = a + bx$
Regression Line	Line representing mean test values with respect to time
S_b	Standard error of estimate of the regression coefficient

S_e or $S_{Y.X}$	Standard deviation of the data about the regression line
Sm	Maximum Stress
Sr	Stress at rupture
Standard Deviation (S_y)	Square root of variance
Strain Rate	Crosshead speed divided by the EGL
"t" test	A statistical test used to detect significant differences between a measured parameter and an expected value of the parameter (determines if regression slope differs from zero at the 95% confidence level)
Variance	The sum of squares of deviations of the test results from the mean of the series after division by one less than the total number of test results
3 Sigma Band	The area between the upper and lower 3 sigma limit. It can be expected that 99.73% of the inventory represented by the test samples would fall within this range assuming that the population is normally distributed.
90-90 Band	It can be stated with 90% confidence that 90% of the inventory represented by the test samples would fall within this range assuming that the population is normally distributed

INTRODUCTION

A. PURPOSE:

Laboratory testing has been performed for twelve years on First Stage LGM-30 F and G Minuteman Motor propellant blocks to evaluate the effects of aging on TP-H1011 propellant. This report contains those tests conducted on propellant as instructed in MMEMP Test Directive GTD-1C, Amendment 2, LGM-30 First Stage Operational Propellant Laboratory Testing.

Statistical analysis of the data from tests performed will provide early warning if serious degradation trends develop. Annual evaluation of the propellant provides data for input into engineering reliability analysis for service life predictions.

B. BACKGROUND:

LGM-30 F and G testing was started in 1966 with phase testing at 24 month intervals (Report Numbers 78 - zero time; 104, 162, 185-Phase I, 176, 239, 257-Phase I, 271-Phase III). Report Number 257 was the first time that LGM-30 F and G data were statistically analyzed separately from LGM-30A and B data. The present report is a continuation of testing and statistical analysis.

Zero time testing for LGM-30A, B, F and G was started as soon as possible after receipt of the propellant by MANCP. Data from these tests were used to establish a base line for each test parameter.

The LGM-30F and G propellant test matrix (Table 1) is used to determine the number of specimens to be taken from each propellant loaf and the specific test or tests to which these specimens are to be subjected. Very low rate and low rate tensile specimens are taken on all LGM-30F and G blocks. Specimens for other physical and combustion tests are taken from every third (LGM-30F and G) block.

TABLE 1

SAMPLE PLAN

The Procedure for determining tests to be performed on propellant batch samples of LGM-30 F & G First Stage Motors are as follows:

1. Divide the USAF motor serial numbers into three groups by dividing the last three digits of each serial number by three to determine the remainder integer, e.g., 154 ÷ 3 = 51 with a remainder integer of 1.

2. Use the remainder integer to enter the following matrix to determine the group of tests to be performed on the forward, middle, and aft batch samples associated with a particular motor serial number.

GROUP MATRIX

TP-H1011 PROPELLANT BATCH SAMPLE	GROUP I	GROUP II	GROUP III
Forward	1	2	0
Middle	0	1	2
Aft	2	0	1

Each group will receive the following tests:

TEST MATRIX

GROUP I	GROUP II	GROUP III
High Rate Triaxial	Dynamic Response	High Rate Hydrostatic
Creep	Stress Relaxation	Sol Gel
Biaxial Low Rate	Burning Rate	DSC
TCLE	Heat of Explosion	TGA
Hardness	Pressure Time	DTA
Ignitability		Impact

NOTE: Low Rate and Very Low Rate Tensile tests are performed on all blocks.

STATISTICAL APPROACH

In order to determine aging trends for shelf/service life predictions, as directed by Service Engineering, First Stage LGM-30 F and G Minuteman TP-H1011 propellant blocks have been under-going testing since 1966, statistically analyzed and reported on a regular test cycle by this laboratory.

The primary reason for performing statistical analysis on test data is for the detection of propellant changes due to aging that would affect motor reliability. The method of analysis called regression was used to examine data and to draw meaningful conclusions about dependency relationships that may exist i.e., relationship between age versus test results.

In selecting the best fit model for the regression equation, six models were fitted to the data (see regression models at the end of this statistical approach). The linear model $Y = a + bX$ was found to be the best fit model for 96% of the regression plots. The model used is shown in the regression equation at the top of every regression plot and those which are not linear will also be listed and discussed in the test results section.

Individual data points from different time periods were used to establish a least squares trend line for the data. The variance about the regression line, obtained using individual values of the dependent variable, was used to compute a tolerance interval such that at the 90% confidence level 90% of the sample distribution falls within this interval. This tolerance interval was extrapolated to a maximum of 24 months into the future from age of the oldest motor tested. The 't' values and the

significance of this statistic, which are reported for each regression model, give an indication of the "statistical significance" of the slope of the trend line as compared to a line of zero slope. Data were plotted by computer. The 'y' axis is computed so that the values at one inch intervals are peculiar to the data spread of the parameter tested. Plotted data points represent means at the particular ages at which testing occurred. The number of specimens at each age point is indicated on the sample size summary sheet accompanying the regression plot. Variance at each test age can be determined by consulting the G085 data storage system.

A comparison of the slopes of the regression trend lines and their Y - axis intercepts found in the regression equation was performed. Of the tests common to this test period and the last test performed (MANCP Report Nr 360 (76)), the following observations were made: 23.68% of the aging trend lines have become flatter or closer to a line of zero slope which indicates less change due to age; 63.16% of the aging trend lines show more change although the changes are gradual and no operational problems are expected at this time; and 13.16% of the aging trend lines show no change from the last test period.

A post cure effect (propellant stabilizing after the first year or two) has been observed on some of the early test data (stress relaxation at -65°F, -40°F, and 20°F; TGA percent weight loss at 250°C; DTA exotherm 1, and exotherm 2); which tended to bias and skew the projected trend lines. To overcome this factor, two methods of analysis were performed: First, where possible, non-linear models were used that would best fit the total data (TGA % weight loss at 250°C, DTA exotherm 1 and exotherm 2 data); second, where non-

linear models did not fit the data, this early data was eliminated (Stress Relaxation at -60°F, -40°F, and 20°F data). By compensating for this post cure biasing a more accurate aging trend line for service life prediction is provided.

REGRESSION MODELS

Reciprocal of X	$Y = a + b\ (1/X)$
Natural log of X	$Y = a + b\ (\text{LN } X)$
LOG to the base 10 of X	$Y = a + b\ (\text{LOG } X)$
Square Root of X	$Y = a + b\ \sqrt[2]{X}$
Cube Root of X	$Y = a + b\ \sqrt[3]{X}$
Linear equation	$Y = a + bX$

TEST RESULTS

VERY LOW RATE TENSILE (0.002 in/in/min):

The very low rate tensile data shows a statistically significant decrease for strains and an increase for stresses and modulus. The trends are gradual for the respective regressions and no problems are indicated for at least two years after the last test date (Figures 1 thru 5).

LOW RATE BIAXIAL TENSILE:

A statistically significant gradual decrease is shown for strains and a statistically significant gradual increase is shown for stresses and modulus (Figures 6 thru 10).

LOW RATE TENSILE:

Low rate tensile data shows a statistically significant gradual decrease for strains and a statistically significant increase for stresses and modulus (Figures 11 thru 15).

HIGH RATE TRIAXIAL TENSILE:

The strains, stresses and modulus show a statistically significant gradual decrease (Figures 16 thru 20).

HIGH RATE HYDROSTATIC TENSILE:

The strains show a statistically significant gradual decrease with the stresses and modulus showing a statistically significant gradual increase (Figures 21 thru 25).

TENSILE SUMMARY:

The test data shows that the strain is gradually decreasing and stress and modulus is gradually increasing, except for the high rate triaxial test data which shows a gradual decrease for stress and modulus.

Therefore, based on the analysis of the data from the tensile test parameters, it does not appear that meaningful degradation is occurring at this time and no operational problems are expected for at least two years beyond the last data point.

STRESS RELAXATION MODULUS:

For the 0.5% strains at -65°F, a statistically significant gradual increase is shown (figures 26 thu 29). There is no significant trend for the 0.5% strain at -40°F except for the 1000 second regression which shows a statistically significant gradual decrease (Figures 30 thru 33).

For the 3% strain at 20°F, 77°F, 100°F, 140°F and 180°F, a statistically significant gradual increase is shown except for 20°F at 10, 50 and 100 seconds which is not changing significantly (Figures 34 thru 53).

SOL GEL:

The percent extractables do not show a statistically significant change. A statistically significant increase is shown for the gel swell ratio, sol gel density and crosslink density (Figures 54 thru 57).

TEAR ENERGY:

No significant change is shown in the regression (Figure 58).

HARDNESS:

Shore A ten second hardness data shows a statistically significant gradual increase (Figure 59).

SUMMARY OF TENSILE, HARDNESS & SOL GEL TESTING:

The tensile, hardness, stress relaxation and sol gel testing data correlate well. The regressions show a gradual decrease in strains and a gradual increase in stresses, hardness and crosslink density. The statistically significant changes are gradual and no operational problems are expected for at least two years beyond the last test data date.

BURNING RATE:

The burning rate shows a statistically significant gradual decrease. (Figure 60).

PRESSURE TIME:

Maximum pressure shows a statistically significant gradual decrease and the time to maximum pressure is not changing significantly (Figures 61 and 62).

IGNITABILITY:

Ignitability shows a statistically significant gradual increase in the time required for ignition (Figure 63).

TCLE:

The thermal coefficient of linear expansion for both below and

above the glass transition point (Tg) shows a statistically significant gradual increase (Figures 64 and 65).

TGA:

A statistically significant increase is shown for the ignition temperature (9°C rise/min) and the percent weight loss at 250°C hold (12°C rise/min to hold) with the weight loss at ignition (9°C rise/min) showing no significant change (Figures 66 thru 68). For percent weight loss at 250°C hold, Model $\frac{1}{X}$ was found to better represent the data than the linear model.

DTA:

The endotherm, first exotherm and second exotherm show a statistically significant decrease. For exotherm 1 and 2, the Model log X was found to be a better representative of the data than the linear model. The third exotherm and ignition temperatures show a statistically significant increase (Figures 69 thru 73).

DSC:

A statistically significant decrease is seen in all regressions (Figures 74 thru 76).

CONCLUSIONS

Twelve years of aging at ambient temperature (77°F) has not greatly changed the properties of the propellant. Some test parameters indicate slight aging trends, but nothing that would adversely affect the operational characteristics of the rocket motor propellant.

From the statistical analysis, it does not appear that significant propellant degradation is occurring. Based on the twelve years of accumulated data, there is no reason to suspect that properties will show much change for at least two years past the last data point. Therefore, propellant reliability should not change appreciably over that time period. Since failure limits are not available for the parameters tested, this statement is based on the fact that the slope of the regression curves where statistically significant are, with few exceptions, relatively flat or close to a line of zero slope and have not changed appreciably from the last test period.

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
2.0	1	33.0	134	58.0	325	83.0	60	108.0	63
9.0	10	34.0	148	59.0	287	84.0	26	109.0	96
10.0	5	35.0	107	60.0	382	85.0	30	110.0	42
11.0	15	36.0	219	61.0	242	86.0	62	111.0	21
12.0	15	37.0	141	62.0	295	87.0	104	112.0	100
13.0	30	38.0	117	63.0	216	88.0	121	113.0	223
14.0	10	39.0	105	64.0	115	89.0	130	114.0	69
15.0	35	40.0	119	65.0	90	90.0	114	115.0	65
16.0	25	41.0	153	66.0	61	91.0	62	116.0	243
17.0	55	42.0	120	67.0	24	92.0	49	117.0	223
18.0	25	43.0	142	68.0	101	93.0	78	118.0	125
19.0	37	44.0	100	69.0	165	94.0	78	119.0	126
20.0	18	45.0	135	70.0	203	95.0	116	120.0	168
21.0	50	46.0	116	71.0	111	96.0	149	121.0	102
22.0	12	47.0	148	72.0	95	97.0	102	122.0	9
23.0	46	48.0	138	73.0	62	98.0	84	123.0	39
24.0	49	49.0	151	74.0	125	99.0	81	124.0	27
25.0	36	50.0	176	75.0	138	100.0	31	125.0	66
26.0	47	51.0	329	76.0	105	101.0	63	126.0	44
27.0	44	52.0	296	77.0	130	102.0	12	127.0	92
28.0	50	53.0	256	78.0	76	103.0	37	128.0	51
29.0	37	54.0	226	79.0	99	104.0	45	129.0	27
30.0	61	55.0	468	80.0	101	105.0	9	130.0	142
31.0	76	56.0	437	81.0	125	106.0	5	131.0	68
32.0	138	57.0	377	82.0	102	107.0	10	132.0	3
								134.0	54
								135.0	24
								136.0	6
								137.0	60
								138.0	234
								139.0	118
								140.0	27

WING 6.V.L.R.TENSILE.STRAIN AT MAX STRESS.CHS=0.002 IN/MIN TP-H1011

This sample size summary is applicable to figures 1 thru 3

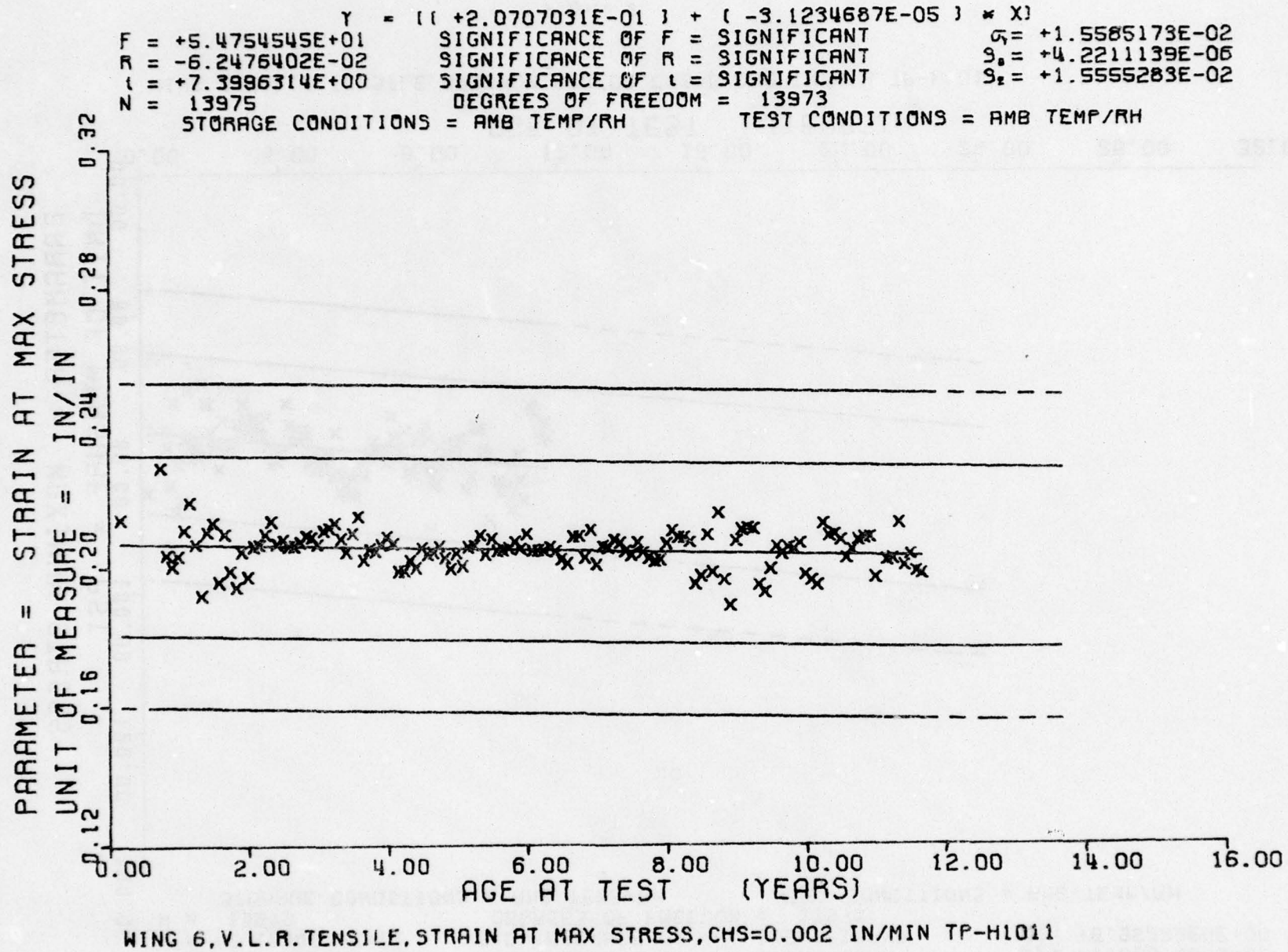

Y = [(+2.0707031E-01) + (-3.1234687E-05) * X]
F = +5.4754545E+01 SIGNIFICANCE OF F = SIGNIFICANT
R = -6.2476402E-02 SIGNIFICANCE OF R = SIGNIFICANT
t = +7.3986314E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 13975 DEGREES OF FREEDOM = 13973
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
σ = +1.5585173E-02
S0 = +4.2211139E-06
Sz = +1.5555283E-02
PARAMETER = STRAIN AT MAX STRESS
UNIT OF MEASURE = IN/IN
0.12
0.16
0.20
0.24
0.28
0.32
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,V.L.R.TENSILE,STRAIN AT MAX STRESS,CHS=0.002 IN/MIN TP-H1011

Figure 1

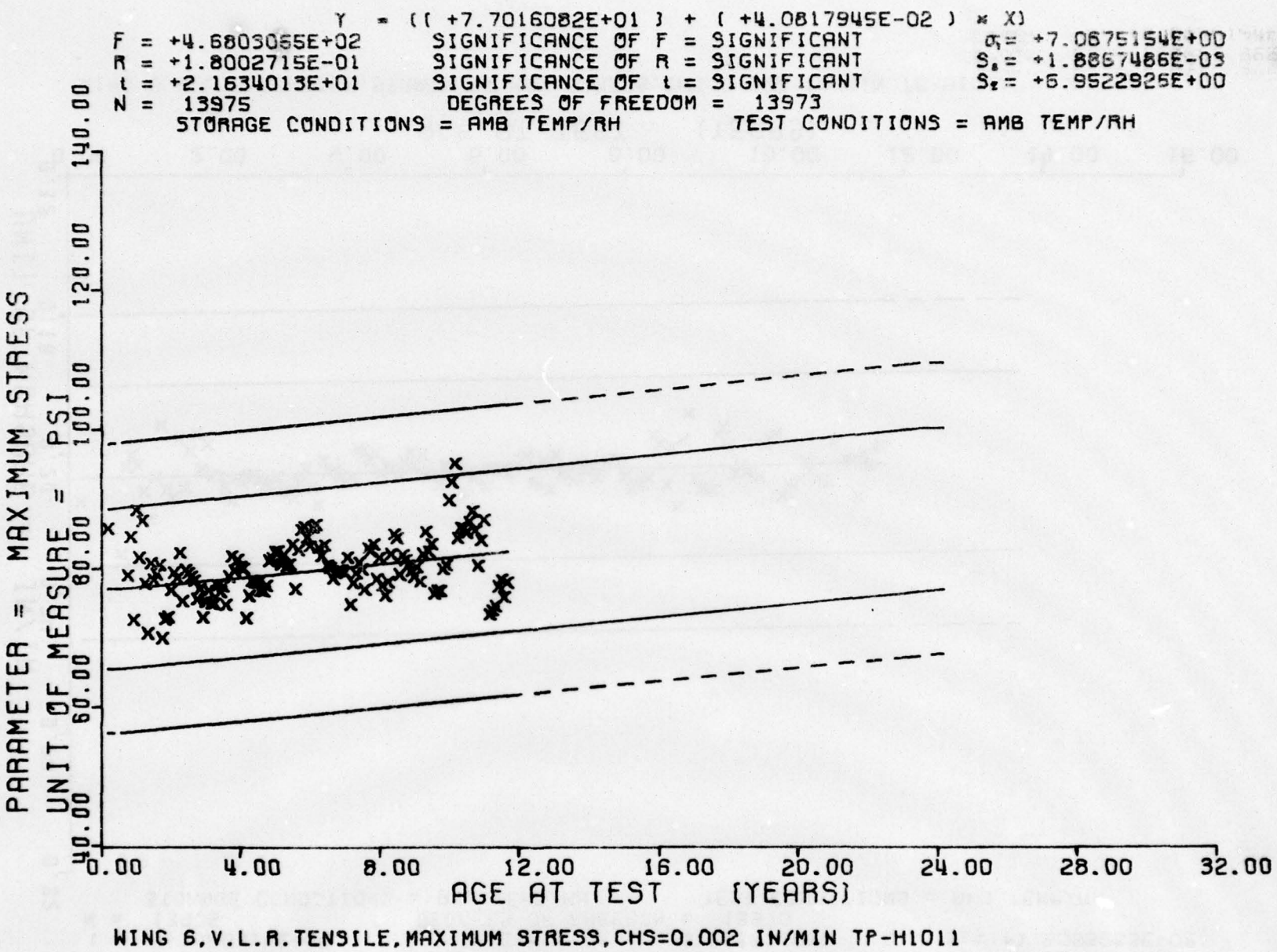

Y = ((+7.7016082E+01) + (+4.0817945E-02) * X)
F = +4.6803065E+02
R = +1.8002715E-01
t = +2.1634013E+01
N = 13975
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 13973
σ1 = +7.0675154E+00
Sa = +1.8867486E-03
Se = +6.9522926E+00
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
140.00
120.00
100.00
80.00
60.00
40.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
WING 6,V.L.R.TENSILE,MAXIMUM STRESS,CHS=0.002 IN/MIN TP-H1011

Figure 2

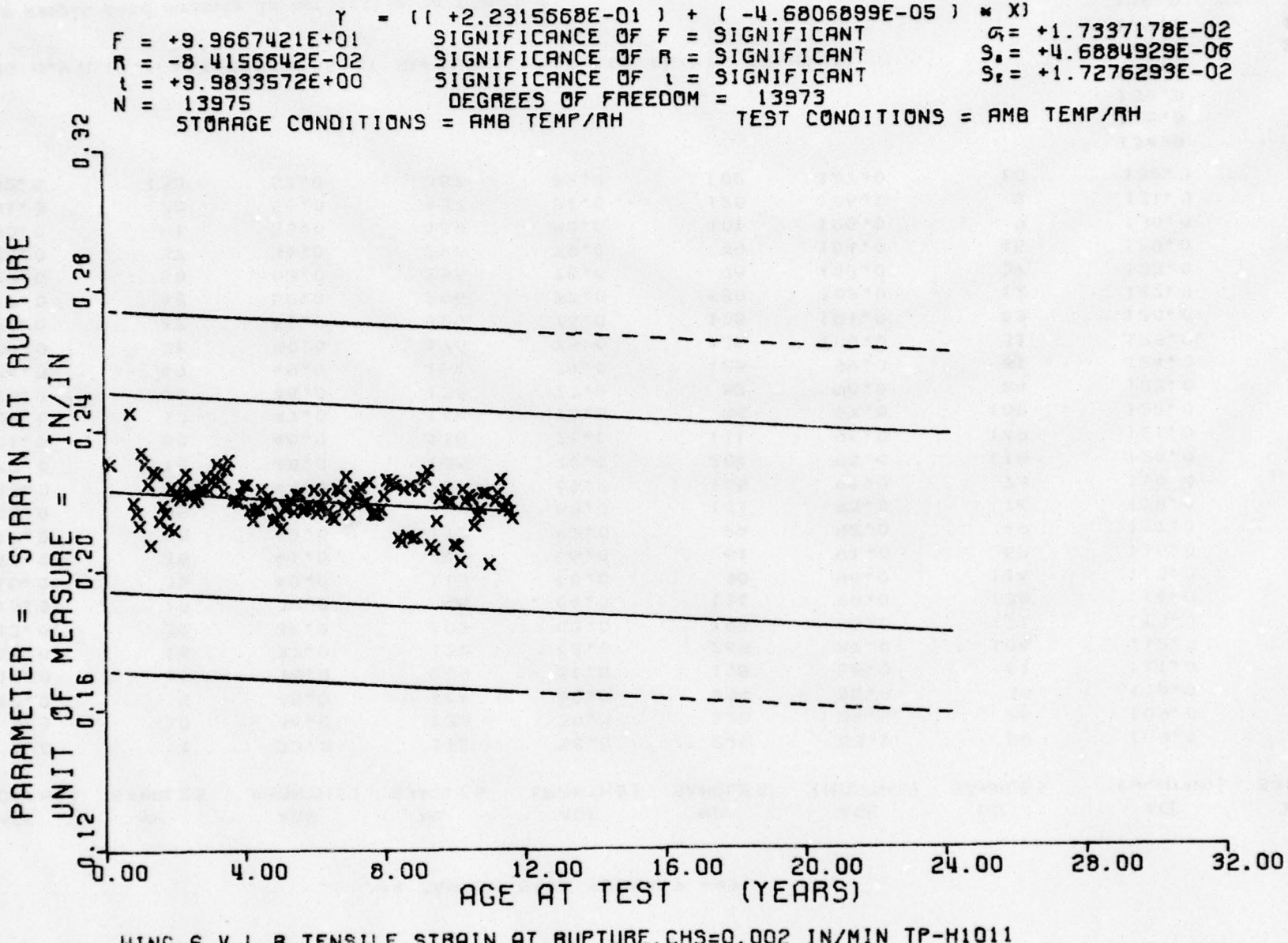

Y = ((+2.2315668E-01) + (-4.6806899E-05) * X)
F = +9.9667421E+01 SIGNIFICANCE OF F = SIGNIFICANT
R = -8.4156642E-02 SIGNIFICANCE OF R = SIGNIFICANT
t = +9.9833572E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 13975 DEGREES OF FREEDOM = 13973
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.12
0.16
0.20
0.24
0.28
0.32
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
WING 6,V.L.R.TENSILE,STRAIN AT RUPTURE,CHS=0.002 IN/MIN TP-H1011

Figure 3

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
2.0	1	33.0	122	58.0	249	83.0	60	108.0	63
9.0	10	34.0	133	59.0	220	84.0	26	109.0	96
10.0	5	35.0	104	60.0	294	85.0	30	110.0	42
11.0	15	36.0	209	61.0	198	86.0	61	111.0	21
12.0	15	37.0	132	62.0	265	87.0	104	112.0	100
13.0	30	38.0	102	63.0	193	88.0	121	113.0	223
14.0	10	39.0	96	64.0	111	89.0	130	114.0	70
15.0	35	40.0	113	65.0	90	90.0	114	115.0	65
16.0	25	41.0	146	66.0	61	91.0	62	116.0	243
17.0	55	42.0	112	67.0	24	92.0	49	117.0	223
18.0	25	43.0	120	68.0	101	93.0	78	118.0	125
19.0	37	44.0	97	69.0	165	94.0	78	119.0	126
20.0	18	45.0	135	70.0	204	95.0	116	120.0	168
21.0	50	46.0	116	71.0	111	96.0	149	121.0	102
22.0	12	47.0	148	72.0	95	97.0	102	122.0	9
23.0	46	48.0	138	73.0	62	98.0	84	123.0	39
24.0	49	49.0	151	74.0	125	99.0	81	124.0	27
25.0	36	50.0	176	75.0	138	100.0	31	125.0	66
26.0	47	51.0	329	76.0	105	101.0	63	126.0	44
27.0	44	52.0	296	77.0	130	102.0	12	127.0	92
28.0	50	53.0	256	78.0	76	103.0	37	128.0	51
29.0	37	54.0	226	79.0	99	104.0	45	129.0	27
30.0	61	55.0	468	80.0	101	105.0	9	130.0	142
31.0	70	56.0	437	81.0	125	106.0	5	131.0	68
32.0	133	57.0	367	82.0	102	107.0	10	132.0	3
								134.0	54
								135.0	24
								136.0	6
								137.0	60
								138.0	234
								139.0	118
								140.0	27

WING 6.V.L.R.TENSILE.STRESS AT RUPTURE.CHS=0.002 IN/MIN TP-H1011

This sample size summary is applicable to figure 4

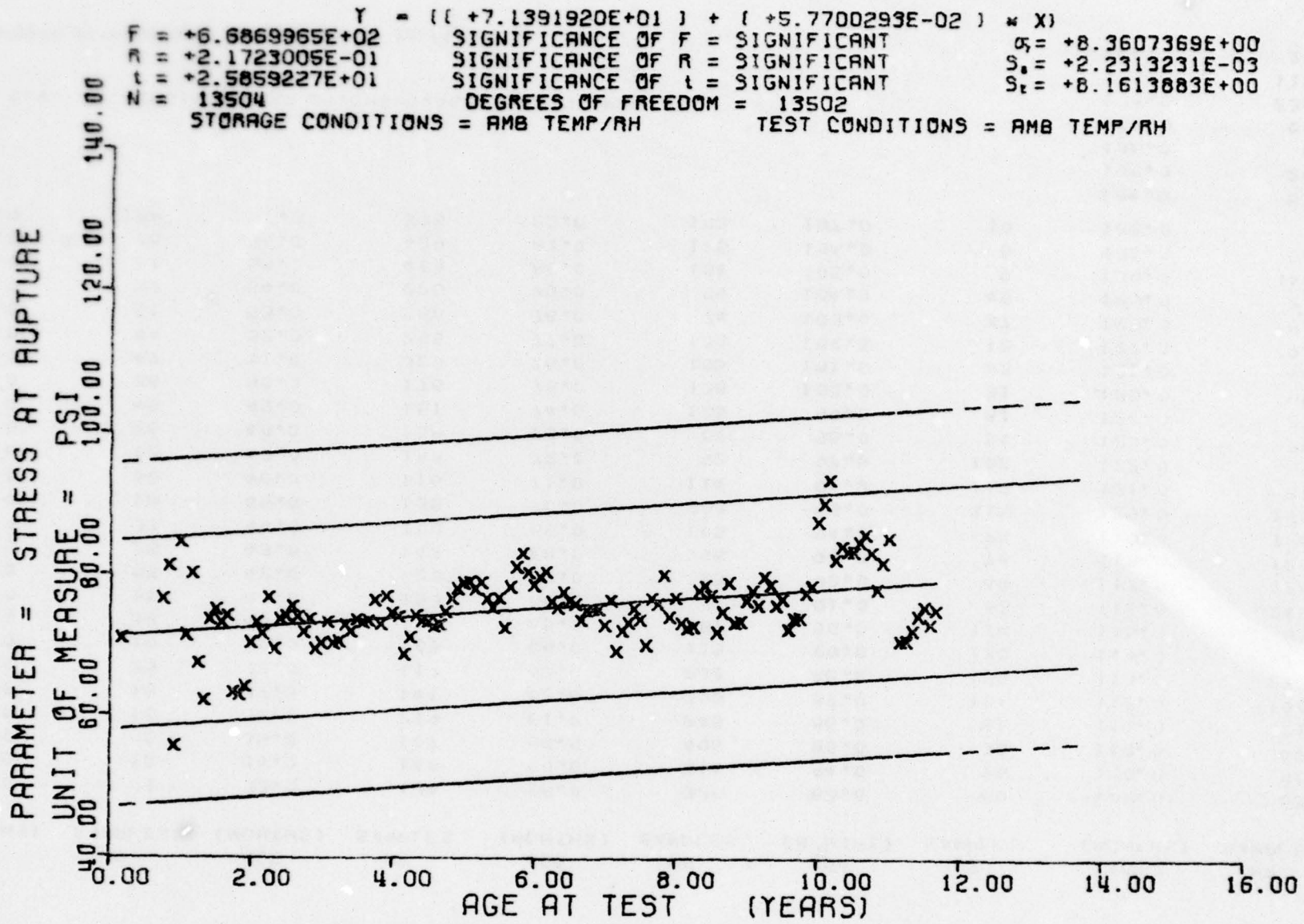

Y = ((+7.1391920E+01) + (+5.7700293E-02) * X)
F = +6.6869965E+02
R = +2.1723005E-01
t = +2.5859227E+01
N = 13504
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 13502
σ = +8.3607369E+00
S = +2.2313231E-03
S = +8.1613883E+00
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRESS AT RUPTURE
UNIT OF MEASURE = PSI
140.00
120.00
100.00
80.00
60.00
40.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,V.L.R.TENSILE,STRESS AT RUPTURE,CHS=0.002 IN/MIN TP-H1011

Figure 4

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
2.0	1	33.0	134	58.0	325	83.0	60	108.0	63
9.0	10	34.0	148	59.0	314	84.0	26	109.0	96
10.0	5	35.0	107	60.0	406	85.0	30	110.0	42
11.0	15	36.0	219	61.0	245	86.0	61	111.0	21
12.0	15	37.0	141	62.0	300	87.0	104	112.0	100
13.0	30	38.0	117	63.0	232	88.0	120	113.0	223
14.0	10	39.0	105	64.0	115	89.0	130	114.0	70
15.0	32	40.0	119	65.0	87	90.0	114	115.0	65
16.0	25	41.0	153	66.0	61	91.0	62	116.0	243
17.0	55	42.0	120	67.0	23	92.0	49	117.0	223
18.0	25	43.0	142	68.0	96	93.0	78	118.0	125
19.0	37	44.0	100	69.0	165	94.0	78	119.0	126
20.0	18	45.0	135	70.0	203	95.0	115	120.0	150
21.0	50	46.0	116	71.0	114	96.0	149	121.0	87
22.0	12	47.0	148	72.0	92	97.0	102	122.0	9
23.0	46	48.0	138	73.0	62	98.0	84	123.0	39
24.0	49	49.0	151	74.0	125	99.0	81	124.0	27
25.0	36	50.0	176	75.0	138	100.0	31	125.0	66
26.0	47	51.0	329	76.0	105	101.0	63	126.0	44
27.0	44	52.0	296	77.0	130	102.0	12	127.0	92
28.0	51	53.0	256	78.0	74	103.0	37	128.0	51
29.0	37	54.0	226	79.0	99	104.0	45	129.0	27
30.0	61	55.0	468	80.0	101	105.0	9	130.0	142
31.0	76	56.0	439	81.0	125	106.0	5	131.0	68
32.0	138	57.0	375	82.0	102	107.0	10	132.0	3
								134.0	53
								135.0	24
								136.0	6
								137.0	60
								138.0	234
								139.0	118
								140.0	27

WING 6.V.L.R.TENSILE.MODULUS.CHS=0.002 IN/MIN TP-H1011

This sample size summary is applicable to figure 5

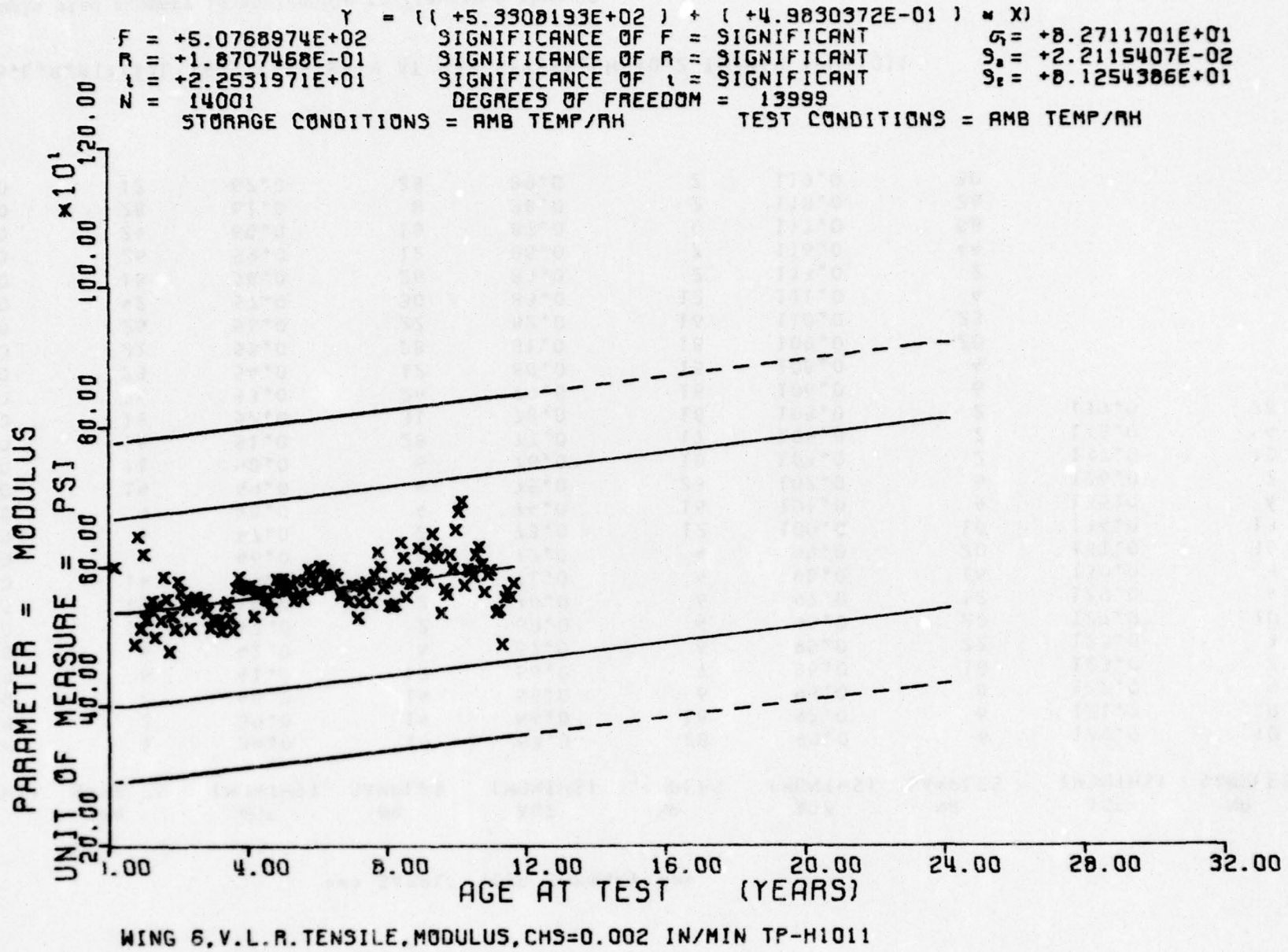

Y = ((+5.3308193E+02) + (+4.9830372E-01) * X)
F = +5.0768974E+02 SIGNIFICANCE OF F = SIGNIFICANT
R = +1.8707468E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +2.2531971E+01 SIGNIFICANCE OF t = SIGNIFICANT
N = 14001 DEGREES OF FREEDOM = 13999
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MODULUS
UNIT OF MEASURE = PSI
×10¹
120.00
100.00
80.00
60.00
40.00
20.00
1.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
WING 6,V.L.R.TENSILE,MODULUS,CHS=0.002 IN/MIN TP-H1011

Figure 5

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
1.0	1	38.0	10	63.0	28	90.0	6	120.0	40
12.0	2	39.0	14	64.0	16	92.0	6	121.0	30
13.0	2	40.0	14	65.0	6	93.0	8	122.0	4
15.0	6	41.0	12	66.0	7	94.0	18	123.0	2
16.0	6	42.0	6	67.0	6	95.0	22	125.0	4
17.0	12	43.0	2	69.0	4	96.0	20	127.0	10
19.0	10	44.0	2	70.0	6	97.0	12	129.0	4
20.0	14	45.0	4	71.0	4	98.0	16	130.0	8
21.0	6	46.0	6	72.0	4	99.0	20	131.0	36
22.0	6	47.0	2	73.0	12	100.0	10	134.0	13
23.0	9	48.0	4	74.0	16	101.0	4	135.0	4
24.0	14	49.0	4	75.0	23	102.0	6	136.0	2
25.0	11	50.0	6	76.0	10	103.0	2	137.0	10
26.0	16	51.0	28	77.0	17	104.0	2	138.0	54
27.0	18	52.0	31	78.0	18	105.0	2	139.0	28
28.0	26	53.0	24	79.0	16	106.0	6		
29.0	23	54.0	12	80.0	15	108.0	4		
30.0	22	55.0	28	81.0	18	109.0	20		
31.0	26	56.0	22	82.0	16	110.0	23		
32.0	42	57.0	30	83.0	12	111.0	4		
33.0	18	58.0	26	84.0	2	113.0	2		
34.0	26	59.0	12	85.0	2	116.0	44		
35.0	24	60.0	18	87.0	4	117.0	58		
36.0	28	61.0	8	88.0	2	118.0	26		
37.0	12	62.0	28	89.0	2	119.0	30		

WING 6,L.R.BIAXIAL TENSILE,STRAIN AT MAX STRESS,CHS=0.2 IN/MIN TPH-1011

This sample size summary is applicable to figures 6 thru 10

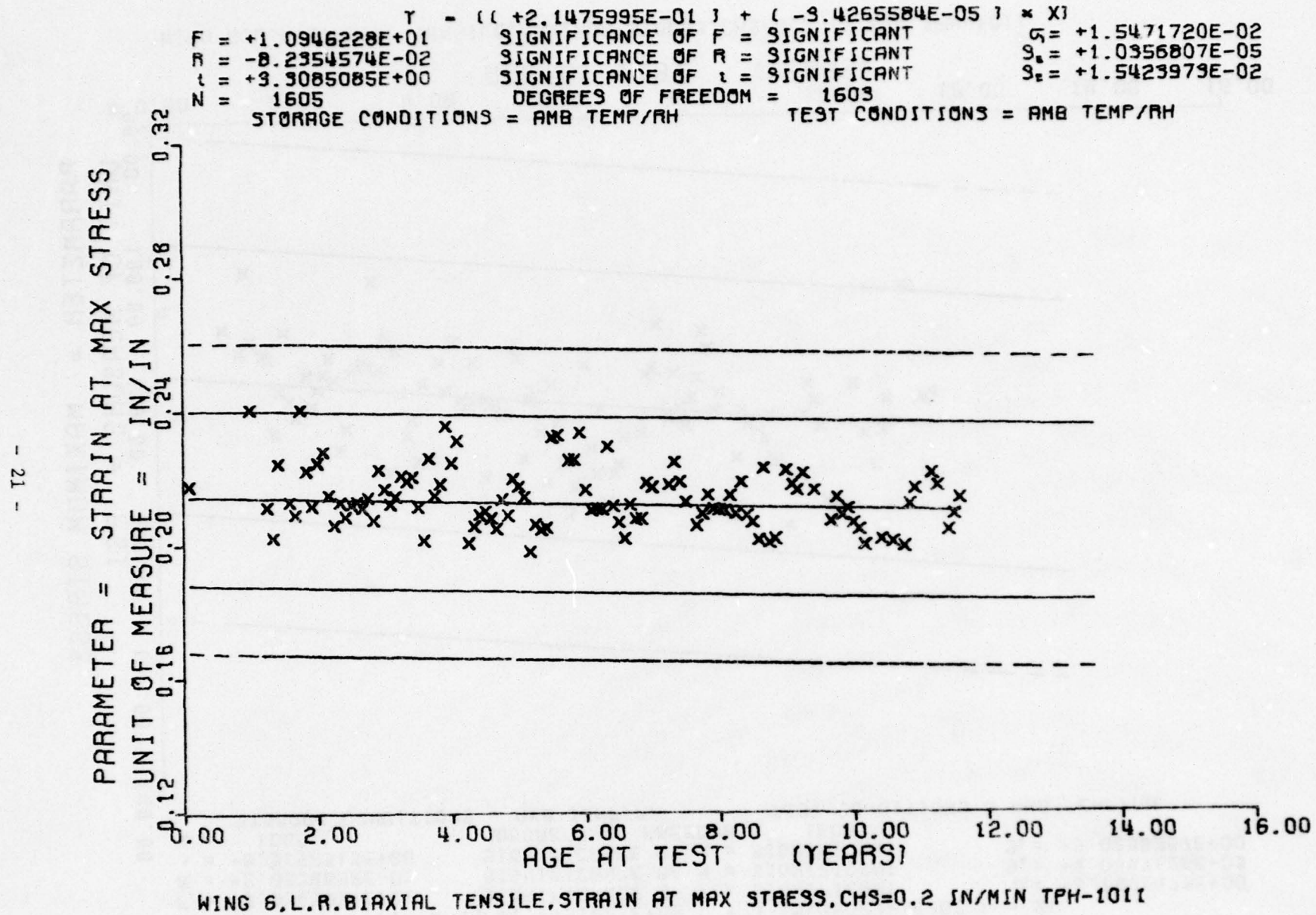

Y = ((+2.1475995E-01) + (-3.4265584E-05) * X)
F = +1.0946228E+01
R = -8.2354574E-02
t = +3.3085085E+00
N = 1605
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 1603
σ = +1.5471720E-02
σa = +1.0356807E-05
σe = +1.5423979E-02
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT MAX STRESS
UNIT OF MEASURE = IN/IN
0.32
0.28
0.24
0.20
0.16
0.12
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,L.R.BIAXIAL TENSILE,STRAIN AT MAX STRESS,CHS=0.2 IN/MIN TPH-1011

Figure 6

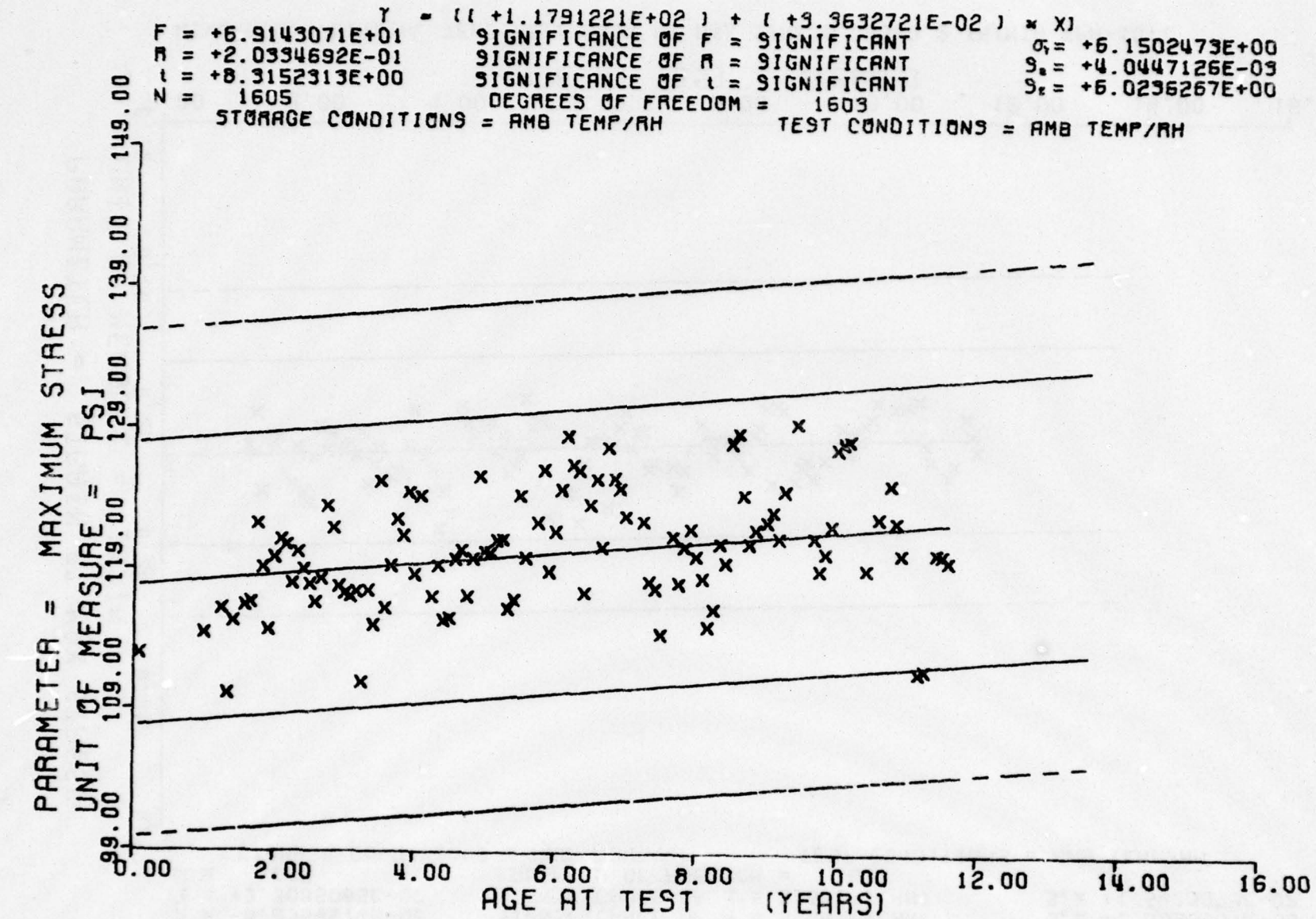

Y = ((+1.1791221E+02) + (+9.3632721E-02) * X)
F = +6.9143071E+01 SIGNIFICANCE OF F = SIGNIFICANT σ1 = +6.1502473E+00
R = +2.0334692E-01 SIGNIFICANCE OF R = SIGNIFICANT Sa = +4.0447126E-03
t = +8.3152313E+00 SIGNIFICANCE OF t = SIGNIFICANT Se = +6.0236267E+00
N = 1605 DEGREES OF FREEDOM = 1603
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
149.00
139.00
129.00
119.00
109.00
99.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,L.R.BIAXIAL TENSILE,MAXIMUM STRESS,CHS=0.2 IN/MIN TPH-1011

Figure 7

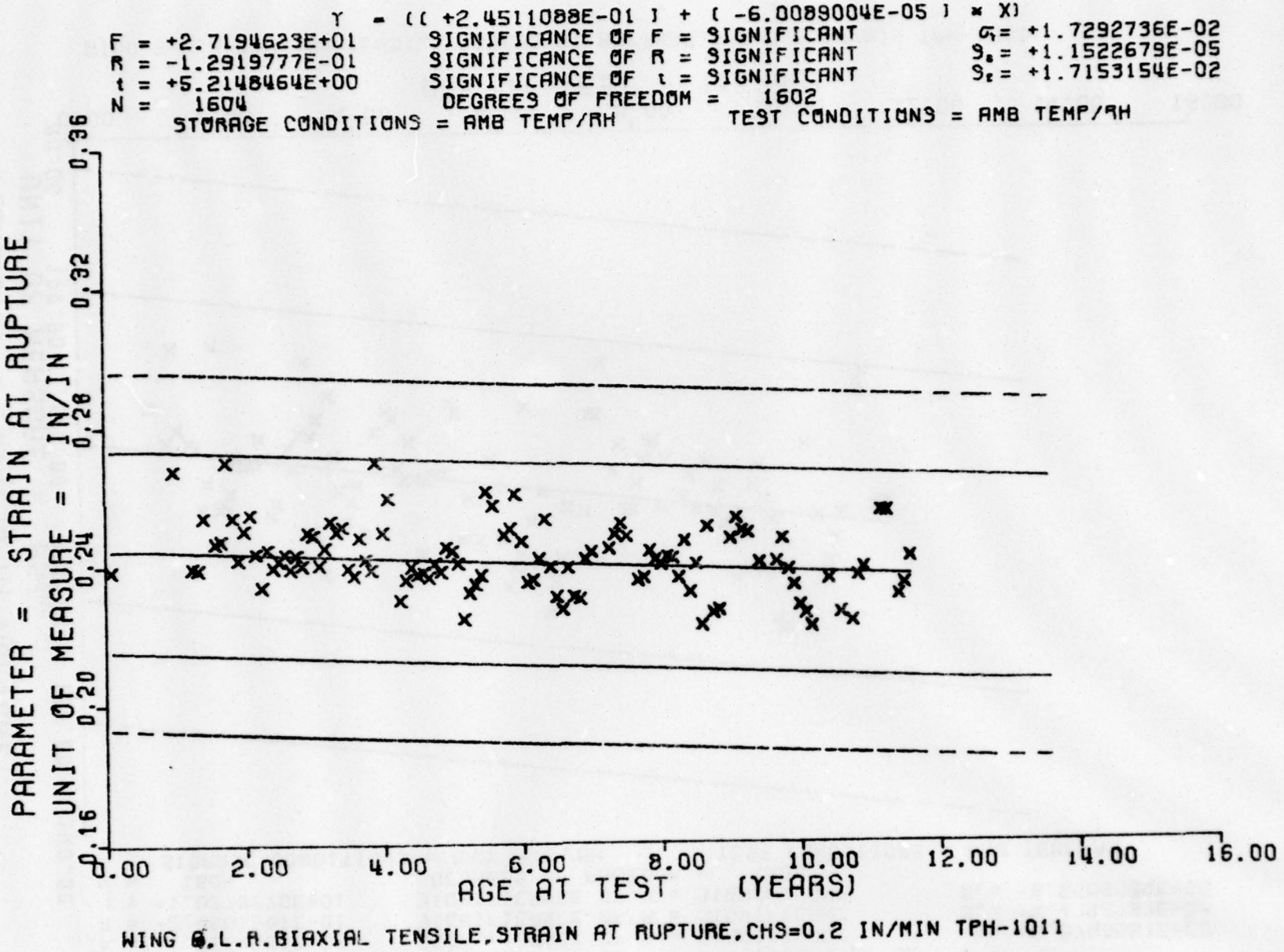

Y = ((+2.4511088E-01) + (-6.0089004E-05) * X)
F = +2.7194623E+01
R = -1.2919777E-01
t = +5.2148464E+00
N = 1604
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 1602
σ = +1.7292736E-02
σa = +1.1522679E-05
σε = +1.7153154E-02
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.36
0.32
0.28
0.24
0.20
0.16
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING G.L.R.BIAXIAL TENSILE,STRAIN AT RUPTURE,CHS=0.2 IN/MIN TPH-1011

Figure 8

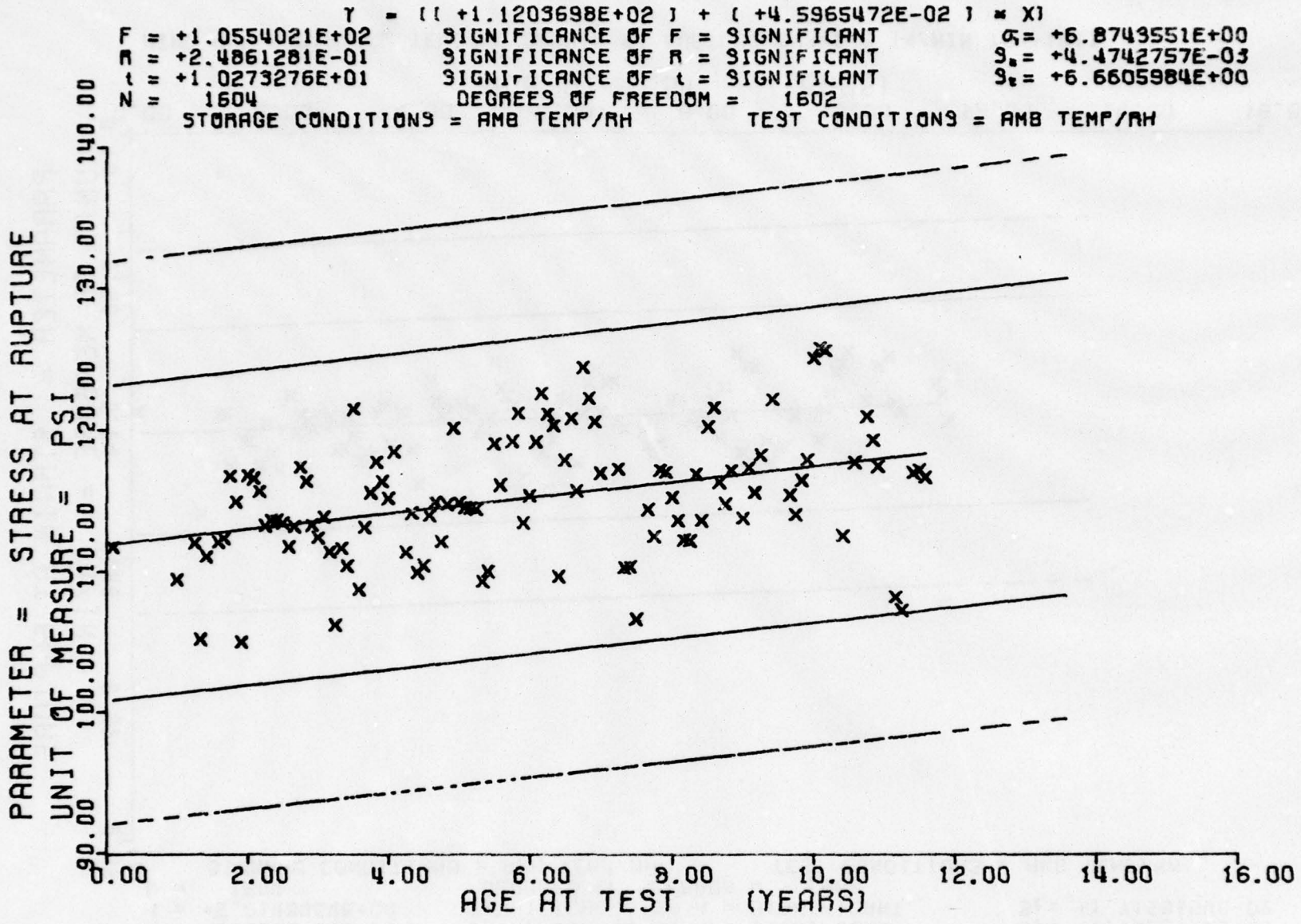

Y = [+1.1203698E+02] + [+4.5965472E-02] * X1
F = +1.0554021E+02 SIGNIFICANCE OF F = SIGNIFICANT σ = +6.8743551E+00
R = +2.4861281E-01 SIGNIFICANCE OF R = SIGNIFICANT σb = +4.4742757E-03
t = +1.0273276E+01 SIGNIFICANCE OF t = SIGNIFICANT σt = +6.6605984E+00
N = 1604 DEGREES OF FREEDOM = 1602
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRESS AT RUPTURE
UNIT OF MEASURE = PSI
90.00
100.00
110.00
120.00
130.00
140.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,L.R.BIAXIAL TENSILE,STRESS AT RUPTURE,CHS=0.2 IN/MIN TPH-1011

Figure 9

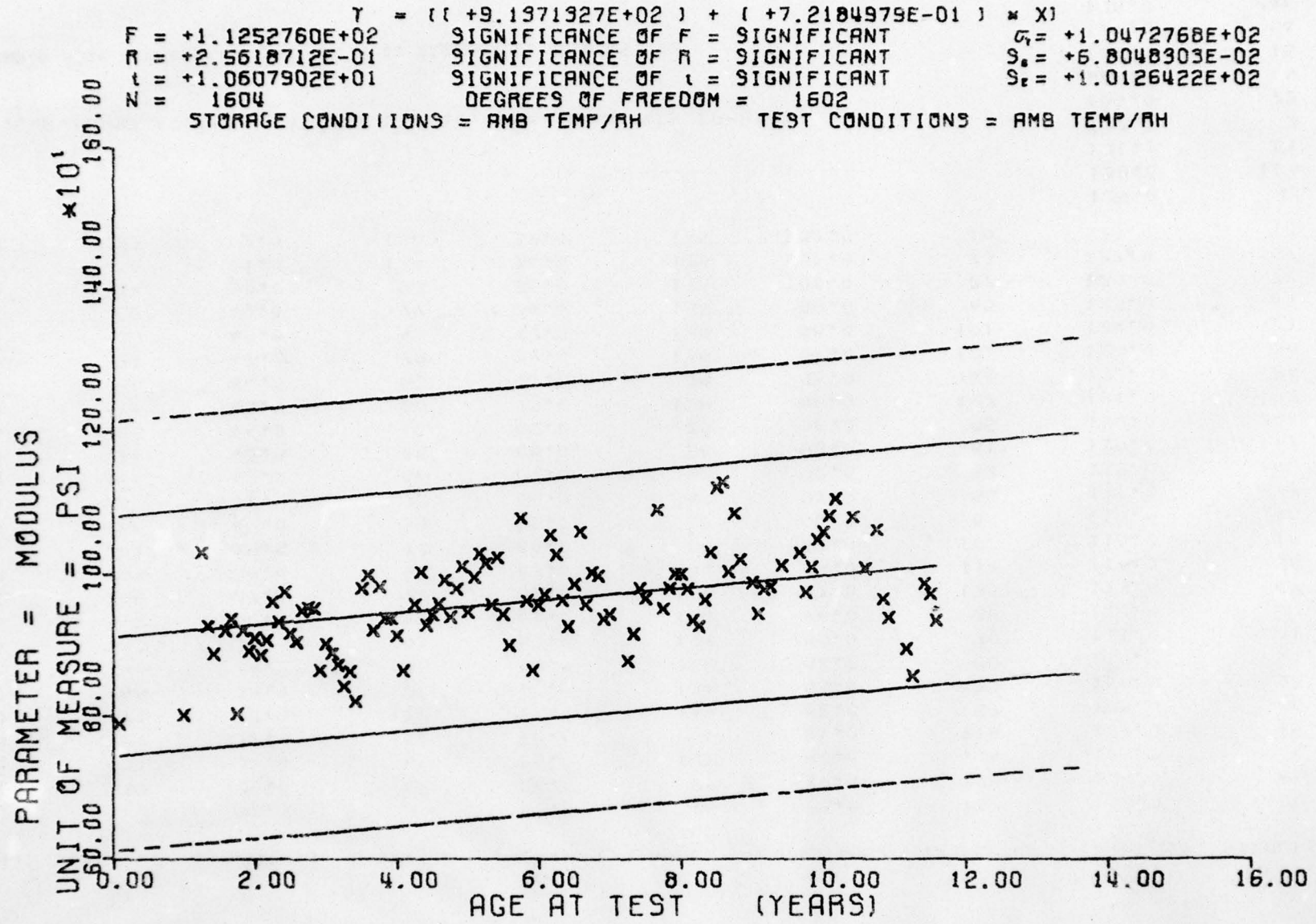

Y = [+9.1971327E+02] + [+7.2184979E-01] * X]
F = +1.1252760E+02 SIGNIFICANCE OF F = SIGNIFICANT σ = +1.0472768E+02
R = +2.5618712E-01 SIGNIFICANCE OF R = SIGNIFICANT Sa = +6.8048303E-02
t = +1.0607902E+01 SIGNIFICANCE OF t = SIGNIFICANT Se = +1.0126422E+02
N = 1604 DEGREES OF FREEDOM = 1602
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MODULUS
UNIT OF MEASURE = PSI *10¹
160.00
140.00
120.00
100.00
80.00
60.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,L.R.BIAXIAL TENSILE,MODULUS,CHS=0.2 IN/MIN TPH-1011

Figure 10

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
2.0	5	28.0	79	53.0	76	78.0	162	103.0	39
4.0	37	29.0	52	54.0	77	79.0	108	104.0	45
5.0	151	30.0	49	55.0	137	80.0	114	105.0	9
6.0	191	31.0	52	56.0	91	81.0	118	107.0	15
7.0	171	32.0	112	57.0	145	82.0	57	108.0	66
8.0	140	33.0	85	58.0	134	83.0	79	109.0	93
9.0	105	34.0	75	59.0	102	84.0	30	110.0	41
10.0	183	35.0	41	60.0	108	85.0	30	111.0	21
11.0	192	36.0	145	61.0	150	86.0	38	112.0	57
12.0	196	37.0	77	62.0	185	87.0	135	113.0	67
13.0	195	38.0	36	63.0	244	88.0	114	114.0	38
14.0	201	39.0	72	64.0	89	89.0	107	115.0	18
15.0	158	40.0	59	65.0	58	90.0	60	116.0	246
16.0	204	41.0	32	66.0	40	91.0	55	117.0	237
17.0	168	42.0	66	67.0	35	92.0	53	118.0	143
18.0	18	43.0	75	68.0	50	93.0	61	119.0	117
19.0	55	44.0	15	69.0	70	94.0	95	120.0	204
20.0	16	45.0	20	70.0	120	95.0	103	121.0	93
21.0	60	46.0	55	71.0	75	96.0	148	122.0	24
22.0	31	47.0	79	72.0	119	97.0	101	123.0	30
23.0	30	48.0	40	73.0	120	98.0	101	124.0	21
24.0	65	49.0	77	74.0	154	99.0	65	125.0	42
25.0	30	50.0	93	75.0	175	100.0	27	126.0	72
26.0	56	51.0	154	76.0	125	101.0	73	127.0	57
27.0	53	52.0	196	77.0	145	102.0	10	128.0	33
								129.0	33
								130.0	126
								131.0	51
								132.0	3
								134.0	72
								135.0	9
								136.0	15
								137.0	54
								138.0	246
								139.0	123

WING 6,L.R.TENSILE,STRAIN AT MAX STRESS,CHS=2.0 IN/MIN TP-H1011

This sample size summary is applicable to figures 11 thru 15

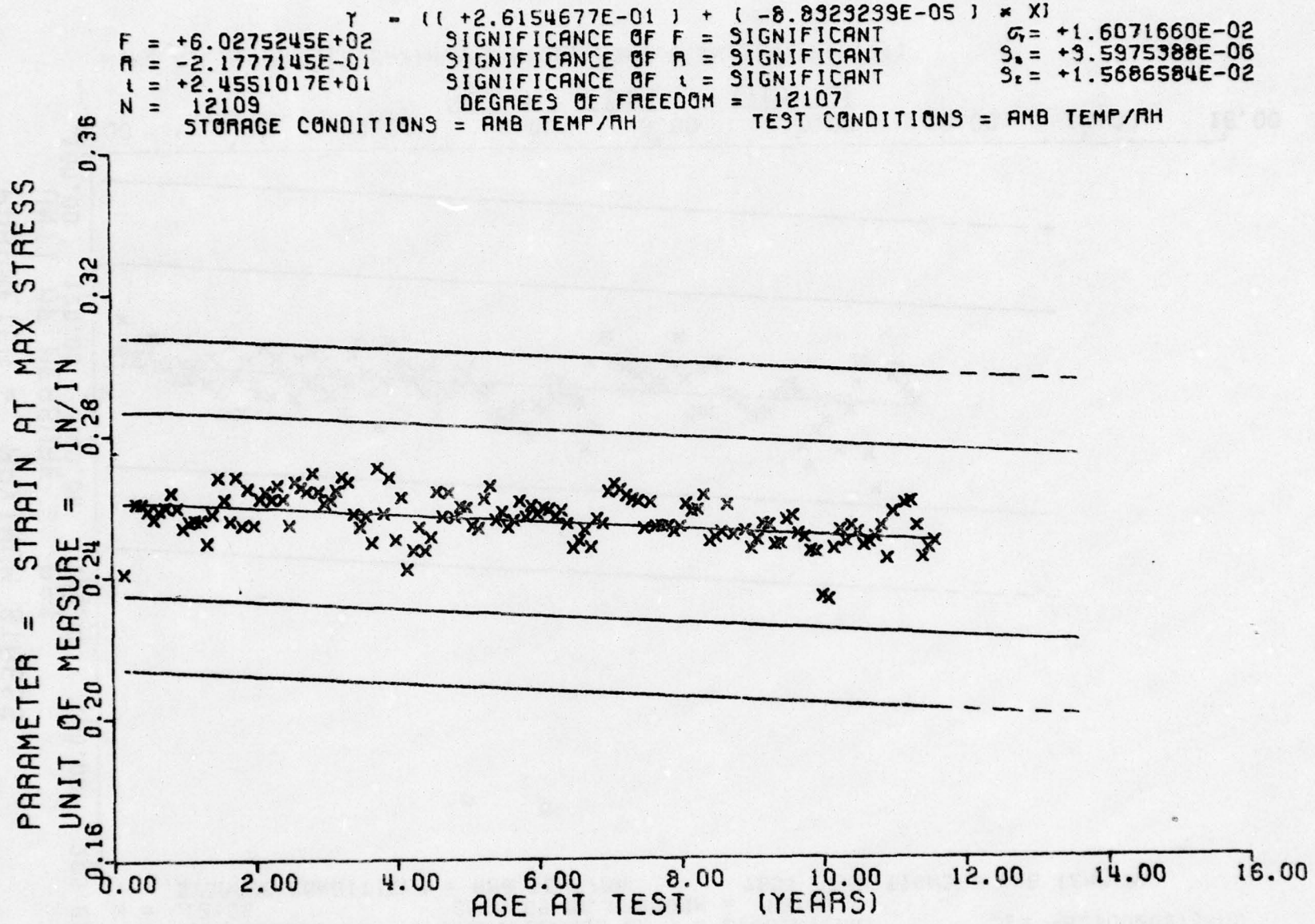

Y = ((+2.6154677E-01) + (-8.8923239E-05) * X)
F = +6.0275245E+02 SIGNIFICANCE OF F = SIGNIFICANT
R = -2.1777145E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +2.4551017E+01 SIGNIFICANCE OF t = SIGNIFICANT
N = 12109 DEGREES OF FREEDOM = 12107
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT MAX STRESS
UNIT OF MEASURE = IN/IN
0.16
0.20
0.24
0.28
0.32
0.36
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,L.R.TENSILE,STRAIN AT MAX STRESS,CHS=2.0 IN/MIN TP-H1011

Figure 11

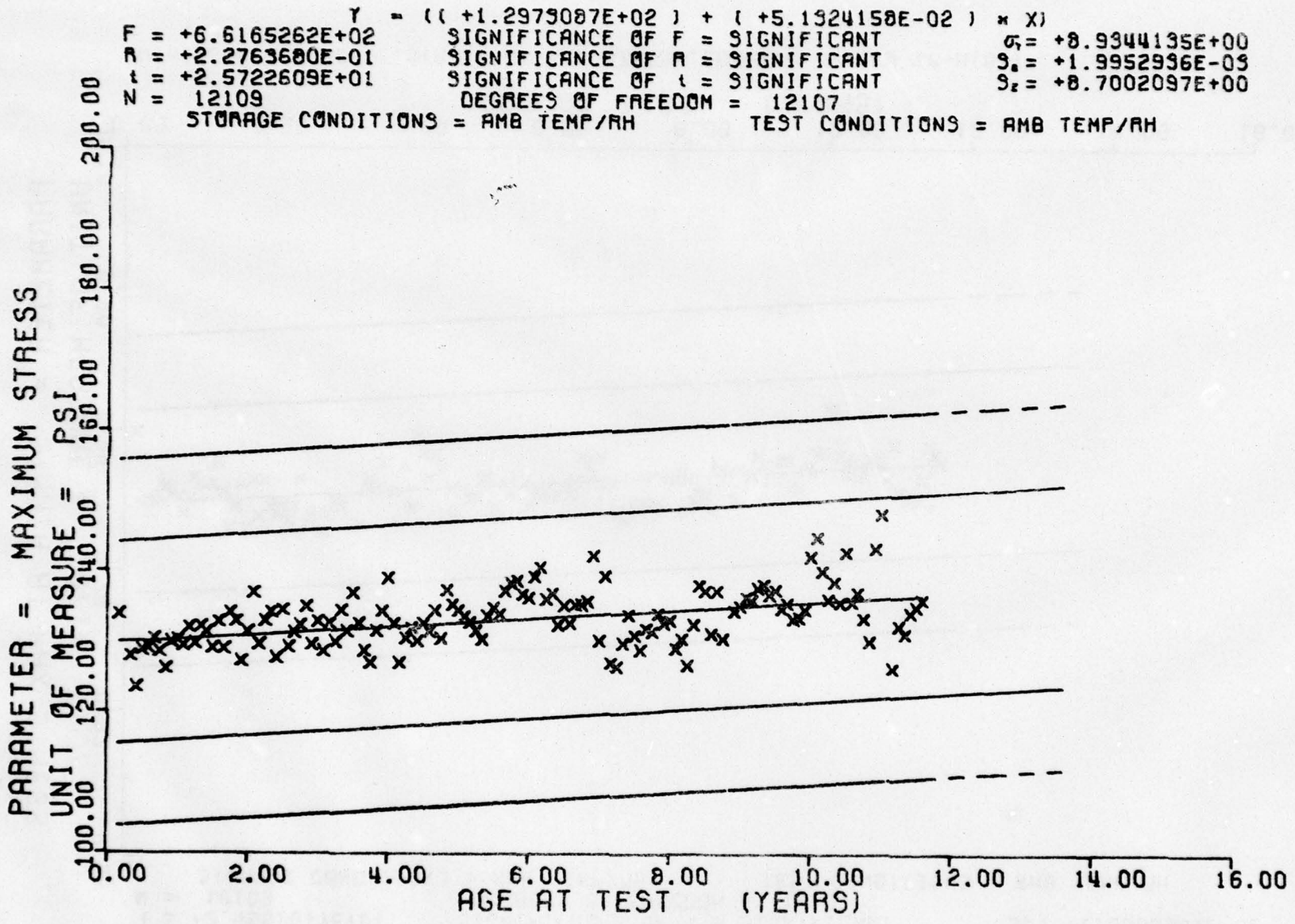

Y = ((+1.2979087E+02) + (+5.1324158E-02) * X)
F = +6.6165262E+02 SIGNIFICANCE OF F = SIGNIFICANT σ₁ = +8.9344135E+00
R = +2.2763680E-01 SIGNIFICANCE OF R = SIGNIFICANT Sₑ = +1.9952936E-03
t = +2.5722609E+01 SIGNIFICANCE OF t = SIGNIFICANT Sᵣ = +8.7002097E+00
N = 12109 DEGREES OF FREEDOM = 12107
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
100.00
120.00
140.00
160.00
180.00
200.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,L.R.TENSILE,MAXIMUM STRESS,CHS=2.0 IN/MIN TP-H1011

Figure 12

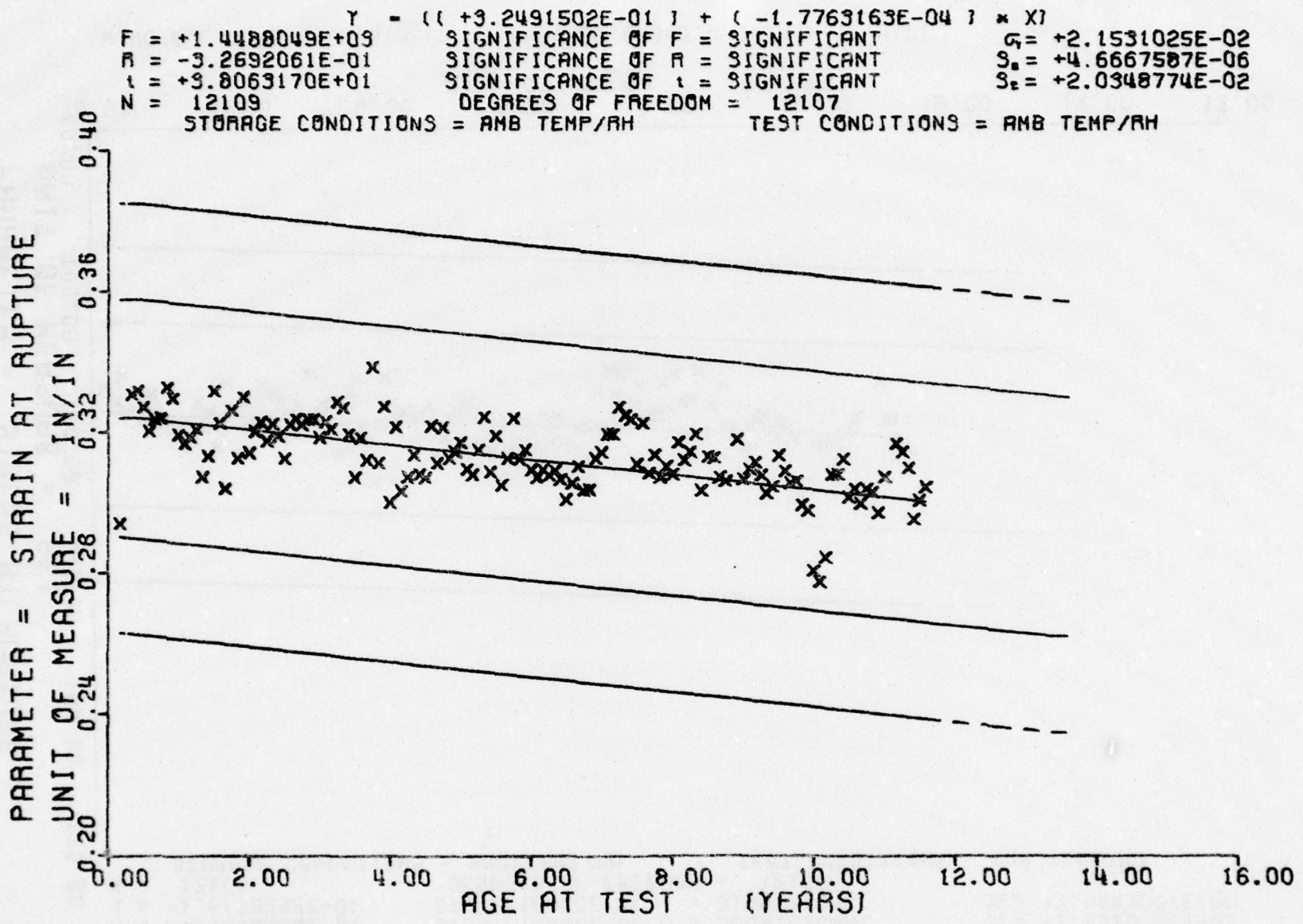

Y = ((+3.2491502E-01) + (-1.7763163E-04) x X)
F = +1.4488049E+03 SIGNIFICANCE OF F = SIGNIFICANT σ = +2.1531025E-02
R = -3.2692061E-01 SIGNIFICANCE OF R = SIGNIFICANT Sa = +4.6667587E-06
t = +3.8063170E+01 SIGNIFICANCE OF t = SIGNIFICANT St = +2.0348774E-02
N = 12109 DEGREES OF FREEDOM = 12107
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.40
0.36
0.32
0.28
0.24
0.20
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,L.R.TENSILE,STRAIN AT RUPTURE,CHS=2.0 IN/MIN TP-H1011

Figure 13

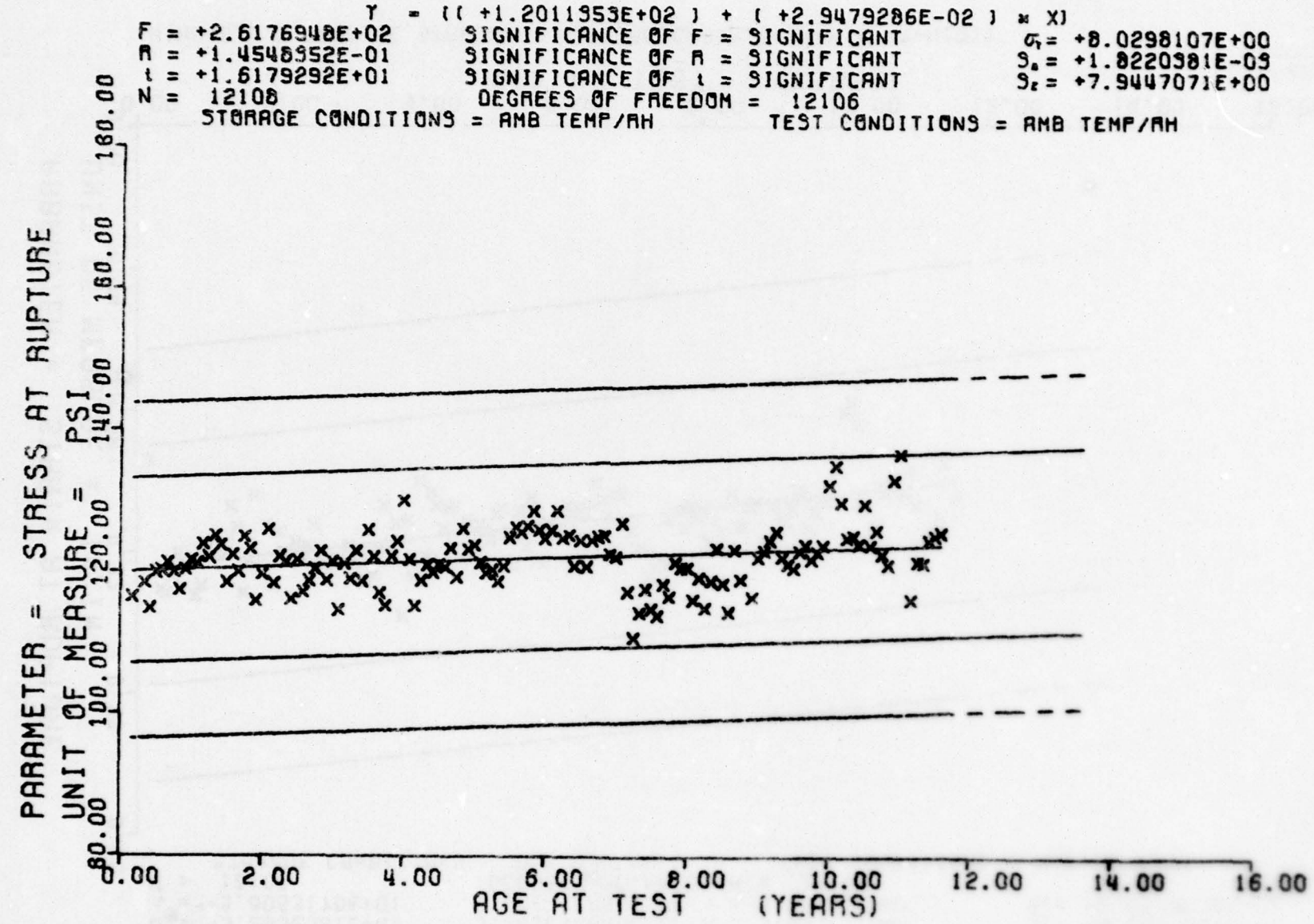

Y = ((+1.2011353E+02) + (+2.9479286E-02) * X)
F = +2.6176948E+02
R = +1.4548552E-01
t = +1.6179292E+01
N = 12108
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 12106
σt = +8.0298107E+00
Sa = +1.8220381E-03
Sε = +7.9447071E+00
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRESS AT RUPTURE
UNIT OF MEASURE = PSI
80.00
100.00
120.00
140.00
160.00
180.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,L.R.TENSILE,STRESS AT RUPTURE,CHS=2.0 IN/MIN TP-H1011

Figure 14

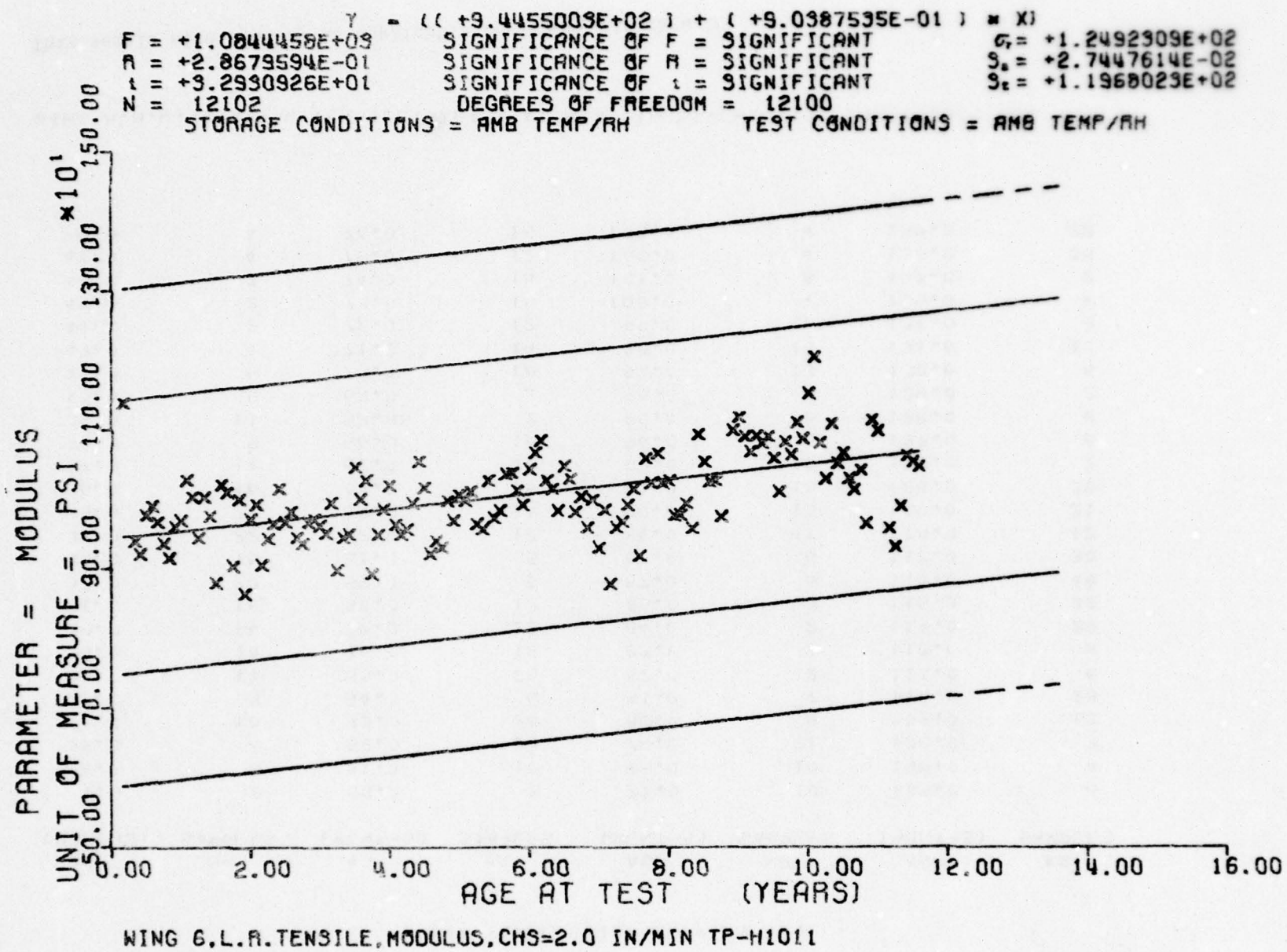

Y = ((+9.4455003E+02) + (+9.0387535E-01) * X)
F = +1.0844458E+03
R = +2.8679594E-01
t = +3.2930926E+01
N = 12102
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 12100
σy = +1.2492309E+02
Sa = +2.7447614E-02
Sε = +1.1968023E+02
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MODULUS
UNIT OF MEASURE = PSI
*10¹
150.00
130.00
110.00
90.00
70.00
50.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,L.R.TENSILE,MODULUS,CHS=2.0 IN/MIN TP-H1011

Figure 15

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
1.0	2	50.0	8	77.0	10	105.0	6
24.0	6	51.0	16	78.0	10	106.0	4
25.0	6	52.0	24	79.0	21	108.0	2
26.0	10	53.0	26	80.0	8	109.0	13
27.0	3	54.0	6	81.0	7	110.0	28
28.0	11	55.0	26	82.0	12	111.0	6
29.0	14	56.0	12	83.0	2	113.0	8
30.0	14	57.0	22	84.0	2	114.0	29
31.0	16	58.0	12	86.0	3	115.0	32
32.0	23	59.0	5	87.0	6	116.0	46
33.0	15	61.0	5	88.0	8	117.0	30
34.0	22	62.0	12	89.0	11	118.0	12
35.0	22	63.0	13	90.0	13	119.0	21
36.0	16	64.0	16	91.0	10	120.0	35
37.0	14	65.0	18	93.0	10	122.0	2
38.0	9	66.0	10	94.0	8	127.0	6
39.0	11	68.0	2	95.0	8	128.0	2
40.0	9	69.0	2	96.0	6	129.0	2
41.0	6	70.0	10	97.0	13	130.0	6
42.0	4	71.0	14	98.0	10	131.0	12
44.0	2	72.0	12	99.0	6	134.0	2
45.0	2	73.0	18	100.0	4	135.0	4
46.0	2	74.0	18	101.0	6	137.0	2
47.0	4	75.0	12	102.0	4	138.0	35
49.0	4	76.0	16	103.0	4	139.0	23

WING 6,H.R.TRIAXIAL TENSILE,STRAIN AT MAX STRESS,CHS=1750 IN/MIN,800 PSI

This sample size summary is applicable to figures 16 thru 20

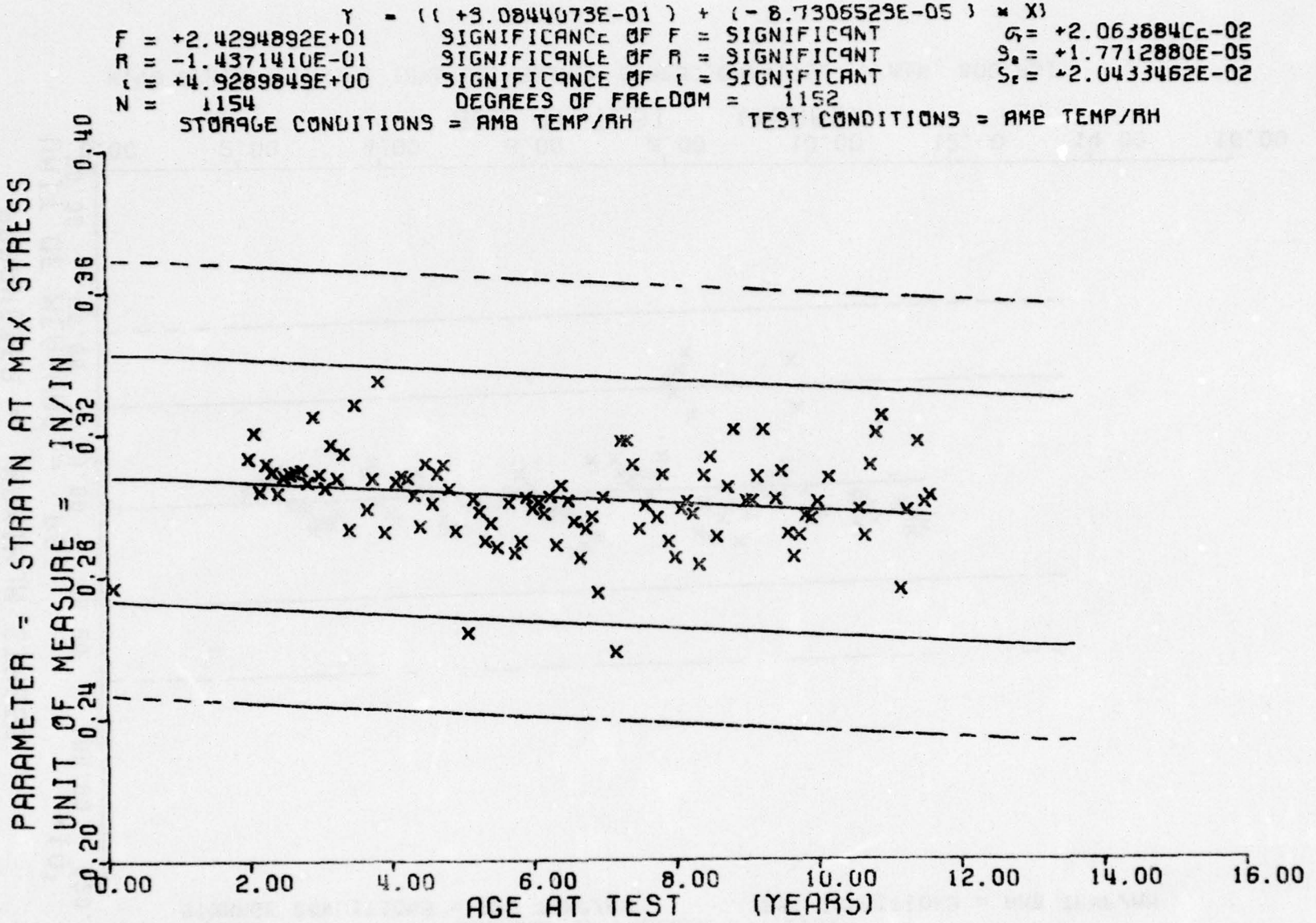

Y = ((+3.0844073E-01) + (-8.7306529E-05) * X)
F = +2.4294892E+01
SIGNIFICANCE OF F = SIGNIFICANT
σf = +2.0638684E-02
R = -1.4371410E-01
SIGNIFICANCE OF R = SIGNIFICANT
Sa = +1.7712880E-05
t = +4.9289849E+00
SIGNIFICANCE OF t = SIGNIFICANT
Se = +2.0433462E-02
N = 1154
DEGREES OF FREEDOM = 1152
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT MAX STRESS
UNIT OF MEASURE = IN/IN
0.40
0.36
0.32
0.28
0.24
0.20
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,H.R.TRIAXIAL TENSILE,STRAIN AT MAX STRESS,CHS=1750 IN/MIN,800 PSI

Figure 16

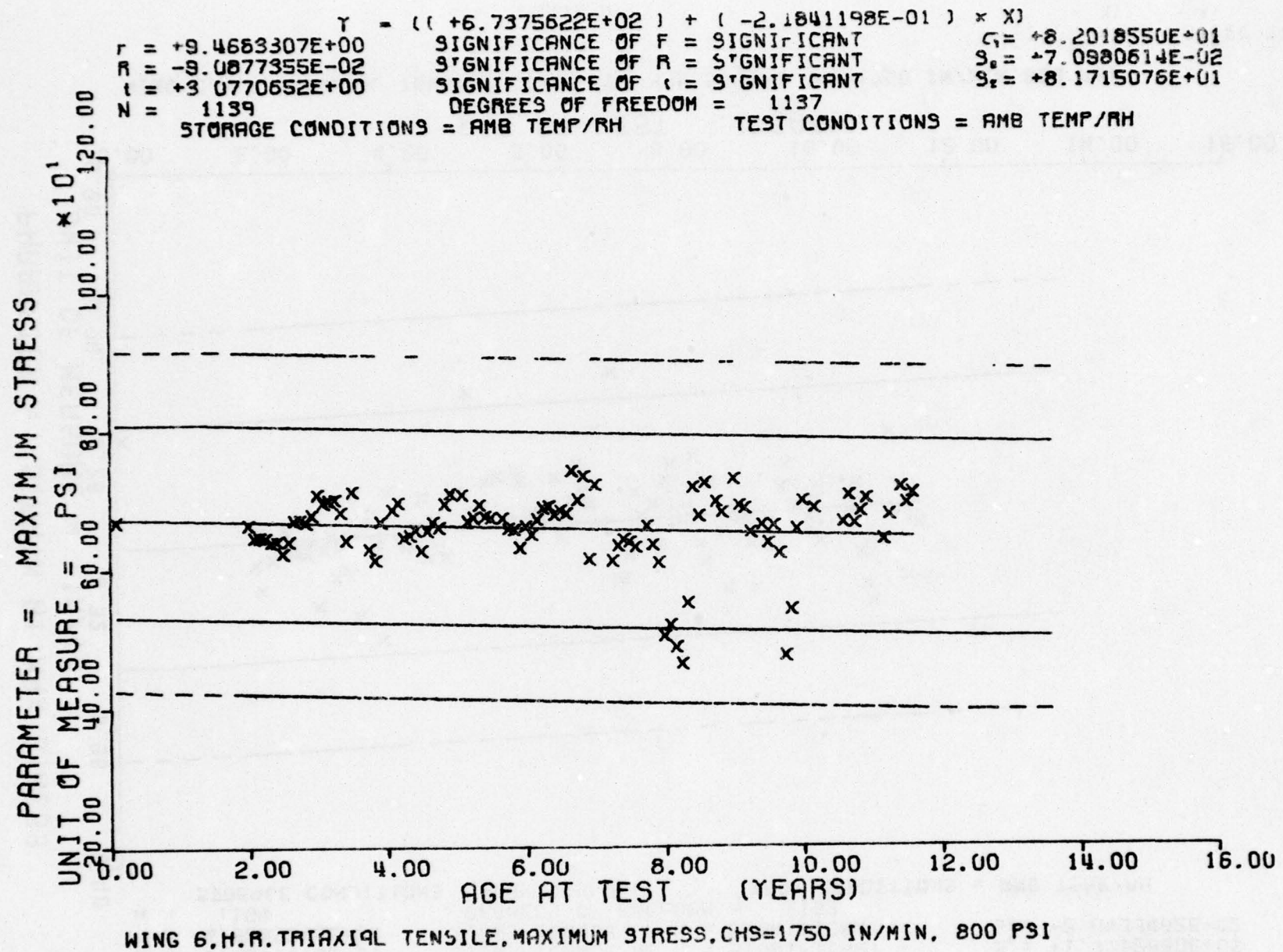

Y = ((+6.7375622E+02) + (-2.1841198E-01) * X)
r = +9.4683307E+00
R = -9.0877355E-02
t = +3.0770652E+00
N = 1139
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 1137
S_y = +8.2018550E+01
S_e = +7.0980614E-02
S_x = +8.1715076E+01
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
*10^1
120.00
100.00
80.00
60.00
40.00
20.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,H.R.TRIAXIAL TENSILE,MAXIMUM STRESS,CHS=1750 IN/MIN, 800 PSI

Figure 17

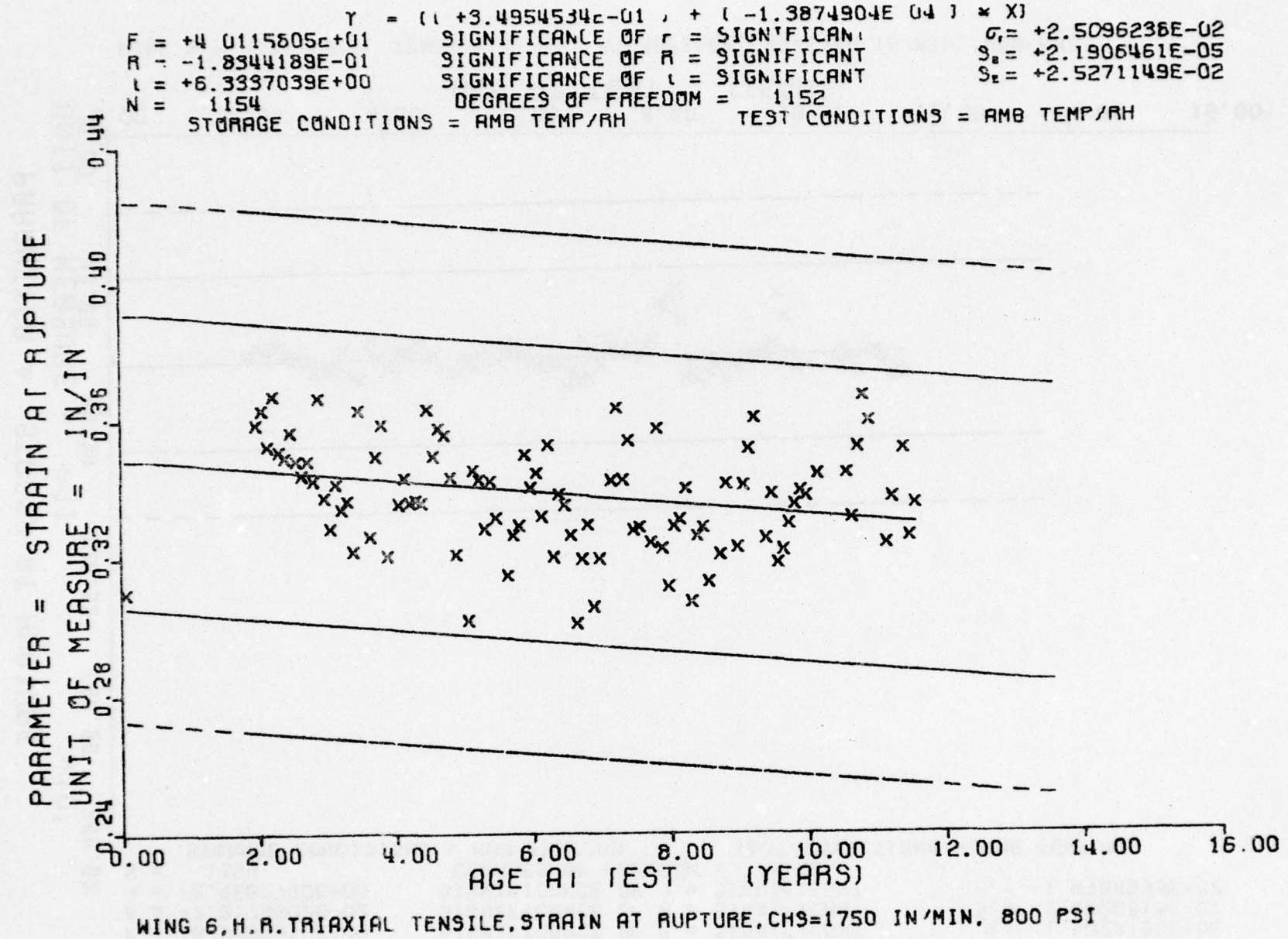

Y = (+3.4954534E-01) + (-1.3874904E 04) * X)
F = +4 0115805E+01
SIGNIFICANCE OF r = SIGNIFICANT
σ_r = +2.5096236E-02
R = -1.8344189E-01
SIGNIFICANCE OF R = SIGNIFICANT
S_a = +2.1906461E-05
t = +6.3337039E+00
SIGNIFICANCE OF t = SIGNIFICANT
S_t = +2.5271149E-02
N = 1154
DEGREES OF FREEDOM = 1152
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.44
0.40
0.36
0.32
0.28
0.24
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,H.R.TRIAXIAL TENSILE,STRAIN AT RUPTURE,CHS=1750 IN/MIN, 800 PSI

Figure 18

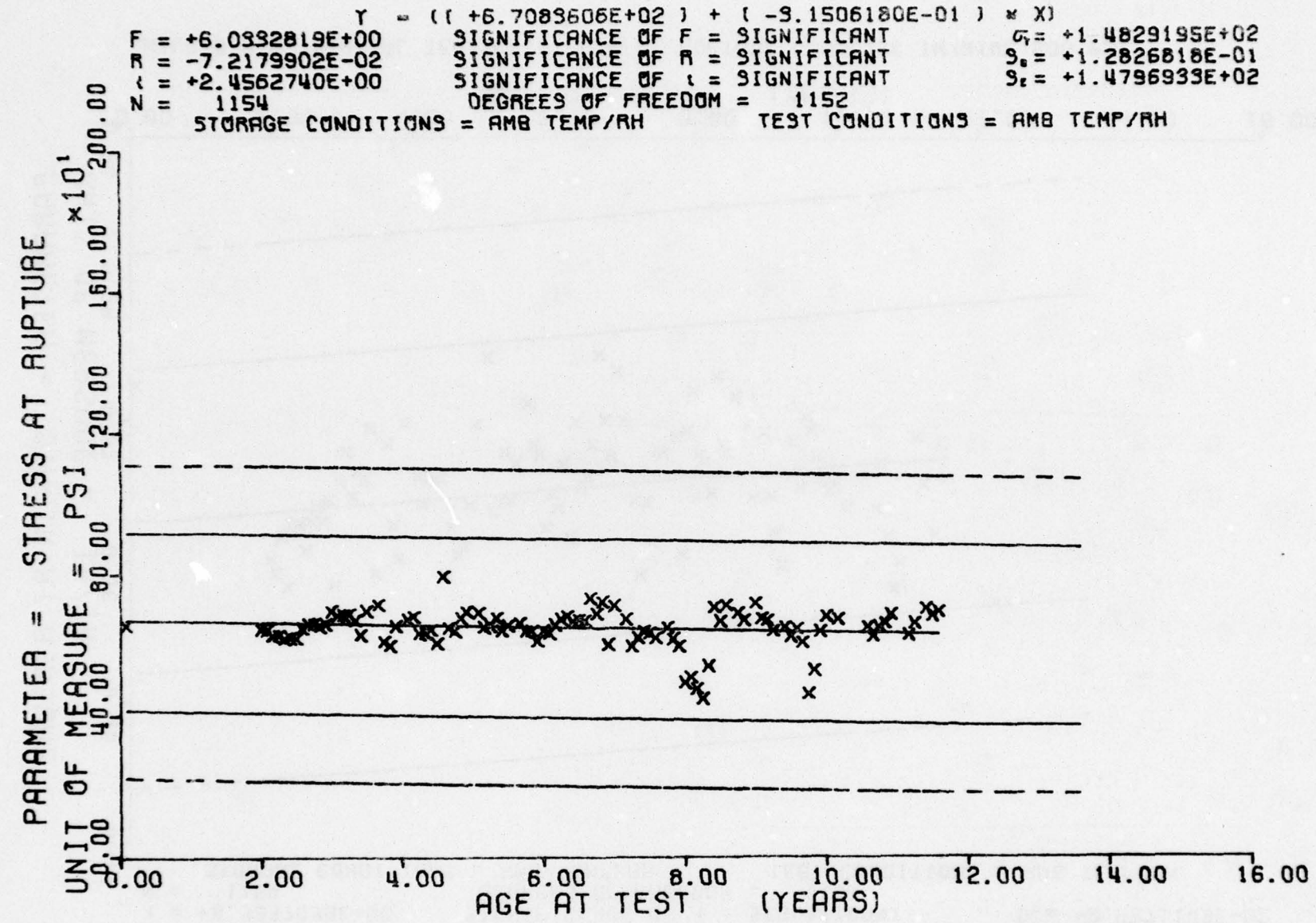

Y = ((+6.7083606E+02) + (-9.1506180E-01) * X)
F = +6.0332819E+00 SIGNIFICANCE OF F = SIGNIFICANT
R = -7.2179902E-02 SIGNIFICANCE OF R = SIGNIFICANT
t = +2.4562740E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 1154 DEGREES OF FREEDOM = 1152
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRESS AT RUPTURE
UNIT OF MEASURE = PSI x10¹
200.00
160.00
120.00
80.00
40.00
0.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,H.R.TRIAXIAL TENSILE,STRESS AT RUPTURE,CHS=1750 IN/MIN, 800 PSI

Figure 19

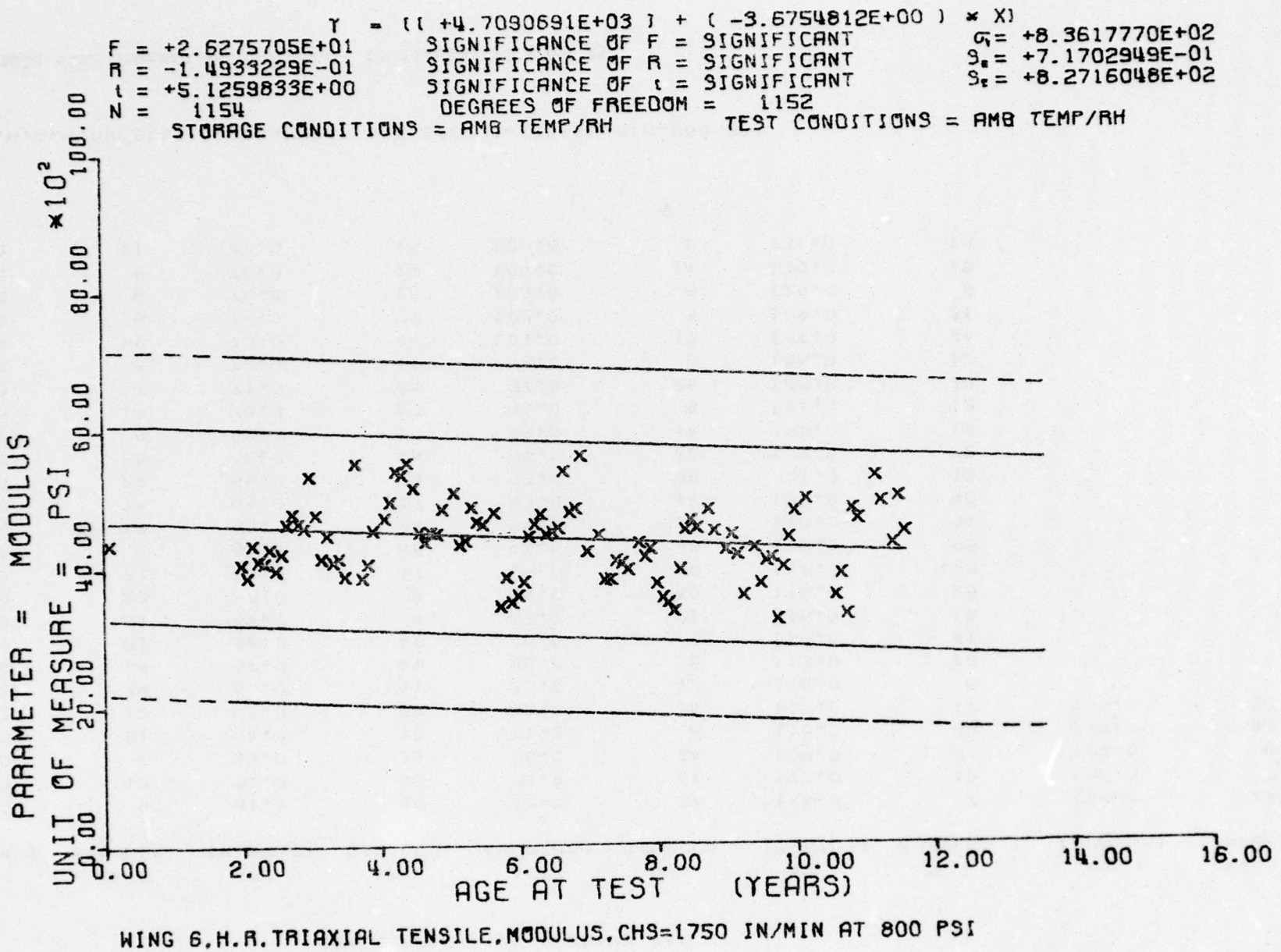

Y = ((+4.7090691E+03) + (-3.6754812E+00) * X)
F = +2.6275705E+01 SIGNIFICANCE OF F = SIGNIFICANT
R = -1.4933229E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +5.1259833E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 1154 DEGREES OF FREEDOM = 1152
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
σ1 = +8.3617770E+02
Se = +7.1702949E-01
St = +8.2716048E+02
PARAMETER = MODULUS
UNIT OF MEASURE = PSI *10²
100.00
80.00
60.00
40.00
20.00
0.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,H.R.TRIAXIAL TENSILE,MODULUS,CHS=1750 IN/MIN AT 800 PSI

Figure 20

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
24.0	9	51.0	35	78.0	27	106.0	7	134.0	24
25.0	12	52.0	65	79.0	61	107.0	10	136.0	3
26.0	6	53.0	34	80.0	14	109.0	21	137.0	6
27.0	21	54.0	10	81.0	6	110.0	36	138.0	43
28.0	12	55.0	37	82.0	18	111.0	12	139.0	57
29.0	29	56.0	41	83.0	13	112.0	6		
30.0	18	57.0	48	85.0	5	113.0	75		
31.0	21	58.0	40	86.0	5	114.0	41		
32.0	31	59.0	4	87.0	21	115.0	15		
33.0	23	60.0	8	88.0	15	116.0	25		
34.0	21	61.0	17	89.0	40	117.0	109		
35.0	5	62.0	40	90.0	40	118.0	25		
36.0	17	63.0	84	91.0	15	119.0	34		
37.0	24	64.0	17	92.0	14	120.0	42		
38.0	22	65.0	25	93.0	20	121.0	15		
39.0	20	68.0	16	94.0	22	122.0	2		
40.0	9	69.0	27	95.0	14	123.0	15		
41.0	17	70.0	27	96.0	5	124.0	12		
42.0	7	71.0	24	97.0	26	125.0	30		
43.0	5	72.0	11	98.0	5	126.0	12		
44.0	10	73.0	44	101.0	17	127.0	24		
45.0	5	74.0	38	102.0	5	128.0	21		
46.0	5	75.0	28	103.0	5	129.0	6		
49.0	8	76.0	19	104.0	14	130.0	15		
50.0	11	77.0	15	105.0	5	131.0	18		

WING 6,H.R.HYDROSTATIC,STRAIN AT MAX STRESS,1750IN/MIN,800 PSI

This sample size summary is applicable to figures 21 thru 25

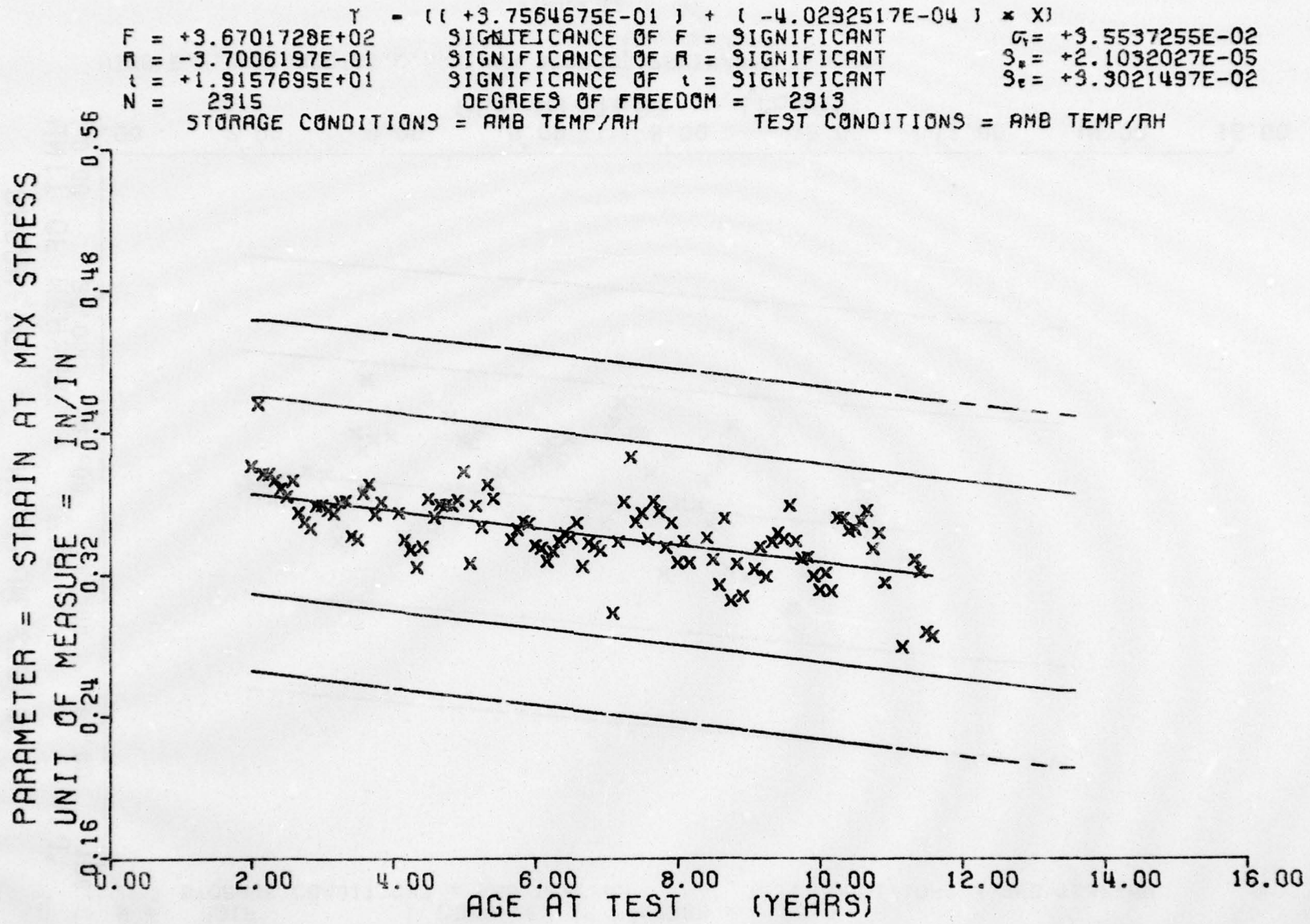

Y = ((+3.7564675E-01) + (-4.0292517E-04) * X)
F = +3.6701728E+02
R = -3.7006197E-01
t = +1.9157695E+01
N = 2315
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 2313
σ1 = +3.5537255E-02
Sa = +2.1032027E-05
Se = +3.3021497E-02
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT MAX STRESS
UNIT OF MEASURE = IN/IN
0.16
0.24
0.32
0.40
0.48
0.56
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,H.R.HYDROSTATIC,STRAIN AT MAX STRESS,1750IN/MIN,800 PSI

Figure 21

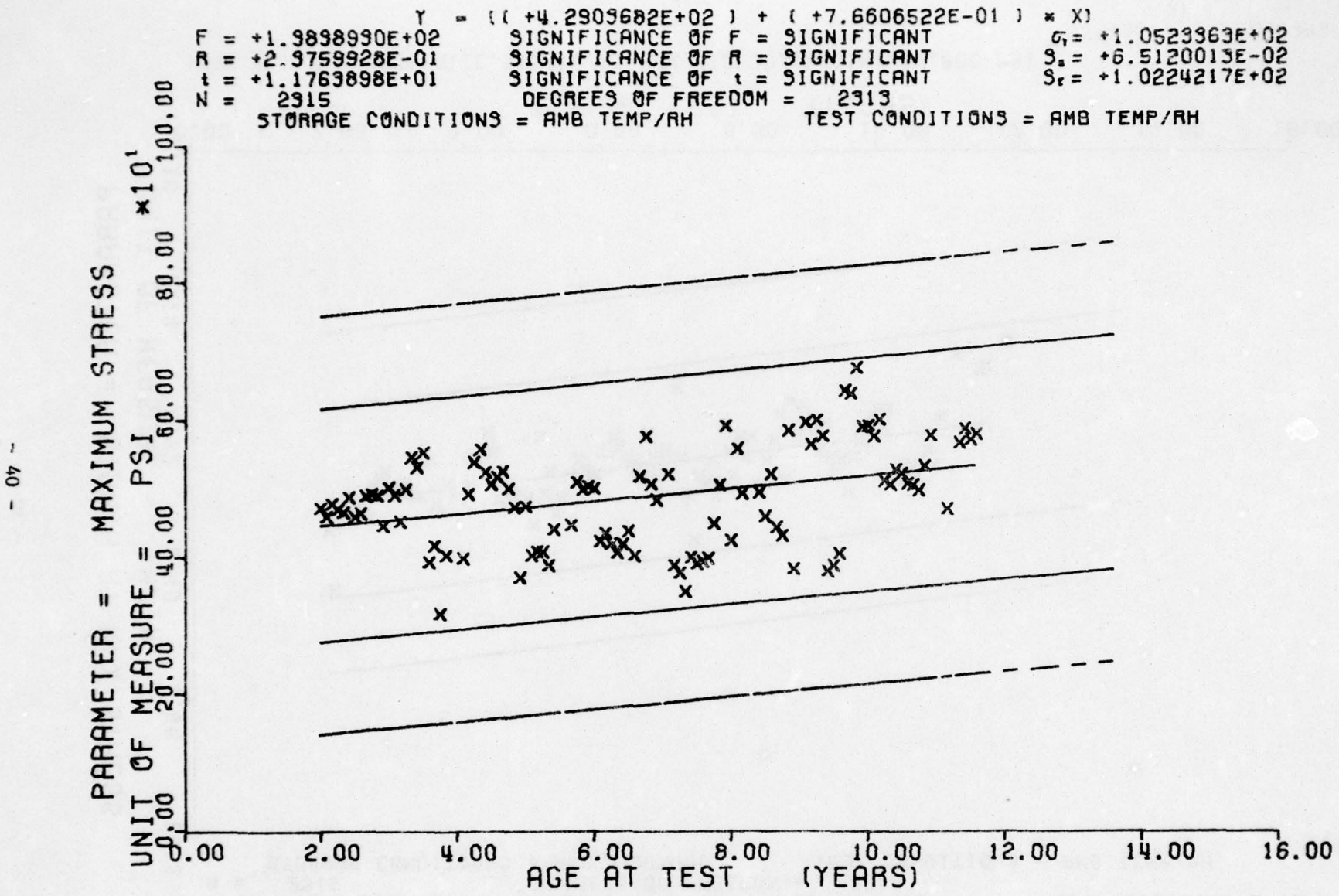

Y = ((+4.2909682E+02) + (+7.6606522E-01) * X)
F = +1.9898990E+02 SIGNIFICANCE OF F = SIGNIFICANT σ1 = +1.0523363E+02
R = +2.9759928E-01 SIGNIFICANCE OF R = SIGNIFICANT Sa = +6.5120013E-02
t = +1.1763898E+01 SIGNIFICANCE OF t = SIGNIFICANT Sr = +1.0224217E+02
N = 2315 DEGREES OF FREEDOM = 2313
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI *10¹
0.00
20.00
40.00
60.00
80.00
100.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,H.R.HYDROSTATIC,MAXIMUM STRESS,1750IN/MIN,800 PSI

Figure 22

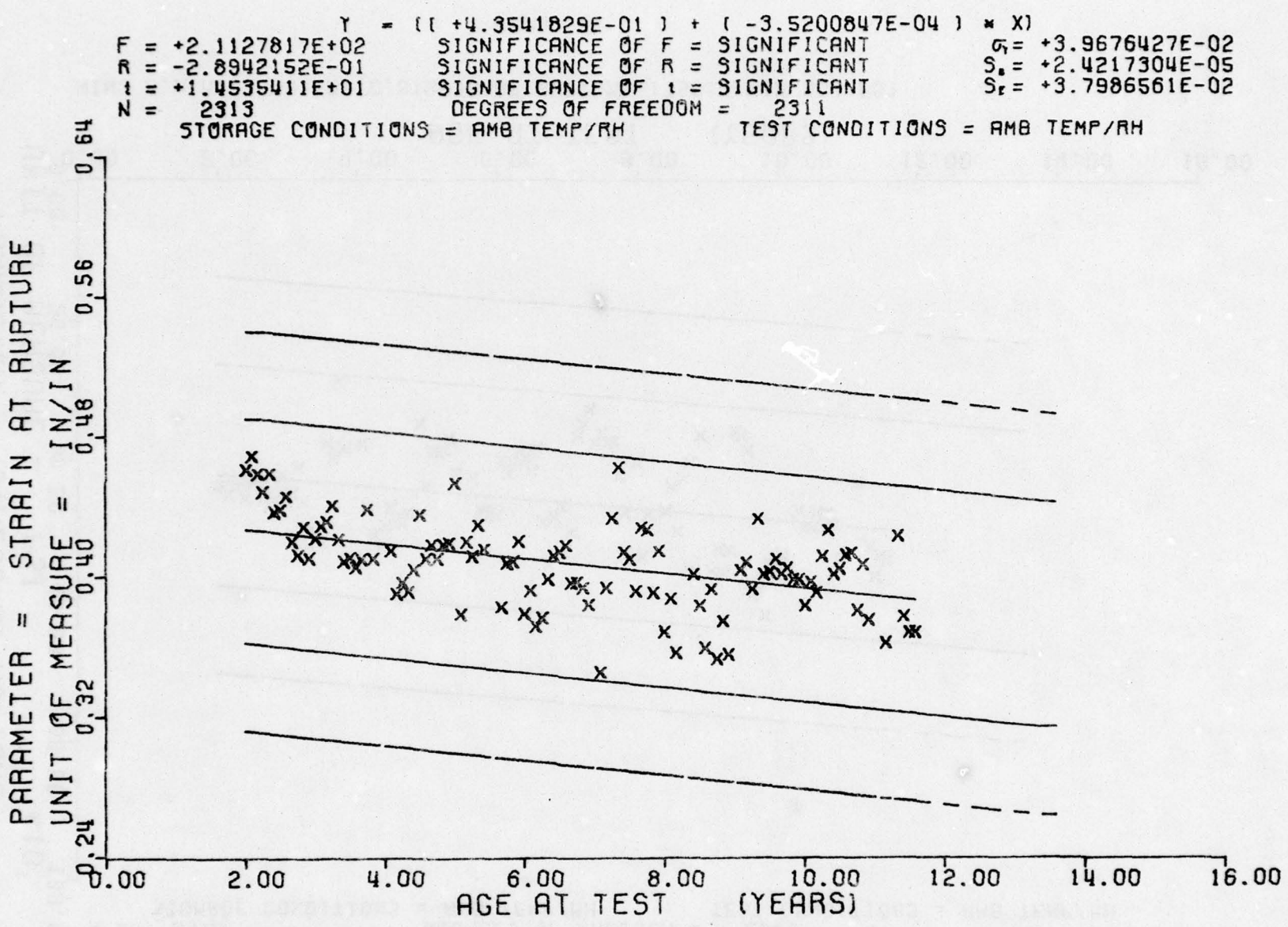

Y = ((+4.3541829E-01) + (-3.5200847E-04) * X)
F = +2.1127817E+02
R = -2.8942152E-01
t = +1.4535411E+01
N = 2313
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 2311
σ1 = +3.9676427E-02
Sa = +2.4217304E-05
Sr = +3.7986561E-02
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.24
0.32
0.40
0.48
0.56
0.64
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,H.R.HYDROSTATIC,STRAIN AT RUPTURE,1750IN/MIN,800 PSI

Figure 23

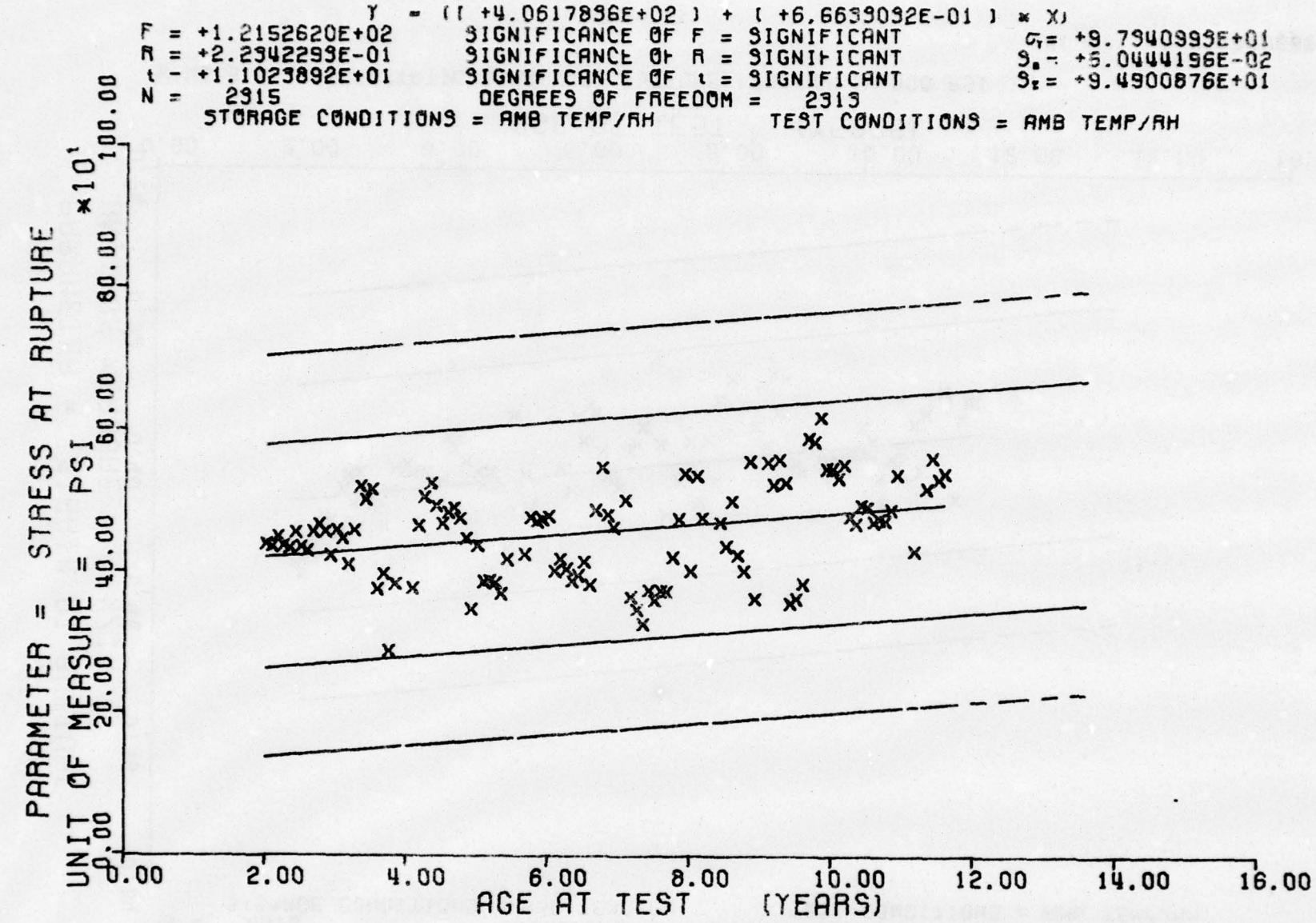

Y = (+4.0617896E+02) + (+6.6639032E-01) * X
F = +1.2152620E+02 SIGNIFICANCE OF F = SIGNIFICANT σ = +9.7940993E+01
R = +2.2942299E-01 SIGNIFICANCE OF R = SIGNIFICANT Sa = +5.0444196E-02
t = +1.1023892E+01 SIGNIFICANCE OF t = SIGNIFICANT Sz = +9.4900876E+01
N = 2315 DEGREES OF FREEDOM = 2313
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRESS AT RUPTURE
UNIT OF MEASURE = PSI *10¹
0.00
20.00
40.00
60.00
80.00
100.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,H.R.HYDROSTATIC,STRESS AT RUPTURE,1750IN/MIN,800 PSI

Figure 24

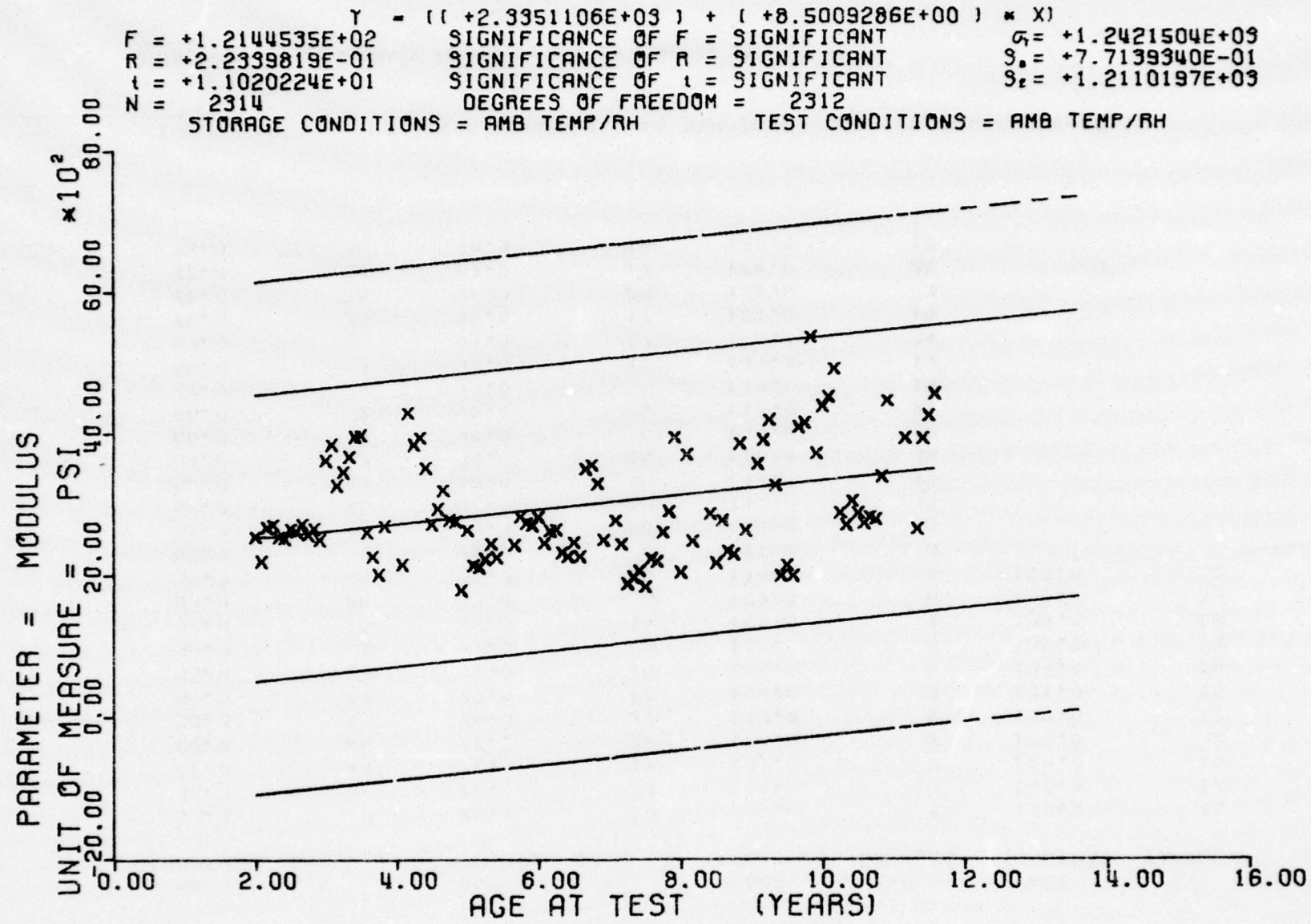

Y = ((+2.3351106E+03) + (+8.5009286E+00) * X)
F = +1.2144535E+02 SIGNIFICANCE OF F = SIGNIFICANT σ = +1.2421504E+03
R = +2.2339819E-01 SIGNIFICANCE OF R = SIGNIFICANT S = +7.7139340E-01
t = +1.1020224E+01 SIGNIFICANCE OF t = SIGNIFICANT S = +1.2110197E+03
N = 2314 DEGREES OF FREEDOM = 2312
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MODULUS
UNIT OF MEASURE = PSI *10²
80.00
60.00
40.00
20.00
0.00
-20.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,H.R.HYDROSTATIC,MODULUS,1750 IN/MIN, 800 PSI

Figure 25

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
49.0	2	74.0	29	99.0	8	126.0	19
50.0	26	75.0	23	100.0	6	127.0	12
51.0	49	76.0	17	101.0	9	128.0	15
52.0	46	77.0	34	102.0	5	129.0	2
53.0	18	78.0	22	103.0	6	130.0	12
54.0	27	79.0	12	104.0	3	131.0	15
55.0	27	80.0	14	105.0	6	134.0	16
56.0	21	81.0	8	107.0	6	135.0	3
57.0	24	82.0	14	108.0	9	138.0	28
58.0	20	83.0	9	109.0	6	139.0	39
59.0	9	84.0	5	110.0	6	153.0	32
60.0	9	85.0	6	111.0	3		
61.0	21	86.0	3	112.0	8		
62.0	46	87.0	18	113.0	45		
63.0	23	88.0	16	114.0	15		
64.0	27	89.0	15	115.0	30		
65.0	9	90.0	6	116.0	22		
66.0	2	91.0	5	117.0	21		
67.0	9	92.0	6	118.0	15		
68.0	3	93.0	16	119.0	19		
69.0	20	94.0	17	120.0	24		
70.0	30	95.0	17	121.0	15		
71.0	38	96.0	20	122.0	3		
72.0	30	97.0	17	124.0	21		
75.0	30	98.0	16	125.0	17		

WING 6,STRESS RELAXATION MODULUS,0.5% STRAIN,10 SEC,-55 DEG F,TPH-1011

This sample size summary is applicable to figures 26 thru 29

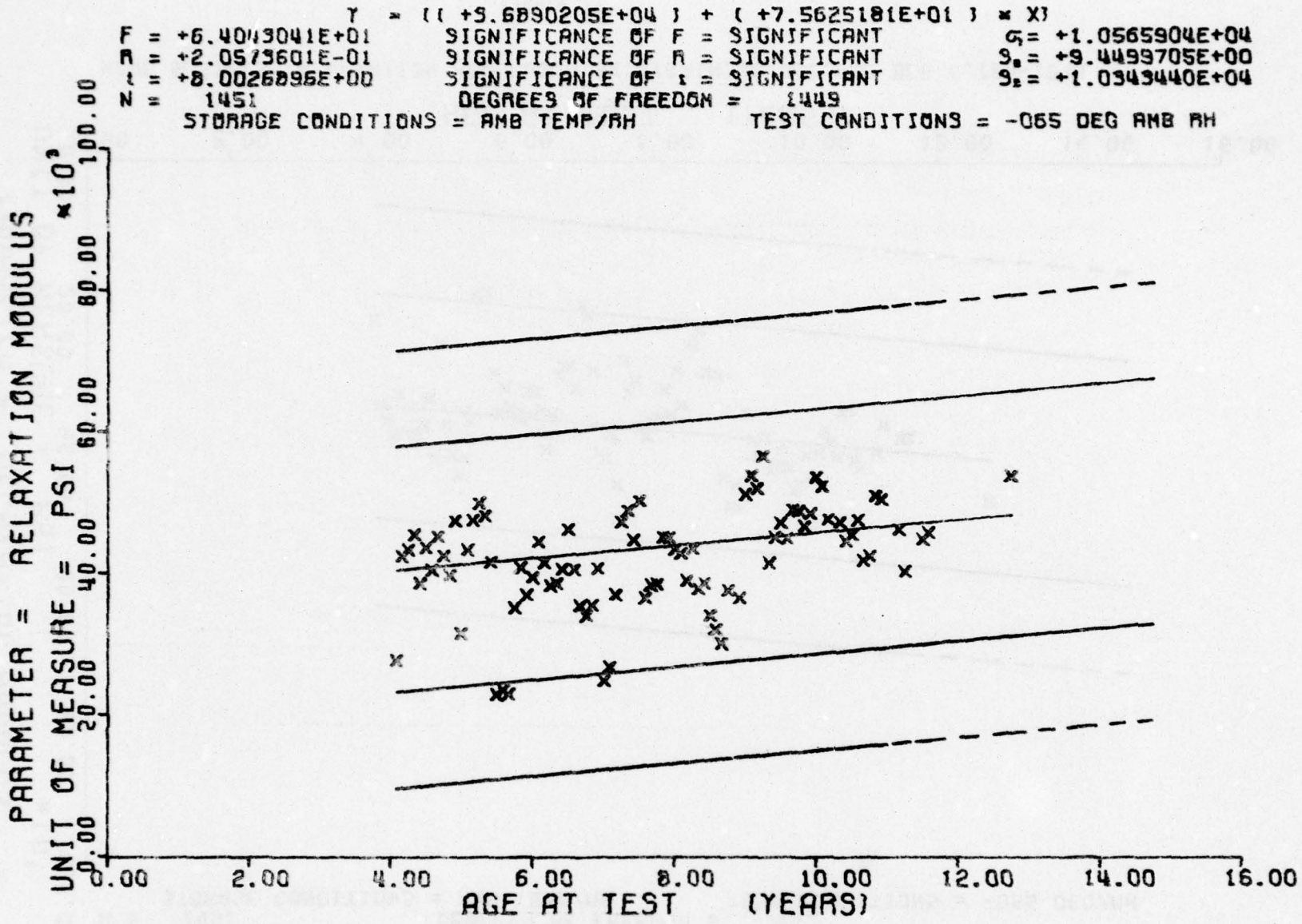

Y = ((+5.6890205E+04) + (+7.5625181E+01) * X)
F = +6.4043041E+01 SIGNIFICANCE OF F = SIGNIFICANT σ1 = +1.0565904E+04
R = +2.0573601E-01 SIGNIFICANCE OF R = SIGNIFICANT σe = +9.4499705E+00
t = +8.0026896E+00 SIGNIFICANCE OF t = SIGNIFICANT σ2 = +1.0343440E+04
N = 1451 DEGREES OF FREEDOM = 1449
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = -065 DEG AMB RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10³
0.00
20.00
40.00
60.00
80.00
100.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,0.5% STRAIN,10 SEC,-65 DEG F,TPH-1011

Figure 26

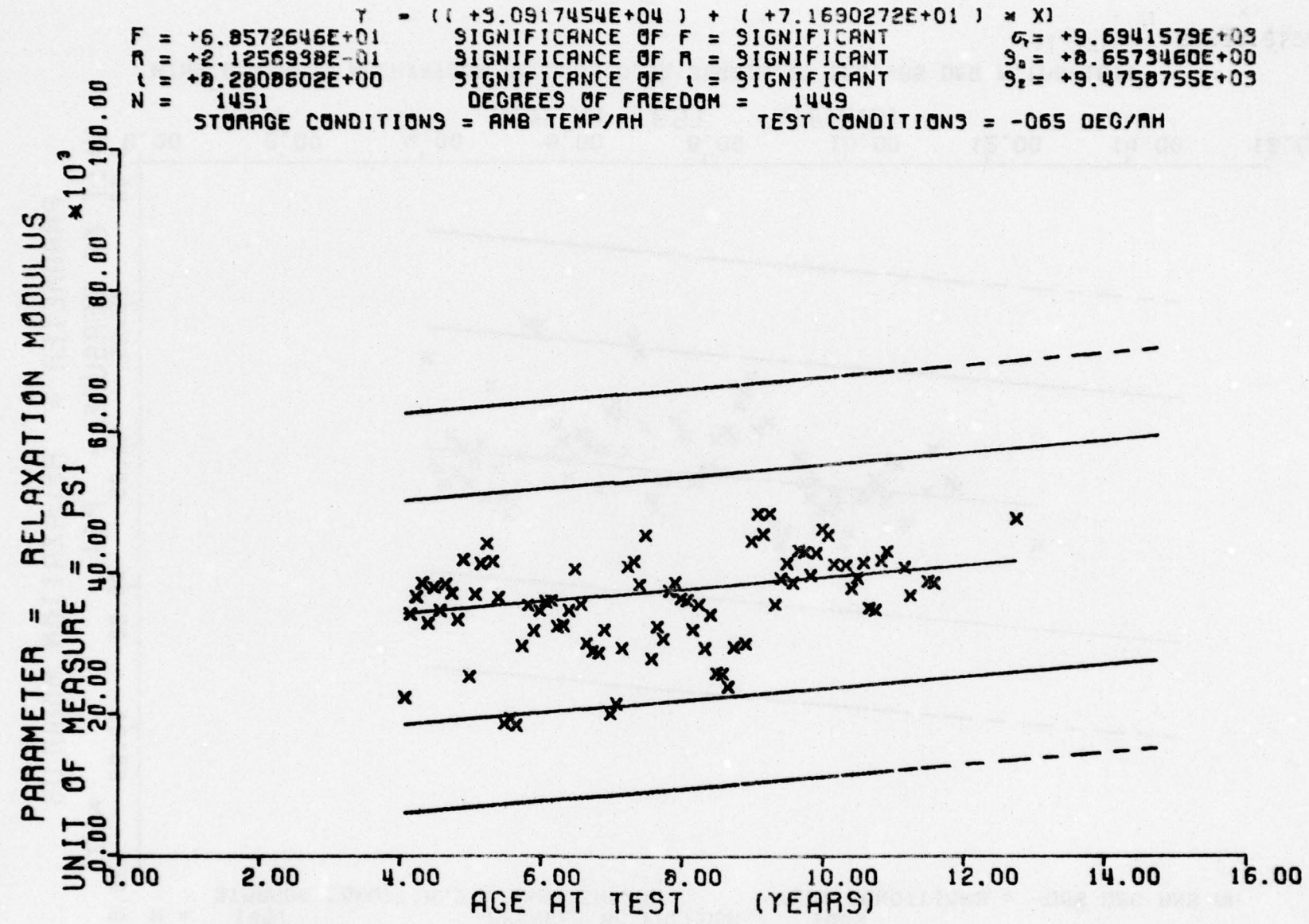

Y = ((+3.0917454E+04) + (+7.1690272E+01) * X)
F = +6.8572646E+01 SIGNIFICANCE OF F = SIGNIFICANT σ = +9.6941579E+03
R = +2.1256938E-01 SIGNIFICANCE OF R = SIGNIFICANT S = +8.6573460E+00
t = +8.2808602E+00 SIGNIFICANCE OF t = SIGNIFICANT S = +9.4758755E+03
N = 1451 DEGREES OF FREEDOM = 1449
STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = -065 DEG/AH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10³
0.00
20.00
40.00
60.00
80.00
100.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,0.5% STRAIN,50 SEC,-65 DEG F,TPH-1011

Figure 27

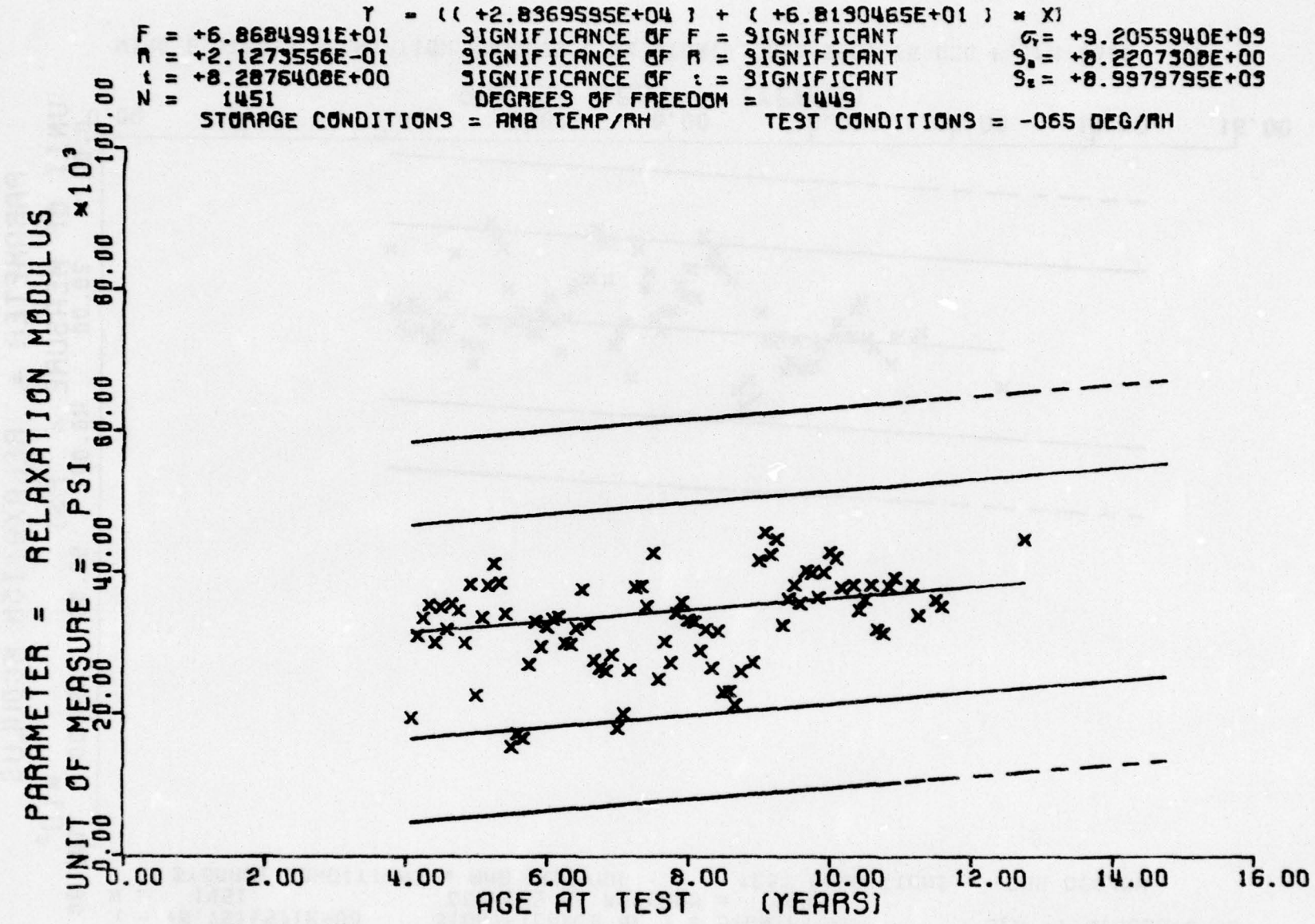

Y = ((+2.8369595E+04) + (+6.8130465E+01) * X)
F = +6.8684991E+01 SIGNIFICANCE OF F = SIGNIFICANT σr = +9.2055940E+03
R = +2.1273556E-01 SIGNIFICANCE OF R = SIGNIFICANT Sa = +8.2207308E+00
t = +8.2876408E+00 SIGNIFICANCE OF t = SIGNIFICANT Se = +8.9979795E+03
N = 1451 DEGREES OF FREEDOM = 1449
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = -065 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10³
0.00
20.00
40.00
60.00
80.00
100.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,0.5% STRAIN,100 SEC.-65 DEG F,TPH-1011

Figure 28

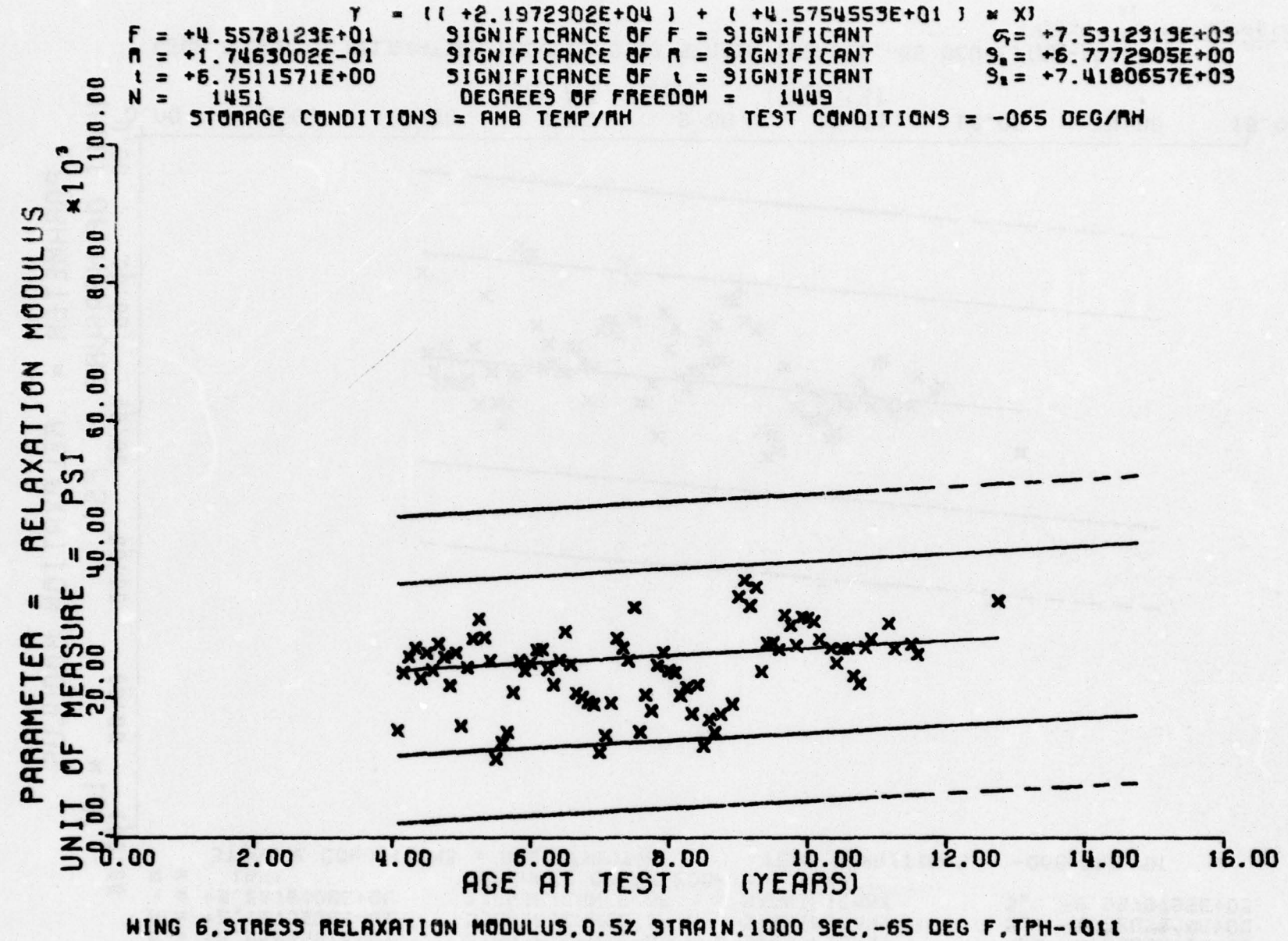

Y = ((+2.1972302E+04) + (+4.5754553E+01) * X)
F = +4.5578123E+01 SIGNIFICANCE OF F = SIGNIFICANT σ = +7.5312319E+03
R = +1.7463002E-01 SIGNIFICANCE OF R = SIGNIFICANT S = +6.7772905E+00
t = +6.7511571E+00 SIGNIFICANCE OF t = SIGNIFICANT S = +7.4180657E+03
N = 1451 DEGREES OF FREEDOM = 1449
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = -065 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10³
0.00
20.00
40.00
60.00
80.00
100.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,0.5% STRAIN,1000 SEC,-65 DEG F,TPH-1011

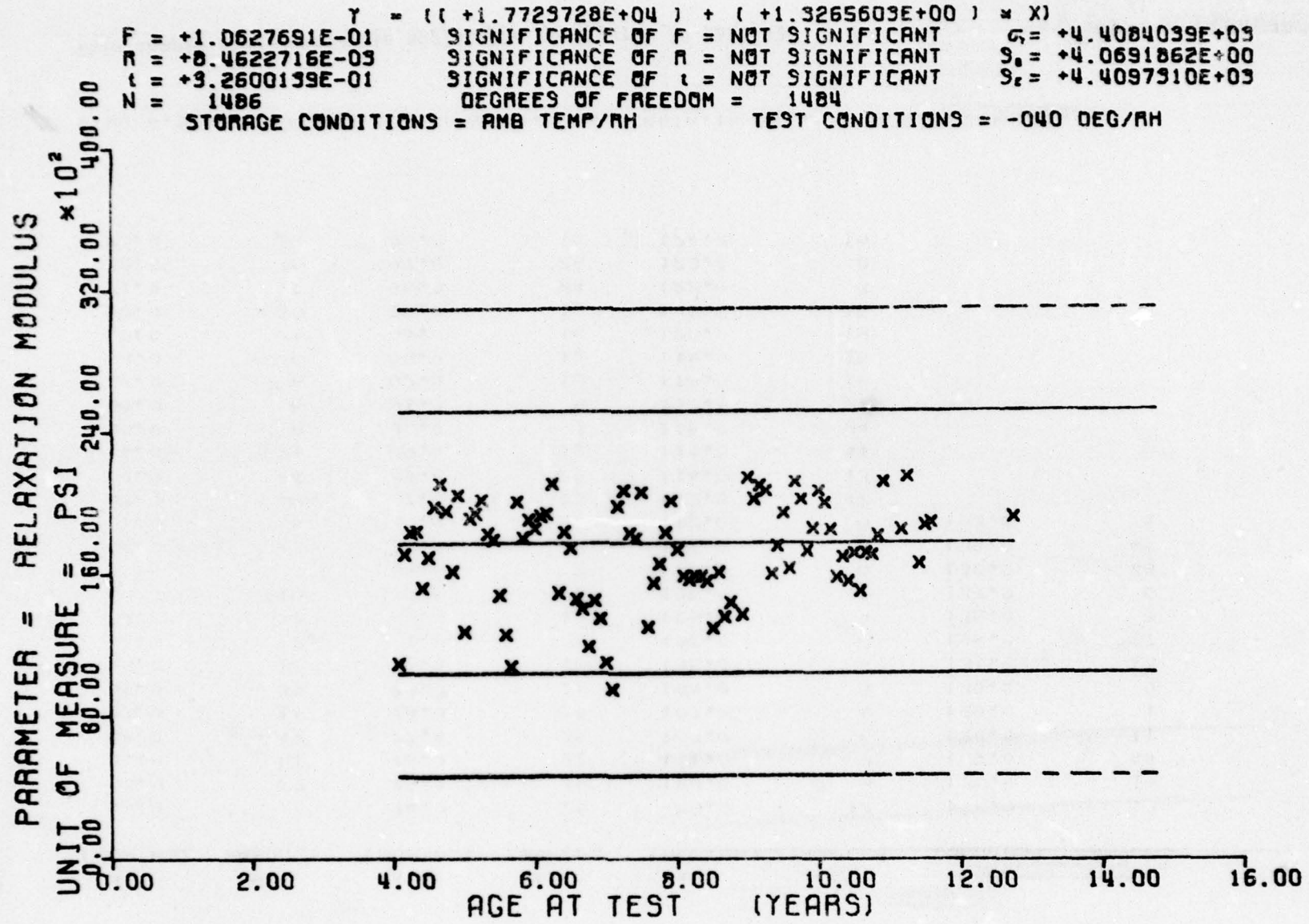
Figure 29

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
49.0	6	74.0	25	99.0	12	125.0	13
50.0	27	75.0	19	100.0	3	126.0	16
51.0	51	76.0	26	101.0	9	127.0	44
52.0	47	77.0	30	102.0	6	128.0	11
53.0	14	78.0	29	103.0	5	129.0	1
54.0	30	79.0	14	104.0	3	130.0	9
55.0	18	80.0	14	105.0	6	131.0	13
56.0	12	81.0	4	107.0	6	134.0	27
57.0	27	82.0	11	108.0	9	135.0	3
58.0	19	83.0	6	109.0	6	137.0	6
59.0	6	84.0	9	110.0	6	138.0	38
60.0	12	85.0	3	111.0	3	139.0	45
61.0	20	86.0	6	112.0	9	153.0	6
62.0	48	87.0	15	113.0	47		
63.0	24	88.0	20	114.0	13		
64.0	21	89.0	12	115.0	41		
65.0	9	90.0	5	116.0	24		
66.0	6	91.0	9	117.0	21		
67.0	6	92.0	12	118.0	15		
68.0	6	93.0	12	119.0	15		
69.0	21	94.0	16	120.0	18		
70.0	30	95.0	15	121.0	15		
71.0	41	96.0	24	122.0	3		
72.0	36	97.0	20	123.0	2		
73.0	25	98.0	18	124.0	10		

WING 6,STRESS RELAXATION MODULUS,0.5% STRAIN,10 SEC.-40 DEG F,TPH-1011

This sample size summary is applicable to figures 30 thru 33



WING 6,STRESS RELAXATION MODULUS,0.5% STRAIN,10 SEC,-40 DEG F,TPH-1011

Figure 30

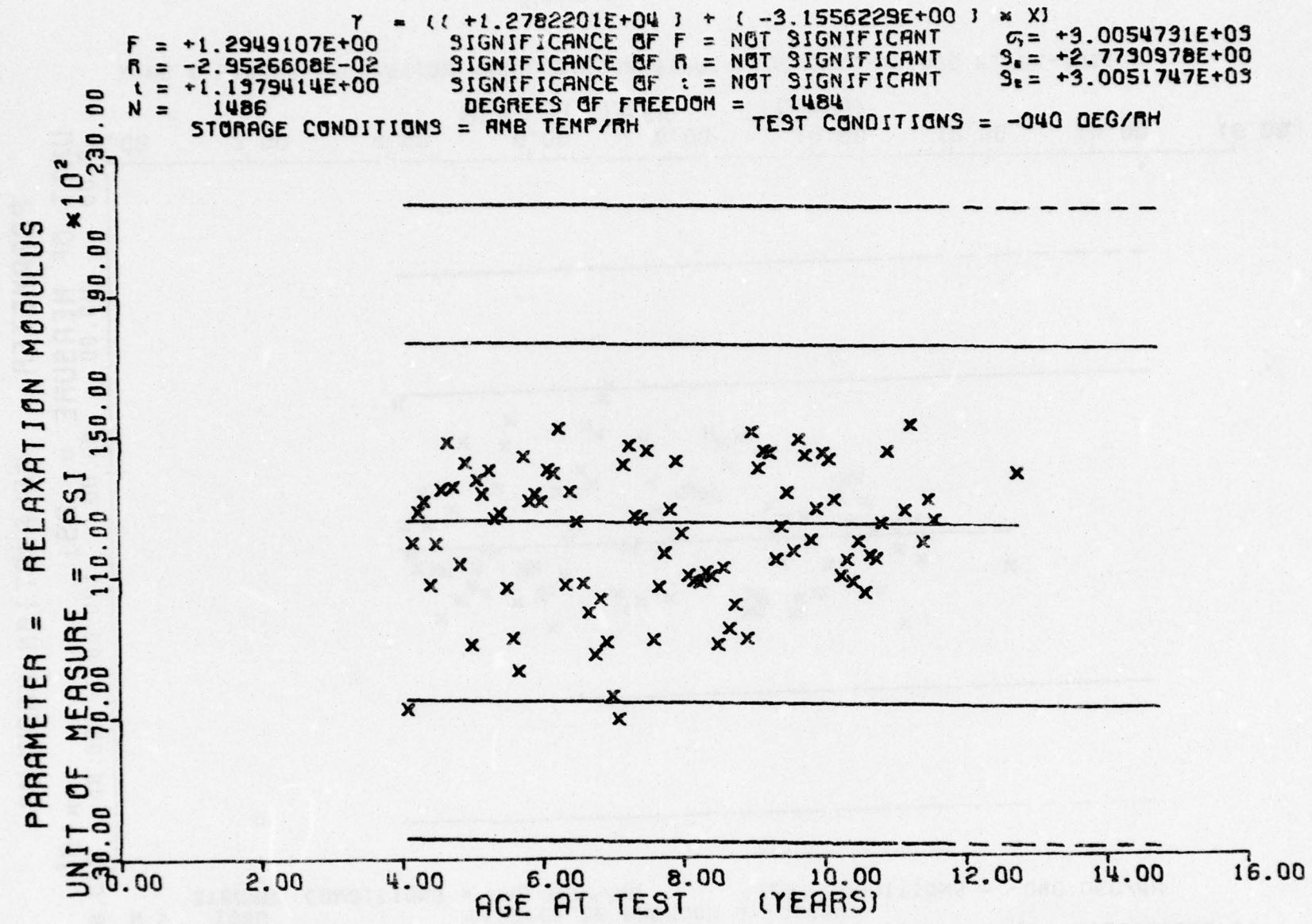
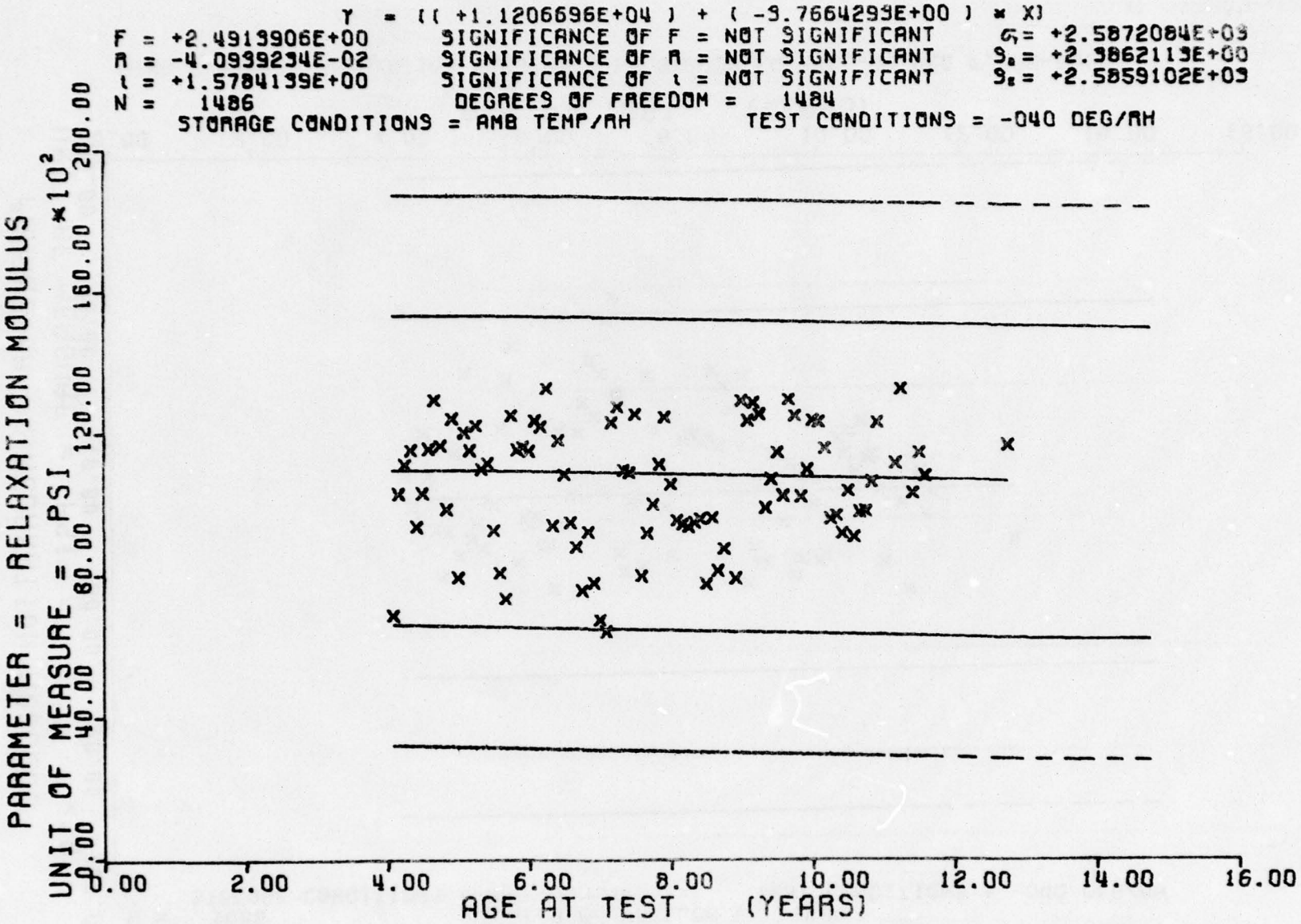
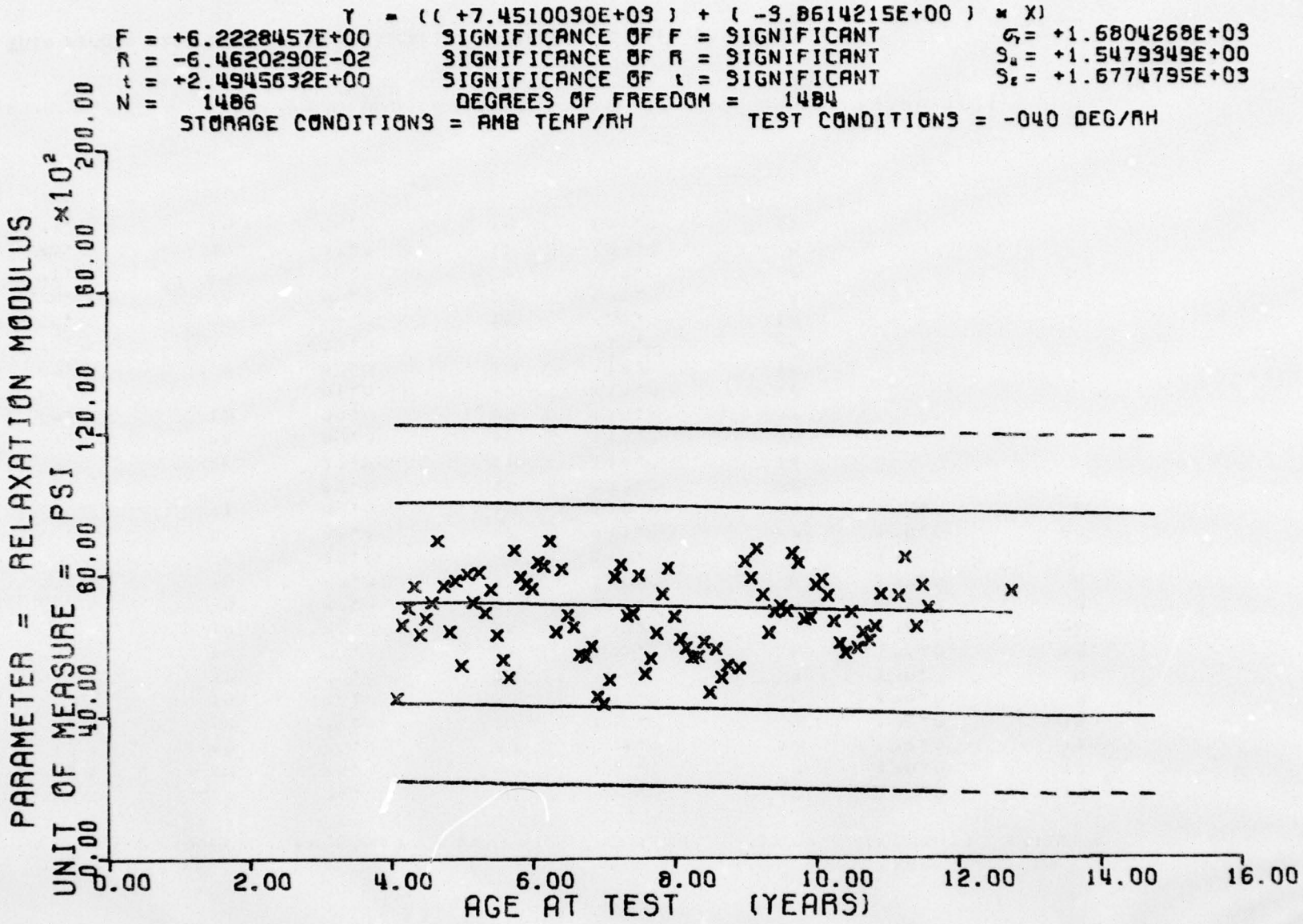

Y = ((+1.2782201E+04) + (-3.1556229E+00) * X)
F = +1.2949107E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ = +3.0054731E+03
R = -2.9526608E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT Se = +2.7790978E+00
t = +1.1379414E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT Sb = +3.0051747E+03
N = 1486 DEGREES OF FREEDOM = 1484
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = -040 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10²
30.00
70.00
110.00
150.00
190.00
230.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,0.5% STRAIN,50 SEC,-40 DEG F,TPH-1011

Figure 31



WING 6,STRESS RELAXATION MODULUS,0.5% STRAIN,100 SEC,-40 DEG F,TPH-1011

Figure 32



WING 6,STRESS RELAXATION MODULUS,0.5% STRAIN,1000 SEC,-40 DEG F,TPH-1011

Figure 33

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NO. SAMPLES	AGE (MONTHS)	NO. SAMPLES	AGE (MONTHS)	NO. SAMPLES	AGE (MONTHS)	NO. SAMPLES
49.0	4	74.0	23	99.0	12	125.0	15
50.0	27	75.0	20	100.0	3	126.0	17
51.0	50	76.0	23	101.0	12	127.0	11
52.0	49	77.0	23	102.0	5	128.0	15
53.0	15	78.0	30	103.0	6	129.0	3
54.0	39	79.0	15	104.0	3	130.0	9
55.0	18	80.0	21	105.0	6	131.0	15
56.0	19	81.0	15	107.0	6	134.0	24
57.0	20	82.0	15	108.0	9	135.0	3
58.0	16	83.0	12	109.0	6	137.0	6
59.0	6	84.0	9	110.0	6	138.0	20
60.0	22	85.0	3	111.0	3	139.0	60
61.0	21	86.0	15	112.0	24	153.0	6
62.0	40	87.0	14	113.0	38		
63.0	24	88.0	21	114.0	14		
64.0	24	89.0	15	115.0	30		
65.0	12	90.0	15	116.0	33		
66.0	9	91.0	12	117.0	21		
67.0	7	92.0	12	118.0	15		
68.0	6	93.0	15	119.0	24		
69.0	29	94.0	15	120.0	18		
70.0	24	95.0	27	121.0	15		
71.0	43	96.0	24	122.0	3		
72.0	30	97.0	12	123.0	6		
73.0	18	98.0	18	124.0	17		

WING 6,STRESS RELAXATION MODULUS,2.0% STRAIN,10 SEC, 20 DEG F,TPH-1011

This sample size summary is applicable to figures 34 thru 37

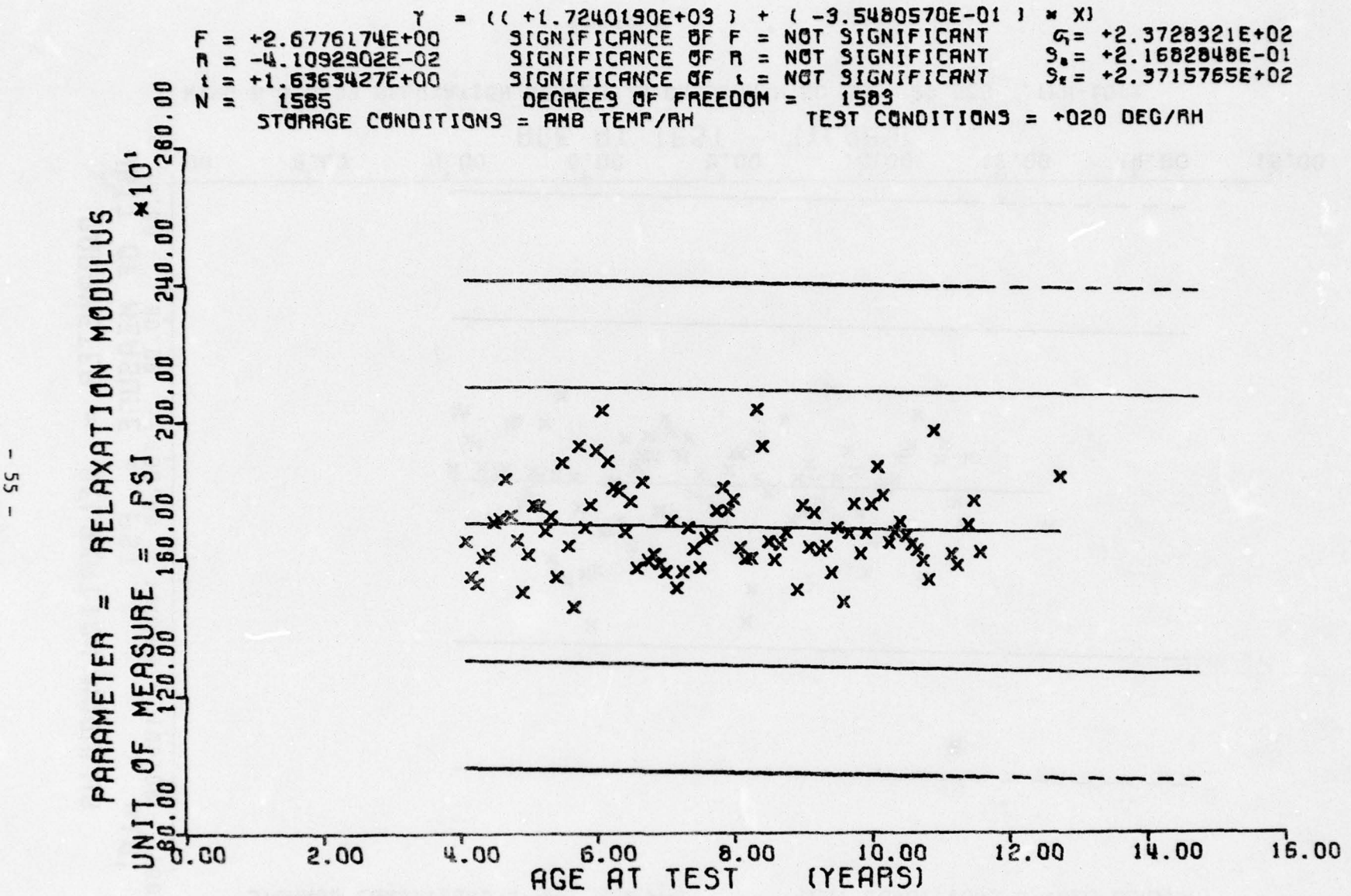

Y = ((+1.7240190E+03) + (-3.5480570E-01) * X)
F = +2.6776174E+00
R = -4.1092902E-02
t = +1.6363427E+00
N = 1585
SIGNIFICANCE OF F = NOT SIGNIFICANT
SIGNIFICANCE OF R = NOT SIGNIFICANT
SIGNIFICANCE OF t = NOT SIGNIFICANT
DEGREES OF FREEDOM = 1583
σ1 = +2.3728321E+02
Se = +2.1682848E-01
Sε = +2.3715765E+02
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = +020 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10¹
80.00
120.00
160.00
200.00
240.00
280.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,10 SEC, 20 DEG F,TPH-1011

Figure 34

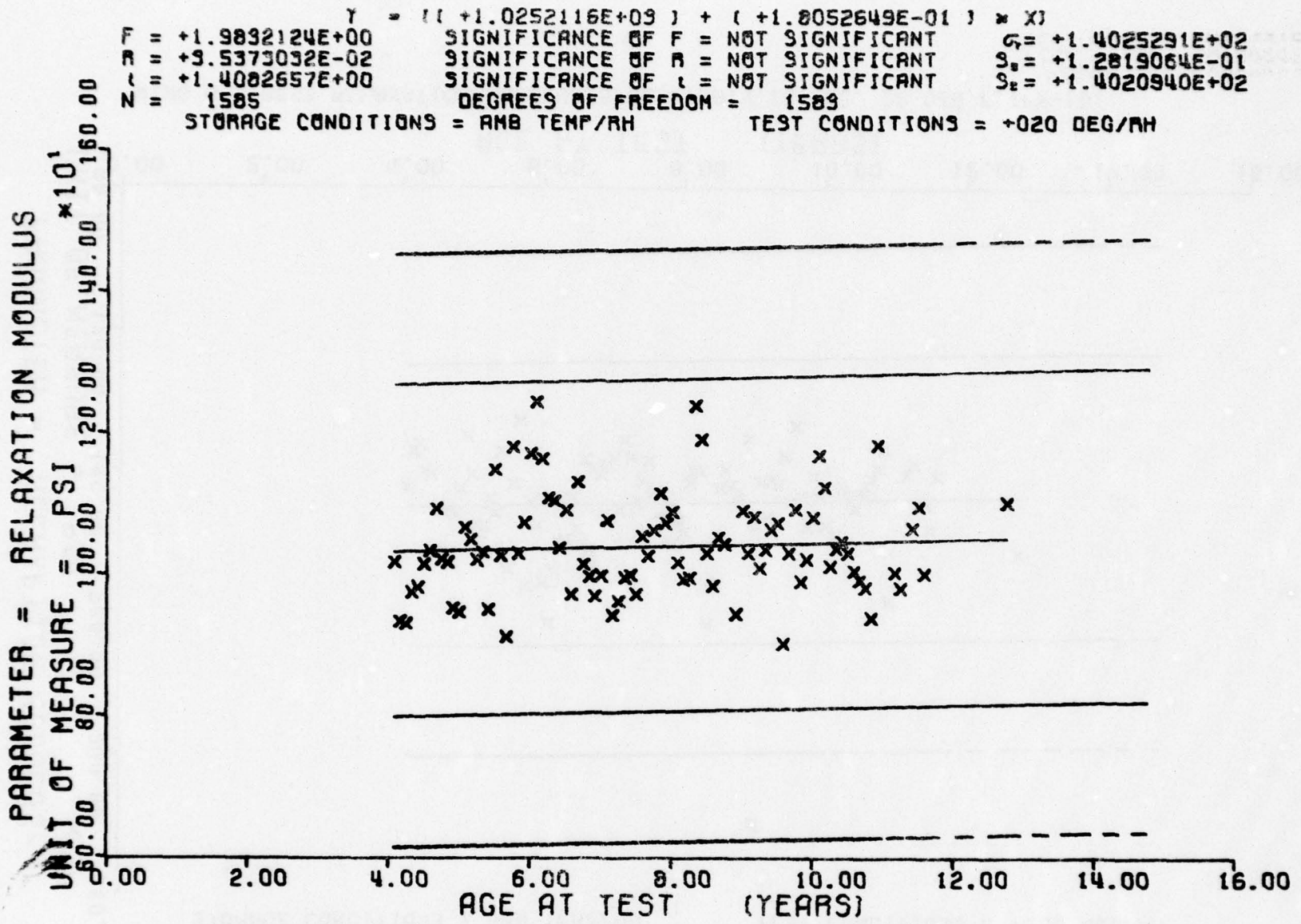
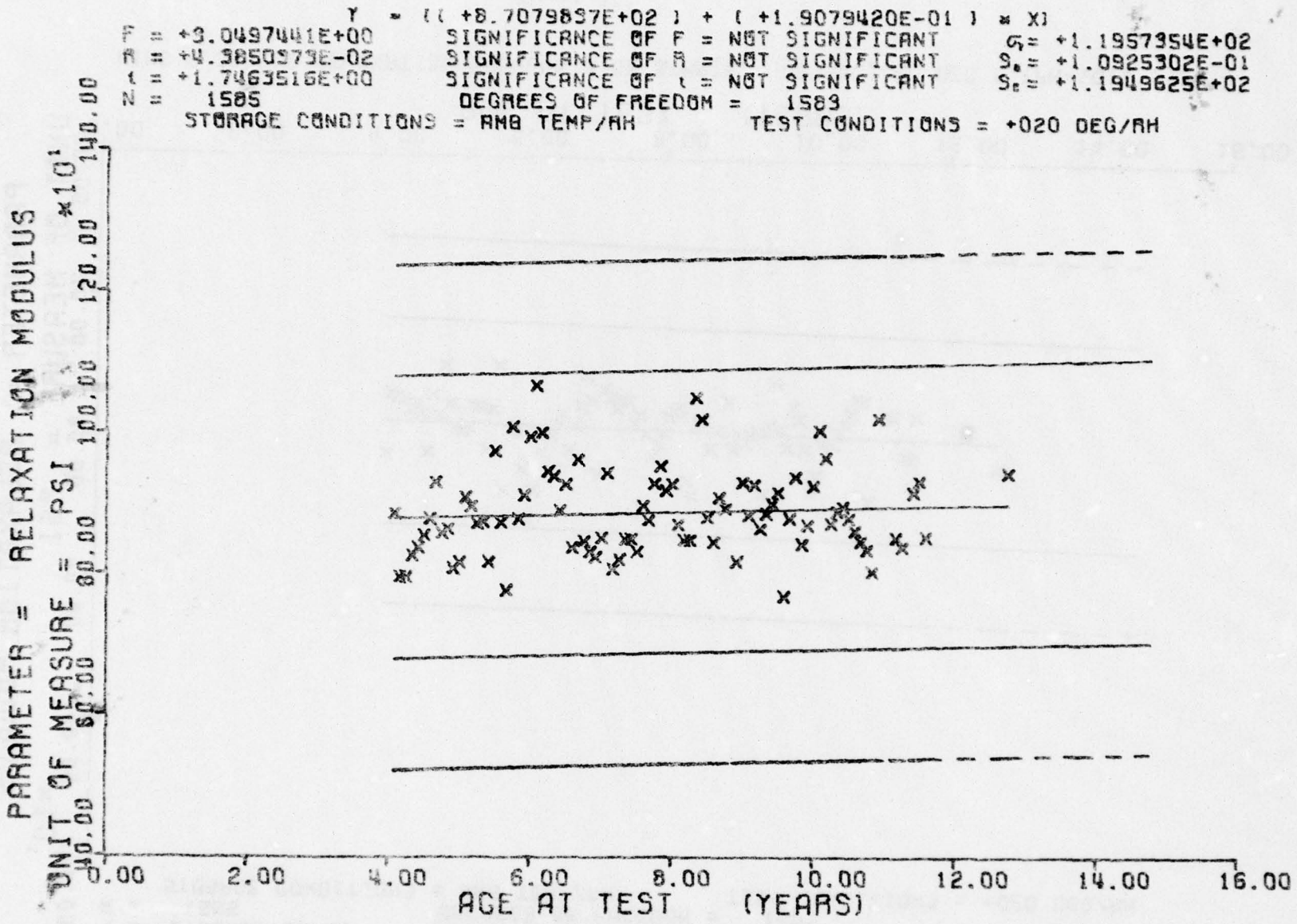

Y = [(+1.0252116E+03) + (+1.8052649E-01) * X]
F = +1.9832124E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ = +1.4025291E+02
R = +3.5373032E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT Sb = +1.2819064E-01
t = +1.4082657E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT Se = +1.4020940E+02
N = 1585 DEGREES OF FREEDOM = 1583
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +020 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10¹
60.00
80.00
100.00
120.00
140.00
160.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,50 SEC, 20 DEG F,TPH-1011

Figure 35



WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,100 SEC, 20 DEG F,TPH-1011

Figure 36

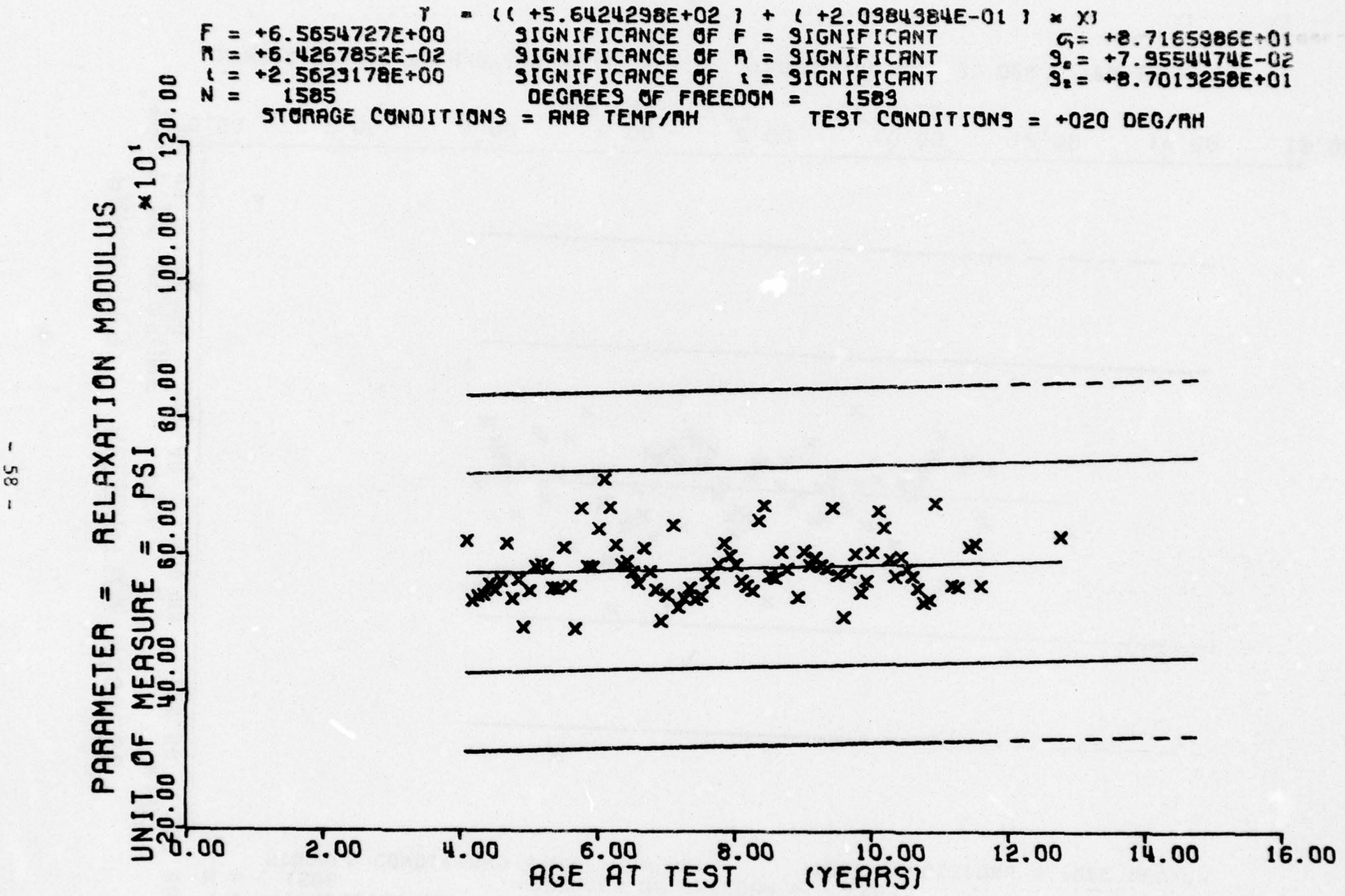

Y = ((+5.6424298E+02) + (+2.0384384E-01) * X)
F = +6.5654727E+00 SIGNIFICANCE OF F = SIGNIFICANT
R = +6.4267852E-02 SIGNIFICANCE OF R = SIGNIFICANT
t = +2.5623178E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 1585 DEGREES OF FREEDOM = 1583
STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = +020 DEG/AH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10¹
20.00
40.00
60.00
80.00
100.00
120.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,1000 SEC, 20 DEG F,TPH-1011

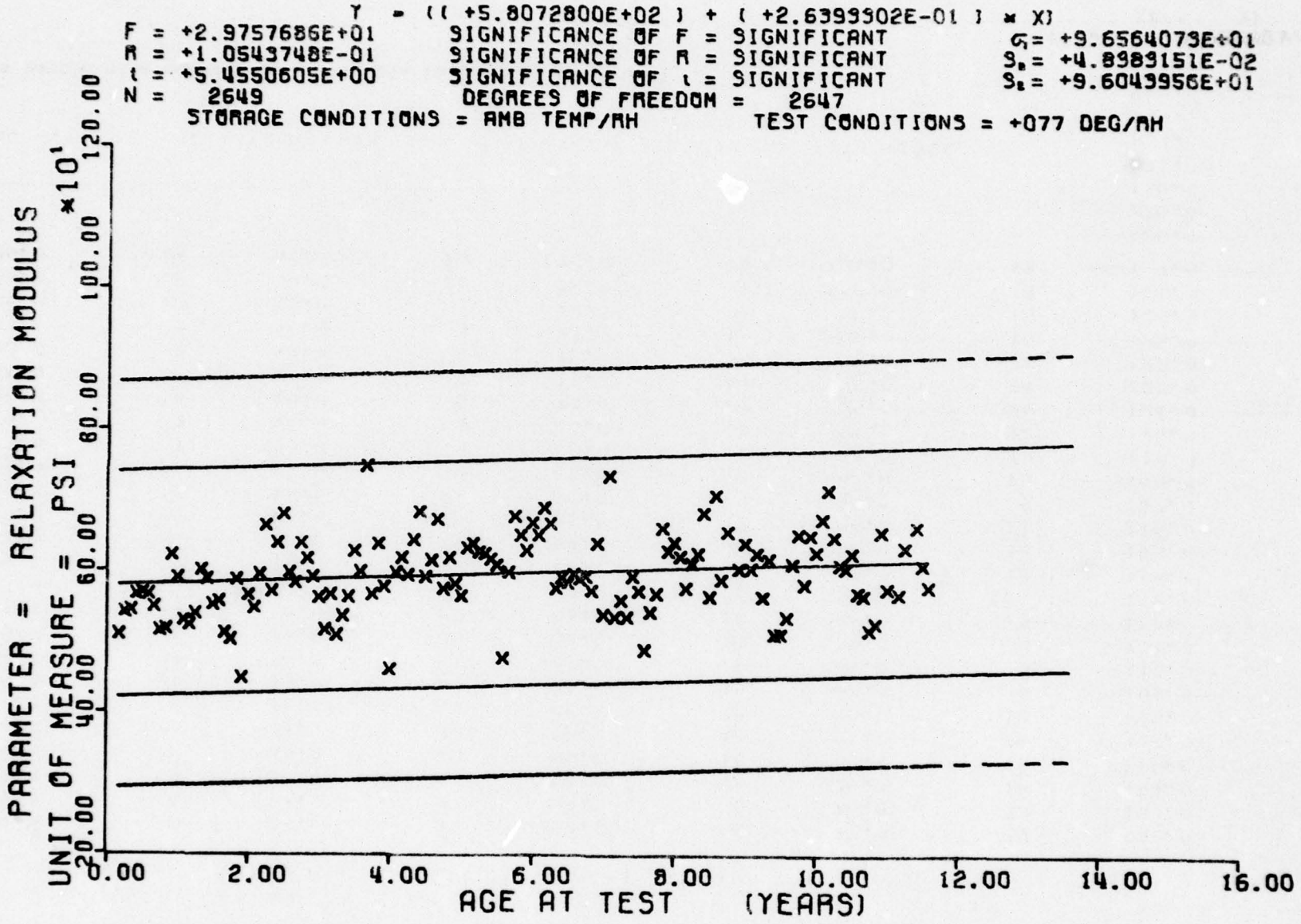
Figure 37

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NO. SAMPLES	AGE (MONTHS)	NO. SAMPLES	AGE (MONTHS)	NO. SAMPLES	AGE (MONTHS)	NO. SAMPLES	AGE (MONTHS)	NO. SAMPLES
2.0	3	27.0	16	52.0	32	77.0	30	102.0	3
3.0	1	28.0	27	53.0	6	78.0	33	103.0	6
4.0	13	29.0	48	54.0	36	79.0	18	104.0	6
5.0	28	30.0	40	55.0	16	80.0	15	105.0	3
6.0	21	31.0	30	56.0	18	81.0	24	107.0	7
7.0	25	32.0	48	57.0	30	82.0	12	108.0	6
8.0	27	33.0	29	58.0	19	83.0	9	109.0	6
9.0	36	34.0	51	59.0	5	84.0	9	110.0	6
10.0	32	35.0	30	60.0	23	85.0	3	111.0	3
11.0	47	36.0	52	61.0	15	86.0	15	112.0	21
12.0	44	37.0	15	62.0	57	87.0	21	113.0	47
13.0	20	38.0	13	63.0	21	88.0	18	114.0	17
14.0	44	39.0	21	64.0	27	89.0	18	115.0	9
15.0	39	40.0	12	65.0	12	90.0	21	116.0	56
16.0	10	41.0	21	66.0	9	91.0	9	117.0	18
17.0	25	42.0	9	67.0	3	92.0	15	118.0	15
18.0	1	43.0	9	69.0	9	93.0	12	119.0	21
19.0	7	44.0	3	69.0	24	94.0	12	120.0	21
20.0	4	45.0	6	70.0	43	95.0	24	121.0	12
21.0	9	46.0	9	71.0	44	96.0	24	122.0	3
22.0	6	47.0	9	72.0	36	97.0	21	123.0	6
23.0	3	48.0	3	73.0	18	98.0	15	124.0	18
24.0	10	49.0	6	74.0	33	99.0	15	125.0	15
25.0	15	50.0	21	75.0	27	100.0	3	126.0	15
26.0	24	51.0	76	76.0	24	101.0	12	127.0	12
								128.0	15
								129.0	3
								130.0	9
								131.0	15
								132.0	2
								134.0	24
								135.0	3
								137.0	6
								138.0	38
								139.0	42

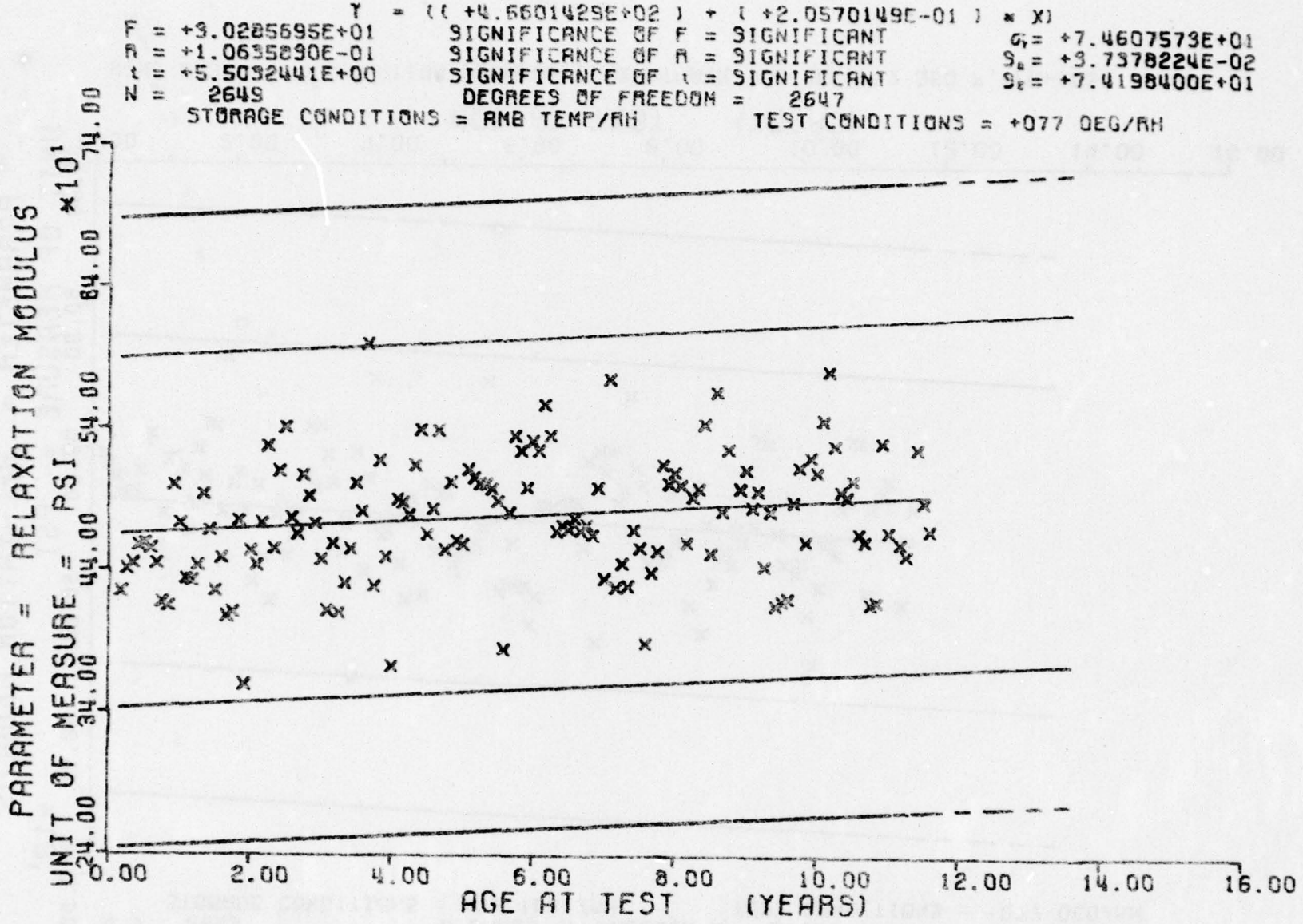
YING'S STRESS RELAXATION MODULUS,5.0% STRAIN,10 SEC. 77 DEG F,TPH-1011

This sample size summary is applicable to figures 38 thru 41



WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,10 SEC, 77 DEG F,TPH-1011

Figure 38



NING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,50 SEC, 77 DEG F,TPH-1011

Figure 39

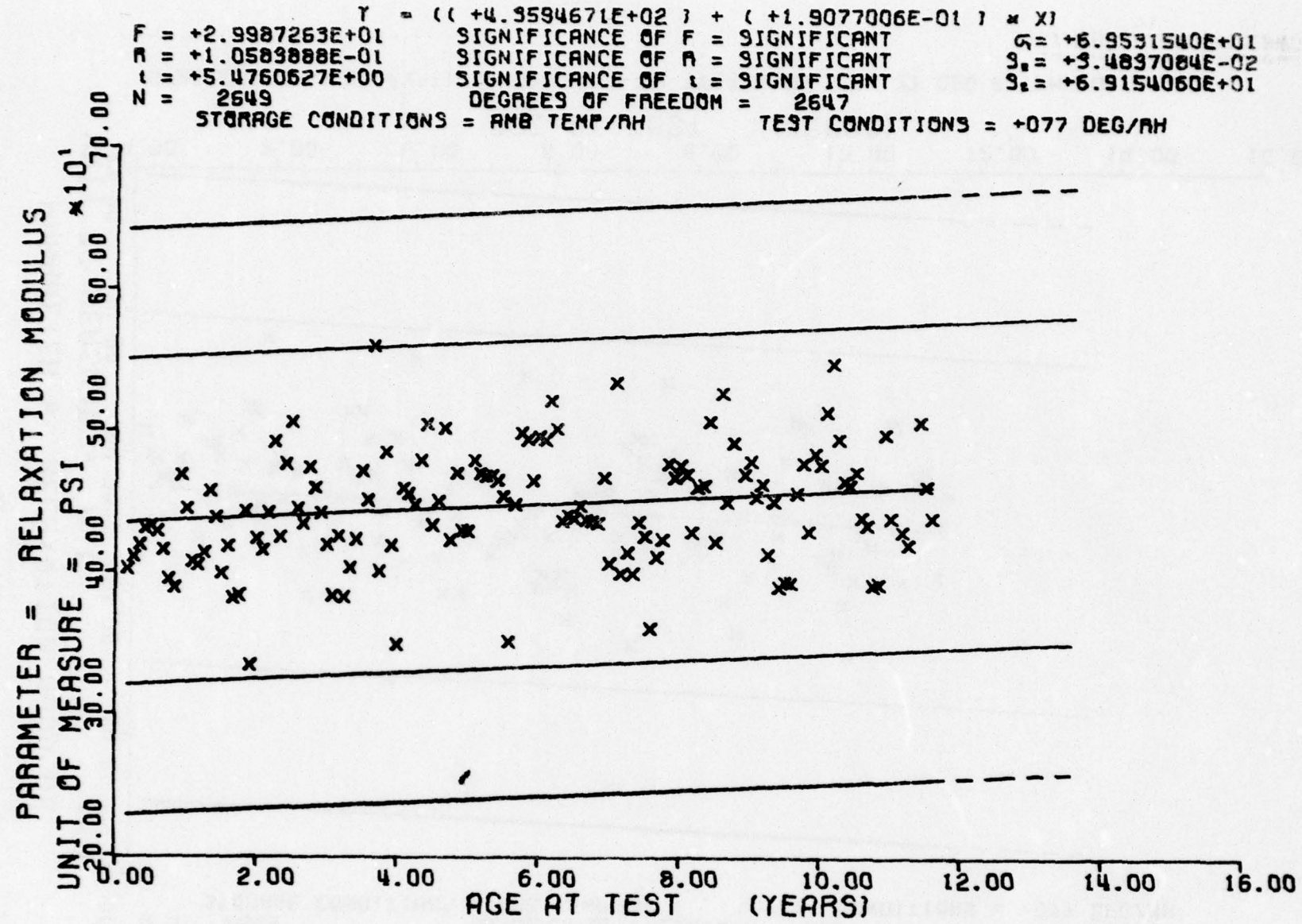
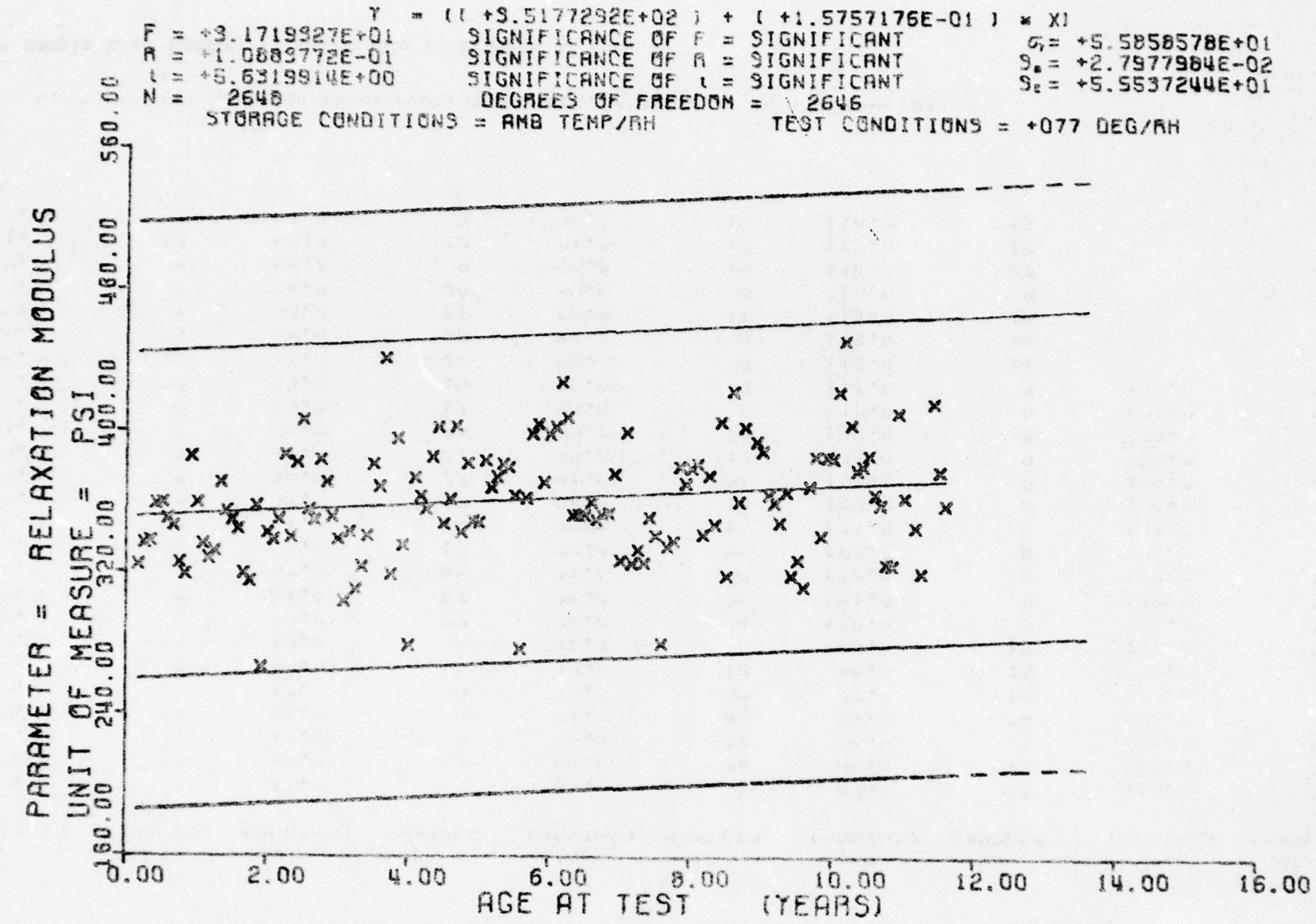

Y = ((+4.3594671E+02) + (+1.9077006E-01) * X)
F = +2.9987263E+01 SIGNIFICANCE OF F = SIGNIFICANT
R = +1.0583888E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +5.4760627E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 2649 DEGREES OF FREEDOM = 2647
STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = +077 DEG/AH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10¹
70.00
60.00
50.00
40.00
30.00
20.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,100 SEC, 77 DEG F,TPH-1011

Figure 40



WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,1000 SEC, 77 DEG F,TPH-1011

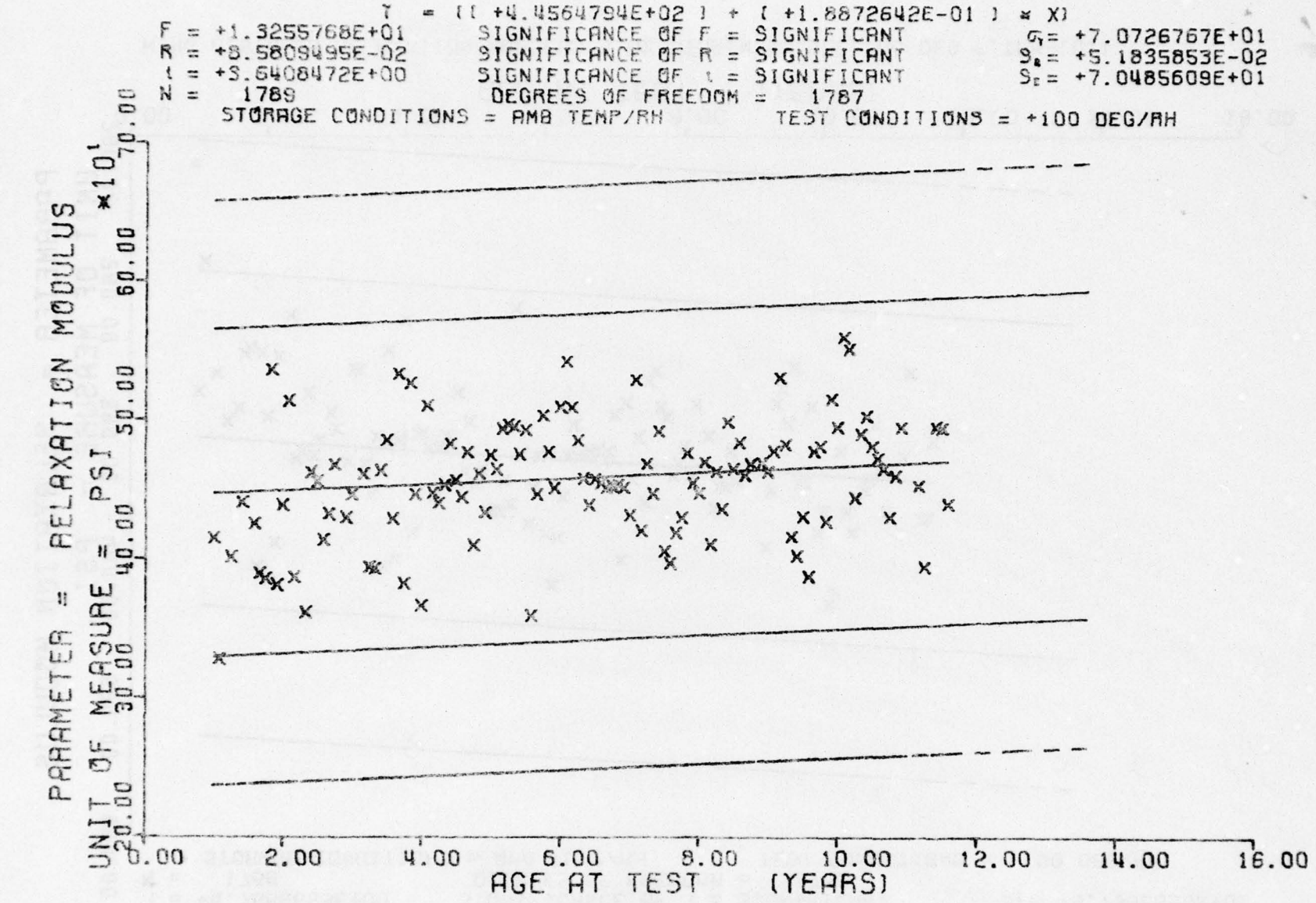
Figure 41

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
15.0	3	42.0	9	68.0	9	93.0	15	119.0	21
17.0	3	44.0	3	69.0	24	94.0	15	120.0	21
19.0	6	45.0	9	70.0	27	95.0	21	121.0	12
17.0	15	46.0	6	71.0	45	96.0	24	122.0	3
19.0	6	47.0	9	72.0	30	97.0	15	123.0	9
20.0	3	48.0	3	73.0	18	98.0	18	124.0	15
21.0	9	49.0	6	74.0	36	99.0	12	125.0	15
22.0	3	50.0	27	75.0	24	100.0	3	126.0	18
23.0	3	51.0	57	76.0	26	101.0	9	127.0	12
24.0	6	52.0	45	77.0	30	102.0	6	128.0	15
25.0	9	53.0	12	78.0	30	103.0	6	129.0	3
26.0	3	54.0	28	79.0	15	104.0	6	130.0	12
27.0	3	55.0	27	80.0	18	105.0	3	131.0	12
28.0	9	56.0	27	81.0	21	107.0	5	134.0	24
29.0	9	57.0	31	82.0	12	108.0	9	135.0	3
31.0	3	58.0	24	83.0	12	109.0	5	137.0	9
32.0	9	59.0	12	84.0	9	110.0	6	138.0	45
33.0	9	60.0	15	85.0	3	111.0	3	139.0	45
35.0	15	61.0	20	86.0	9	112.0	24		
36.0	24	62.0	48	87.0	6	113.0	36		
38.0	6	63.0	21	88.0	11	114.0	18		
39.0	9	64.0	30	89.0	6	115.0	9		
40.0	9	65.0	9	90.0	15	116.0	27		
41.0	12	66.0	12	91.0	12	117.0	18		
42.0	6	67.0	3	92.0	15	118.0	15		

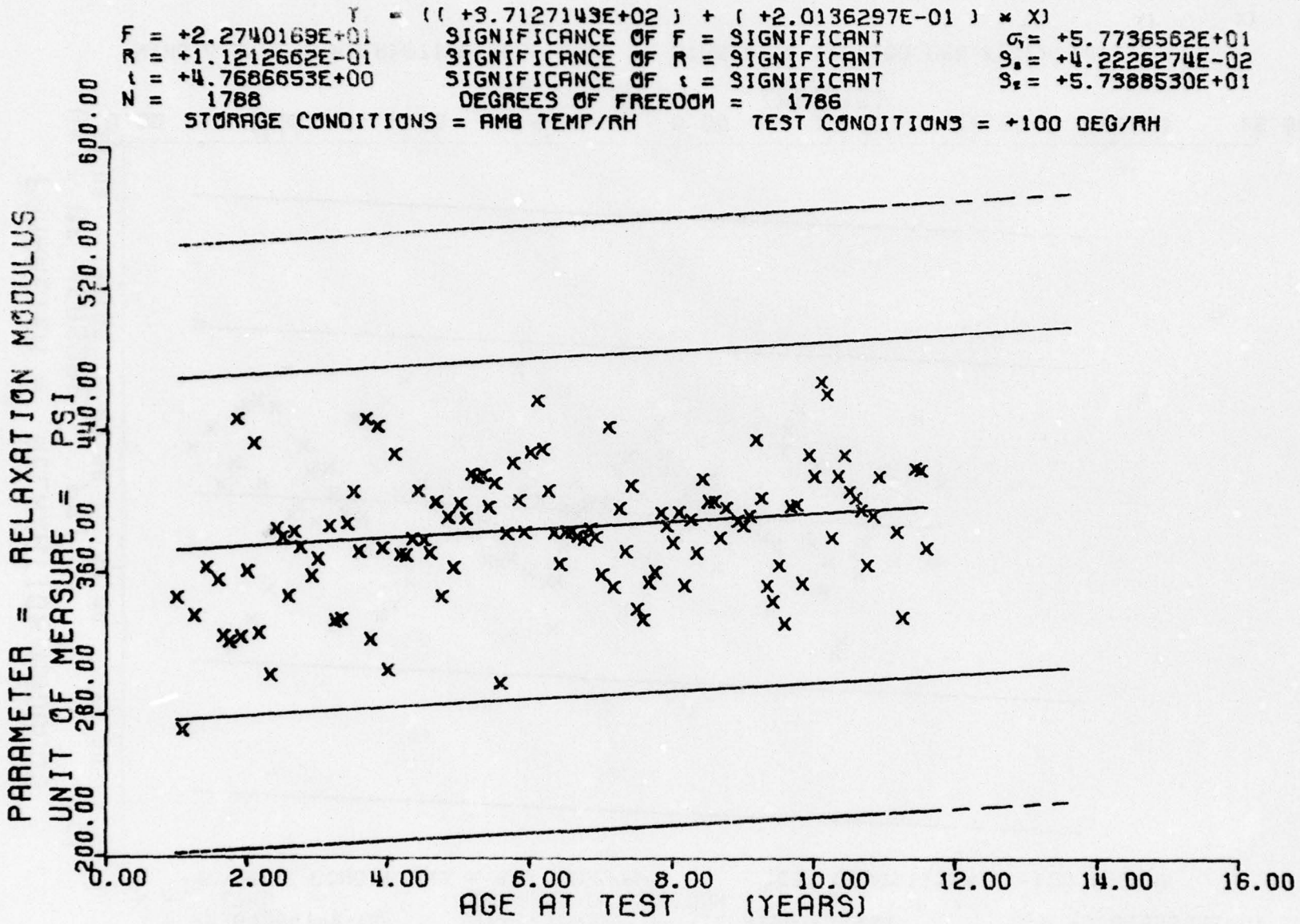
WING 6,STRESS RELAXATION MODULUS,2.0% STRAIN,10 SEC,100 DEG F,TPH-1011

This sample size summary is applicable to figures 42 thru 45



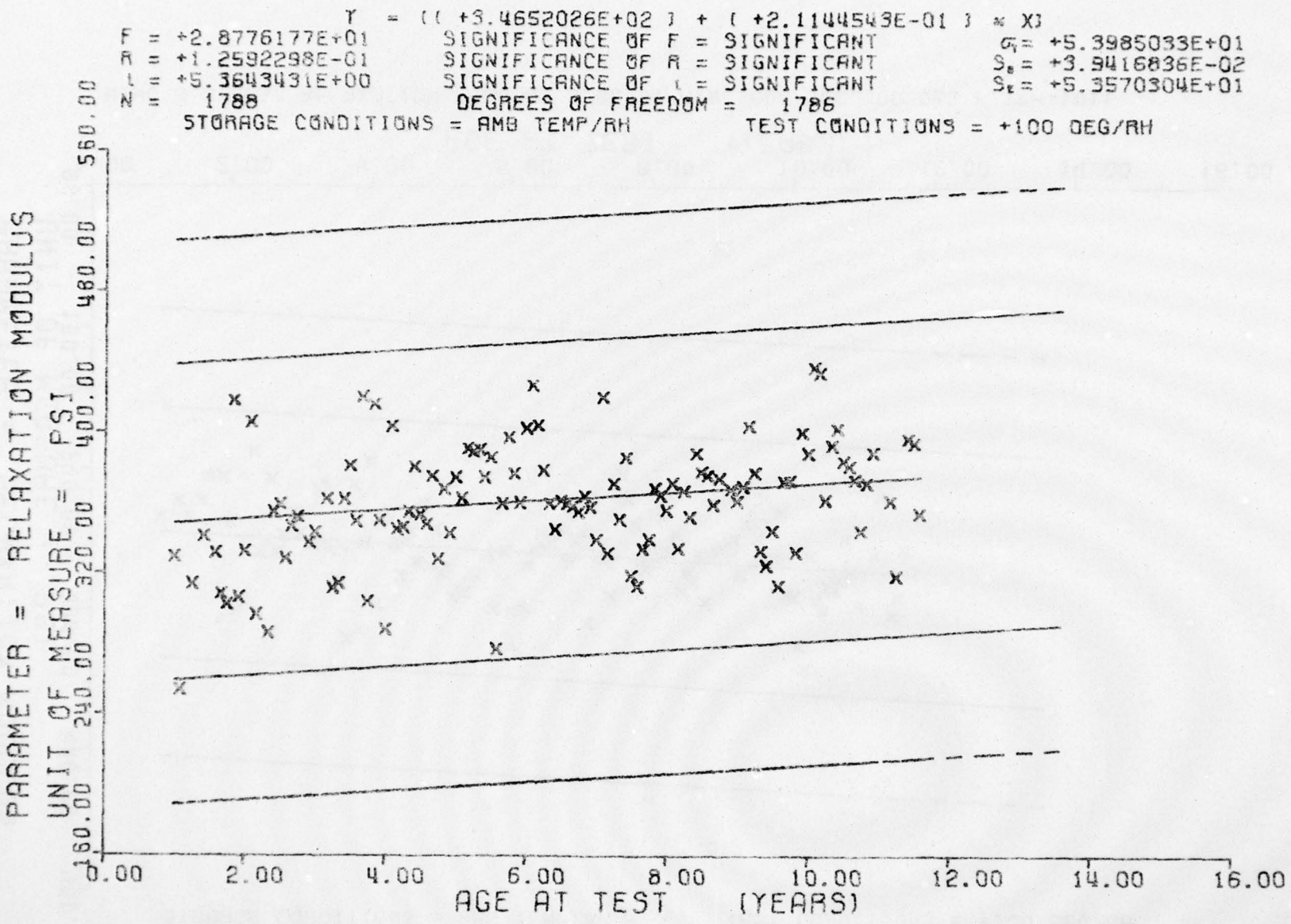
WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,10 SEC,100 DEG F,TPH-1011

Figure 42



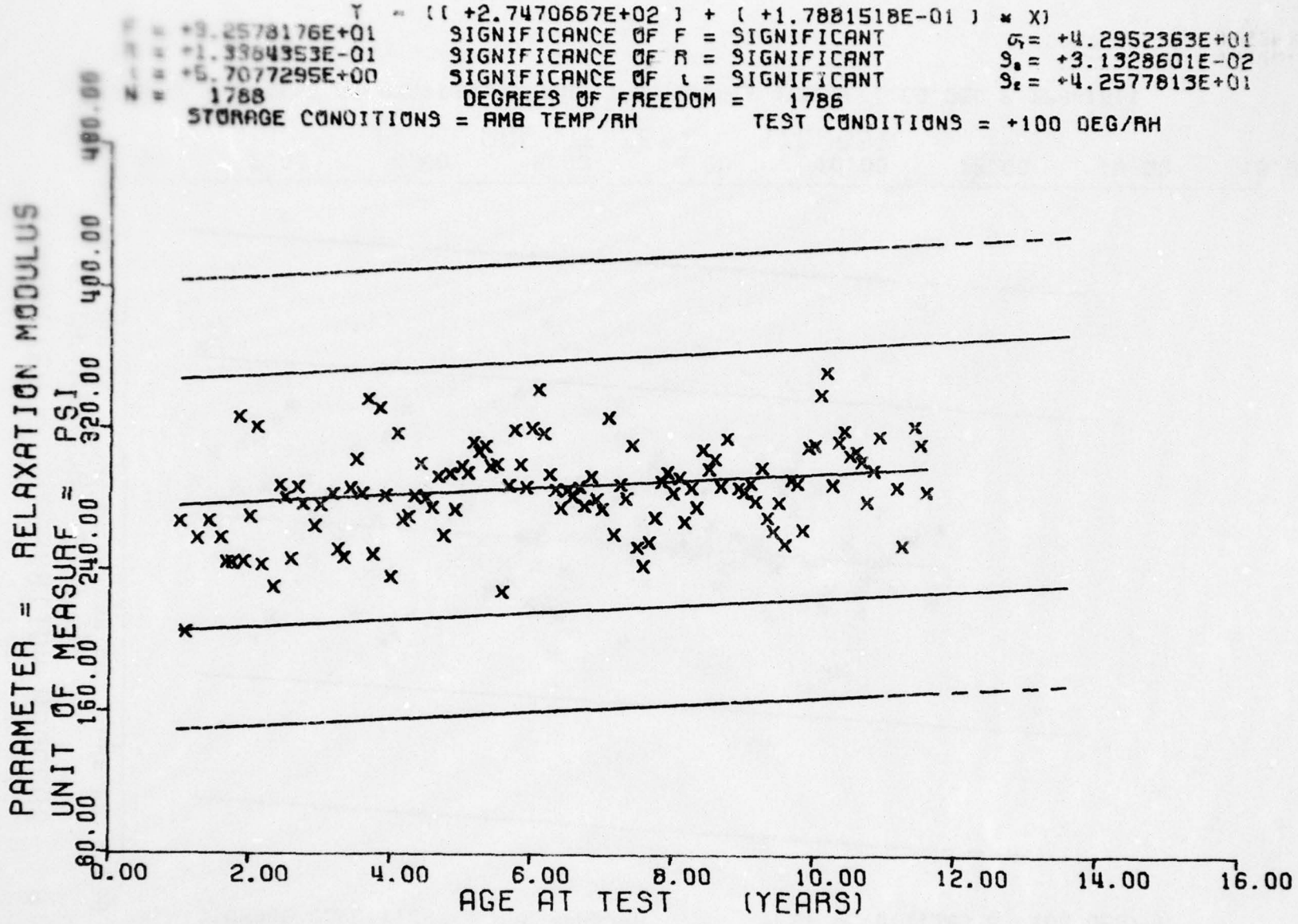
WING 6, STRESS RELAXATION MODULUS, 3.0% STRAIN, 50 SEC, 100 DEG F, TPH-1011

Figure 43



WING 6, STRESS RELAXATION MODULUS, 3.0% STRAIN, 100 SEC, 100 DEG F, TPH-1011

Figure 44



WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,1000 SEC,100 DEG F,TPH-1011

Figure 45

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NP SAMPLES	AGE (MONTHS)	NP SAMPLES	AGE (MONTHS)	NP SAMPLES	AGE (MONTHS)	NP SAMPLES	AGE (MONTHS)	NP SAMPLES
12.0	3	39.0	27	64.0	30	89.0	6	115.0	9
13.0	3	40.0	18	65.0	9	90.0	12	116.0	27
15.0	6	41.0	18	66.0	12	91.0	15	117.0	18
16.0	3	42.0	12	67.0	3	92.0	12	118.0	21
17.0	12	43.0	6	68.0	9	93.0	15	119.0	21
18.0	6	44.0	3	69.0	27	94.0	18	120.0	18
20.0	6	45.0	3	70.0	45	95.0	17	121.0	15
21.0	6	46.0	6	71.0	51	96.0	27	122.0	3
22.0	3	47.0	9	72.0	39	97.0	14	123.0	9
23.0	6	48.0	6	73.0	18	98.0	18	124.0	15
24.0	15	49.0	6	74.0	22	99.0	12	125.0	15
25.0	15	50.0	27	75.0	24	100.0	3	126.0	18
26.0	18	51.0	60	76.0	30	101.0	9	127.0	12
27.0	15	52.0	54	77.0	30	102.0	5	128.0	12
28.0	24	53.0	12	78.0	30	103.0	6	129.0	2
29.0	45	54.0	27	79.0	14	104.0	3	130.0	6
30.0	39	55.0	27	80.0	17	105.0	3	131.0	18
31.0	33	56.0	24	81.0	18	107.0	6	134.0	24
32.0	51	57.0	33	82.0	12	108.0	9	135.0	3
33.0	27	58.0	24	83.0	12	109.0	6	137.0	9
34.0	57	59.0	9	84.0	9	110.0	6	138.0	36
35.0	30	60.0	17	85.0	3	111.0	3	139.0	48
36.0	45	61.0	24	86.0	9	112.0	21		
37.0	18	62.0	48	87.0	12	113.0	36		
38.0	12	63.0	21	88.0	12	114.0	18		

BEST AVAILABLE COPY

COPY AVAILABLE TO DDC DOES NOT PERMIT FULLY LEGIBLE PRODUCTION

WING 6.STRESS RELAXATION MODULUS,3.0% STRAIN,10 SEC,140 DEG F,TFH-1011

This sample size summary is applicable to figures 46 thru 49

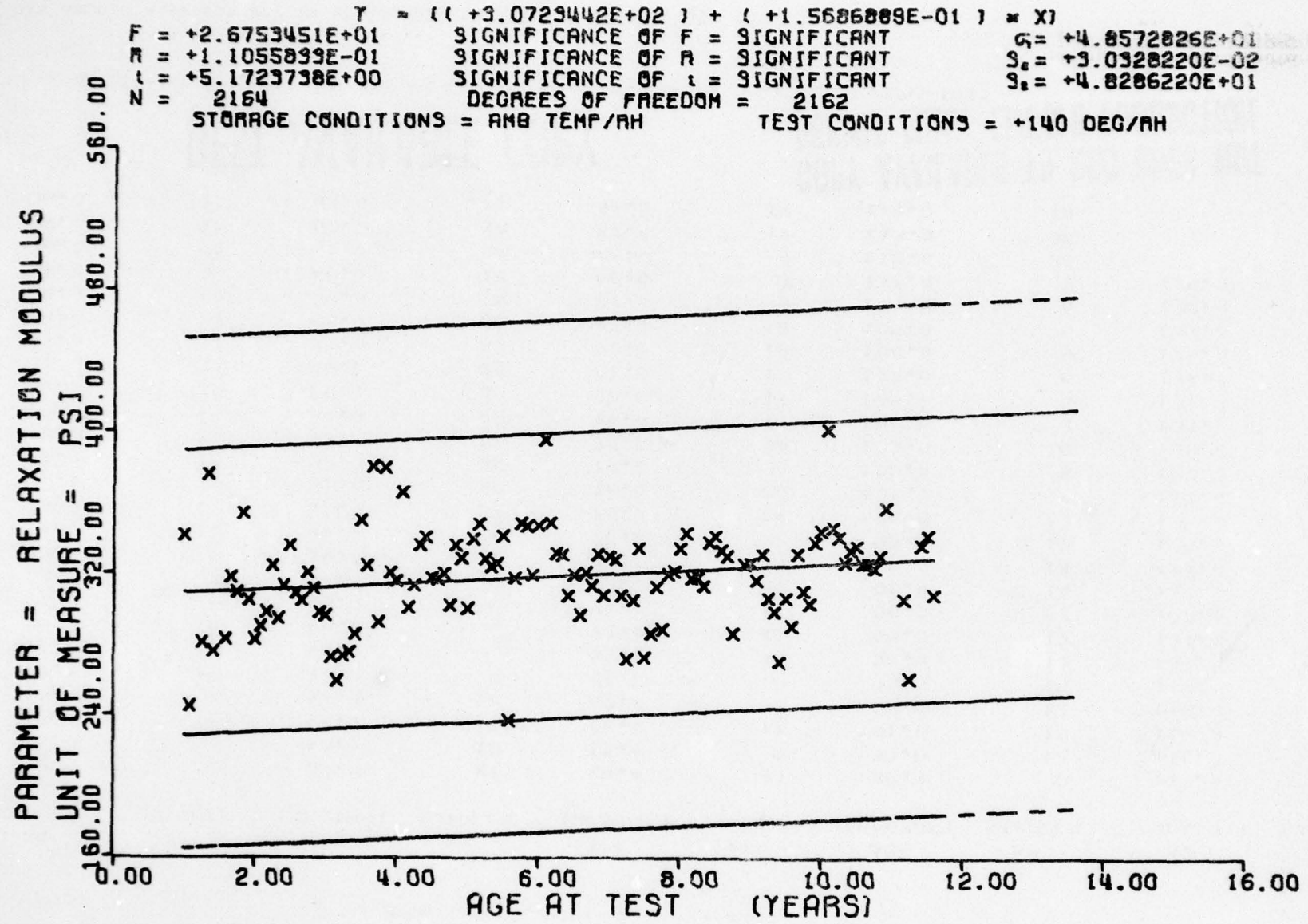
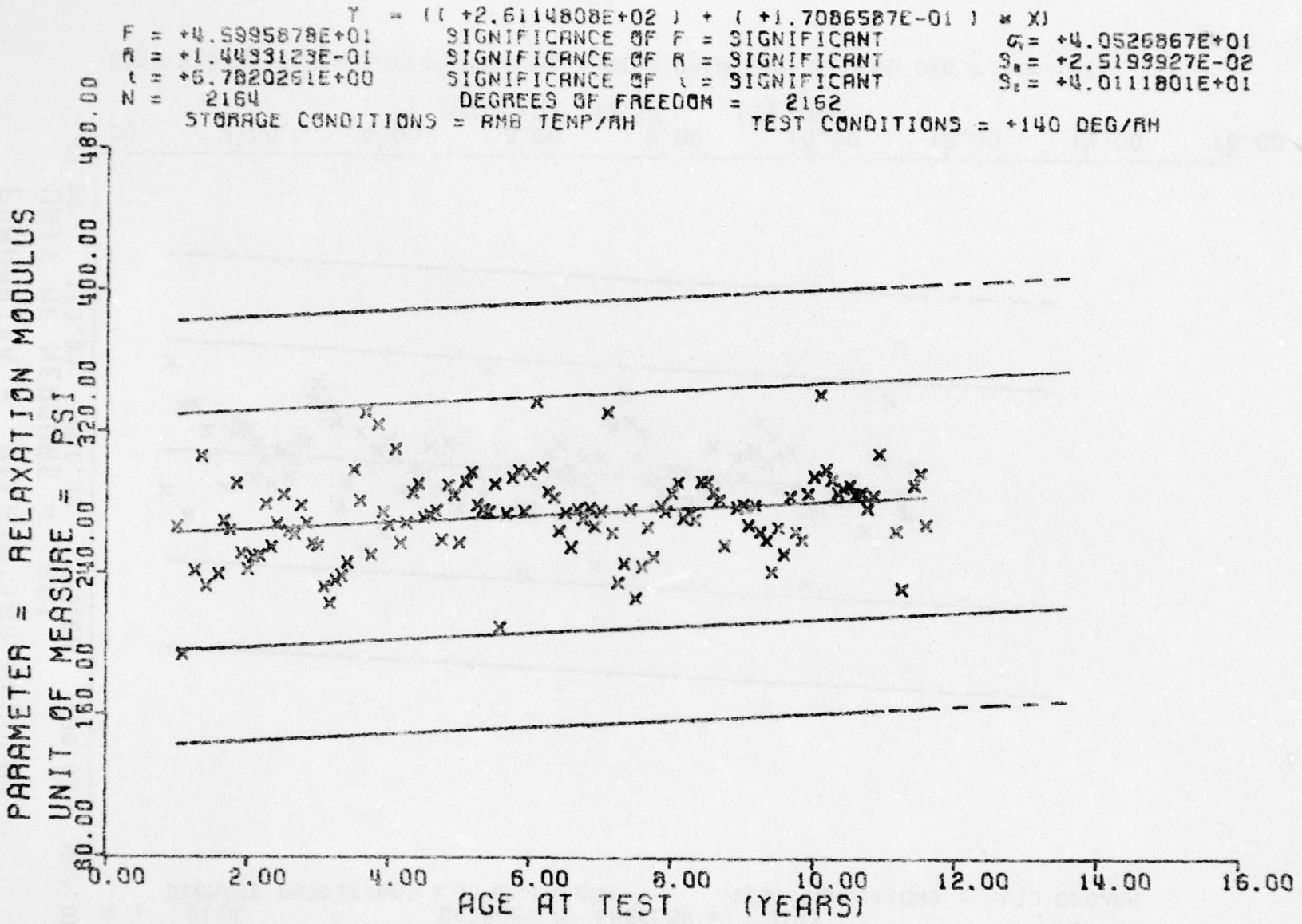
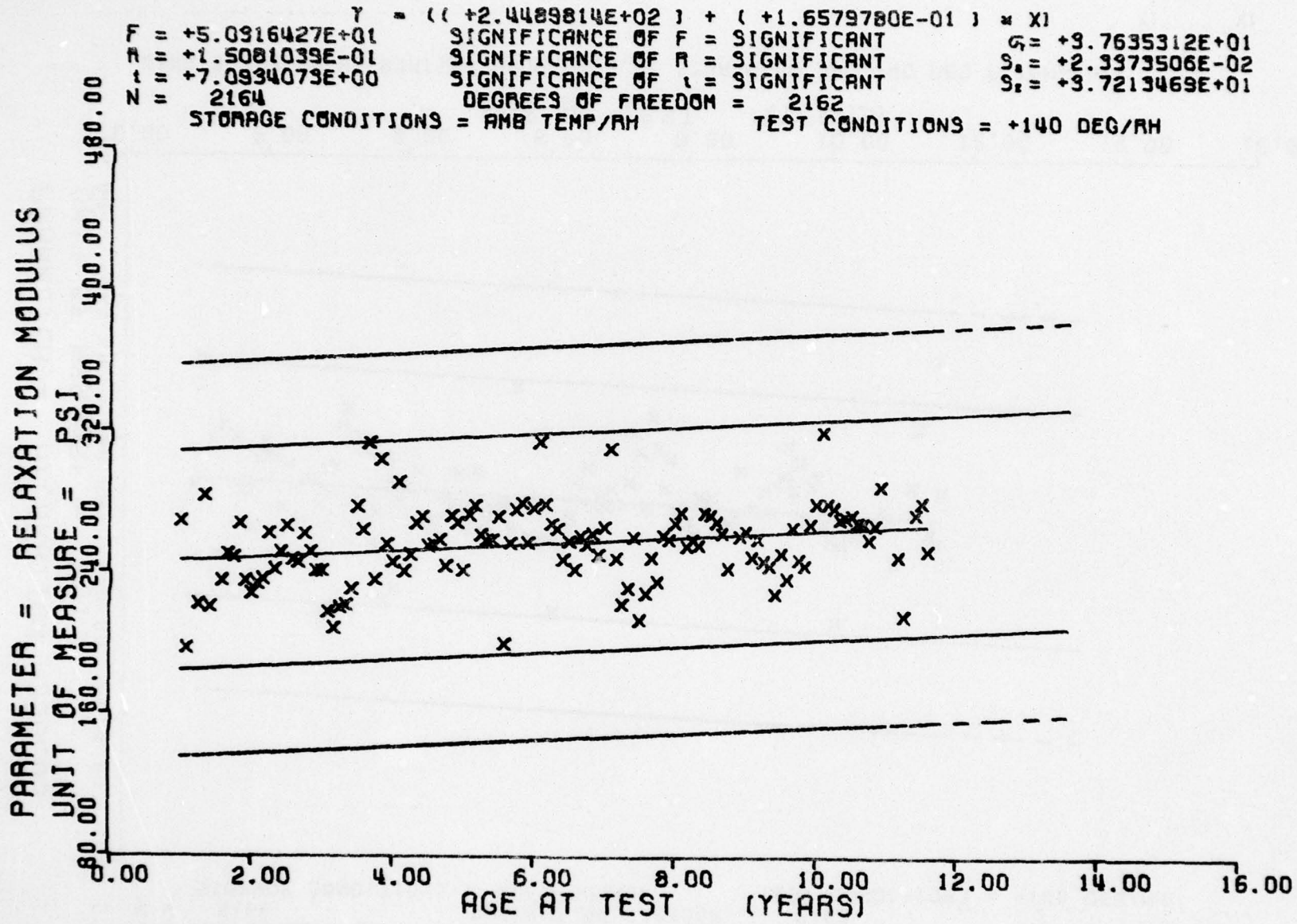

Y = ((+3.0729442E+02) + (+1.5686889E-01) * X)
F = +2.6753451E+01 SIGNIFICANCE OF F = SIGNIFICANT σ = +4.8572826E+01
R = +1.1055899E-01 SIGNIFICANCE OF R = SIGNIFICANT Sa = +3.0328220E-02
t = +5.1723738E+00 SIGNIFICANCE OF t = SIGNIFICANT Sb = +4.8286220E+01
N = 2164 DEGREES OF FREEDOM = 2162
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +140 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI
160.00
240.00
320.00
400.00
480.00
560.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,9.0% STRAIN,10 SEC,140 DEG F,TPH-1011

Figure 46



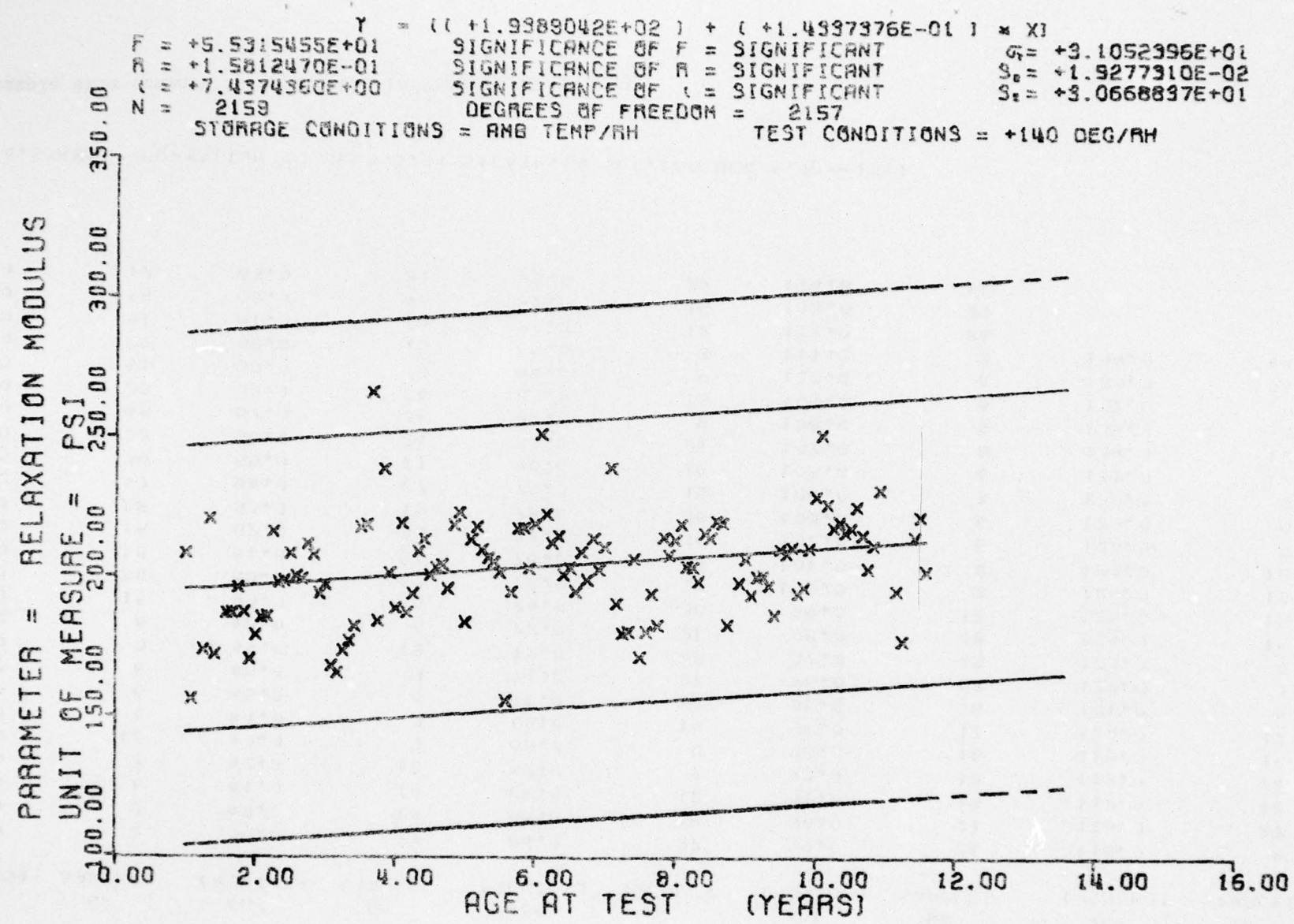
WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,50 SEC,140 DEG F,TPH-1011

Figure 47



WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,100 SEC,140 DEG F,TPH-1011

Figure 48



WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,1000 SEC,140 DEG F,TPH-1011

Figure 49

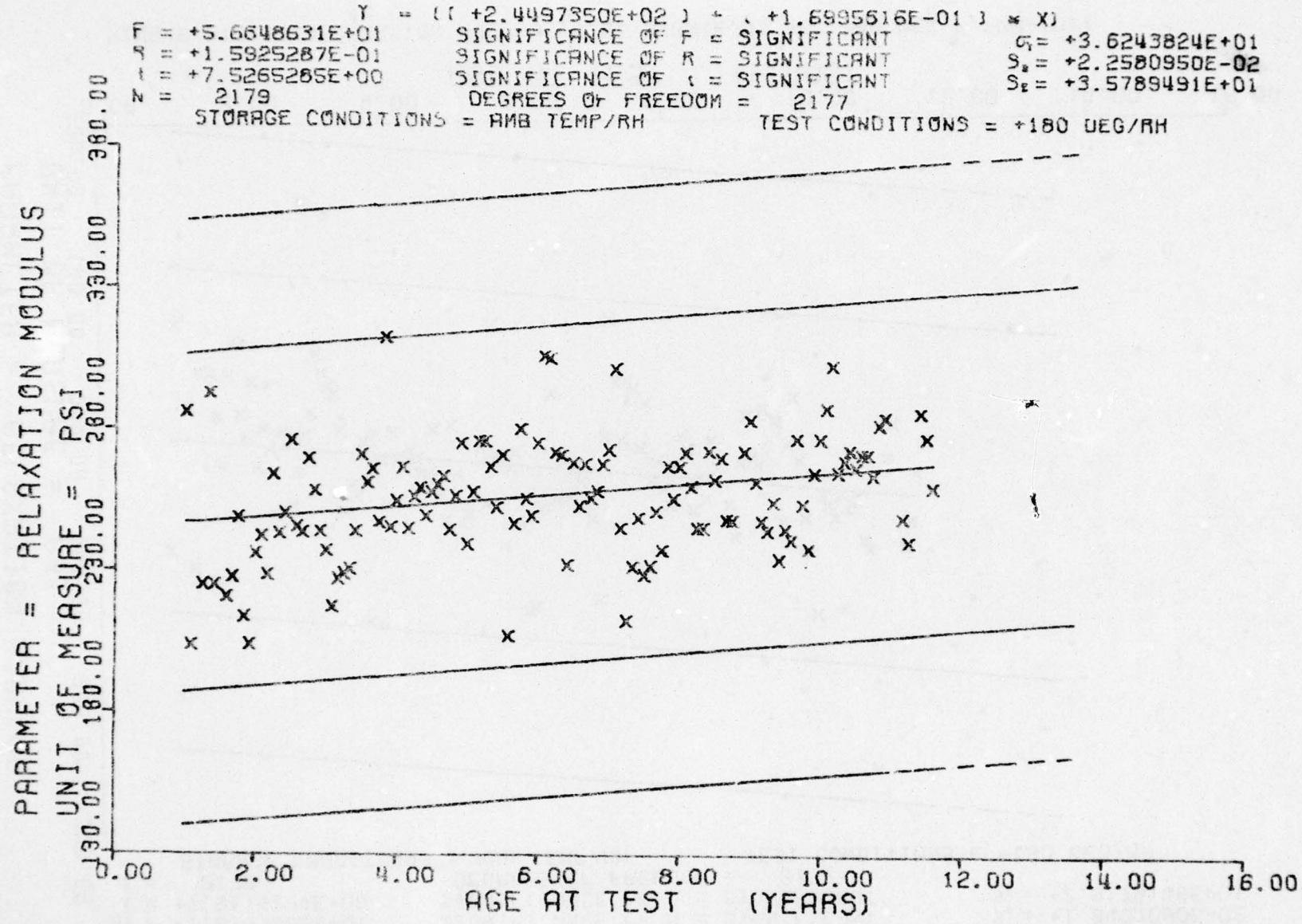
COPY AVAILABLE TO DDC DOES NOT PERMIT FULLY LEGIBLE PRODUCTION

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
12.0	3	39.0	27	64.0	27	89.0	21	115.0	9
13.0	3	40.0	18	65.0	12	90.0	21	116.0	27
15.0	6	41.0	18	66.0	12	91.0	15	117.0	18
16.0	3	42.0	12	67.0	3	92.0	12	118.0	14
17.0	12	43.0	9	68.0	9	93.0	15	119.0	15
19.0	6	44.0	3	69.0	18	94.0	17	120.0	17
20.0	6	45.0	6	70.0	20	95.0	18	121.0	6
21.0	6	46.0	3	71.0	27	96.0	27	122.0	3
22.0	3	47.0	12	72.0	45	97.0	15	123.0	9
23.0	6	48.0	6	73.0	21	98.0	18	124.0	15
24.0	18	49.0	6	74.0	30	99.0	12	125.0	15
25.0	20	50.0	27	75.0	27	100.0	3	126.0	18
26.0	15	51.0	51	76.0	33	101.0	9	127.0	12
27.0	15	52.0	53	77.0	24	102.0	6	128.0	9
28.0	26	53.0	15	78.0	36	103.0	6	129.0	6
29.0	47	54.0	27	79.0	15	104.0	3	130.0	9
30.0	39	55.0	27	80.0	18	105.0	6	131.0	12
31.0	33	56.0	24	81.0	21	107.0	6	134.0	12
32.0	48	57.0	36	82.0	9	108.0	9	135.0	3
33.0	30	58.0	24	83.0	15	109.0	6	137.0	9
34.0	51	59.0	9	84.0	9	110.0	6	138.0	54
35.0	27	60.0	15	85.0	3	111.0	3	139.0	44
36.0	51	61.0	24	86.0	12	112.0	24		
37.0	18	62.0	46	87.0	15	113.0	39		
38.0	12	63.0	21	88.0	27	114.0	15		

WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,10 SEC,180 DEC F,TPH-1011

This sample size summary is applicable to figures 50 thru 53



WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,10 SEC,180 DEG F,TPH-1011

Figure 50

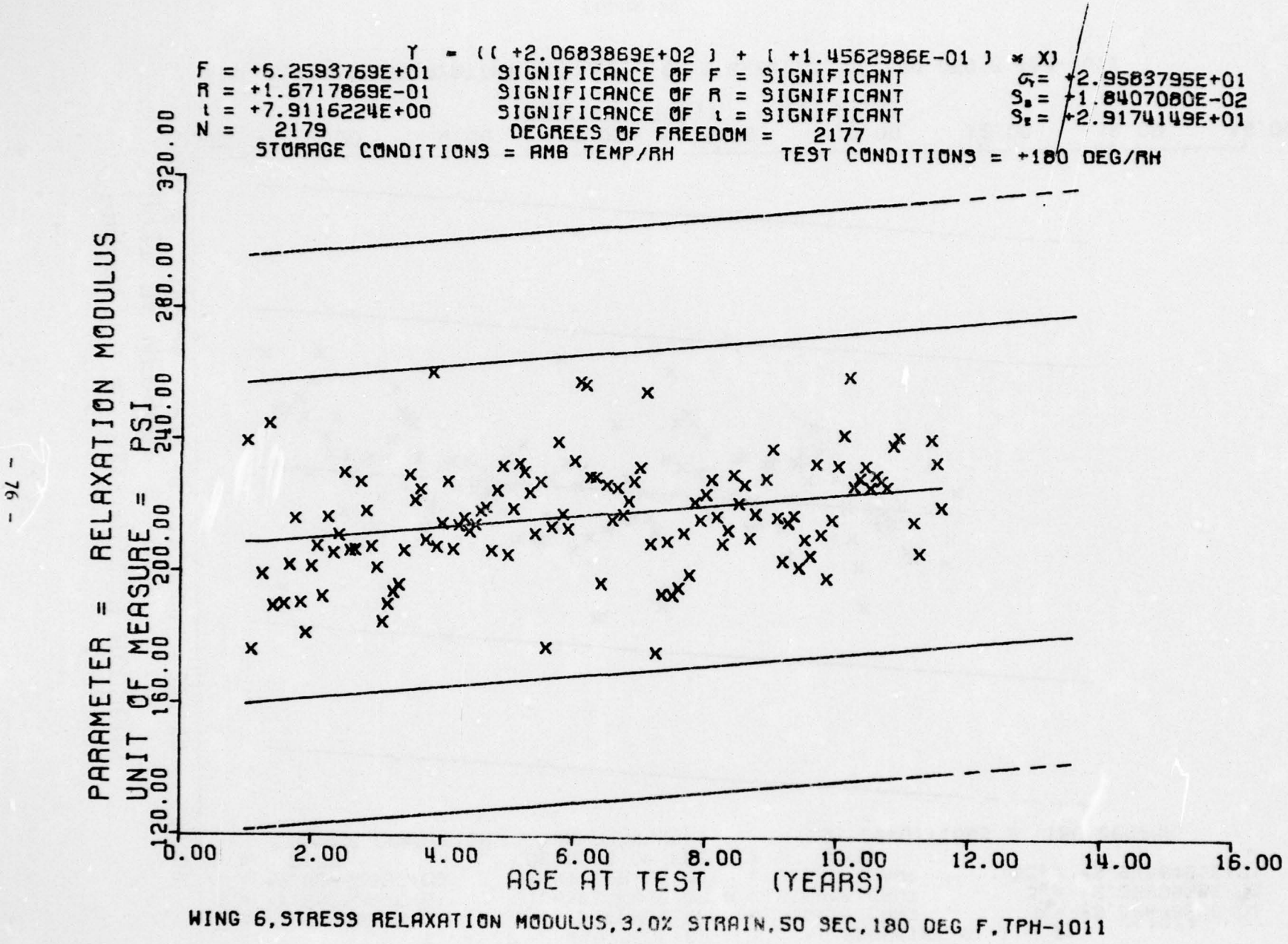
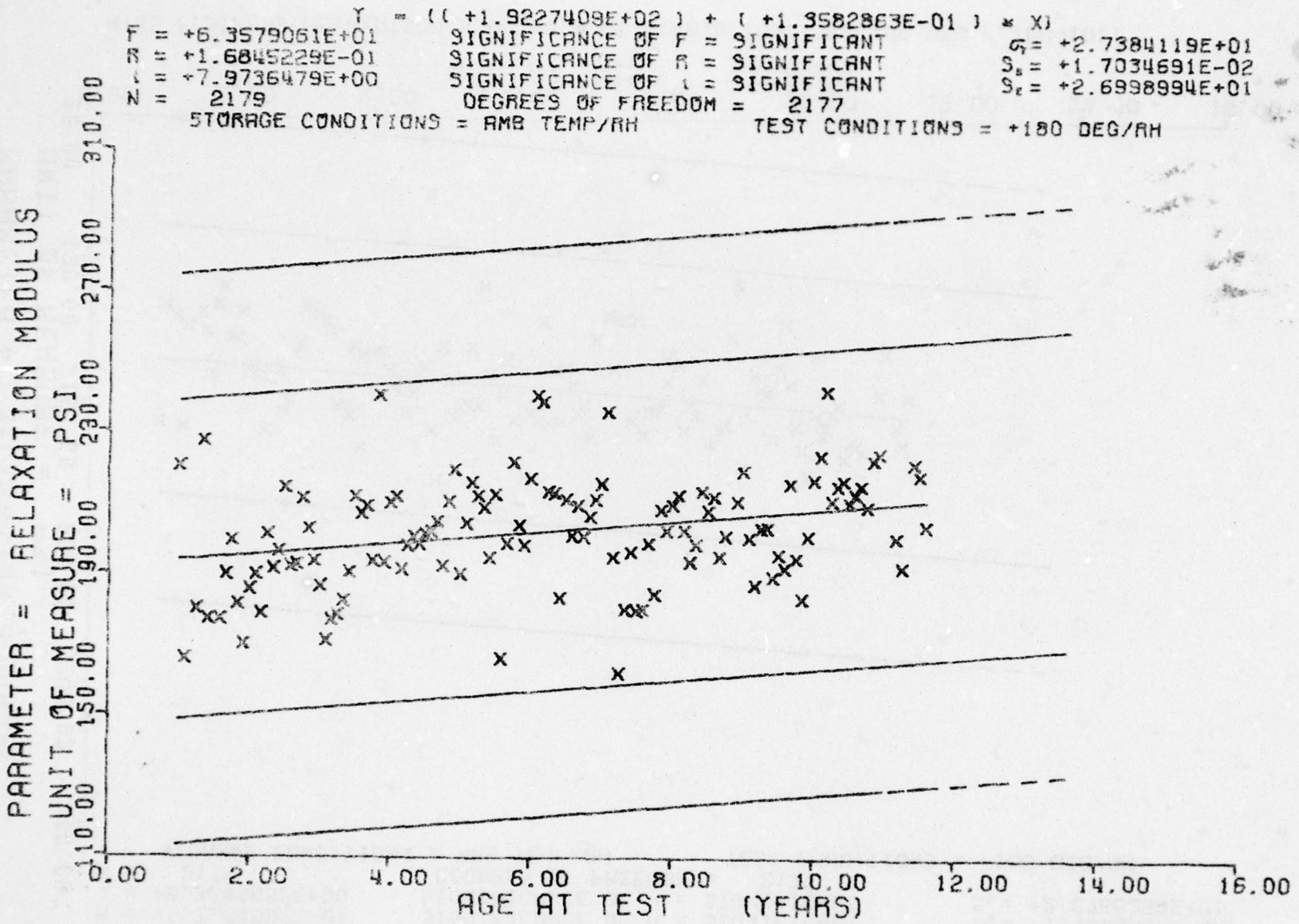
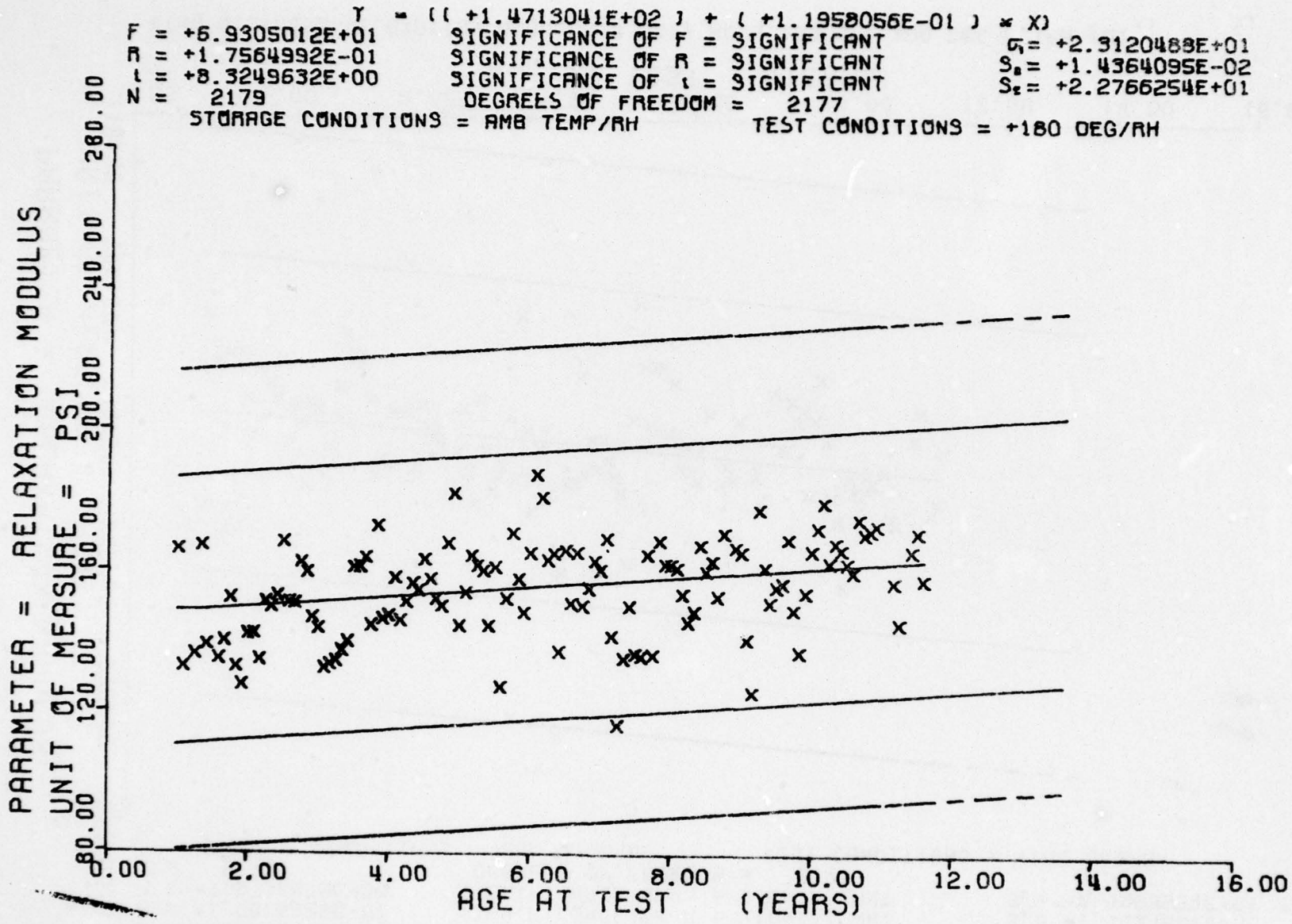

Y = ((+2.0683869E+02) + (+1.4562986E-01) * X)
F = +6.2593769E+01
R = +1.6717869E-01
t = +7.9116224E+00
N = 2179
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 2177
σ_Y = +2.9583795E+01
S_a = +1.8407080E-02
S_E = +2.9174149E+01
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = +180 DEG/RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI
120.00
160.00
200.00
240.00
280.00
320.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,50 SEC,180 DEG F,TPH-1011

Figure 51



WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,100 SEC,180 DEG F,TPH-101

Figure 52



WING 6,STRESS RELAXATION MODULUS,3.0% STRAIN,1000 SEC,180 DEG F,TPH-1011

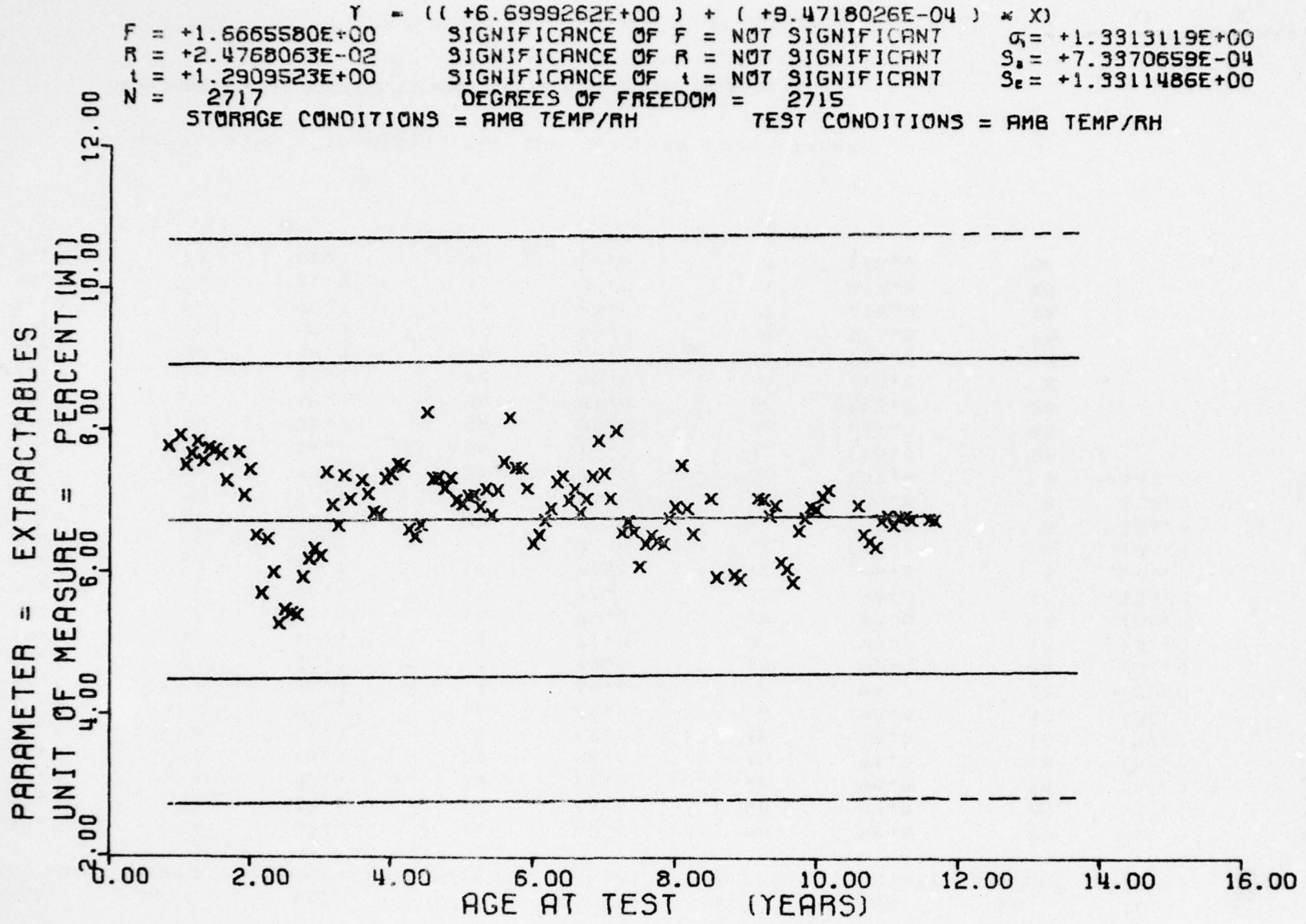
Figure 53

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
10.0	4	37.0	12	63.0	36	88.0	20	119.0	64
12.0	4	38.0	12	64.0	48	89.0	28	120.0	68
13.0	4	39.0	12	65.0	44	90.0	24	121.0	20
14.0	8	40.0	20	66.0	16	91.0	40	122.0	8
15.0	4	41.0	8	67.0	16	92.0	16	127.0	24
16.0	4	43.0	16	68.0	8	93.0	12	128.0	8
17.0	4	44.0	4	69.0	8	94.0	16	129.0	40
18.0	20	45.0	8	70.0	12	95.0	20	130.0	16
19.0	12	46.0	12	71.0	32	96.0	12	131.0	31
20.0	8	47.0	16	72.0	48	97.0	12	132.0	24
22.0	8	48.0	24	73.0	32	98.0	16	133.0	4
23.0	12	49.0	16	74.0	72	99.0	8	134.0	24
24.0	4	50.0	8	75.0	52	102.0	4	135.0	25
25.0	28	51.0	20	76.0	40	103.0	8	136.0	8
26.0	24	52.0	60	77.0	32	106.0	8	139.0	72
27.0	24	53.0	71	78.0	32	107.0	8	140.0	17
28.0	28	54.0	36	79.0	32	110.0	20		
29.0	24	55.0	32	80.0	32	111.0	44		
30.0	28	56.0	8	81.0	11	112.0	20		
31.0	44	57.0	12	82.0	8	113.0	8		
32.0	32	58.0	40	83.0	12	114.0	48		
33.0	36	59.0	20	84.0	8	115.0	48		
34.0	28	60.0	28	85.0	9	116.0	12		
35.0	52	61.0	31	86.0	4	117.0	19		
36.0	24	62.0	40	87.0	8	118.0	56		

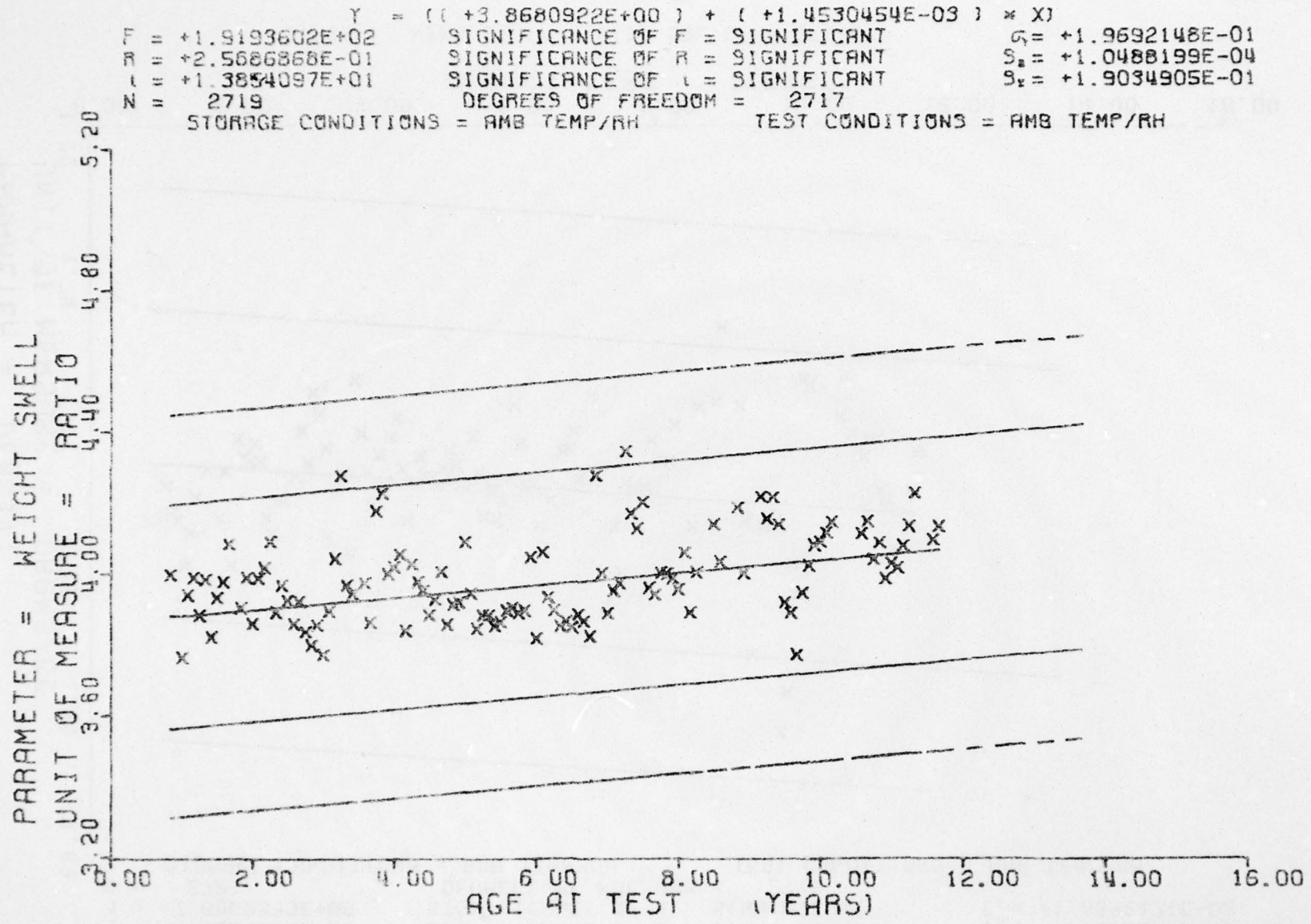
STAGE 1, WING 6 TP-H1011, SOL GM, PERCENT EXTRACTABLES

This sample size summary is applicable to figures 54 thru 56



STAGE 1, WING 6 TP-H1011, SOL GEL, PERCENT EXTRACTABLES

Figure 54



STAGE 1, WING 6, TP-H1011, SOL GEL, GEL SWELL RATIO

Figure 55

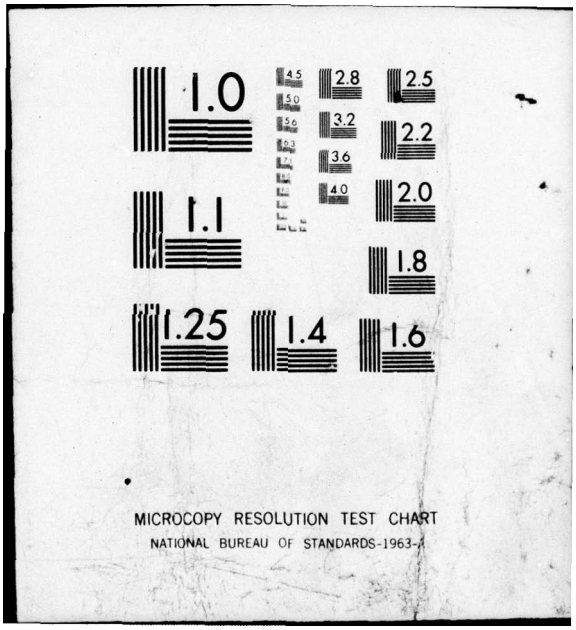
AD-A041 671 OGDEN AIR LOGISTICS CENTER HILL AFB UTAH PROPELLANT L--ETC F/G 21/9.2
PROPELLANT SURVEILLANCE REPORT LGM-30 F AND G STAGE 1. PHASE E.--ETC(U)
MAY 77 J A THOMPSON

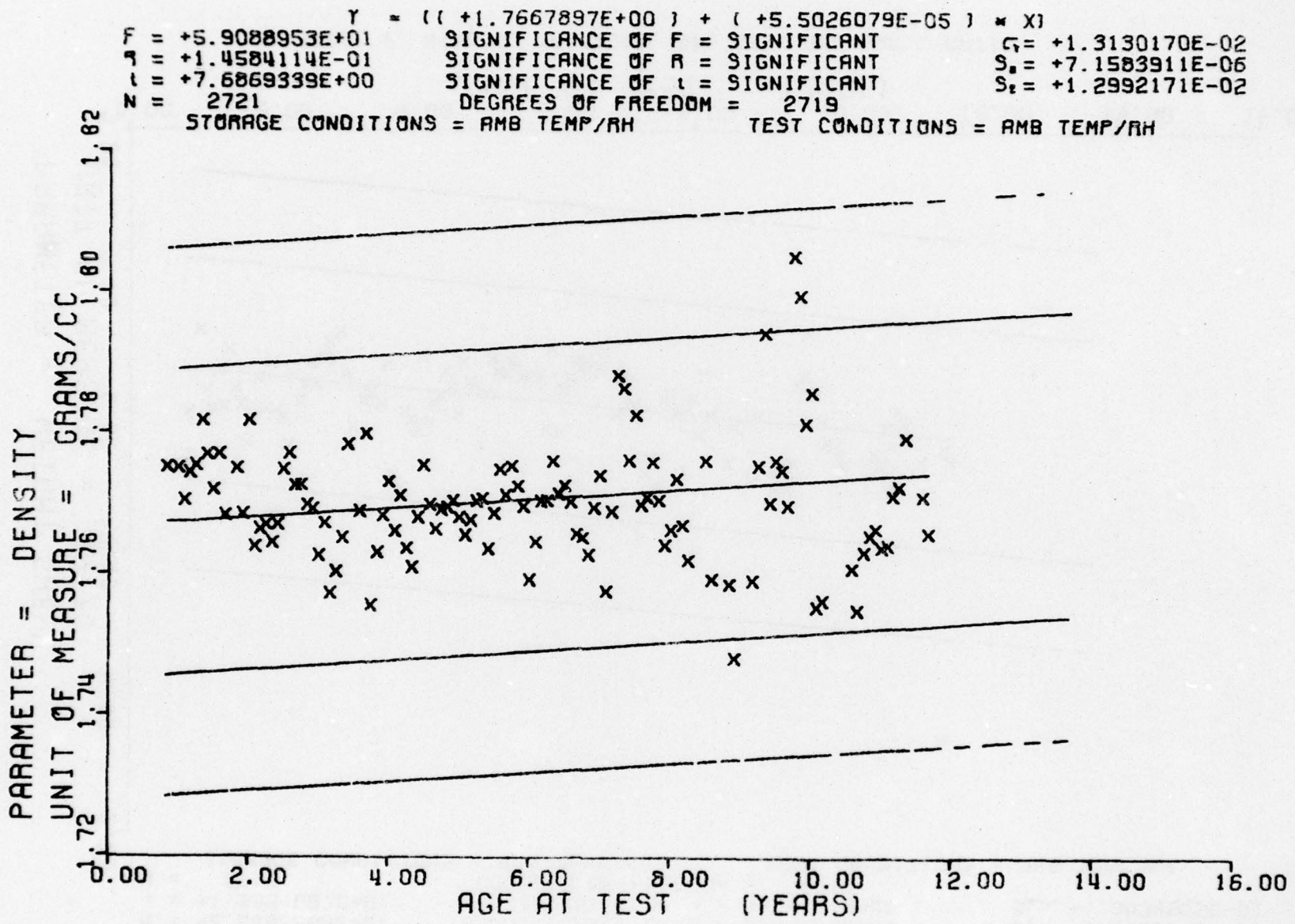
UNCLASSIFIED MANCP-370(77) NL

2 OF 2
AD
A041671



END
DATE FILMED
8-77


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
6.3
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A



STAGE 1, WING 6, TP-H1011, SOL GEL, DENSITY

Figure 56

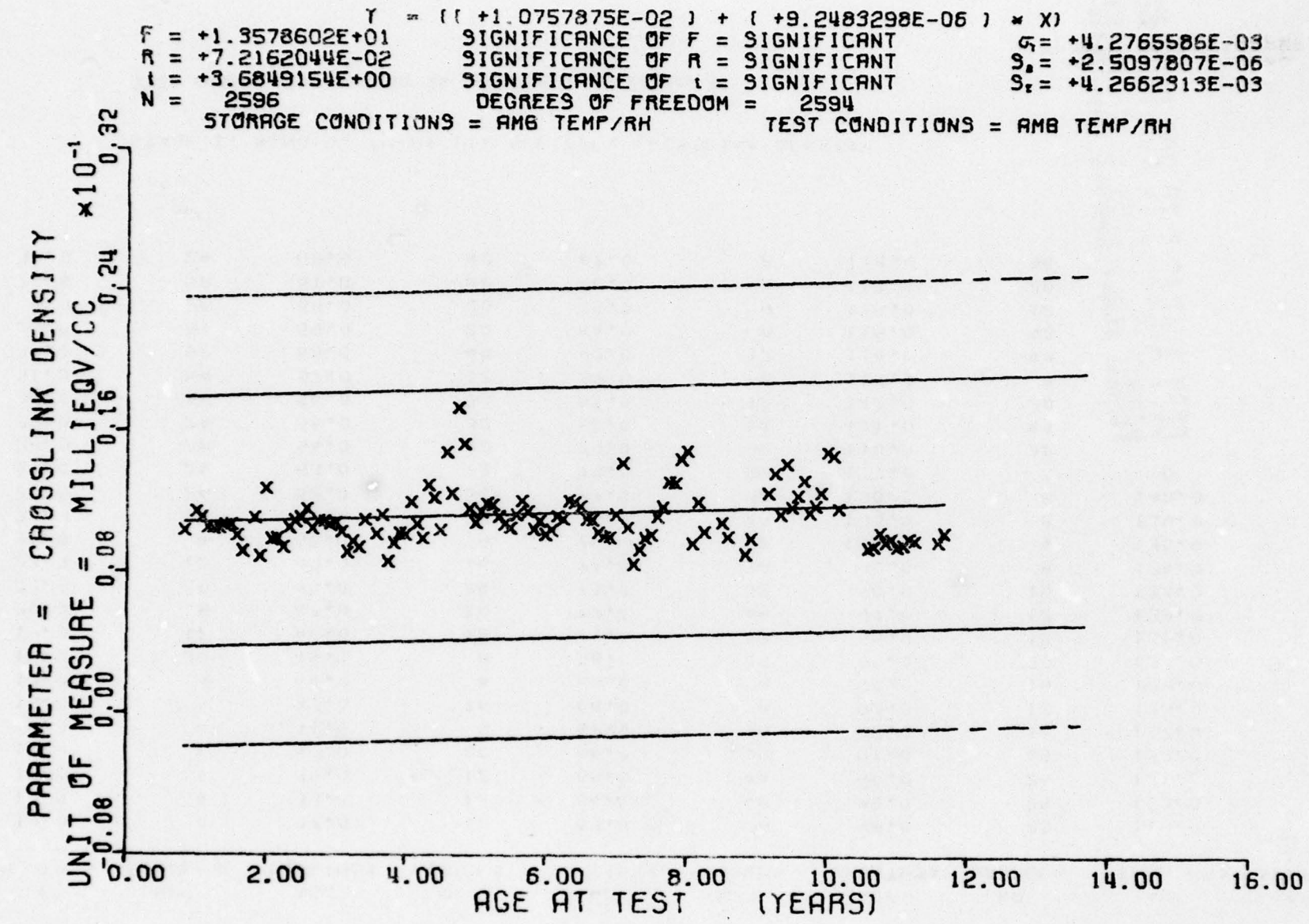
*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
10.0	4	37.0	12	63.0	36	88.0	20	119.0	64
12.0	4	38.0	12	64.0	48	89.0	28	120.0	68
13.0	4	39.0	12	65.0	44	90.0	24	121.0	20
14.0	8	40.0	20	66.0	16	91.0	40	122.0	8
15.0	4	41.0	8	67.0	16	92.0	16	127.0	24
16.0	4	43.0	16	68.0	8	93.0	12	128.0	8
17.0	4	44.0	4	69.0	8	94.0	16	129.0	40
18.0	20	45.0	8	70.0	12	95.0	20	130.0	16
19.0	12	46.0	12	71.0	32	96.0	12	131.0	31
20.0	8	47.0	16	72.0	48	97.0	12	132.0	24
22.0	8	48.0	24	73.0	32	98.0	16	133.0	4
23.0	12	49.0	16	74.0	72	99.0	8	134.0	12
24.0	4	50.0	8	75.0	52	102.0	4	135.0	8
25.0	28	51.0	20	76.0	40	103.0	8	139.0	12
26.0	24	52.0	60	77.0	32	106.0	8	140.0	16
27.0	24	53.0	72	78.0	32	107.0	8		
28.0	28	54.0	12	79.0	32	110.0	20		
29.0	24	55.0	32	80.0	32	111.0	44		
30.0	28	56.0	36	81.0	12	112.0	20		
31.0	44	57.0	12	82.0	8	113.0	8		
32.0	52	58.0	40	83.0	12	114.0	48		
33.0	36	59.0	20	84.0	8	115.0	48		
34.0	28	60.0	28	85.0	9	116.0	12		
35.0	52	61.0	32	86.0	4	117.0	20		
36.0	24	62.0	40	87.0	8	118.0	56		

STAGE 1, WING 6, TP-HICI1, SOL GEL, CROSSLINK DENSITY

This sample size summary is applicable to figure 57

COPY AVAILABLE TO DTIC DOES NOT PERMIT FULLY LEGIBLE REPRODUCTION



STAGE 1, WING 6, TP-H1011, SOL GEL, CROSSLINK DENSITY

Figure 57

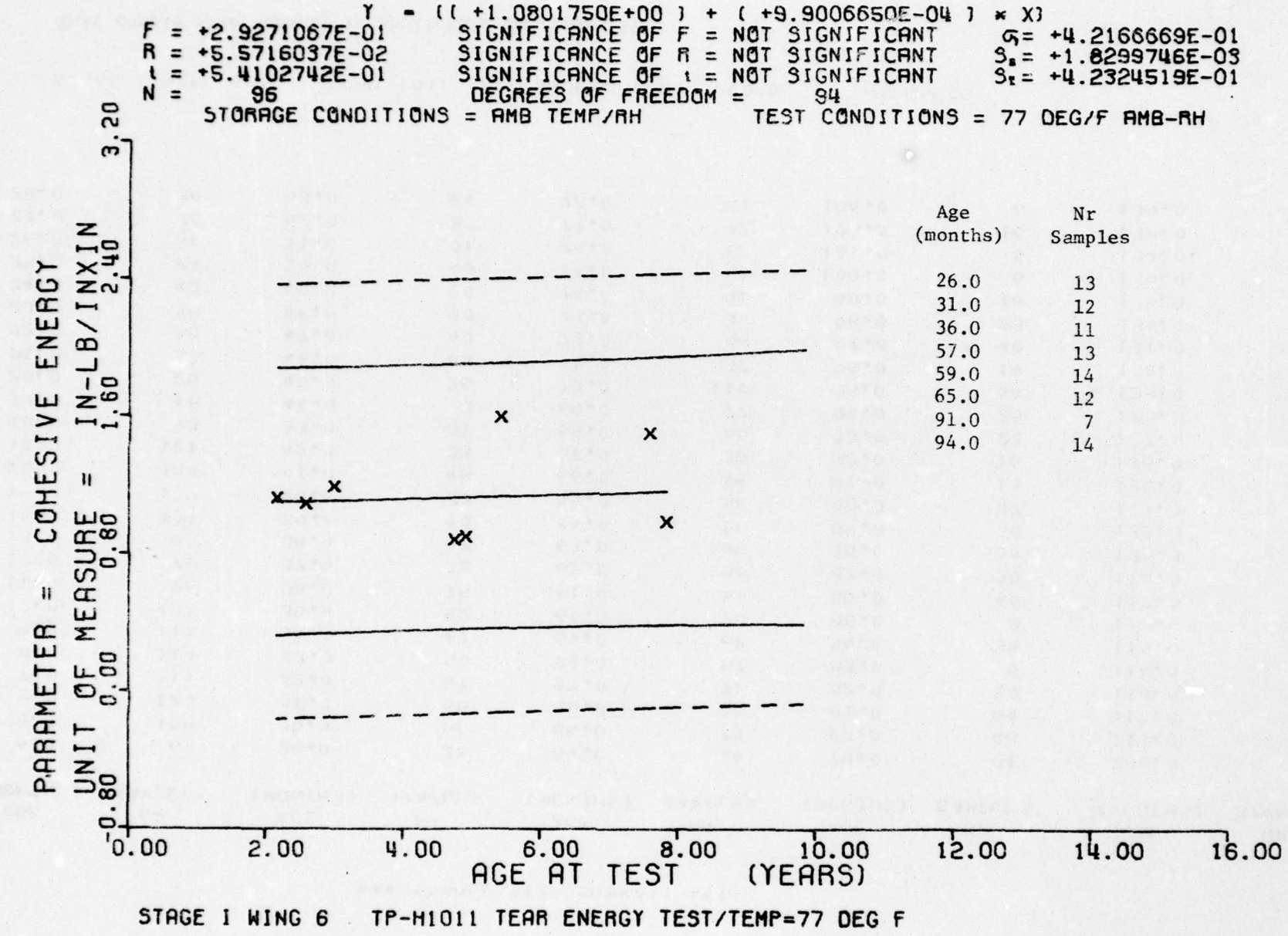

Y = ((+1.0801750E+00) + (+9.9006650E-04) * X)
F = +2.9271067E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ = +4.2166669E-01
R = +5.5716037E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT Sa = +1.8299746E-03
t = +5.4102742E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT St = +4.2324519E-01
N = 96 DEGREES OF FREEDOM = 94
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 77 DEG/F AMB-RH
PARAMETER = COHESIVE ENERGY
UNIT OF MEASURE = IN-LB/INXIN
3.20
2.40
1.60
0.80
0.00
-0.80
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
Age (months)
Nr Samples
26.0 13
31.0 12
36.0 11
57.0 13
59.0 14
65.0 12
91.0 7
94.0 14
STAGE I WING 6 TP-H1011 TEAR ENERGY TEST/TEMP=77 DEG F

Figure 58

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
4.0	66	29.0	36	54.0	54	79.0	31	106.0	5
5.0	108	30.0	66	55.0	73	80.0	48	111.0	3
6.0	123	31.0	56	56.0	48	81.0	64	112.0	21
7.0	114	32.0	67	57.0	71	82.0	50	113.0	45
8.0	114	33.0	59	58.0	57	83.0	5	114.0	15
9.0	117	34.0	47	59.0	67	84.0	35	115.0	3
10.0	108	35.0	52	60.0	70	85.0	8	116.0	33
11.0	126	36.0	76	61.0	51	86.0	46	117.0	33
12.0	75	37.0	32	62.0	60	87.0	30	118.0	6
13.0	93	38.0	57	63.0	69	88.0	38	120.0	6
14.0	104	39.0	40	64.0	58	89.0	30	123.0	12
15.0	109	40.0	32	65.0	56	90.0	37	124.0	12
16.0	108	41.0	45	66.0	45	91.0	16	125.0	27
17.0	121	42.0	33	67.0	30	92.0	16	126.0	18
18.0	93	43.0	31	68.0	66	93.0	23	127.0	24
19.0	46	44.0	3	69.0	77	94.0	26	128.0	15
20.0	25	45.0	35	70.0	110	95.0	44	129.0	15
21.0	35	46.0	63	71.0	37	96.0	14	130.0	9
22.0	30	47.0	40	72.0	66	97.0	40	131.0	3
23.0	35	48.0	50	73.0	36	98.0	28	134.0	18
24.0	42	49.0	28	74.0	91	99.0	16	135.0	3
25.0	24	50.0	40	75.0	64	100.0	6	136.0	3
26.0	54	51.0	91	76.0	62	101.0	5	137.0	18
27.0	36	52.0	82	77.0	72	103.0	16	138.0	52
28.0	36	53.0	24	78.0	51	104.0	6	139.0	21

STAGE 1 WING 6 TD-H 1011 SHORE A, 10 SECOND HARDNESS

This sample size summary is applicable to figure 59

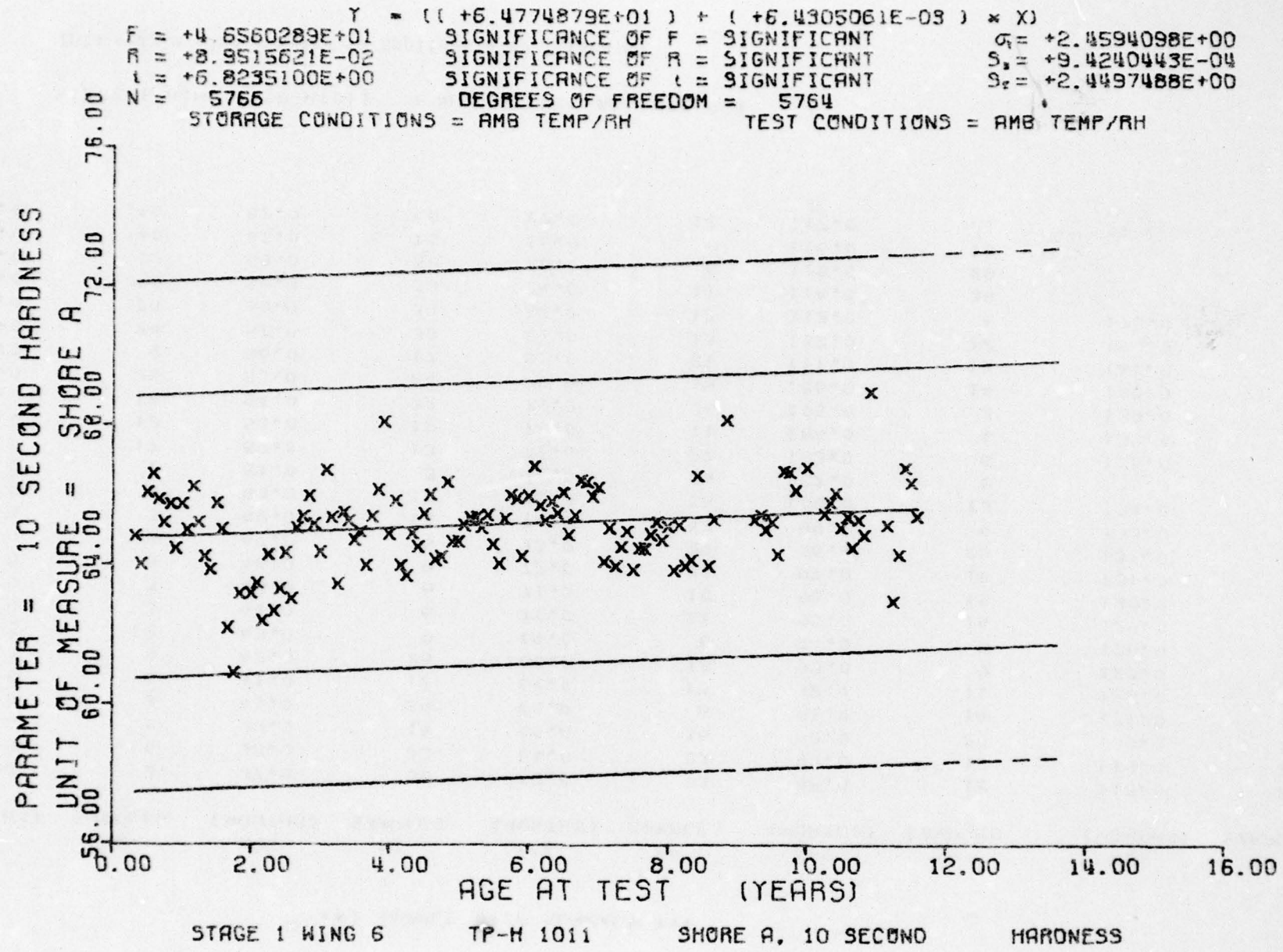

Y = ((+6.4774879E+01) + (+6.4305061E-03) * X)
F = +4.6560289E+01
SIGNIFICANCE OF F = SIGNIFICANT
σ = +2.4594098E+00
R = +8.9515621E-02
SIGNIFICANCE OF R = SIGNIFICANT
S_a = +9.4240443E-04
t = +6.8235100E+00
SIGNIFICANCE OF t = SIGNIFICANT
S_r = +2.4497488E+00
N = 5766
DEGREES OF FREEDOM = 5764
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = 10 SECOND HARDNESS
UNIT OF MEASURE = SHORE A
56.00
60.00
64.00
68.00
72.00
76.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
STAGE 1 WING 6
TP-H 1011
SHORE A, 10 SECOND
HARDNESS

Figure 59

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
10.0	3	37.0	36	63.0	33	88.0	12	118.0	20
12.0	6	38.0	23	64.0	23	89.0	13	119.0	27
14.0	6	39.0	14	65.0	16	90.0	28	120.0	39
15.0	3	40.0	24	66.0	6	91.0	14	121.0	18
16.0	6	41.0	12	67.0	15	92.0	11	122.0	15
17.0	6	42.0	25	68.0	12	93.0	9	127.0	13
18.0	12	43.0	9	69.0	6	94.0	8	128.0	9
19.0	3	44.0	6	70.0	21	95.0	14	129.0	30
20.0	3	45.0	6	71.0	10	96.0	15	130.0	12
21.0	6	46.0	9	72.0	30	97.0	18	131.0	23
22.0	3	47.0	15	73.0	29	98.0	25	132.0	12
23.0	3	49.0	12	74.0	47	99.0	9	133.0	8
24.0	3	50.0	15	75.0	56	100.0	13	134.0	9
25.0	6	51.0	3	76.0	36	102.0	6	135.0	6
26.0	17	52.0	13	77.0	27	103.0	6	136.0	6
27.0	12	53.0	12	78.0	11	104.0	4	138.0	6
28.0	18	54.0	32	79.0	36	105.0	3	139.0	29
29.0	25	55.0	24	80.0	15	106.0	14	140.0	12
30.0	9	56.0	17	81.0	21	111.0	12	141.0	12
31.0	24	57.0	30	82.0	15	112.0	12	155.0	3
32.0	28	58.0	39	83.0	12	113.0	6	175.0	3
33.0	46	59.0	30	84.0	11	114.0	39		
34.0	32	60.0	38	85.0	6	115.0	20		
35.0	40	61.0	15	86.0	6	116.0	16		
36.0	46	62.0	40	87.0	12	117.0	21		

STAGE I WING 6 TP-H1011 BURNING RATE AT 1000 PSI

This sample size summary is applicable to figure 60

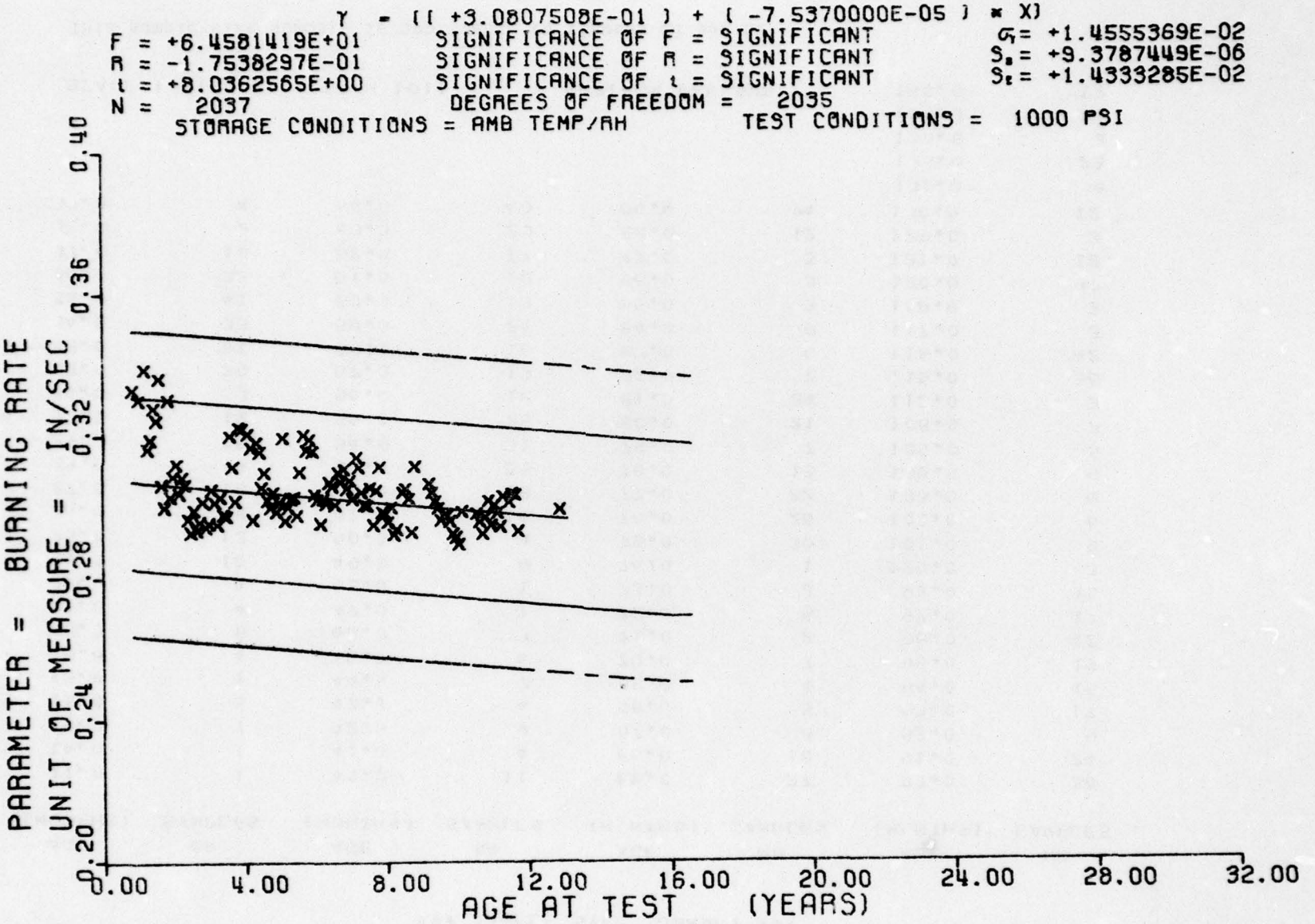

Y = ((+3.0807508E-01) + (-7.5370000E-05) * X)
F = +6.4581419E+01
SIGNIFICANCE OF F = SIGNIFICANT
σ = +1.4555369E-02
R = -1.7538297E-01
SIGNIFICANCE OF R = SIGNIFICANT
Sa = +9.3787449E-06
t = +8.0362565E+00
SIGNIFICANCE OF t = SIGNIFICANT
St = +1.4333285E-02
N = 2037
DEGREES OF FREEDOM = 2035
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = 1000 PSI
PARAMETER = BURNING RATE
UNIT OF MEASURE = IN/SEC
0.40
0.36
0.32
0.28
0.24
0.20
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE I WING 6 TP-H1011 BURNING RATE AT 1000 PSI

Figure 60

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
11.0	1	40.0	11	65.0	27	90.0	36
14.0	1	41.0	4	66.0	18	91.0	24
15.0	1	42.0	9	67.0	8	92.0	9
16.0	5	43.0	4	68.0	5	93.0	17
18.0	1	44.0	7	69.0	4	94.0	15
19.0	4	45.0	4	70.0	7	95.0	19
20.0	5	46.0	3	71.0	2	96.0	12
21.0	4	47.0	7	72.0	6	97.0	17
22.0	4	48.0	1	73.0	2	98.0	15
24.0	10	49.0	9	74.0	1	100.0	3
25.0	13	50.0	4	75.0	30	101.0	9
26.0	12	51.0	14	76.0	26	102.0	6
27.0	18	52.0	18	77.0	22	103.0	6
28.0	18	53.0	35	78.0	13	105.0	9
29.0	25	54.0	31	79.0	7	106.0	6
30.0	12	55.0	25	80.0	21	108.0	3
31.0	33	56.0	18	81.0	24	113.0	3
32.0	39	57.0	19	82.0	7	115.0	36
33.0	51	58.0	16	83.0	9	116.0	42
34.0	33	59.0	24	84.0	9	117.0	3
35.0	41	60.0	13	85.0	3	118.0	3
36.0	33	61.0	10	86.0	3	120.0	39
37.0	10	62.0	17	87.0	3	121.0	12
38.0	2	63.0	20	88.0	12	129.0	3
39.0	4	64.0	40	89.0	24	130.0	12
						131.0	6
						135.0	23
						136.0	3
						139.0	12
STAGE 1 WING 6	TP-H 1011		MAXIMUM PRESSURE			140.0	12

This sample size summary is applicable to figures 61 and 62

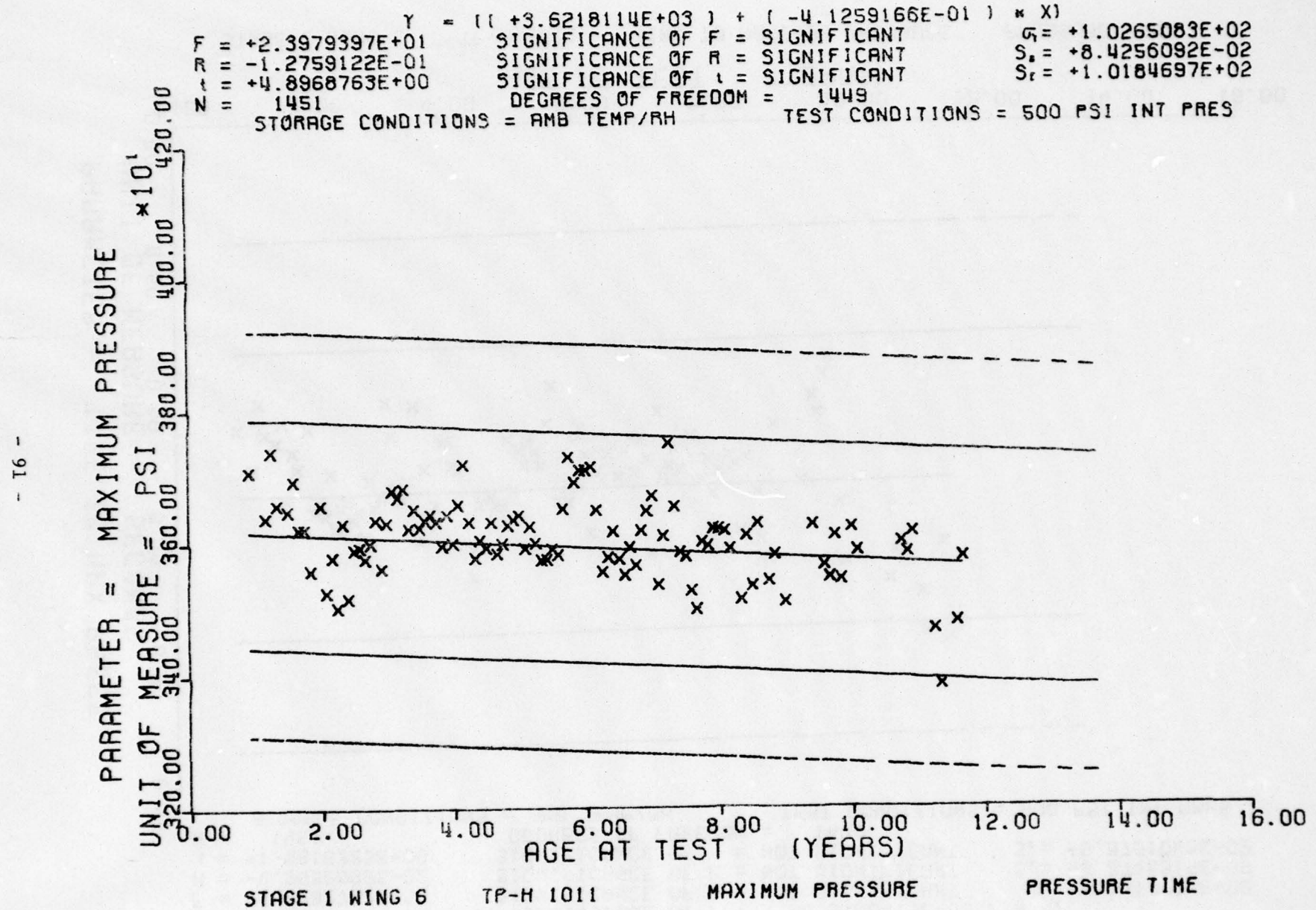

Y = (+3.6218114E+03) + (-4.1259166E-01) * X)
F = +2.3979397E+01 SIGNIFICANCE OF F = SIGNIFICANT
R = -1.2759122E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +4.8968763E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 1451 DEGREES OF FREEDOM = 1449
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 500 PSI INT PRES
PARAMETER = MAXIMUM PRESSURE
UNIT OF MEASURE = PSI *10¹
320.00
340.00
360.00
380.00
400.00
420.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
STAGE 1 WING 6 TP-H 1011 MAXIMUM PRESSURE PRESSURE TIME

Figure 61

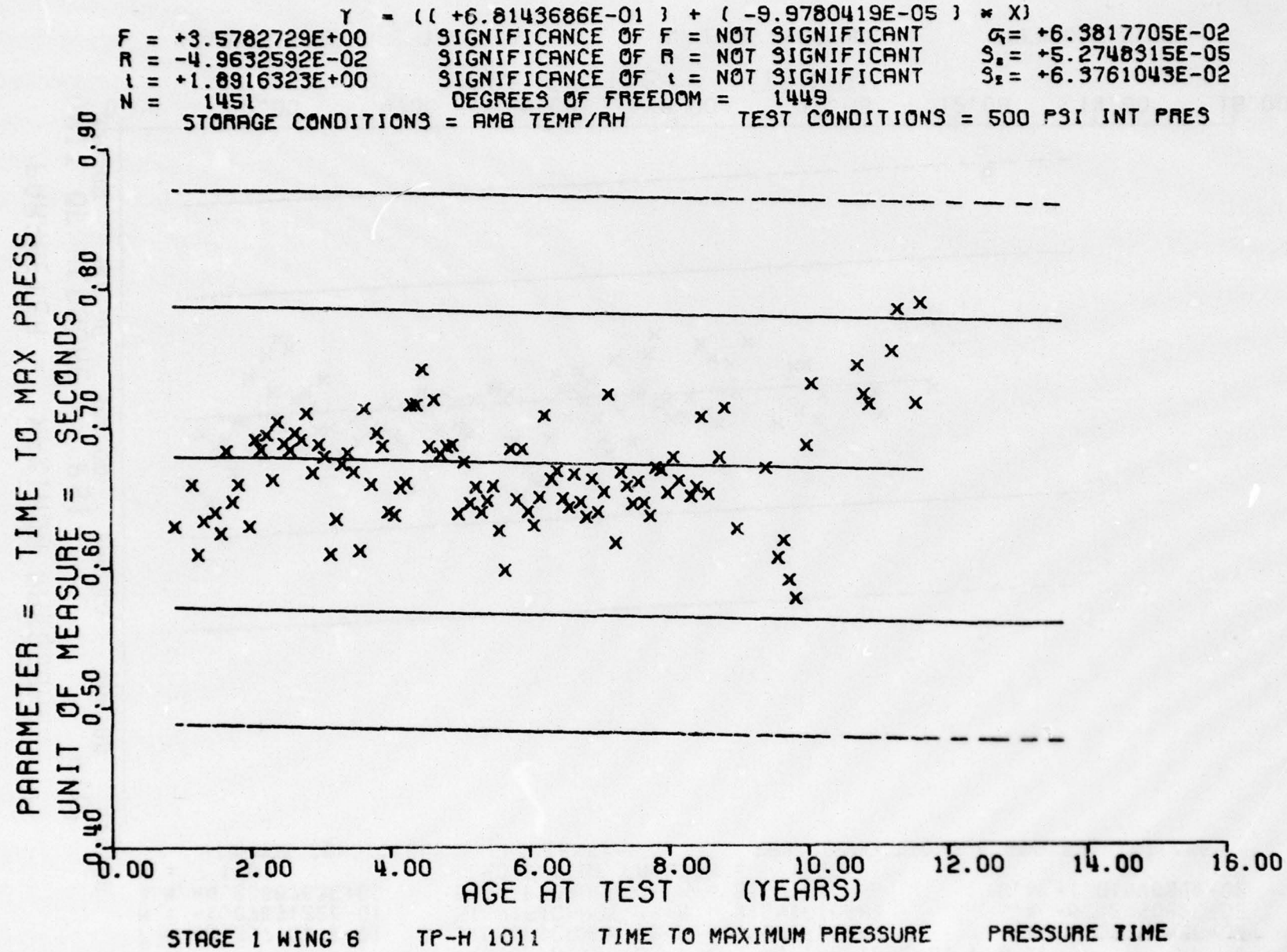

Y = ((+6.8143686E-01) + (-9.9780419E-05) * X)
F = +3.5782729E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ1= +6.3817705E-02
R = -4.9632592E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT Sa= +5.2748315E-05
t = +1.8916323E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT Sz= +6.3761043E-02
N = 1451 DEGREES OF FREEDOM = 1449
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 500 PSI INT PRES
PARAMETER = TIME TO MAX PRESS
UNIT OF MEASURE = SECONDS
0.90
0.80
0.70
0.60
0.50
0.40
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
STAGE 1 WING 6 TP-H 1011 TIME TO MAXIMUM PRESSURE PRESSURE TIME

Figure 62

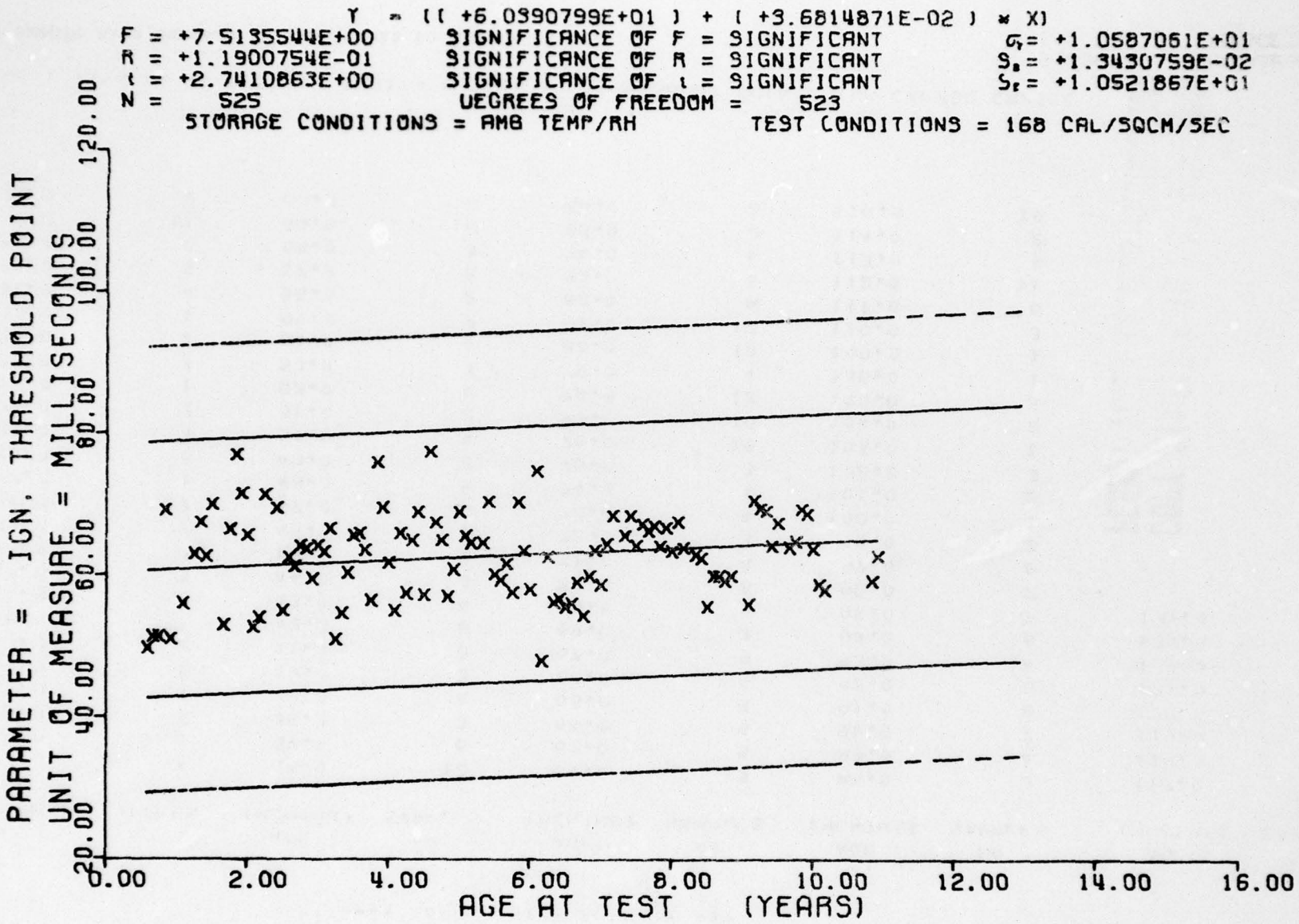
*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
7.0	7	36.0	12	61.0	3	88.0	3	117.0	6
8.0	6	37.0	6	62.0	5	89.0	4	118.0	15
9.0	3	38.0	3	64.0	8	90.0	7	119.0	21
10.0	5	39.0	2	65.0	5	91.0	8	120.0	26
11.0	1	40.0	3	66.0	6	92.0	3	121.0	9
13.0	2	41.0	3	67.0	9	93.0	14	122.0	1
15.0	3	42.0	3	68.0	3	94.0	6	130.0	3
16.0	2	43.0	4	69.0	5	95.0	5	131.0	6
17.0	3	44.0	3	70.0	6	96.0	2		
18.0	2	45.0	2	71.0	4	97.0	6		
20.0	2	46.0	1	72.0	3	98.0	2		
21.0	2	47.0	5	73.0	4	100.0	1		
22.0	1	48.0	5	74.0	1	101.0	2		
23.0	6	49.0	2	75.0	3	102.0	3		
24.0	3	50.0	4	76.0	10	103.0	1		
25.0	3	51.0	2	77.0	10	104.0	2		
26.0	1	52.0	4	78.0	12	105.0	3		
27.0	3	53.0	3	79.0	4	106.0	1		
29.0	2	54.0	4	80.0	10	109.0	1		
30.0	1	55.0	2	81.0	12	110.0	3		
31.0	4	56.0	2	82.0	4	111.0	6		
32.0	5	57.0	2	83.0	6	112.0	11		
33.0	6	58.0	3	84.0	4	113.0	4		
34.0	11	59.0	6	85.0	2	114.0	2		
35.0	2	60.0	6	86.0	2	116.0	19		

STAGE 1 WING 2, TP-H 1011, IGNITABILITY, IGN THRESHOLD POINT, 168 CAL/SQ CM/SEC

This sample size summary is applicable to figure 63

COPY AVAILABLE TO DTIC DOES NOT PERMIT FULLY LEGIBLE REPRODUCTION



STAGE 1 WING 6, TP-H 1011, IGNITABILITY, IGN THRESHOLD POINT, 168 CAL/SQ CM/SEC

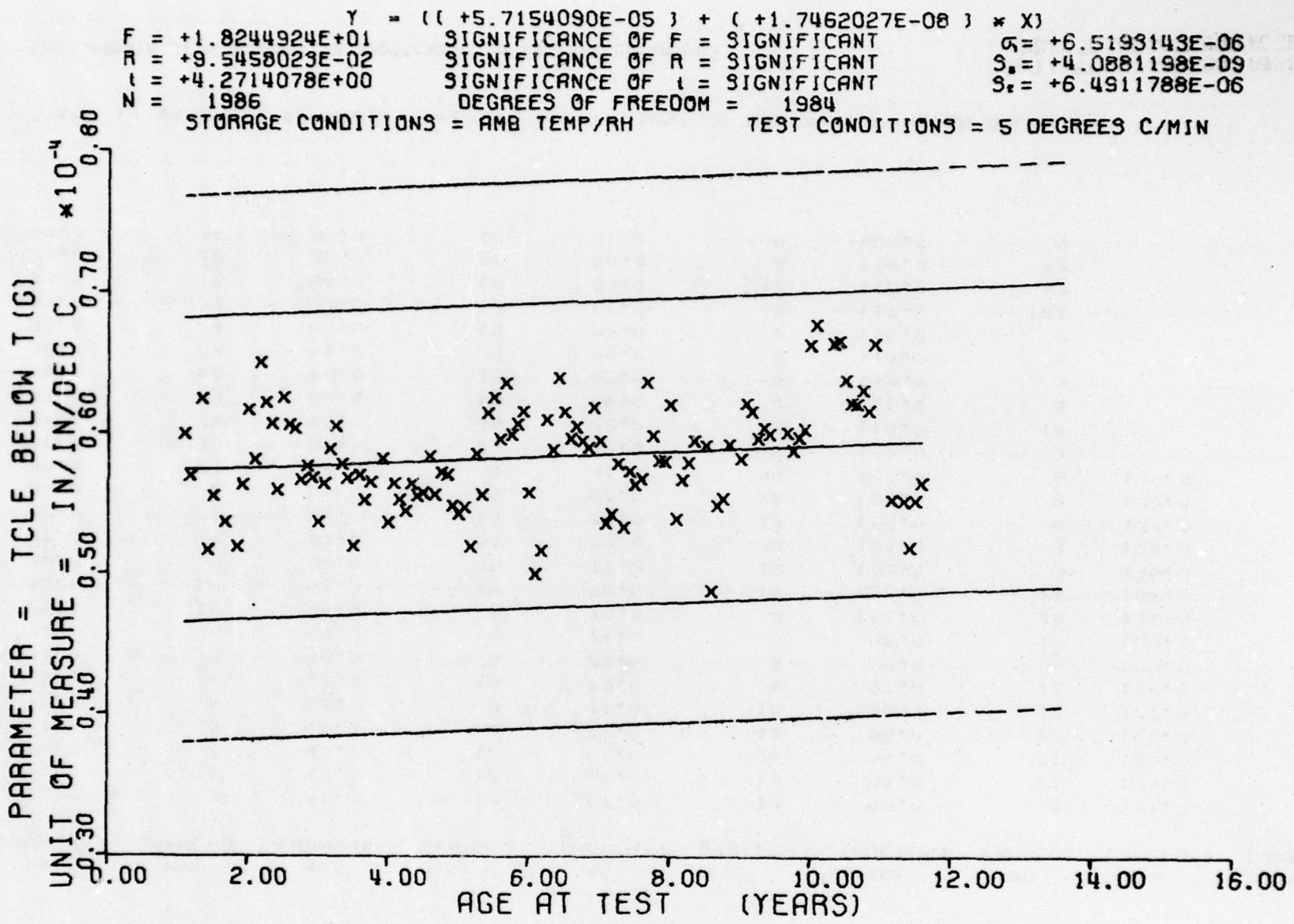
Figure 63

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
13.0	3	41.0	18	67.0	12	92.0	3	121.0	3
14.0	3	42.0	12	68.0	18	93.0	21	124.0	21
16.0	6	43.0	12	69.0	24	94.0	21	125.0	27
17.0	3	44.0	6	70.0	12	95.0	27	126.0	9
18.0	9	45.0	9	71.0	18	96.0	12	127.0	27
20.0	6	47.0	15	72.0	6	97.0	12	128.0	18
22.0	9	48.0	3	73.0	3	98.0	36	129.0	6
23.0	6	49.0	6	74.0	3	99.0	12	130.0	9
24.0	12	50.0	9	75.0	9	100.0	15	131.0	6
25.0	18	51.0	39	76.0	19	102.0	12	134.0	24
26.0	9	52.0	45	77.0	18	103.0	3	135.0	3
27.0	24	53.0	51	78.0	30	104.0	3	136.0	3
28.0	21	54.0	15	79.0	12	105.0	9	137.0	6
29.0	24	55.0	33	80.0	24	106.0	9	138.0	57
30.0	27	56.0	30	81.0	39	108.0	6	139.0	30
31.0	33	57.0	27	82.0	12	109.0	3		
32.0	39	58.0	36	83.0	18	110.0	18		
33.0	33	59.0	15	84.0	9	111.0	3		
34.0	42	60.0	15	85.0	9	112.0	3		
35.0	36	61.0	9	86.0	9	113.0	6		
36.0	24	62.0	15	87.0	6	116.0	9		
37.0	38	63.0	12	88.0	3	117.0	102		
38.0	15	64.0	15	89.0	12	118.0	63		
39.0	12	65.0	21	90.0	9	119.0	12		
40.0	24	66.0	12	91.0	9	120.0	9		

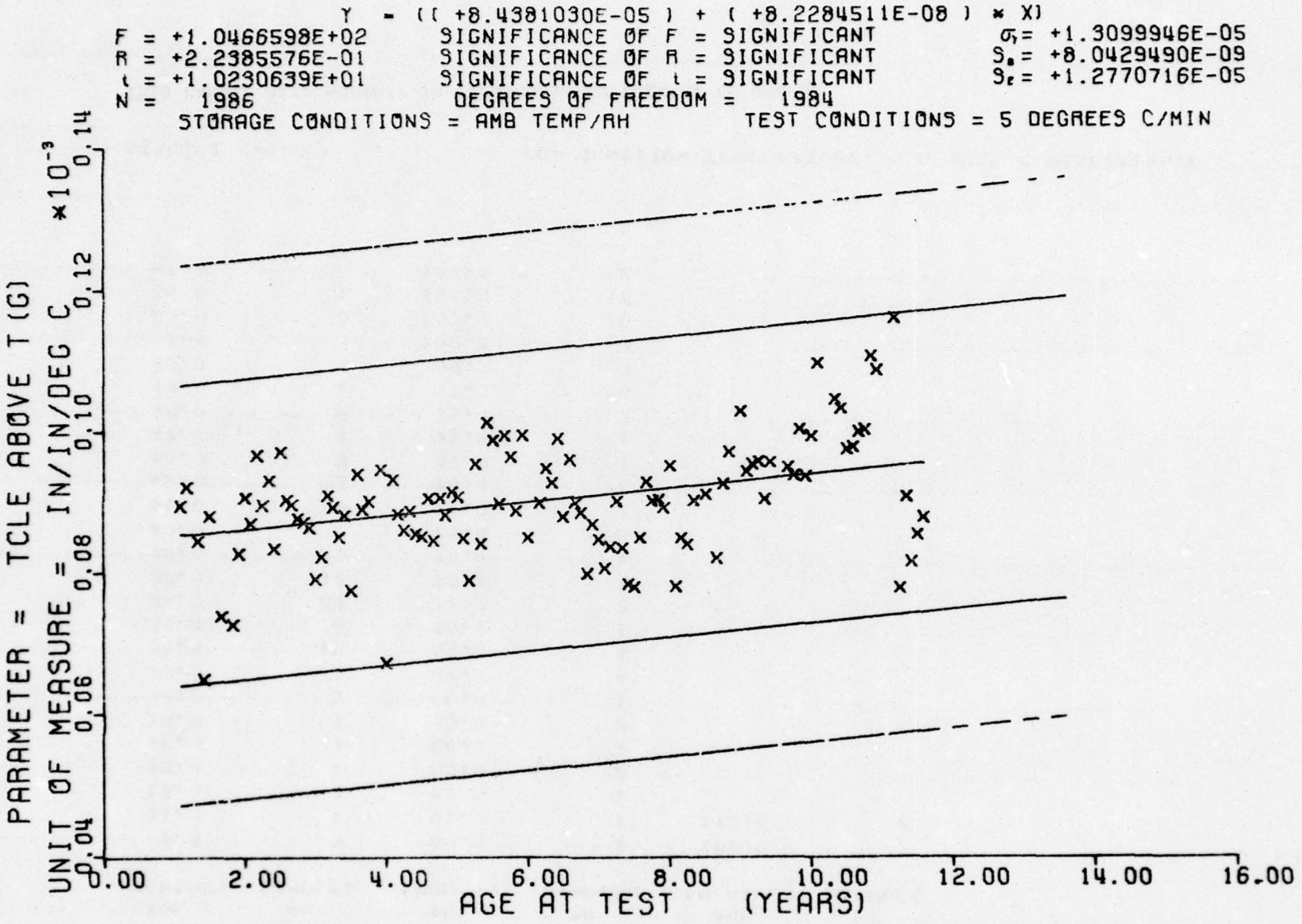
STAGE 1, WING 6, TP-H1011 THERMAL COEFFICIENT OF LINEAR EXPANSION BELOW TG

This sample size summary is applicable to fiugres 64 and 65



STAGE 1, WING 6, TP-H1011 THERMAL COEFFICIENT OF LINEAR EXPANSION BELOW TG

Figure 64



STAGE 1, WING 6, TP-H1011, THERMAL COEFFICIENT OF LINEAR EXPANSION ABOVE TG

Figure 65

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
1.0	3	59.0	1	106.0	2
11.0	1	61.0	1	110.0	2
13.0	1	62.0	1		
15.0	1	63.0	2		
16.0	1	64.0	3		
18.0	1	65.0	2		
20.0	2	66.0	1		
29.0	1	67.0	4		
34.0	10	69.0	4		
35.0	5	70.0	1		
36.0	22	71.0	2		
37.0	12	72.0	1		
39.0	3	73.0	4		
40.0	3	75.0	2		
41.0	3	76.0	1		
42.0	3	79.0	6		
45.0	3	87.0	1		
47.0	1	91.0	1		
48.0	2	95.0	3		
49.0	1	97.0	6		
50.0	3	99.0	3		
51.0	3	102.0	3		
53.0	3	103.0	6		
56.0	1	104.0	3		
57.0	3	105.0	2		

STAGE I WING 6 TGA IGNITION TEMPERATURE, 9 DEGREE C RISE/MINUTE

This sample size summary is applicable to figures 66 and 67

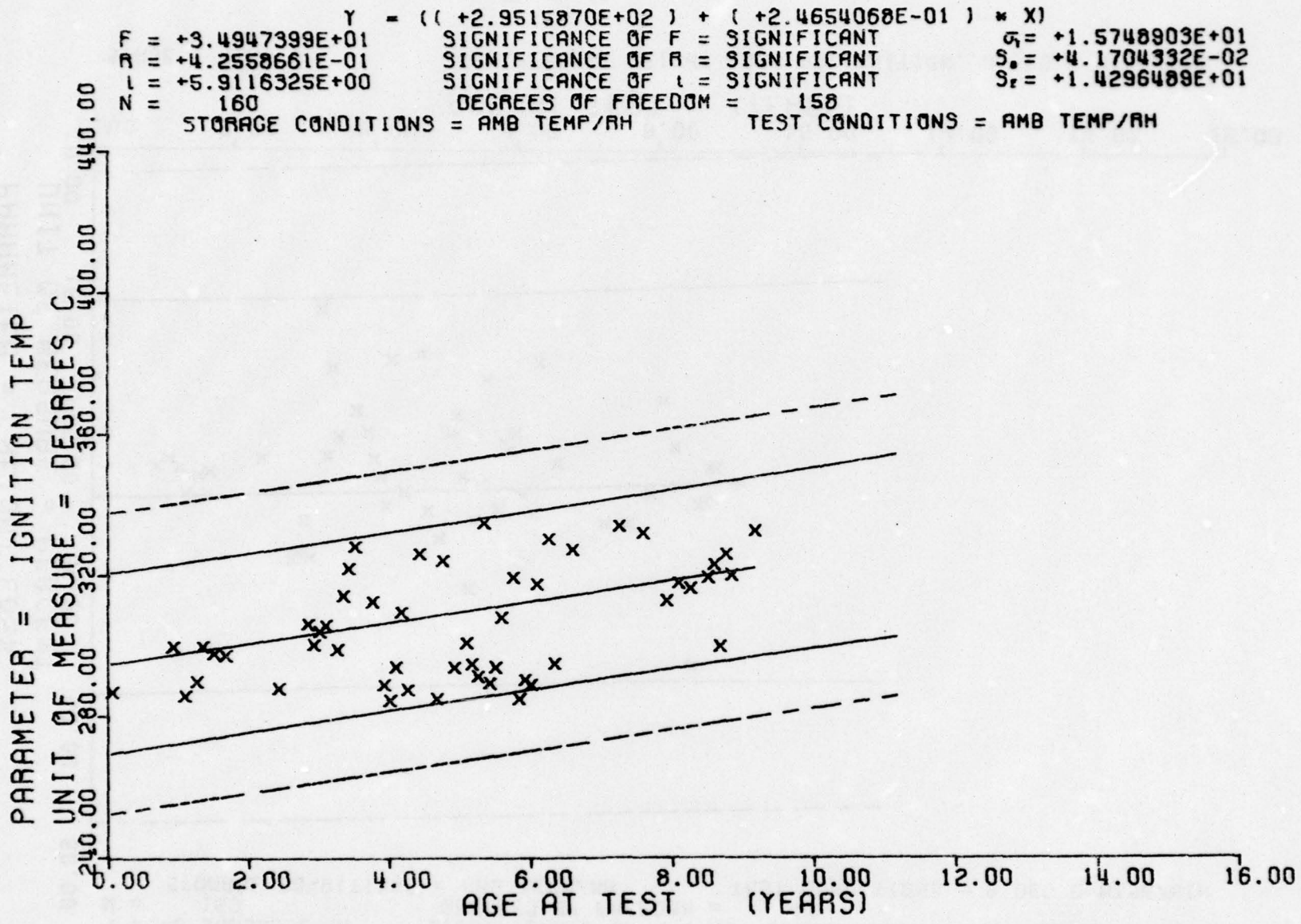

Y = ((+2.9515870E+02) + (+2.4654068E-01) * X)
F = +3.4947399E+01 SIGNIFICANCE OF F = SIGNIFICANT σ1 = +1.5748903E+01
R = +4.2558661E-01 SIGNIFICANCE OF R = SIGNIFICANT Se = +4.1704332E-02
t = +5.9116325E+00 SIGNIFICANCE OF t = SIGNIFICANT Sr = +1.4296489E+01
N = 160 DEGREES OF FREEDOM = 158
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = IGNITION TEMP
UNIT OF MEASURE = DEGREES C
240.00
280.00
320.00
360.00
400.00
440.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
STAGE I WING 6
TGA IGNITION TEMPERATURE, 9 DEGREE C RISE/MINUTE

Figure 66

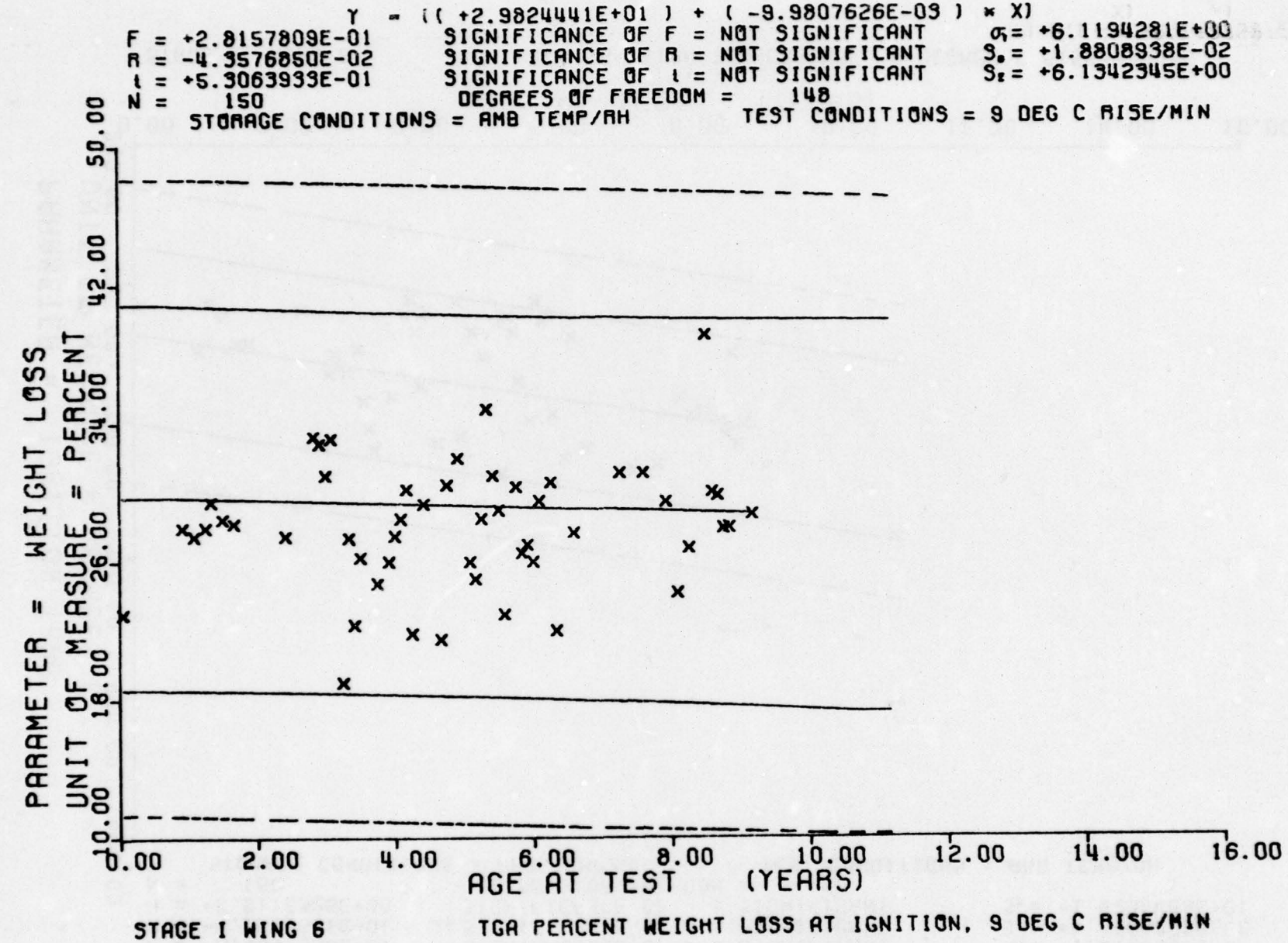

Y = ((+2.9824441E+01) + (-9.9807626E-03) * X)
F = +2.8157809E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ1 = +6.1194281E+00
R = -4.3576850E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT Se = +1.8808938E-02
t = +5.3063933E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT Sz = +6.1342345E+00
N = 150 DEGREES OF FREEDOM = 148
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 9 DEG C RISE/MIN
PARAMETER = WEIGHT LOSS
UNIT OF MEASURE = PERCENT
50.00
42.00
34.00
26.00
18.00
10.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
STAGE I WING 6
TGA PERCENT WEIGHT LOSS AT IGNITION, 9 DEG C RISE/MIN

Figure 67

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
34.0	4	105.0	1
36.0	6	106.0	1
37.0	1	110.0	1
39.0	1		
40.0	1		
41.0	1		
42.0	1		
45.0	1		
50.0	1		
53.0	1		
57.0	1		
64.0	1		
67.0	1		
69.0	1		
73.0	1		
75.0	1		
79.0	2		
87.0	1		
91.0	1		
95.0	1		
97.0	2		
99.0	1		
102.0	1		
103.0	2		
104.0	1		

SAGE I WING 6 TGA % WT LOSS AT 250 DEG C HOLD, 12 DEG RISE/MIN TO HOLD

This sample size summary is applicable to figure 68

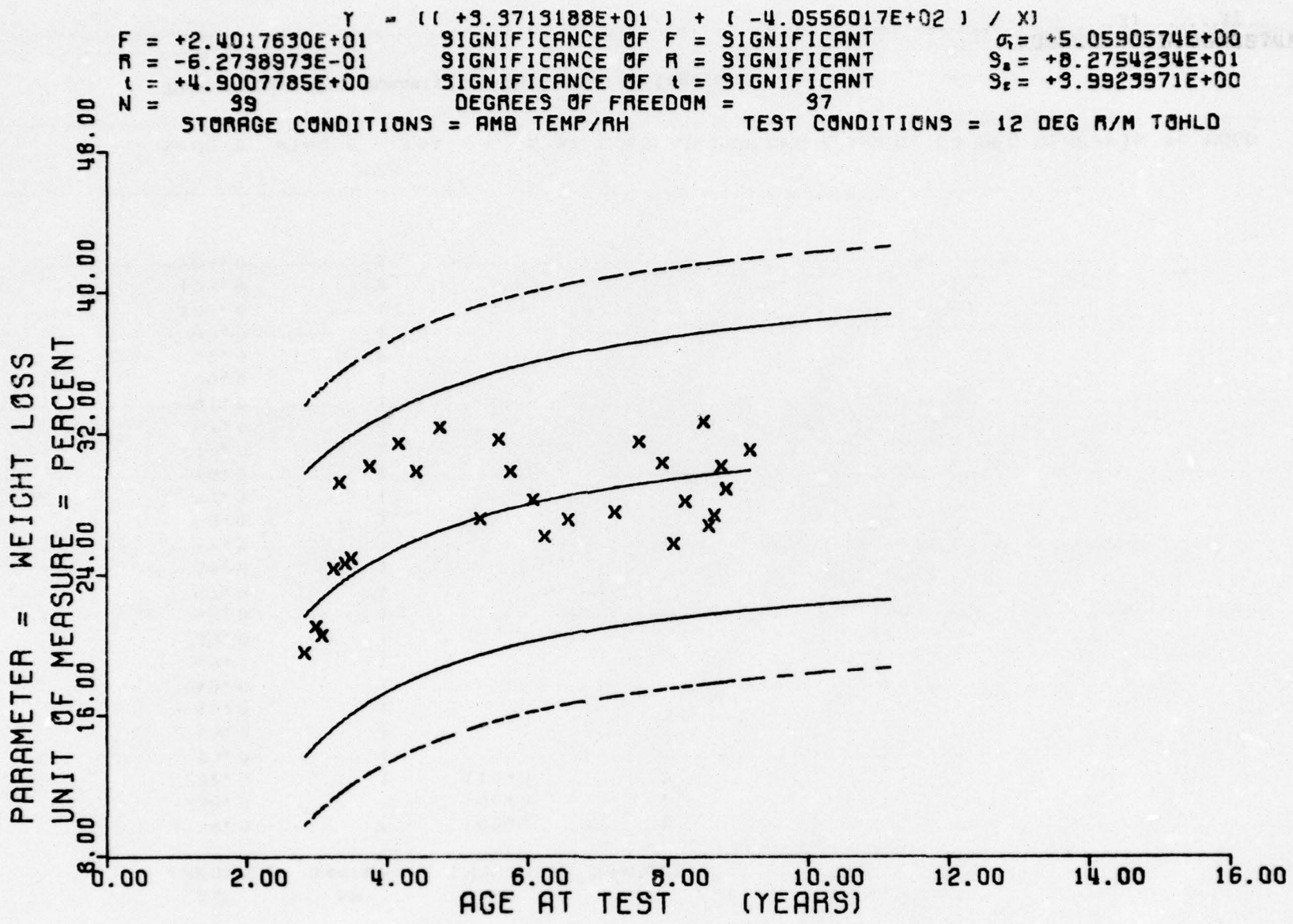

Y = ((+3.3713188E+01) + (-4.0556017E+02) / X)
F = +2.4017630E+01
R = -6.2738973E-01
t = +4.9007785E+00
N = 99
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 97
σ1 = +5.0590574E+00
Sa = +8.2754234E+01
Se = +3.9923971E+00
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = 12 DEG R/M TOHLD
PARAMETER = WEIGHT LOSS
UNIT OF MEASURE = PERCENT
48.00
40.00
32.00
24.00
16.00
8.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
SAGE I WING 6 TGA % WT LOSS AT 250 DEG C HOLD, 12 DEG RISE/MIN TO HOLD

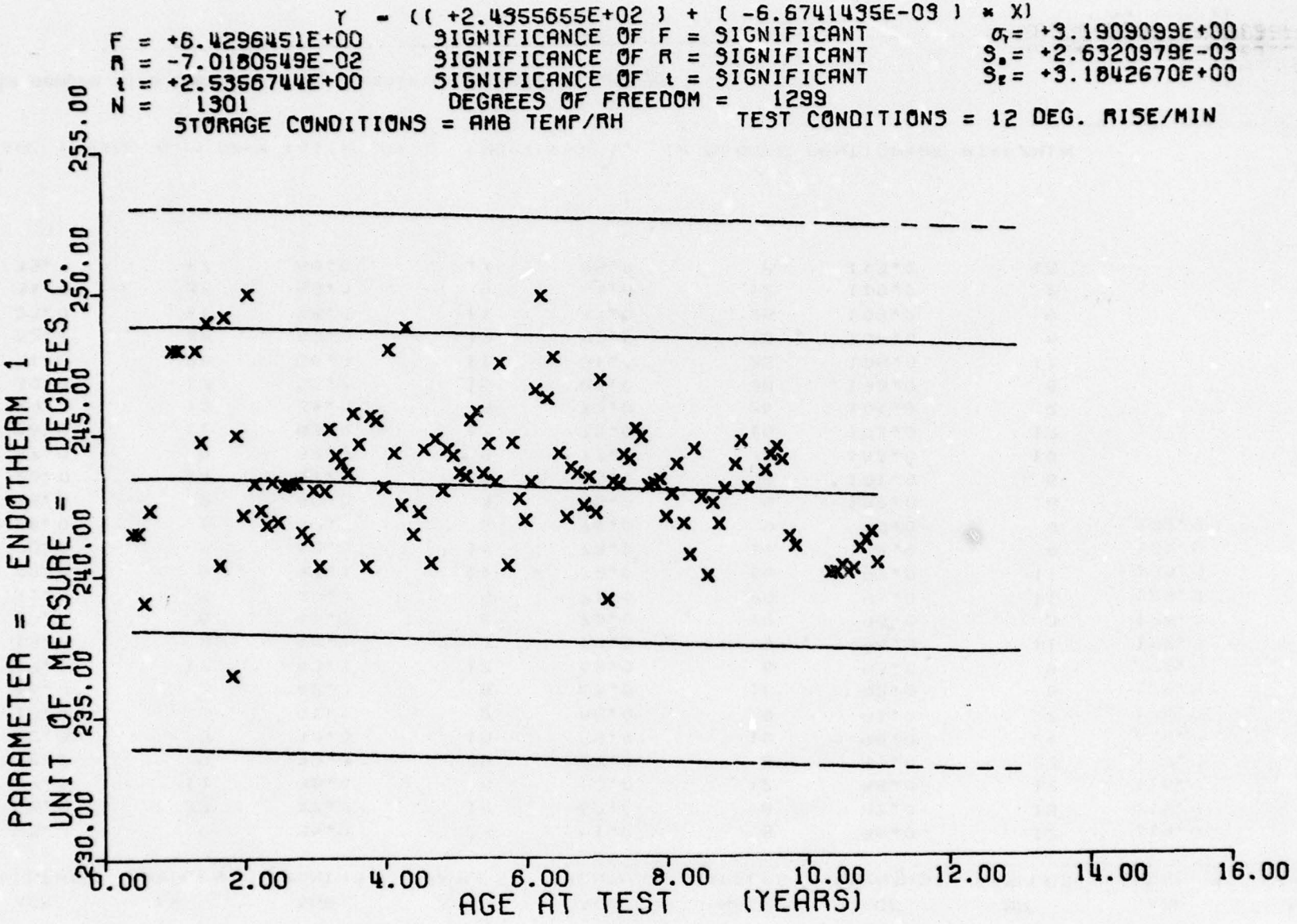
Figure 68

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
5.0	9	36.0	29	61.0	8	86.0	12	114.0	41
6.0	27	37.0	18	62.0	8	87.0	15	115.0	15
7.0	11	38.0	6	63.0	12	88.0	12	116.0	3
8.0	9	39.0	5	64.0	5	89.0	23	117.0	13
12.0	3	40.0	15	65.0	10	90.0	24	118.0	38
13.0	3	41.0	2	66.0	9	91.0	7	124.0	3
16.0	5	42.0	8	67.0	16	92.0	6	125.0	15
17.0	12	43.0	12	68.0	6	93.0	9	126.0	15
18.0	2	44.0	3	69.0	9	94.0	11	127.0	3
20.0	5	45.0	6	70.0	19	95.0	3	128.0	13
21.0	5	46.0	6	71.0	20	96.0	11	129.0	9
22.0	6	47.0	14	72.0	16	97.0	11	130.0	6
23.0	5	48.0	14	73.0	14	98.0	8	131.0	9
24.0	6	49.0	5	74.0	9	99.0	9	132.0	6
25.0	2	50.0	3	75.0	9	100.0	6		
26.0	14	51.0	2	76.0	8	101.0	5		
27.0	9	52.0	5	77.0	7	102.0	10		
28.0	11	53.0	13	78.0	16	103.0	12		
29.0	12	54.0	8	79.0	24	104.0	2		
30.0	13	55.0	15	80.0	30	105.0	8		
31.0	20	56.0	11	81.0	23	106.0	11		
32.0	18	57.0	12	82.0	18	108.0	6		
33.0	11	58.0	14	83.0	26	109.0	9		
34.0	33	59.0	9	84.0	12	110.0	2		
35.0	17	60.0	17	85.0	8	113.0	18		

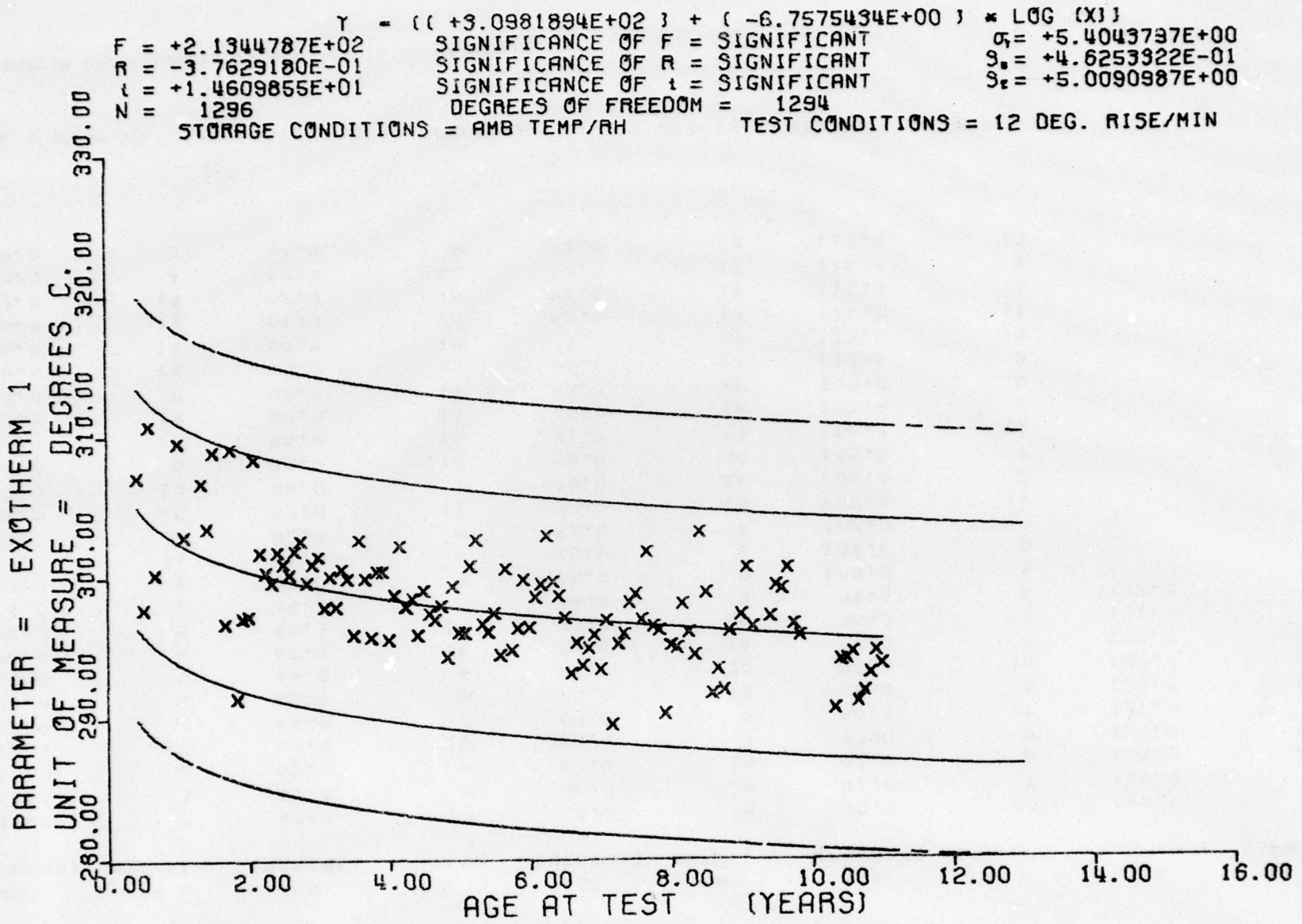
STAGE 1 WING 6, TP-H 1011, DTA, ENDOTHERM 1, 12 DEGREE CENTIGRADE RISE/MIN

This sample size summary is applicable to figures 69 and 70



STAGE 1 WING 6, TP-H 1011, DTA, ENDOTHERM 1, 12 DEGREE CENTIGRADE RISE/MIN

Figure 69



STAGE 1 WING 6, TP-H 1011, DTA, EXOTHERM 1, 12 DEGREE CENTIGRADE RISE/MIN

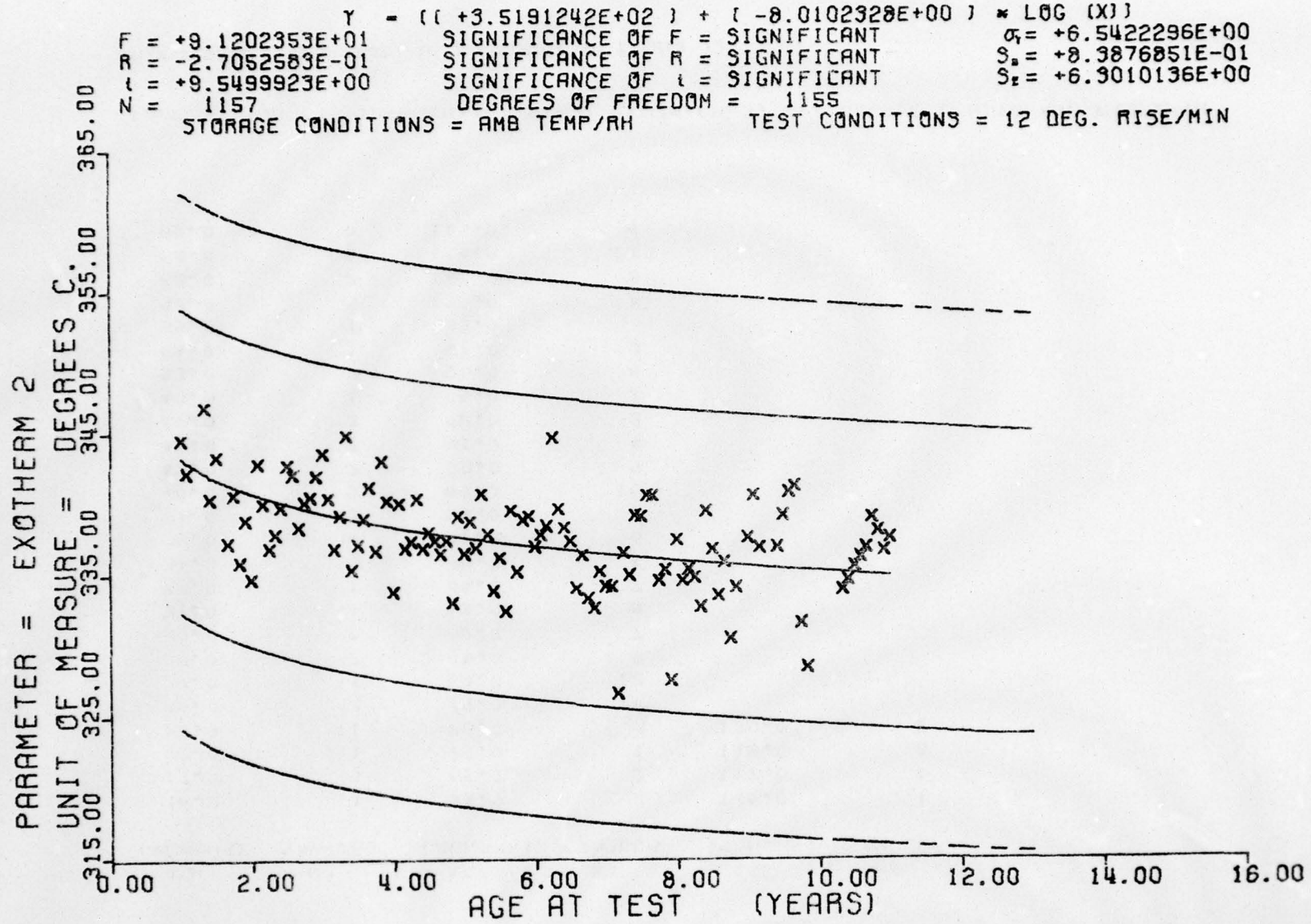
Figure 70

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
12.0	3	40.0	13	65.0	9	90.0	23	118.0	38
13.0	3	41.0	2	66.0	9	91.0	7	124.0	3
16.0	5	42.0	8	67.0	16	92.0	6	125.0	15
17.0	12	43.0	10	68.0	6	93.0	9	126.0	14
18.0	2	44.0	3	69.0	9	94.0	11	127.0	3
20.0	5	45.0	6	70.0	12	95.0	3	128.0	11
21.0	5	46.0	6	71.0	20	96.0	10	129.0	8
22.0	6	47.0	14	72.0	14	97.0	10	130.0	6
23.0	5	48.0	14	73.0	14	98.0	8	131.0	9
24.0	6	49.0	5	74.0	9	99.0	9	132.0	6
25.0	2	50.0	3	75.0	9	100.0	6		
26.0	11	51.0	2	76.0	8	101.0	5		
27.0	8	52.0	4	77.0	7	102.0	10		
28.0	5	53.0	11	78.0	15	103.0	11		
29.0	10	54.0	7	79.0	24	104.0	2		
30.0	9	55.0	15	80.0	30	105.0	7		
31.0	13	56.0	10	81.0	23	106.0	11		
32.0	18	57.0	11	82.0	18	108.0	6		
33.0	7	58.0	14	83.0	22	109.0	9		
34.0	26	59.0	9	84.0	12	110.0	2		
35.0	14	60.0	15	85.0	7	113.0	18		
36.0	24	61.0	8	86.0	12	114.0	41		
37.0	14	62.0	8	87.0	15	115.0	15		
38.0	4	63.0	12	88.0	12	116.0	3		
39.0	3	64.0	4	89.0	23	117.0	13		

STAGE 1 WING 6, TP-H 1011, DTA, EXOTHERM 2, 12 DEGREE CENTIGRADE RISE/MIN

This sample size summary is applicable to figure 71



STAGE 1 WING 6, TP-H 1011, DTA, EXOTHERM 2, 12 DEGREE CENTIGRADE RISE/MIN

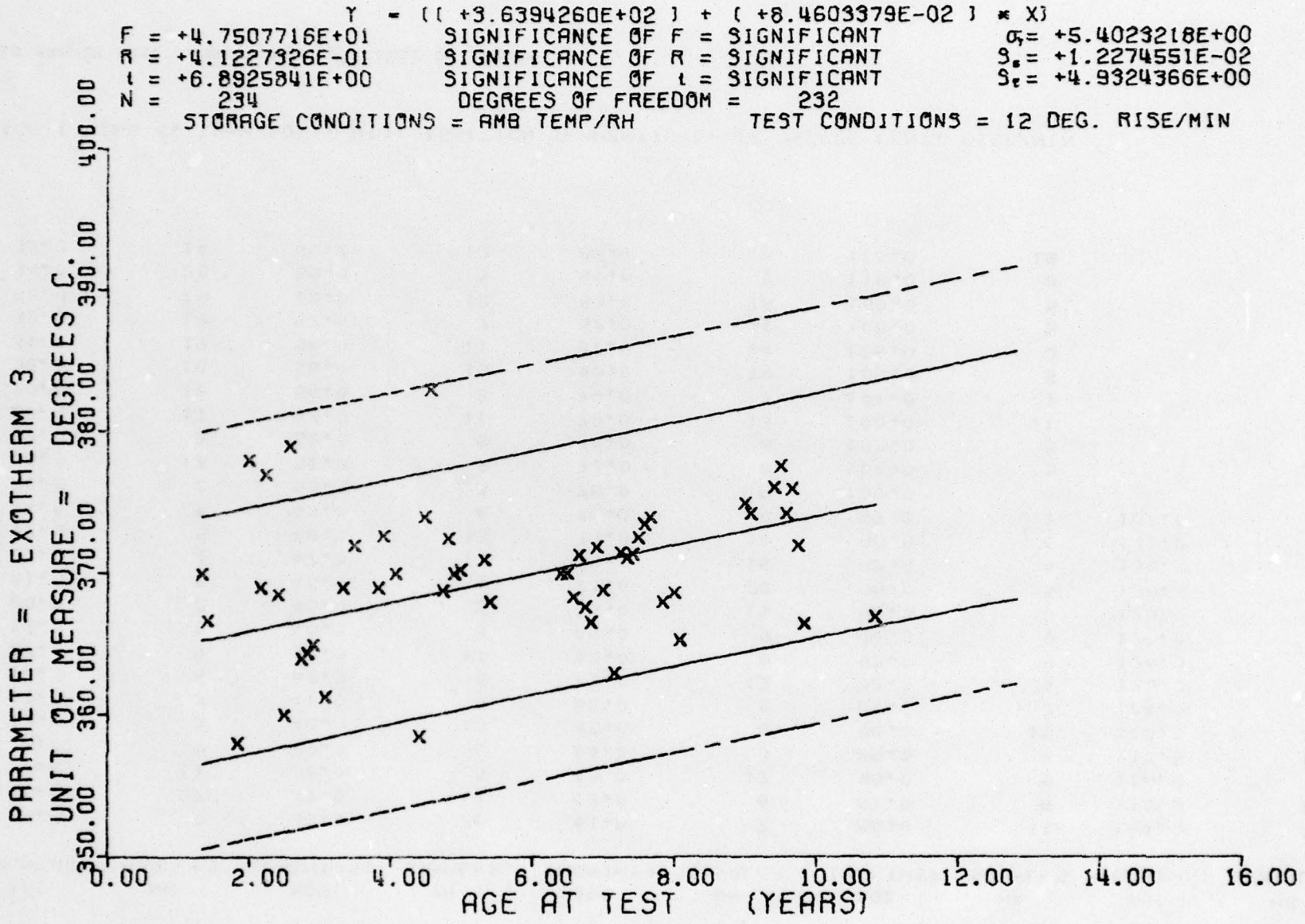
Figure 71

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
16.0	1	64.0	2	116.0	1
17.0	3	65.0	2	117.0	1
22.0	1	77.0	1	118.0	2
24.0	1	78.0	3	130.0	2
26.0	2	79.0	18		
27.0	1	80.0	12		
29.0	2	81.0	9		
30.0	2	82.0	7		
31.0	1	83.0	8		
33.0	1	84.0	7		
34.0	5	86.0	1		
35.0	4	87.0	6		
37.0	3	88.0	8		
40.0	5	89.0	16		
42.0	3	90.0	9		
46.0	2	91.0	4		
47.0	3	92.0	2		
49.0	1	94.0	2		
53.0	2	96.0	6		
54.0	1	97.0	3		
55.0	1	108.0	3		
57.0	5	109.0	4		
58.0	2	113.0	8		
59.0	6	114.0	21		
60.0	4	115.0	4		

STAGE 1 WING 6, TP-H 1011, DTA, EXOTHERM 3, 12 DEGREE CENTIGRADE RISE/MIN

This sample size summary is applicable to figure 72



STAGE 1 WING 6, TP-H 1011, DTA, EXOTHERM 3, 12 DEGREE CENTIGRADE RISE/MIN

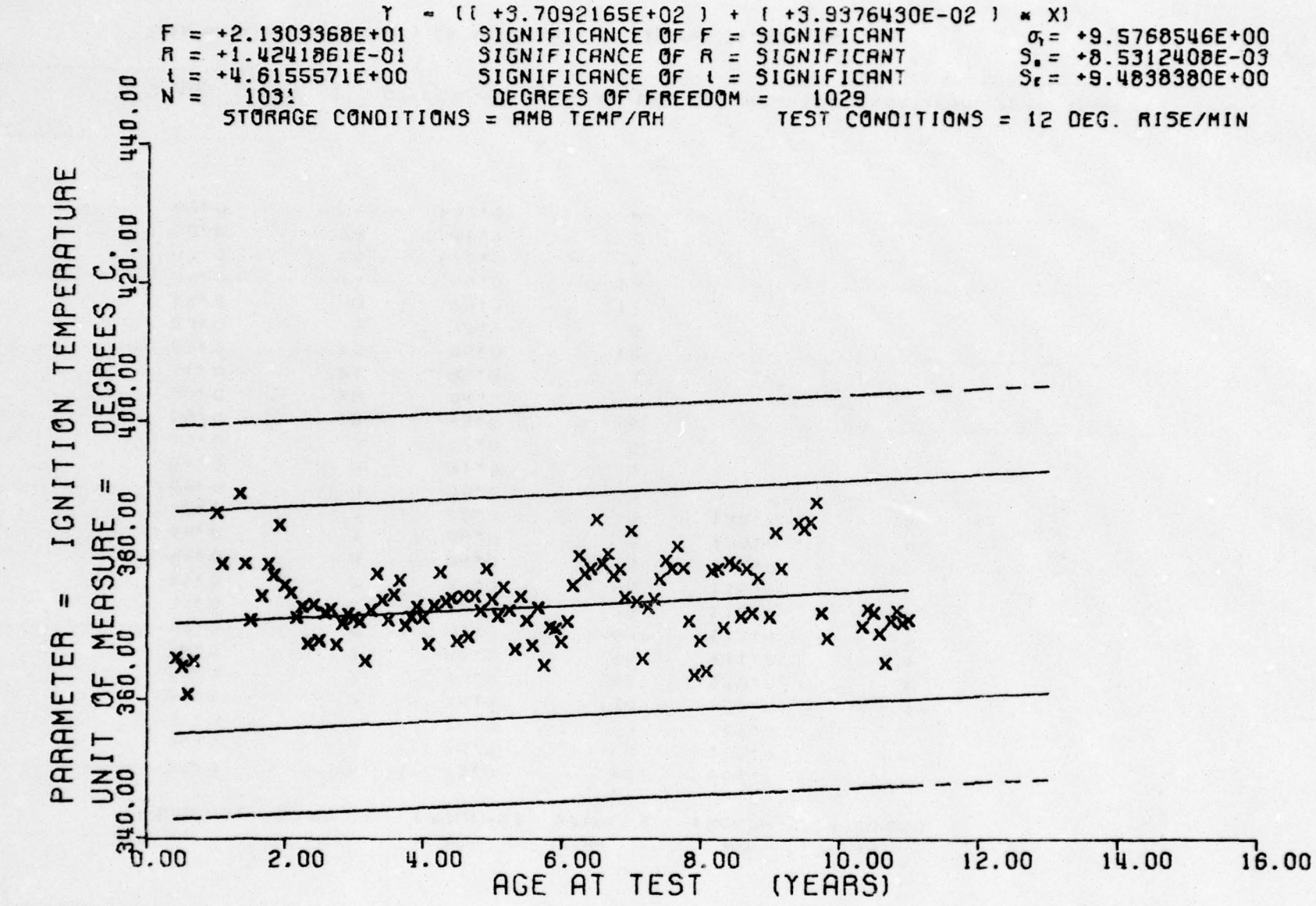
Figure 72

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
5.0	9	36.0	26	61.0	7	86.0	11	114.0	20
5.0	27	37.0	14	62.0	6	87.0	9	115.0	11
7.0	11	38.0	6	63.0	12	88.0	5	116.0	2
8.0	9	39.0	5	64.0	3	89.0	7	117.0	12
12.0	3	40.0	10	65.0	8	90.0	15	118.0	36
13.0	3	41.0	2	66.0	8	91.0	3	124.0	3
16.0	4	42.0	5	67.0	13	92.0	4	125.0	15
17.0	9	43.0	11	68.0	6	93.0	9	126.0	15
18.0	2	44.0	3	69.0	9	94.0	9	127.0	3
20.0	2	45.0	5	70.0	19	95.0	3	128.0	13
21.0	5	46.0	4	71.0	20	96.0	5	129.0	9
22.0	2	47.0	11	72.0	16	97.0	4	130.0	4
23.0	5	48.0	13	73.0	14	98.0	6	131.0	9
24.0	5	49.0	4	74.0	9	99.0	3	132.0	6
25.0	2	50.0	3	75.0	9	100.0	6		
26.0	12	51.0	2	76.0	8	101.0	5		
27.0	8	52.0	5	77.0	6	102.0	8		
28.0	11	53.0	11	78.0	13	103.0	11		
29.0	10	54.0	8	79.0	7	104.0	1		
30.0	10	55.0	15	80.0	19	105.0	5		
31.0	19	56.0	11	81.0	14	106.0	8		
32.0	18	57.0	7	82.0	11	108.0	3		
33.0	10	58.0	12	83.0	18	109.0	5		
34.0	28	59.0	3	84.0	7	110.0	2		
35.0	14	60.0	12	85.0	8	113.0	10		

STAGE 1 WING 6, TP-H 1011, DTA, IGNITION TEMPERATURE, 12 DEGREE CENT. RISE/MIN

This sample size summary is applicable to figure 73



STAGE 1 WING 6, TP-H 1011, DTA, IGNITION TEMPERATURE, 12 DEGREE CENT. RISE/MIN

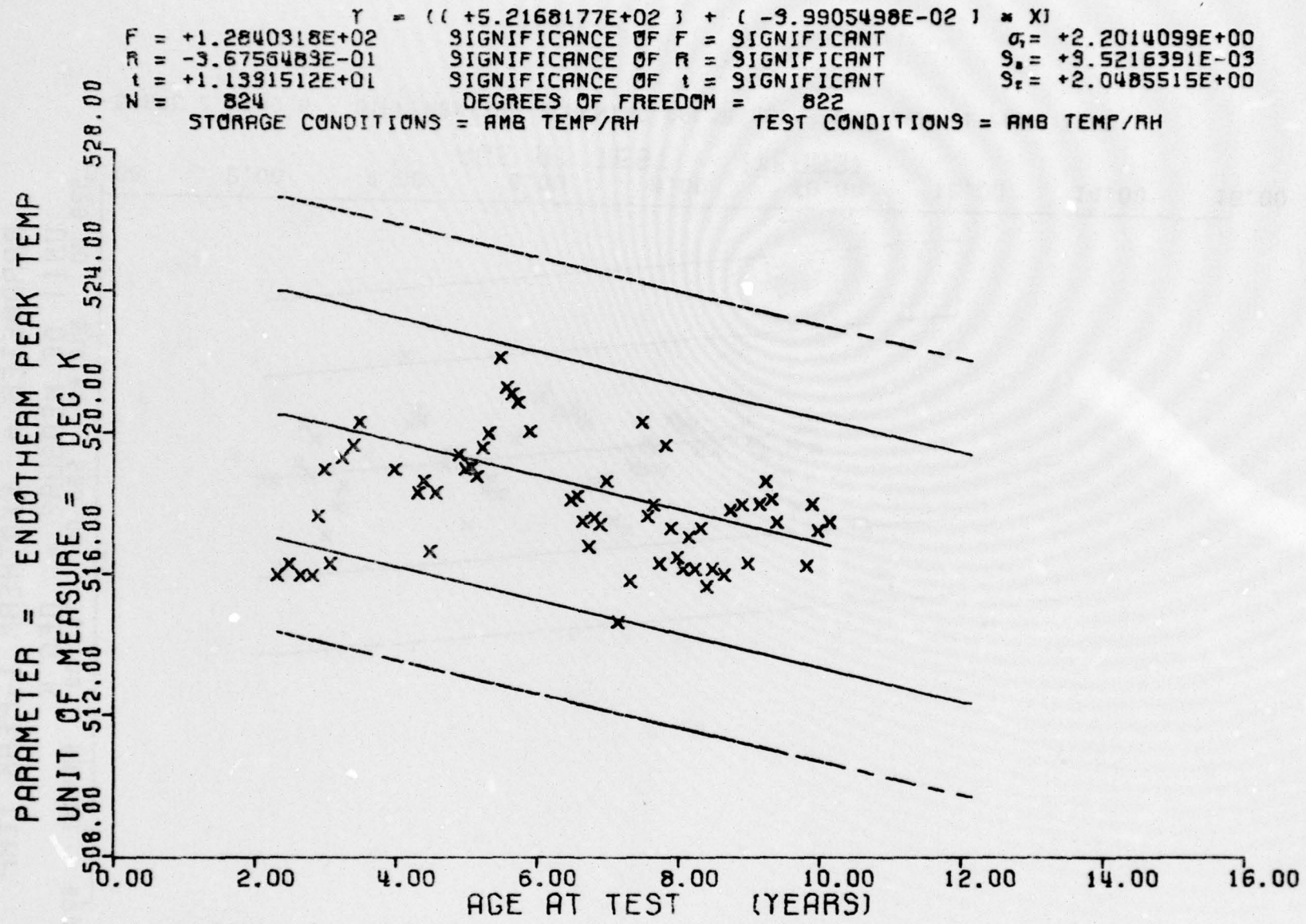
Figure 73

*** SAMPLE SIZE SUMMARY ***

AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES	AGE (MONTHS)	NR SAMPLES
28.0	6	71.0	15	104.0	3
30.0	3	75.0	3	105.0	6
32.0	2	76.0	3	107.0	6
34.0	2	78.0	30	108.0	3
35.0	3	79.0	42	110.0	1
36.0	7	80.0	56	111.0	34
37.0	3	81.0	42	112.0	13
39.0	6	82.0	32	113.0	4
41.0	3	83.0	50	118.0	40
42.0	3	84.0	3	119.0	22
48.0	3	86.0	3	120.0	4
52.0	3	88.0	6	122.0	4
53.0	3	90.0	3		
54.0	3	91.0	9		
56.0	3	92.0	5		
59.0	10	93.0	6		
60.0	18	94.0	3		
61.0	21	95.0	3		
62.0	15	96.0	12		
63.0	5	97.0	6		
64.0	3	98.0	12		
66.0	14	99.0	18		
67.0	54	100.0	6		
68.0	78	101.0	3		
69.0	36	102.0	6		

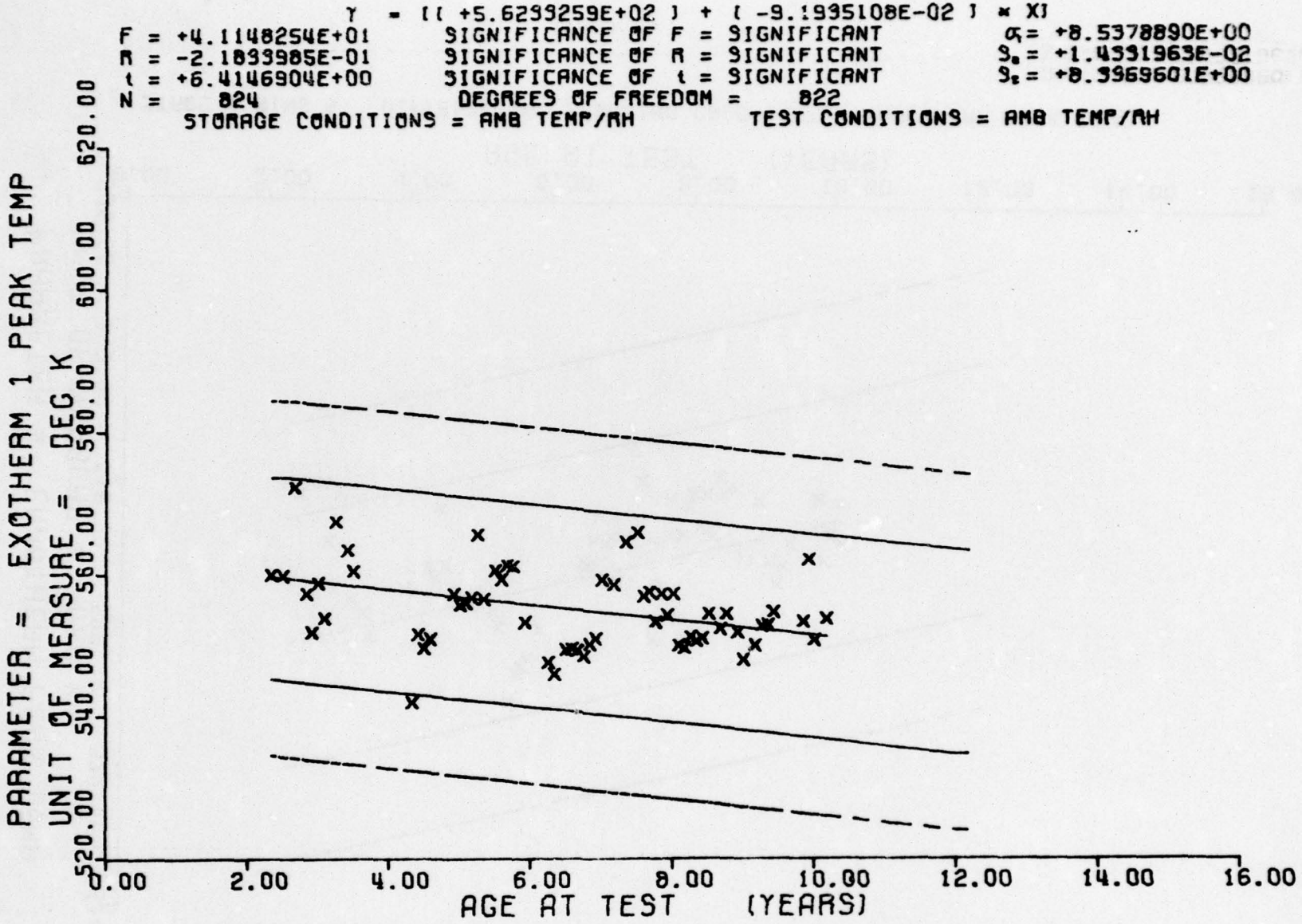
STAGE I WING 6 DIFFERENTIAL SCANNING CALORIMETER ENDOTHERM PEAK TEMP

This sample size summary is applicable to figures 74 thru 76



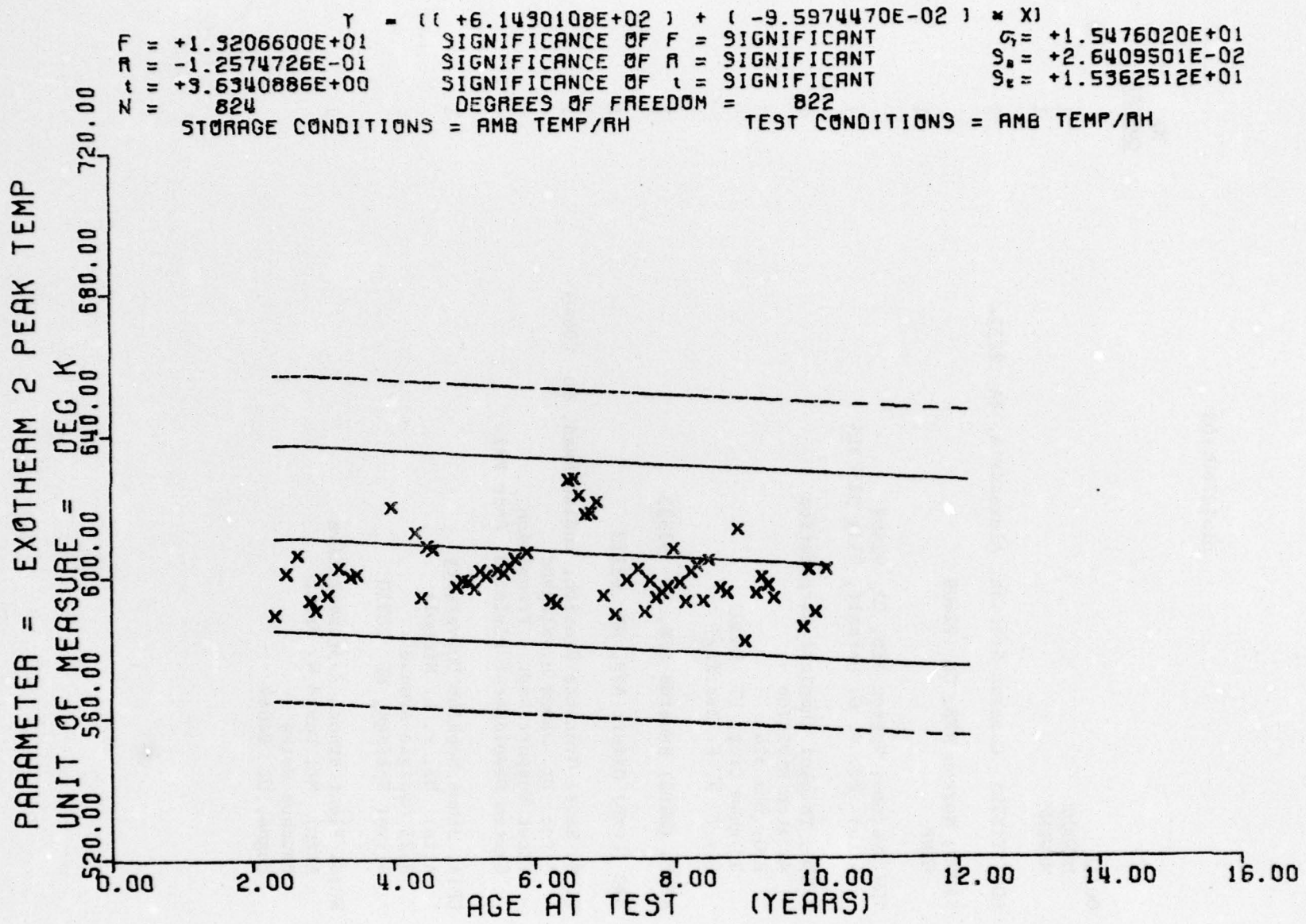
STAGE I WING 6 DIFFERENTIAL SCANNING CALORIMETER ENDOTHERM PEAK TEMP

Figure 74



STAGE I WING 6 DIFFERENTIAL SCANNING CALORIMETER EXOTHERM 1 PEAK TEMP

Figure 75



STAGE I WING 6 DIFFERENTIAL SCANNING CALORIMETER EXOTHERM 2 PEAK TEMP

Figure 76

DISTRIBUTION

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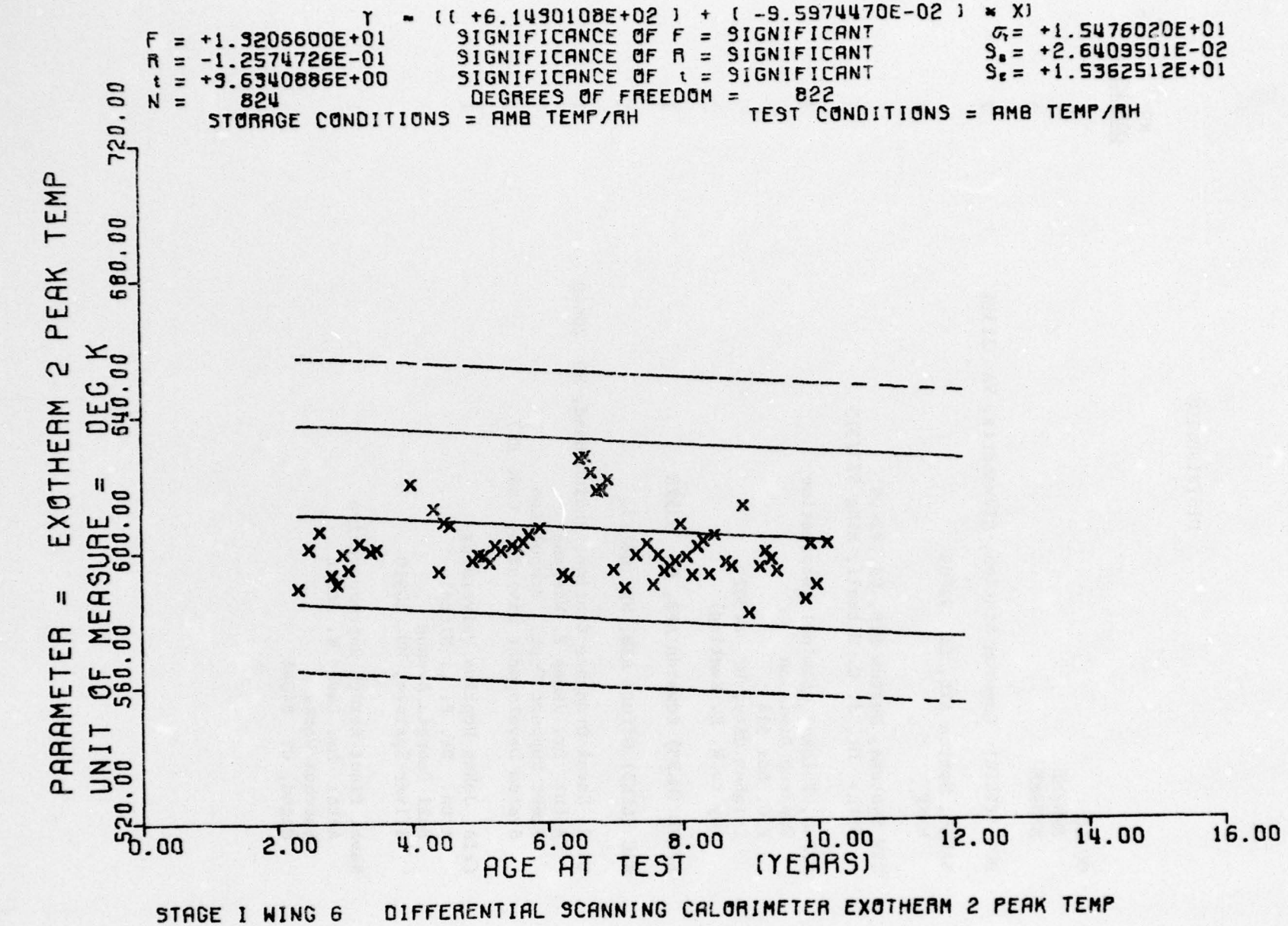

Y = ((+6.1490108E+02) + (-9.5974470E-02) * X)
F = +1.9206600E+01 SIGNIFICANCE OF F = SIGNIFICANT
R = -1.2574726E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +9.6340886E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 824 DEGREES OF FREEDOM = 822
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = EXOTHERM 2 PEAK TEMP
UNIT OF MEASURE = DEG K
520.00
560.00
600.00
640.00
680.00
720.00
0.00
2.00
4.00
6.00
8.00
10.00
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AGE AT TEST (YEARS)
STAGE I WING 6 DIFFERENTIAL SCANNING CALORIMETER EXOTHERM 2 PEAK TEMP

Figure 76

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System Development Division, Code FS7	
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REPORT DOCUMENTATION PAGE

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3. RECIPIENT'S CATALOG NUMBER: (9)
4. TITLE (and Subtitle): (6) Propellant Surveillance Report LGM-30 F & G Stage 1, Phase E, Series III, TP-H1011.
5. TYPE OF REPORT & PERIOD COVERED: Test Results - Semi-annual rept.
6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s): (10) John A. Thompson
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report contains propellant test results from cartons of TP-H1011 bulk propellant representing LGM-30 F & G First Stage Minuteman Motors. This report uses a statistical approach to analyze the bulk carton propellant data. Testing was accomplished in accordance with MMEMP Project M72632-5MP116P.

The data from this test period are combined with data from previous →

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407387

Block 20 continued

testing and entered into the G085 computer for storage, analysis and regression analysis. From the statistical analysis of all data tested to date (twelve years for F & G), significant degradation of the propellant does not appear likely for at least two years past the oldest data point.

Each point on the regression plot represents the mean of all samples at that particular age. The number of samples at each point is indicated on the sample size summary sheet on the page accompanying each regression plot or group of regression plots. The data range at any age can be found by suitable inquiry of the G085 system.