

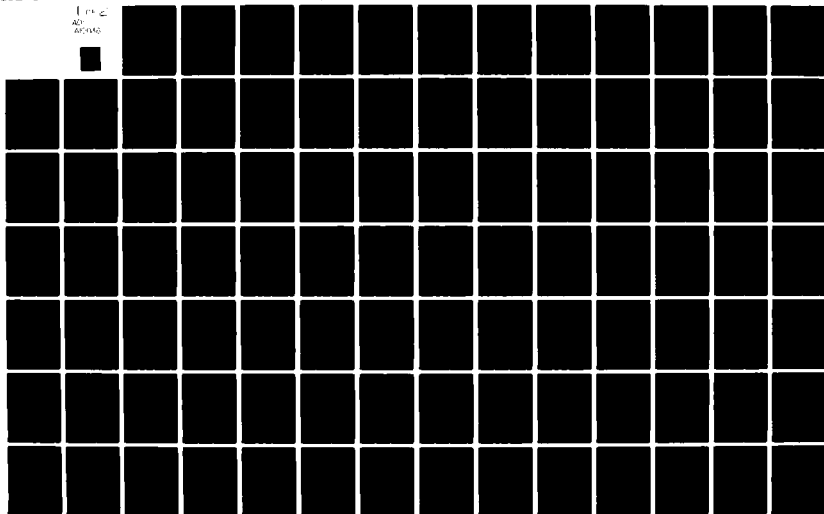
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OGDEN AIR LOGISTICS CENTER HILL AFB UT PROPELLANT AN--ETC F/G 21/9.2
PROPELLANT SURVEILLANCE REPORT, LGM-30F & G STAGE I, PHASE G, S--ETC(U)
MAY 81 J A THOMPSON
MANPA-458(81)

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OGDEN AIR LOGISTICS CENTER

UNITED STATES AIR FORCE

HILL AIR FORCE BASE, UTAH 84056

AD A100361

PROPELLANT
SURVEILLANCE REPORT
LGM-30 F&G STAGE 1
PHASE G, SERIES I
TP-H1011

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JUN 17 1981
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PROPELLANT ANALYSIS LABORATORY

MANPA REPORT

458(81)

MAY 1981

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6 PROPELLANT SURVEILLANCE REPORT.
LGM-30F & G STAGE 1. ~~(REF-111111)~~

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ABSTRACT

This report contains propellant test results from cartons of TP-H1011 bulk propellant representing LGM-30F 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 MMWRBM Project M04046C-WNL01529.

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 (fifteen 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.

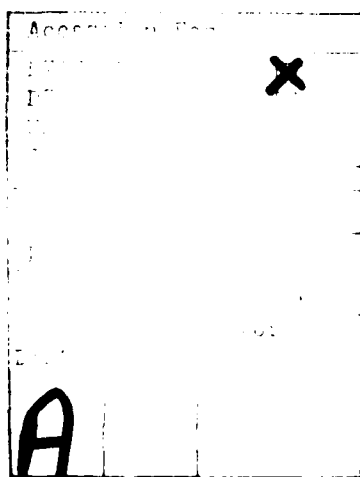


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29B	Zero Time Test Results	29 Jan 64
29C	Zero Time Test Results (Supplement 1)	30 Mar 64
29D	Zero Time Test Results (Aft Closure)	9 Jun 64
29E	Zero Time (Aft Closure Supplement 1)	24 Jun 64
29F	ATP Phase I Test Results	30 Mar 65
29G	ATP Phase I Test Results	19 Aug 65
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32A	Zero Time, wings II-V Test Results	17 Mar 65
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78	Zero Time, wing VI Test Results	3 Feb 67
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118	ATP Phase II, wings II-V (First Group)	5 Mar 68

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130	ATP Phase II, wings II-V (Third Group)	3 May 68
162	ATP Phase I, wing VI (Second Group)	30 Sep 69
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288	Propellant Surveillance Report LGM-30 A & B, Stage I, TP-H1043	Mar 74
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300	Minuteman Stage I Motor Reliability Improvement Program Surveillance	May 74

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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
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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

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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
370	Propellant Surveillance Report LGM-30 F & G, Stage 1, Phase E, Series II, TP-H1011	Apr 77
377	Qualification of a New MAPO Source and ERL-510 Curing Agent for Minuteman Stage 1, UF-2121 Liner	Oct 77
379	Final RIP Report, Minuteman Stage 1 Motor Reliability Improvement Program Surveillance	Oct 77
385	Propellant Surveillance Report LGM-30 A, B, F, & G, Stage 1, TP-H1043	Dec 77
388	Propellant Surveillance Report LGM-30 A & B Stage 1, TP-H1011	Jan 78
390	Propellant Surveillance Report LGM-30 F & G Stage 1, Phase E, Series IV, TP-H1011	Feb 78
392	Propellant Surveillance Report LGM-30 Dissected Motors, Phase IX, TP-H1011	Mar 78
393	Propellant Surveillance Report LGM-30 A & B Stage I, TP-H1011	May 78

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396	Propellant Surveillance Report LGM-30 F & G Stage I, TP-H1011	Jun 78
405	Propellant Surveillance Report LGM-30 F & G Stage I, TP-H1011	Oct 78
406	Propellant Surveillance Report LGM-30 Dissected Motors, Phase X, TP-H1011	Nov 78
416	Propellant Surveillance Report LGM-30 F and G Stage I, TP-H1011	Apr 79
423	Propellant Surveillance Report LGM-30 F and G Stage I, TP-H1011	Oct 79
424	Propellant Surveillance Report LGM-30 Stage I, TP-H1043	Nov 79
425	Propellant Surveillance Report LGM-30 A and B Stage I, TP-H1011	Nov 79
427	Propellant Surveillance Report LGM-30 Dissected Motors, Phase XI, TP-H1011	Nov 79
438	Propellant Surveillance Report LGM-30 F and G Stage I, TP-H1011	Apr 80
445	Propellant Surveillance Report LGM-30 F and G Stage I, TP-H1011	Sep 80
448	Propellant Surveillance Report LGM-30 A and B Stage I, TP-H1011	Nov 80
452	Propellant Surveillance Report LGM-30 Dissected Motors, Phase XI, TP-H1011	Jan 81

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 Committee
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
Linear Regression Equation	The general form of the linear 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

GLOSSARY OF TERMS AND ABBREVIATIONS (cont)

S_e or $S_{Y.X}$	Standard deviation of the data about the regression line
S_m	Maximum Stress
S_r	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
Significant	As used in the statistical sense, means a difference unlikely to have been the result of random sampling from some specified population.

INTRODUCTION

A. PURPOSE:

Laboratory testing has been performed for fifteen years on First Stage LGM-30F 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 MMWRBM 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-30F 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 II; 271-Phase III). Report Number 257 was the first time that LGM-30F 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 MANPA. 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., $154 \div 3 = 51$ 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	
TCLC	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 undergoing 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. Regression analysis was the method used to examine data and to aid in drawing 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, the linear model $Y = a + bX$ was found to be the best fit model for the regression plots.

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' value 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. When a regression slope is indicated to be significant, it should be noted that the slope of the regression line is significant from a statistical standpoint and it is an indication that a change over time is occurring, but does not necessarily mean that the indicated change in the

value obtained during testing is significant in regards to motor operational performance. In a few cases, this small change has become the apparent trend in data variance and regression line trends. However, the changes are gradual and no operational problems are expected at this time.

The 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 regression summary of all test parameters is included in Table 2. The direction of the regression trend lines are also indicated in Table 2. The slopes that are "statistically" not significant from a line of zero slope are labeled as such and those regressions have been left out of this report.

TEST RESULTS

VERY LOW RATE TENSILE:

Very low rate regressions show a statistically significant decrease for strain at maximum stress and strain at rupture. The stresses and modulus show a statistically significant increase (Figures 1 thru 5). The trends are gradual for the respective regressions and no operational problems from the propellant are expected for at least two years beyond the last test data.

LOW RATE BIAXIAL TENSILE:

The strain at maximum stress regression shows a statistically significant gradual increase with the strain at rupture showing no statistically significant change. The stresses and modulus show a statistically significant increase (Figures 6 thru 10).

LOW RATE TENSILE:

Low rate tensile data regressions show 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 strain at maximum stress, strain at rupture and modulus regressions show a statistically significant decrease. Maximum stress shows a statistically significant increase. Stress at rupture does not show a significant change (Figures 16 thru 20).

HIGH RATE HYDROSTATIC TENSILE:

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

TEAR ENERGY:

The cohesive energy shows a statistically significant decrease (Figure 26).

TENSILE SUMMARY:

The test data regressions show that the strain is gradually decreasing and the stress and modulus gradually increasing.

Based on the analysis of test data regressions, it does not appear that meaningful degradation is occurring at this time and no operational problems are expected in the propellant for at least two years beyond the last data point.

STRESS RELAXATION MODULUS:

For the 0.5% strain at -65°F , the regressions for data at 10, 50, 100, and 1000 seconds show a statistically significant gradual increase. (Figures 27 thru 30).

At -40°F , the 10, 50, and 100 second regressions show a statistically significant increase. The 1000 second regression shows no statistically significant change. (Figures 31 thru 34).

The 3% strain regressions at 20°F , 77°F , 100°F , 140°F and 180°F show a statistically significant gradual increase. (Figures 35 thru 54).

SOL GEL:

The percent extractables, density and gel swell ratio do not show a significant change. The crosslink density regression shows a statistically significant increase (Figures 55 thru 58).

CONSTANT STRAIN:

A statistically significant gradual decrease is shown for constant strain (Figure 59).

HARDNESS:

Shore A ten second hardness shows a statistically significant increase (Figure 60).

SUMMARY OF SOL GEL, TENSILE AND HARDNESS DATA:

The crosslink density, constant strain, and hardness data regressions correlate with the tensile data. As the polymer continues to crosslink, the strains decrease and the stresses increase.

PRESSURE TIME:

Maximum pressure and time to maximum pressure shows a statistically significant gradual decrease (Figures 61 and 62).

TCLE (Thermal Coefficient of Linear Expansion):

The thermal coefficient of linear expansion for both above and below the glass transition point (T_g) shows a statistically significant gradual increase (Figures 63 and 64).

TGA (Thermal Gravimetric Analysis):

A statistically significant increase is shown for the ignition temperature (9°C rise/min), no significant percent weight loss at 250°C hold (12°C rise/min to hold) and a statistically significant weight loss at ignition (Figures 65 thru 67).

DTA (Differential Thermal Analysis):

The endotherm and first and second exotherms show a statistically significant decrease. The third exotherm shows a statistically significant increase and the ignition temperature with no significant change (Figures 68 thru 72).

BURNING RATE:

The burning rate shows a statistically significant gradual increase (Figure 73).

DIFFERENTIAL SCANNING CALORIMETER:

The endotherm and first and second exotherms shows a statistically significant decrease. (Figures 74 thru 76).

THERMAL AND COMBUSTION SUMMARY:

The time to maximum pressure from the pressure time data and burning rate data show a correlation. In both cases, the regressions show a gradual increase in rate of reaction. The maximum pressure and DSC regressions also correlate well with each other. In both cases, a gradual decrease in energy is shown.

The ignition temperatures for TGA shows a gradual increase.

From the analyses of the regressions, no combustion problems are expected for at least two years beyond the oldest data point.

CONCLUSIONS

Fifteen 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 fifteen 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.

TABLE 2

Regression Summary

<u>Test Parameter</u>	<u>Slope</u>
Very Low Rate Tensile	
Strain at Maximum Stress	-
Maximum Stress	+
Strain at Rupture	-
Stress at Rupture	+
Modulus	+
Low Rate Biaxial Tensile	
Strain at Maximum Stress	+
Maximum Stress	+
Strain at Rupture	NS
Stress at Rupture	+
Modulus	+
Low Rate Tensile	
Strain at Maximum Stress	-
Maximum Stress	+
Strain at Rupture	-
Stress at Rupture	+
Modulus	+
High Rate Triaxial Tensile	
Strain at Maximum Stress	-
Maximum Stress	+
Strain at Rupture	-
Stress at Rupture	NS
Modulus	-
High Rate Hydrostatic Tensile	
Strain at Maximum Stress	-
Maximum Stress	+
Strain at Rupture	-
Stress at Rupture	+
Modulus	+
Tear Energy	-
Stress Relaxation	
-65°, 10 sec	+
-65°, 50 sec	+
-65°, 100 sec	+
-65°, 1000 sec	+
-40°, 10 sec	+
-40°, 50 sec	+
-40°, 100 sec	+
-40°, 1000 sec	NS

TABLE 2 (cont)

<u>Test Parameter</u>	Regression Summary	<u>Slope</u>
+20°, 10 sec		+
+20°, 50 sec		+
+20°, 100 sec		+
+20°, 1000 sec		+
+77°, 10 sec		+
+77°, 50 sec		+
+77°, 100 sec		+
+77°, 1000 sec		+
+100°, 10 sec		+
+100°, 50 sec		+
+100°, 100 sec		+
+100°, 1000 sec		+
+140°, 10 sec		+
+140°, 50 sec		+
+140°, 100 sec		+
+140°, 1000 sec		+
+180°, 10 sec		+
+180°, 50 sec		+
+180°, 100 sec		+
+180°, 1000 sec		+
Sol Gel		NS
% Extractables		NS
Density		NS
Gel Swell Ratio		NS
Crosslink Density		+
Constant Strain		-
Hardness, Shore A, 10 sec		+
Pressure Time		-
Maximum Pressure		-
Time to Maximum Pressure		-
TCLE		+
Above T _g		+
Below T _g		+
TGA		+
Ignition Temperature		NS
% Weight Loss at 250°		+
% Weight Loss at Ignition		+

TABLE 2 (cont)

<u>Test Parameter</u>		<u>Regression Summary</u>	<u>Slope</u>
DTA			
	Endotherm 1		-
	Exotherm 1		-
	Exotherm 2		-
	Exotherm 3		+
	Ignition Temperature		NS
Burn Rate, 1000 psi			+
DSC			
	Endotherm		-
	Exotherm 1		-
	Exotherm 2		-

NS = Not Significant

- = Negative Slope

+ = Positive Slope

AGE (MOS)	N _R SAMP	AGE (MOS)	N _P SAMP	AGE (MOS)	N _P SAMP	AGE (MOS)	N _P SAMP
8	7	33	152	58	352	83	90
9	19	34	154	59	317	84	56
10	11	35	113	60	413	85	76
11	15	36	226	61	290	86	92
12	30	37	147	62	337	87	122
13	48	38	126	63	243	88	139
14	28	39	119	64	160	89	177
15	38	40	122	65	104	90	156
16	46	41	156	66	79	91	107
17	55	42	123	67	41	92	82
18	28	43	142	68	179	93	117
19	49	44	106	69	234	94	99
20	24	45	135	70	287	95	146
21	56	46	122	71	135	96	148
22	27	47	166	72	124	97	150
23	67	48	177	73	110	98	159
24	55	49	199	74	152	99	191
25	63	50	188	75	198	100	163
26	47	51	347	76	147	101	136
27	50	52	314	77	167	102	51
28	56	53	295	78	91	103	68
29	40	54	232	79	117	104	84
30	73	55	474	80	113	105	33
31	88	56	461	81	155	106	11
32	153	57	392	82	178	107	71

WING 6,V.L.P.TENSILE,STRAIN AT MAX STRESS,CPS=0.002 IN/MIN TC-H1011

This sample size summary is applicable to figures 1 thru 4

WING 6,V.L.P.TENSILE,STRAIN AT MAX STRESS,CPS=0.002 IN/MIN TC-H1011

This sample size summary is applicable to figures 1 thru 4

$Y = ((+2.0614408E-01) + (-1.0576289E-05) \times X)$
 $F = +9.6818826E+00$ SIGNIFICANCE OF F = SIGNIFICANT $S_e = +1.6547034E-02$
 $R = -2.2619789E-02$ SIGNIFICANCE OF R = SIGNIFICANT $S_b = +3.3990177E-06$
 $t = +3.1115723E+00$ SIGNIFICANCE OF t = SIGNIFICANT $S_t = +1.6543227E-02$
 $N = 18915$ DEGREES OF FREEDOM = 18913
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH

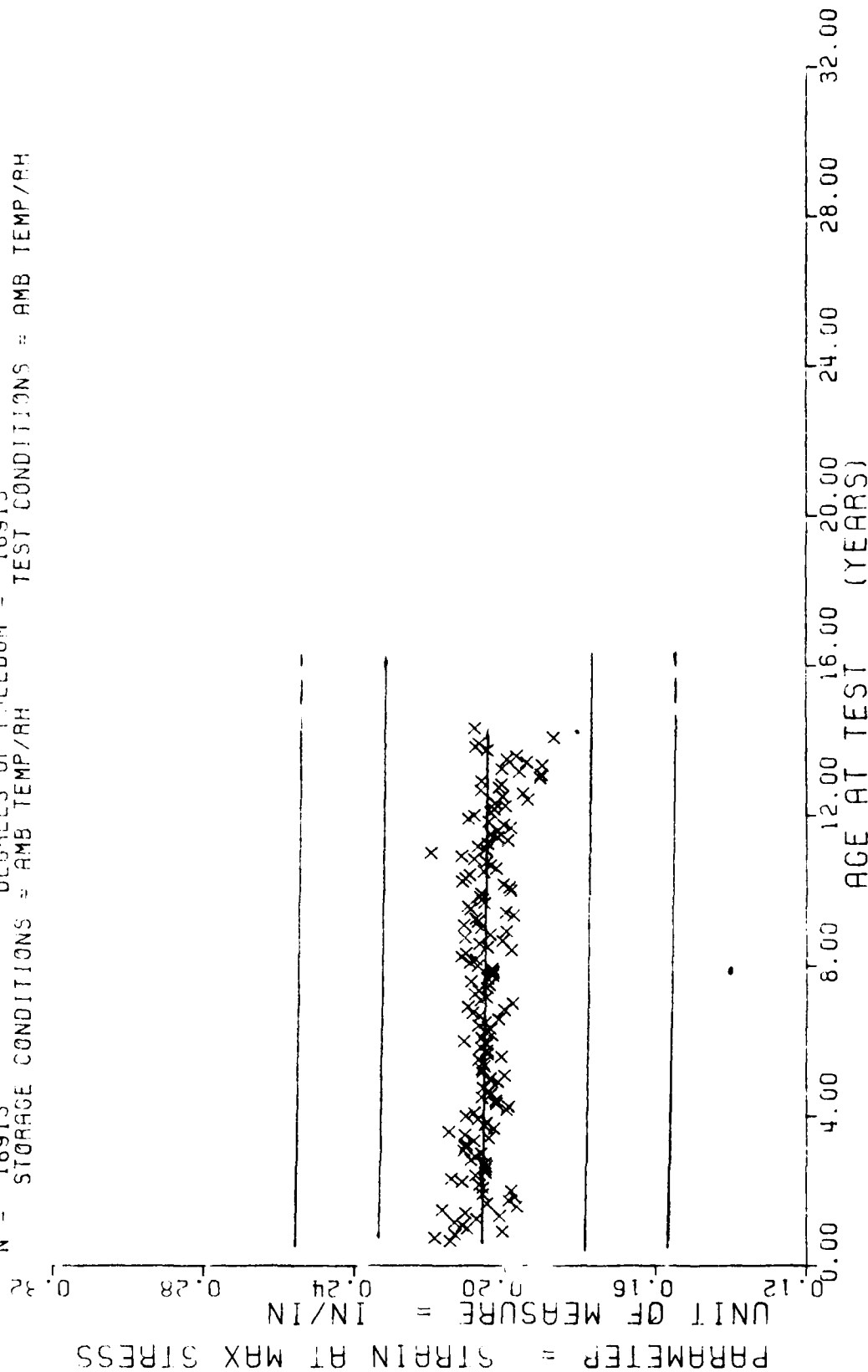
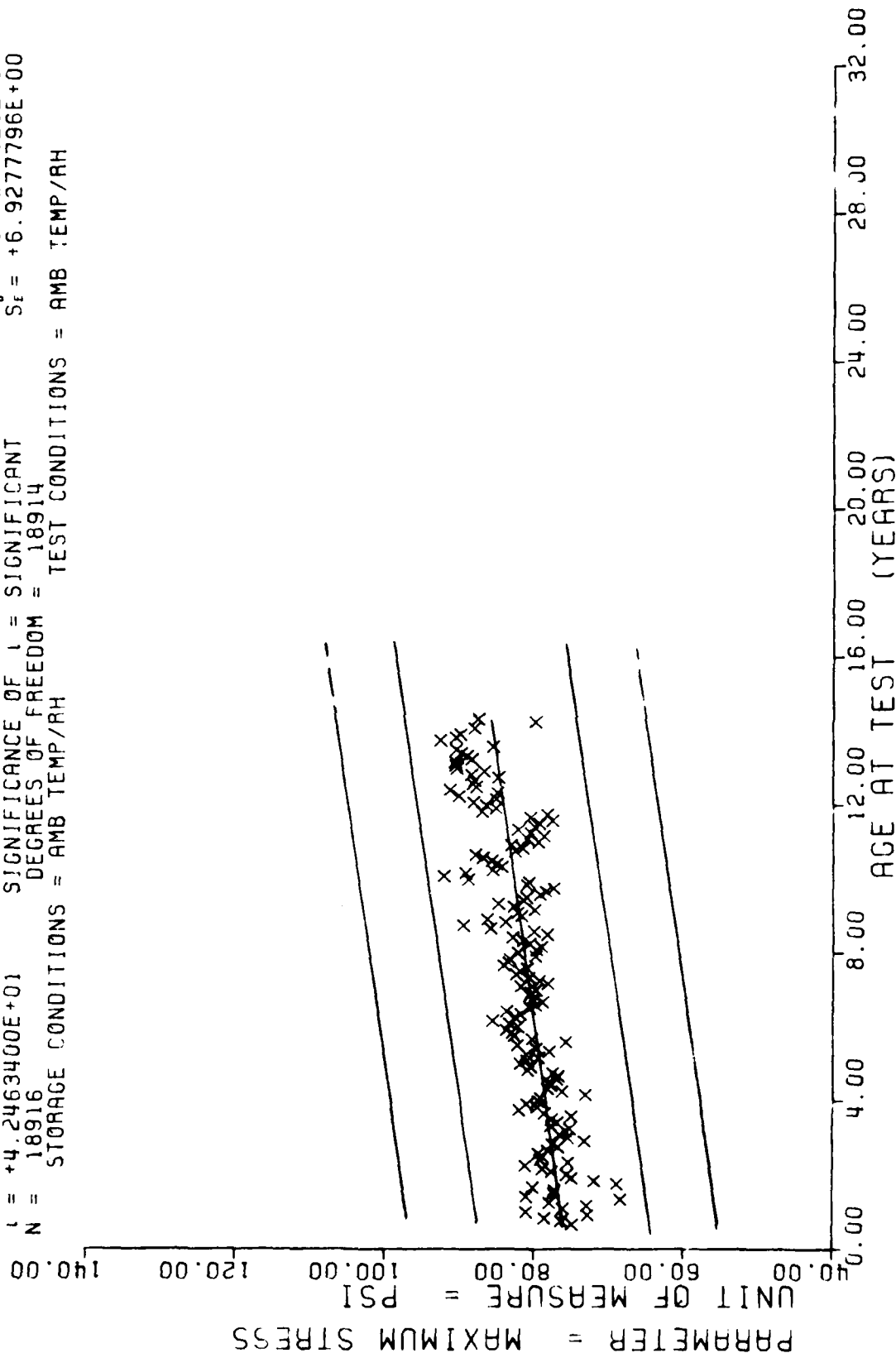


Figure 1

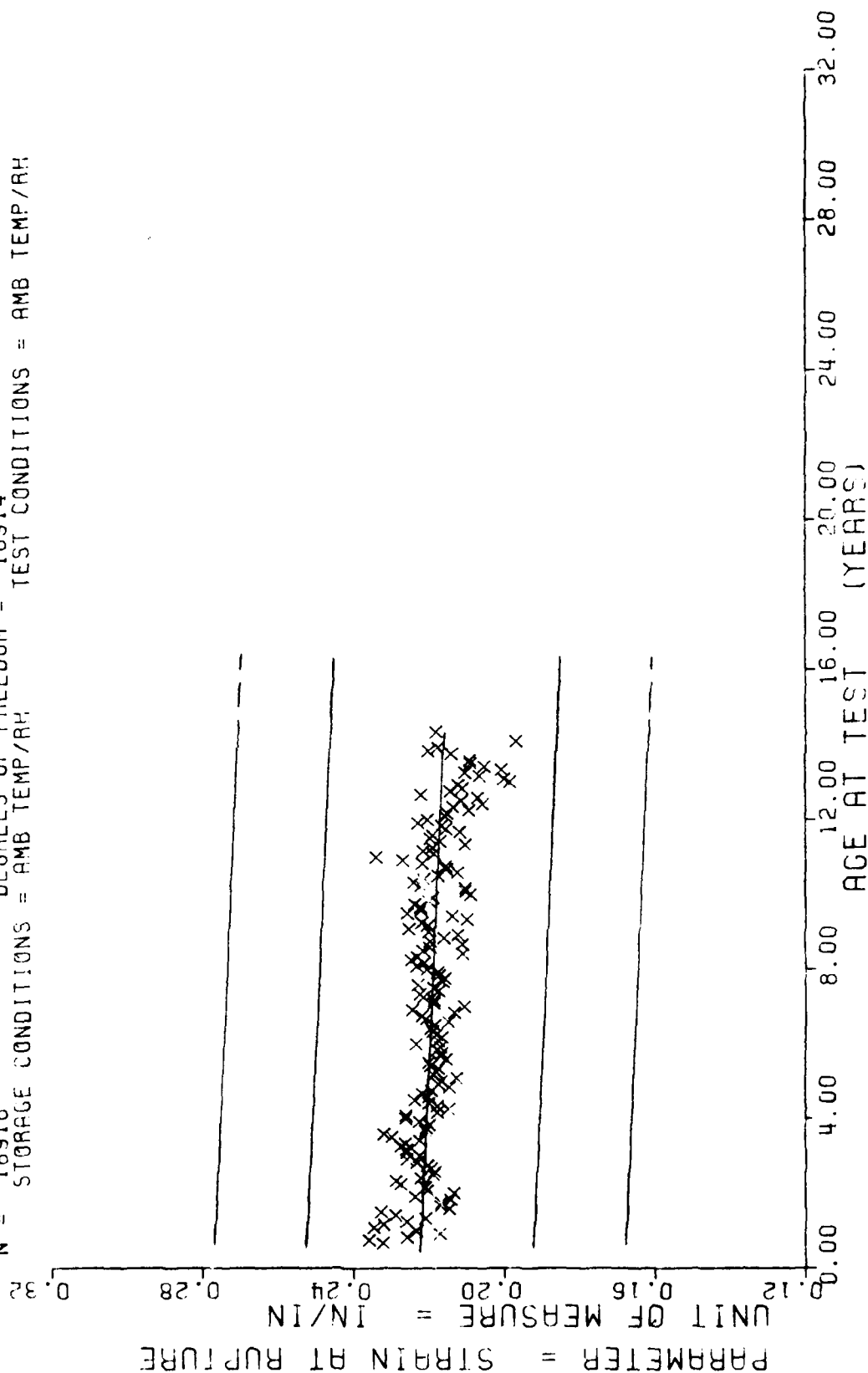
$Y = ((+7.5503613E+01) + (+6.9440829E-02) * X)$
 $F = +1.8031403E+03$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = +2.9501891E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +4.2463400E+01$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 18916$ DEGREES OF FREEDOM = 18914
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



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

Figure 2

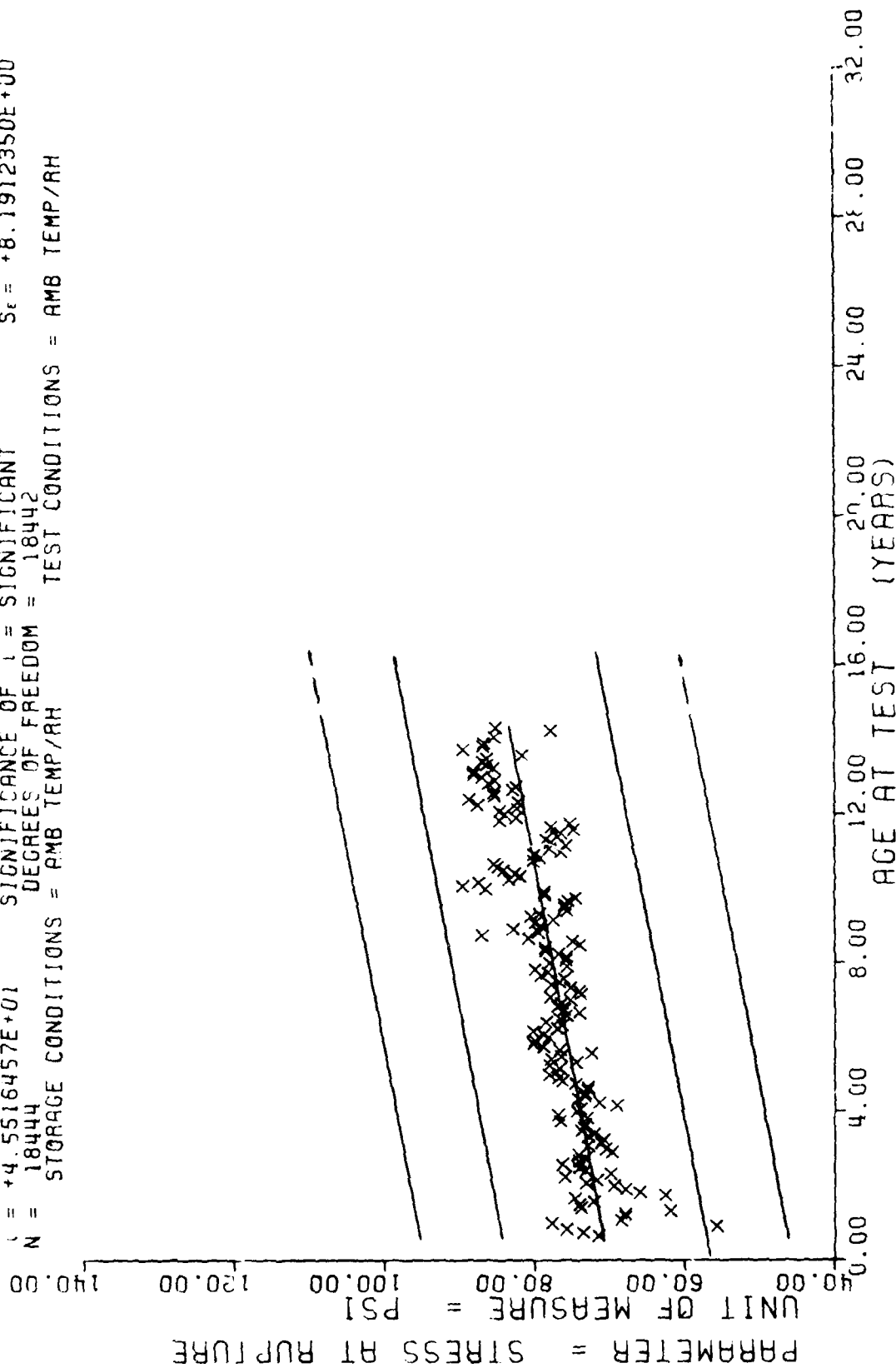
$F = +9.8649144E+01$
 $R = -7.2031978E-02$
 $t = +9.9322275E+00$
 $N = 18916$
 $Y = ((+2.2253759E-01) + (-3.7082666E-05) * X)$
 SIGNIFICANCE OF F = SIGNIFICANT
 SIGNIFICANCE OF R = SIGNIFICANT
 SIGNIFICANCE OF t = SIGNIFICANT
 DEGREES OF FREEDOM = 18914
 STORAGE CONDITIONS = AMB TEMP/RH
 TEST CONDITIONS = AMB TEMP/RH



WING F.V.L.R. TENSILE STRAIN AT RUPTURE, CHS=0.002 IN/MIN TP-H1011

Figure 3

$Y = ((+7.0191148E+01) + (+7.7208365E-02) * X)$
 $F = +2.0717478E+03$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = +3.1779418E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +4.5516457E+01$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 18444$ DEGREES OF FREEDOM = 18442
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



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

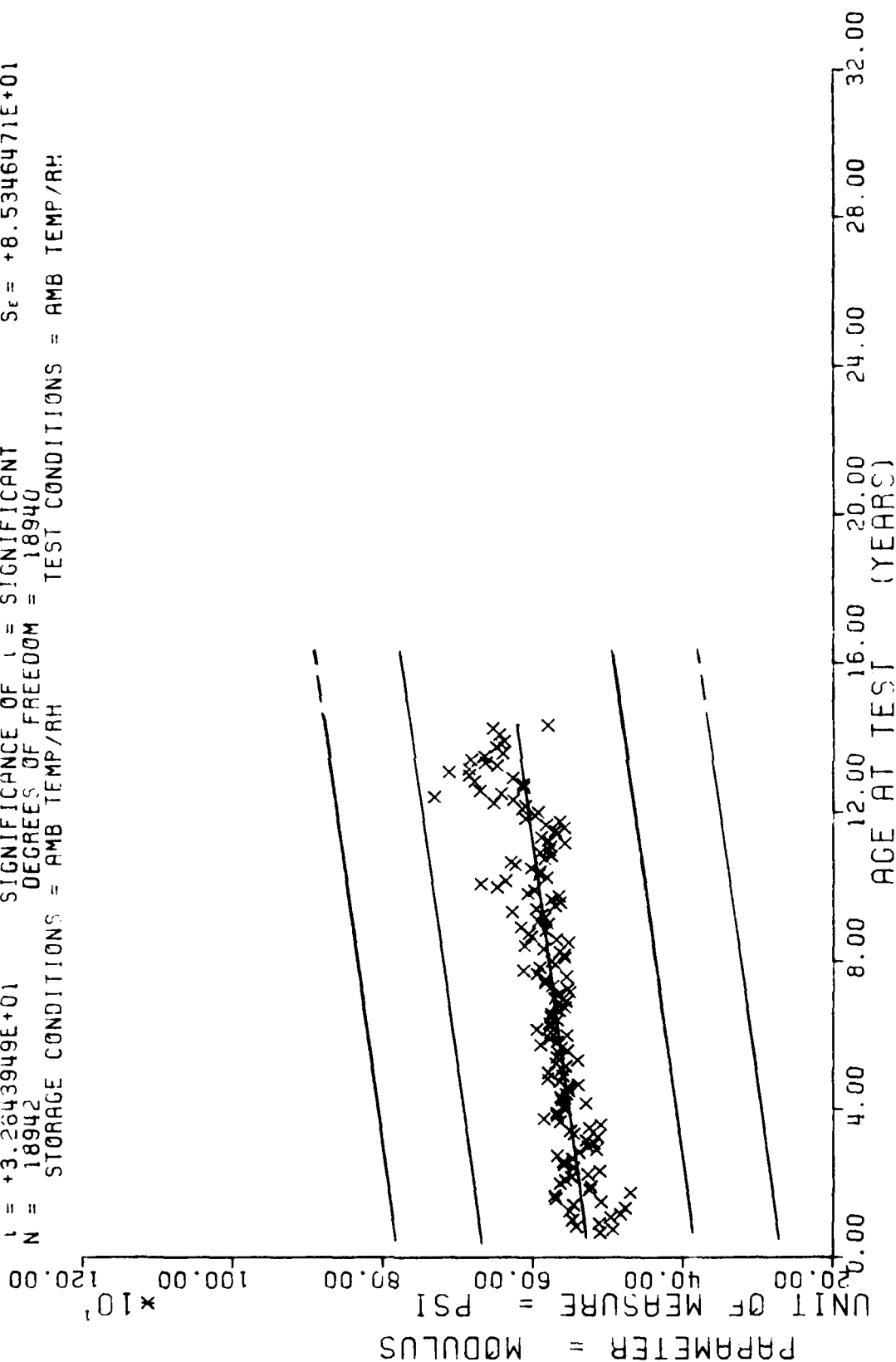
Figure 4

[illegible]

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

This sample size summary is applicable to figure 5

$Y = ((+5.2447943E+02) + (+5.7289257E-01) * X)$
 $F = +1.0656274E+03$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = +2.3079511E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +3.2643949E+01$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 18942$ DEGREES OF FREEDOM = 18940
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



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

Figure 5

AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP
1	1	33	22	58	40	83	16	108	14	135	18				
8	2	34	26	59	31	84	10	109	22	136	4				
9	4	35	26	60	45	85	6	110	27	137	17				
11	6	36	34	61	35	86	7	111	10	138	60				
12	14	37	14	62	57	87	8	112	10	139	38				
13	22	38	11	63	54	88	10	113	19	140	10				
14	4	39	28	64	42	89	8	114	68	141	8				
15	16	40	16	65	18	90	6	115	21	142	6				
16	12	41	14	66	27	91	15	116	50	143	26				
17	14	42	8	67	32	92	10	117	68	144	43				
18	16	43	2	68	32	93	12	118	34	145	6				
19	14	44	5	69	34	94	29	119	32	146	8				
20	16	45	4	70	43	95	27	120	45	147	4				
21	12	46	10	71	17	96	32	121	32	148	2				
22	10	47	16	72	26	97	39	122	10	149	6				
23	13	48	24	73	32	98	57	123	2	150	6				
24	16	49	34	74	40	99	42	125	12	151	8				
25	25	50	24	75	43	100	18	127	10	152	5				
26	22	51	34	76	18	101	14	128	5	154	4				
27	24	52	49	77	19	102	8	129	8	155	2				
28	28	53	41	78	22	103	3	130	24	156	4				
29	23	54	20	79	20	104	14	131	80	157	12				
30	26	55	32	80	17	105	6	132	26	158	2				
31	26	56	36	81	29	106	6	133	12	159	2				
32	42	57	40	82	24	107	2	134	22	160	4				
										161	4				
										162	1				
										163	2				
										165	2				
										166	6				
										167	4				
										169	2				
										171	2				

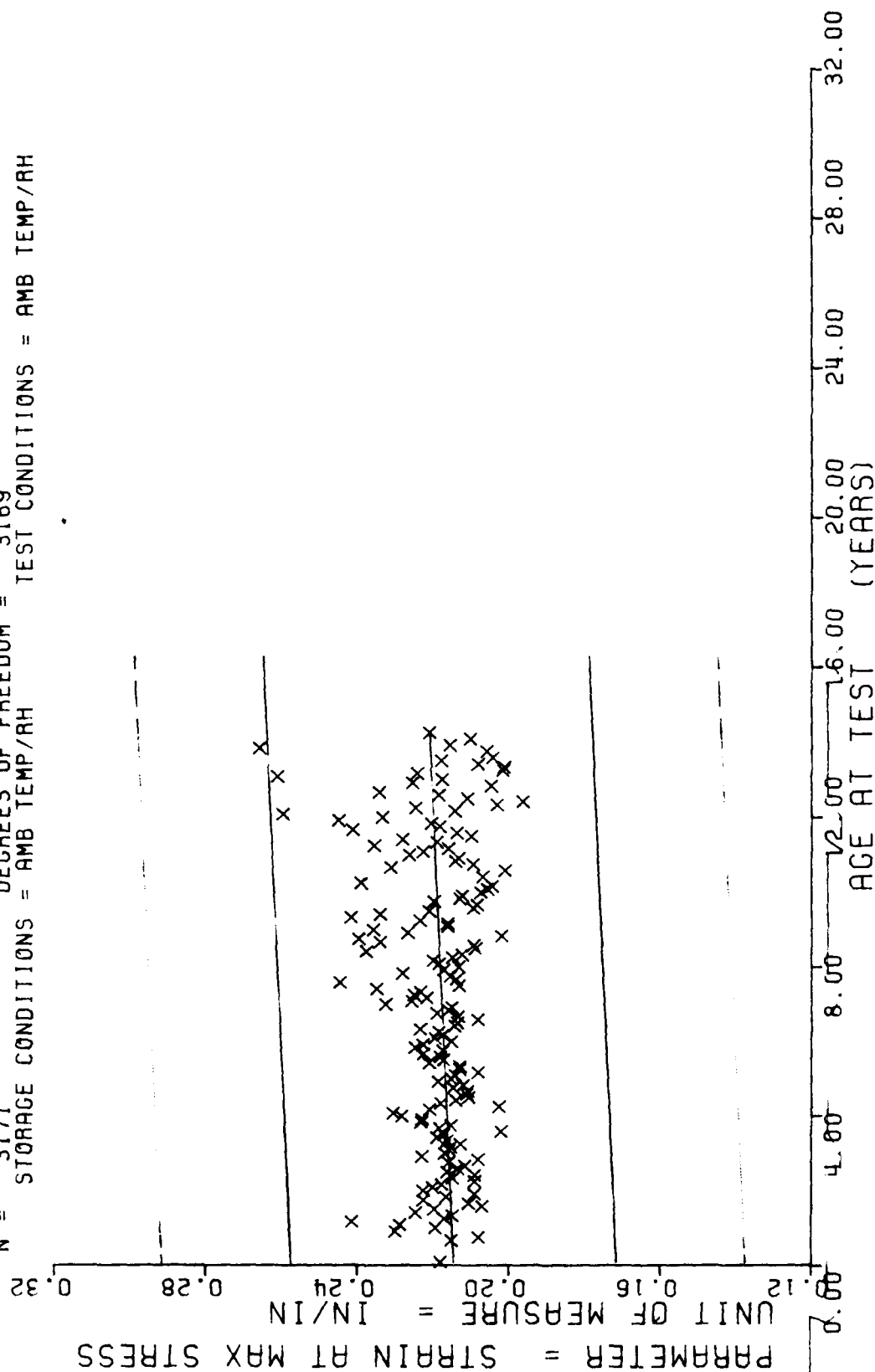
WING 6.L.R.BIAXIAL TENSILE,STRAIN AT MAX STRESS,CHS=0.2 IN/MIN TPH-1011

This sample size summary is applicable to figures 6 thru 9

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 9

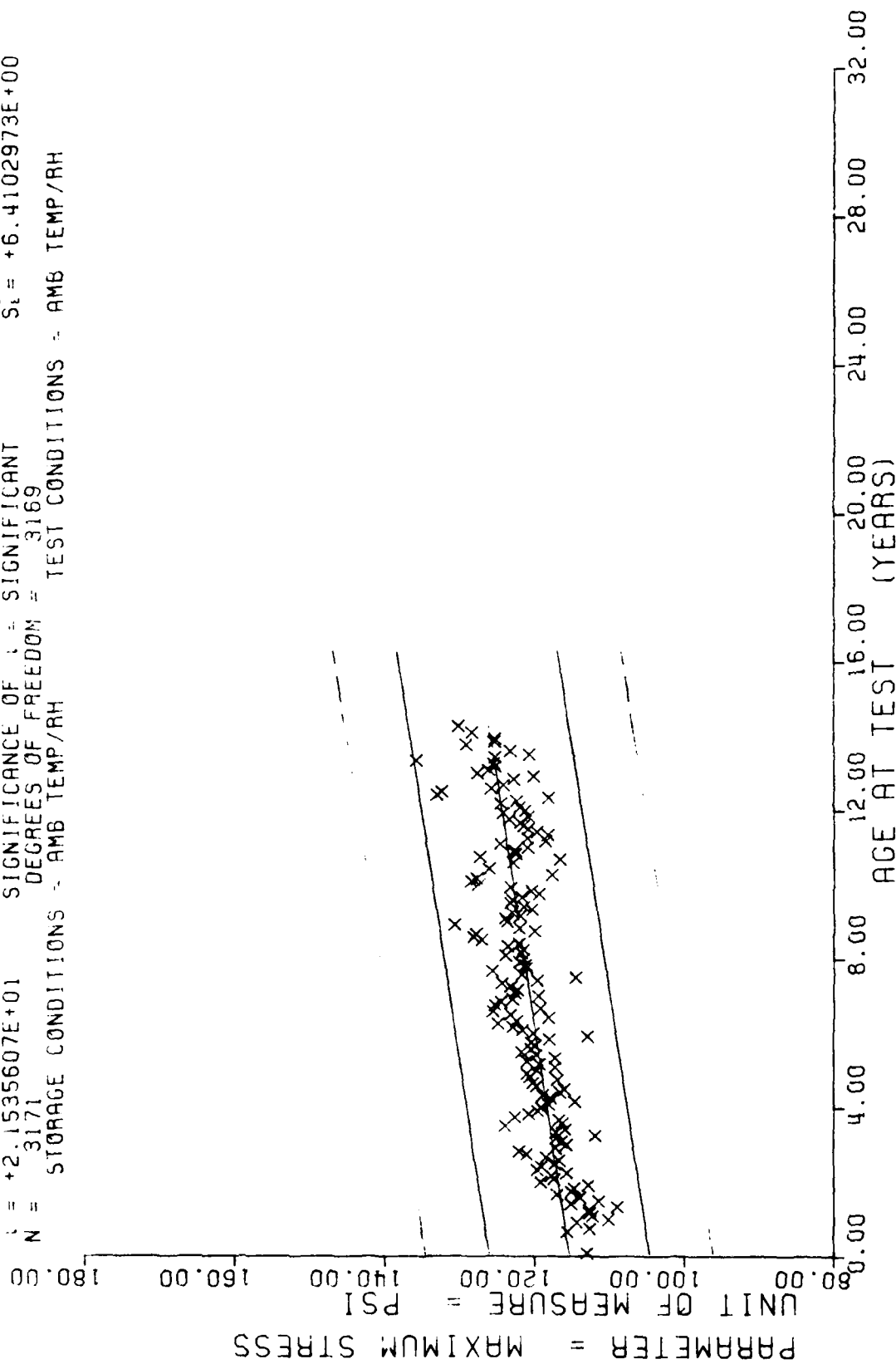
$Y = ((+2.1445920E-01) + (+3.8080394E-05) * X)$
 $F = +1.0422109E+01$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = +5.7253721E-02$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +3.2283292E+00$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 3171$ DEGREES OF FREEDOM = 3169
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



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

Figure 6

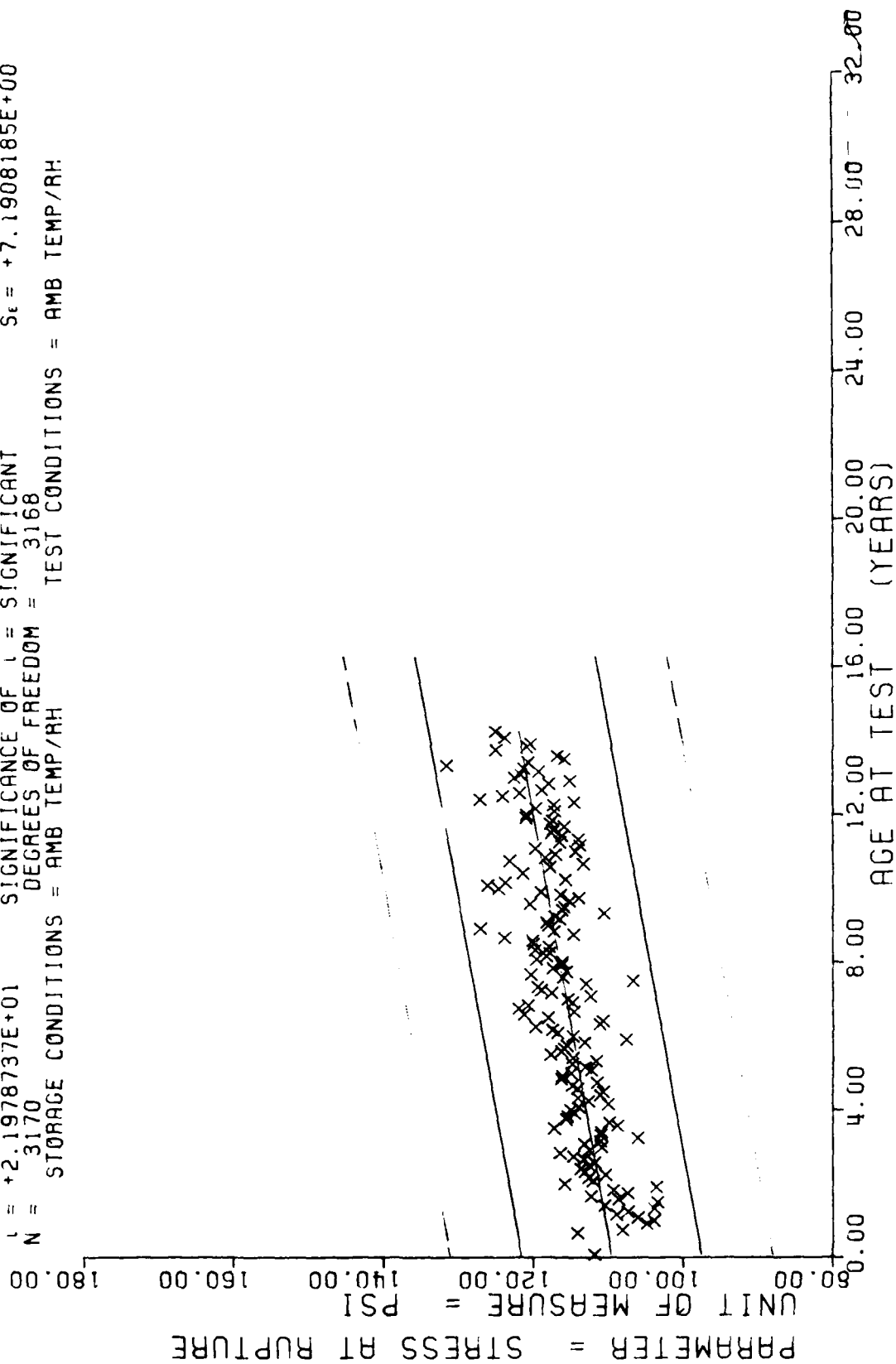
F = +4.6378240E+02
 R = +3.5730364E-01
 I = +2.1535607E+01
 N = 3171
 Y = ((+1.1531096E+02) + (+6.3413869E-02) * X)
 SIGNIFICANCE OF F = SIGNIFICANT
 SIGNIFICANCE OF R = SIGNIFICANT
 SIGNIFICANCE OF I = SIGNIFICANT
 DEGREES OF FREEDOM = 3169
 STORAGE CONDITIONS = AMB TEMP/RH
 TEST CONDITIONS = AMB TEMP/RH



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

Figure 7

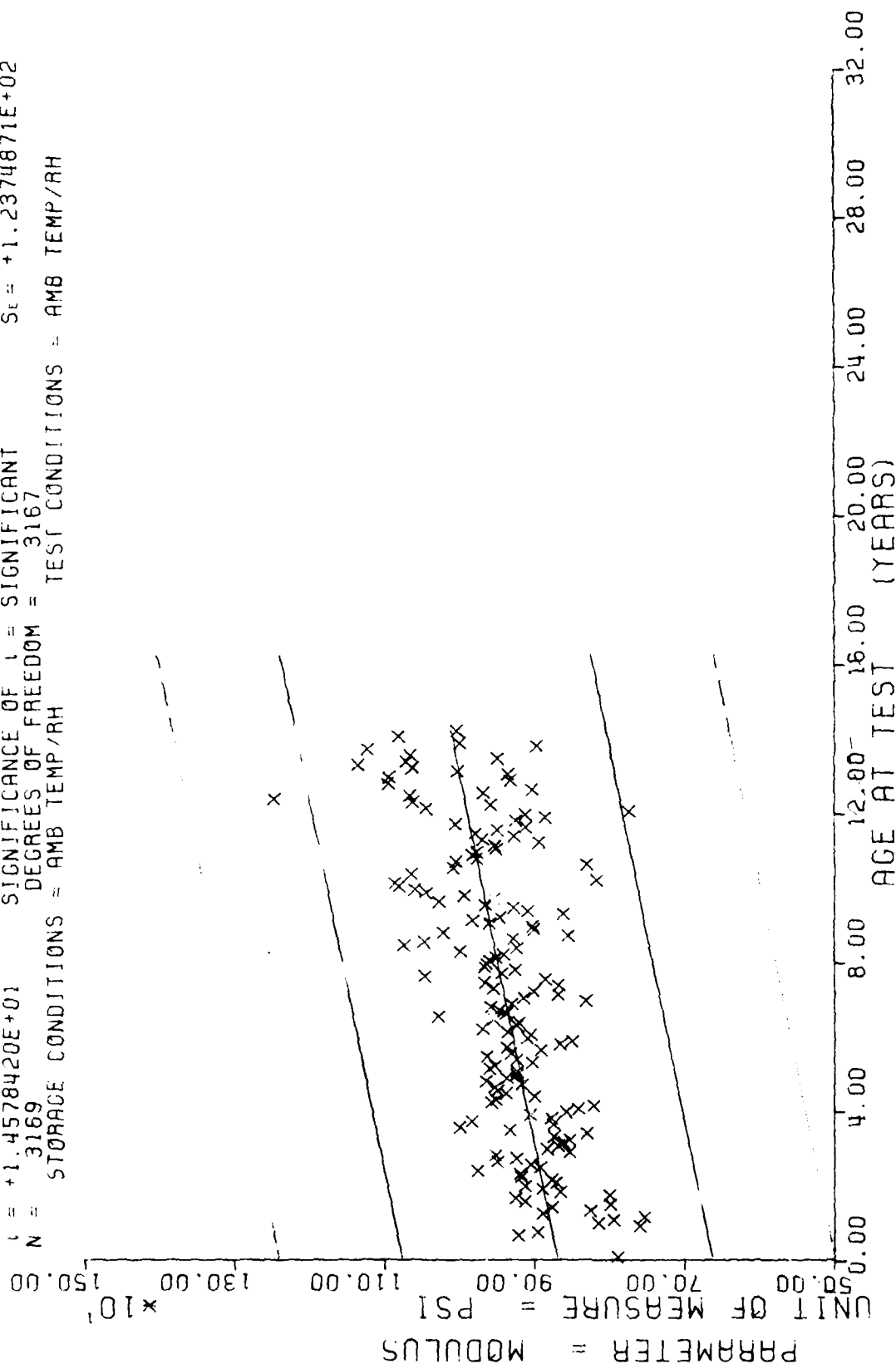
$Y = ((+1.0952397E+02) + (+7.2609432E-02) * X)$
 $F = +4.6306491E+02$ SIGNIFICANCE OF F = SIGNIFICANT $\sigma_r = +7.7183948E+00$
 $R = +3.6374159E-01$ SIGNIFICANCE OF R = SIGNIFICANT $S_b = +3.3036215E-03$
 $t = +2.1978737E+01$ SIGNIFICANCE OF t = SIGNIFICANT $S_e = +7.1908185E+00$
 $N = 3170$ DEGREES OF FREEDOM = 3168
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



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

Figure 8

$Y = ((+8.7012944E+02) + (+8.2937775E-01) * X)$
 $F = +2.1253034E+02$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = +2.5077387E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +1.4578420E+01$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 3169$ DEGREES OF FREEDOM = 3167
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



WING 6.L.R.BIAXIAL TENSILE MODULUS.CHS=0.2 IN/MIN TPH-1011

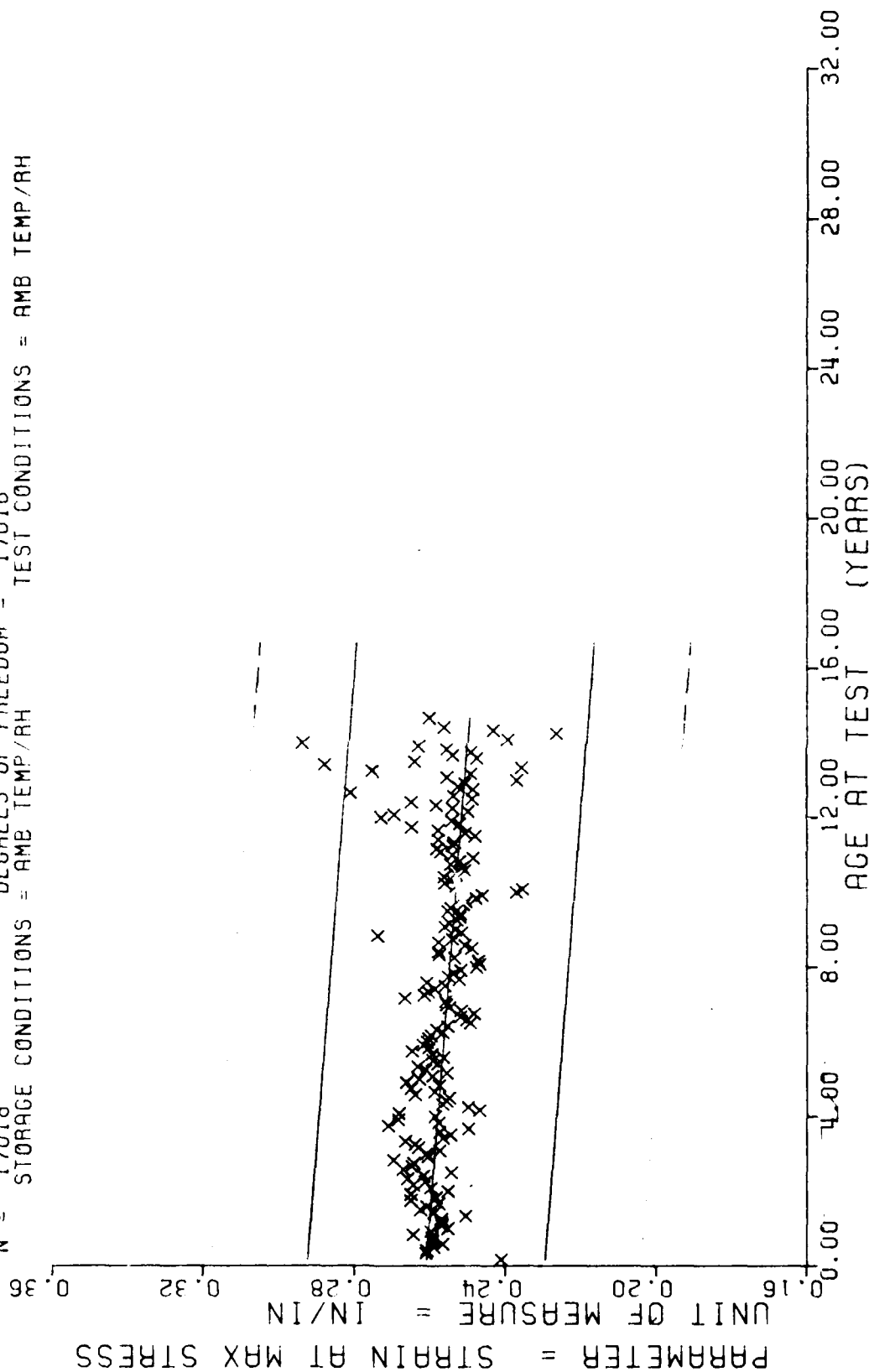
Figure 9

[illegible]

WING 6, L.P. TENSILE, STRESS AT RUPTURE, CHS=2.0 IN/MIN TP-H1011

This sample size summary is applicable to figures 10 thru 14

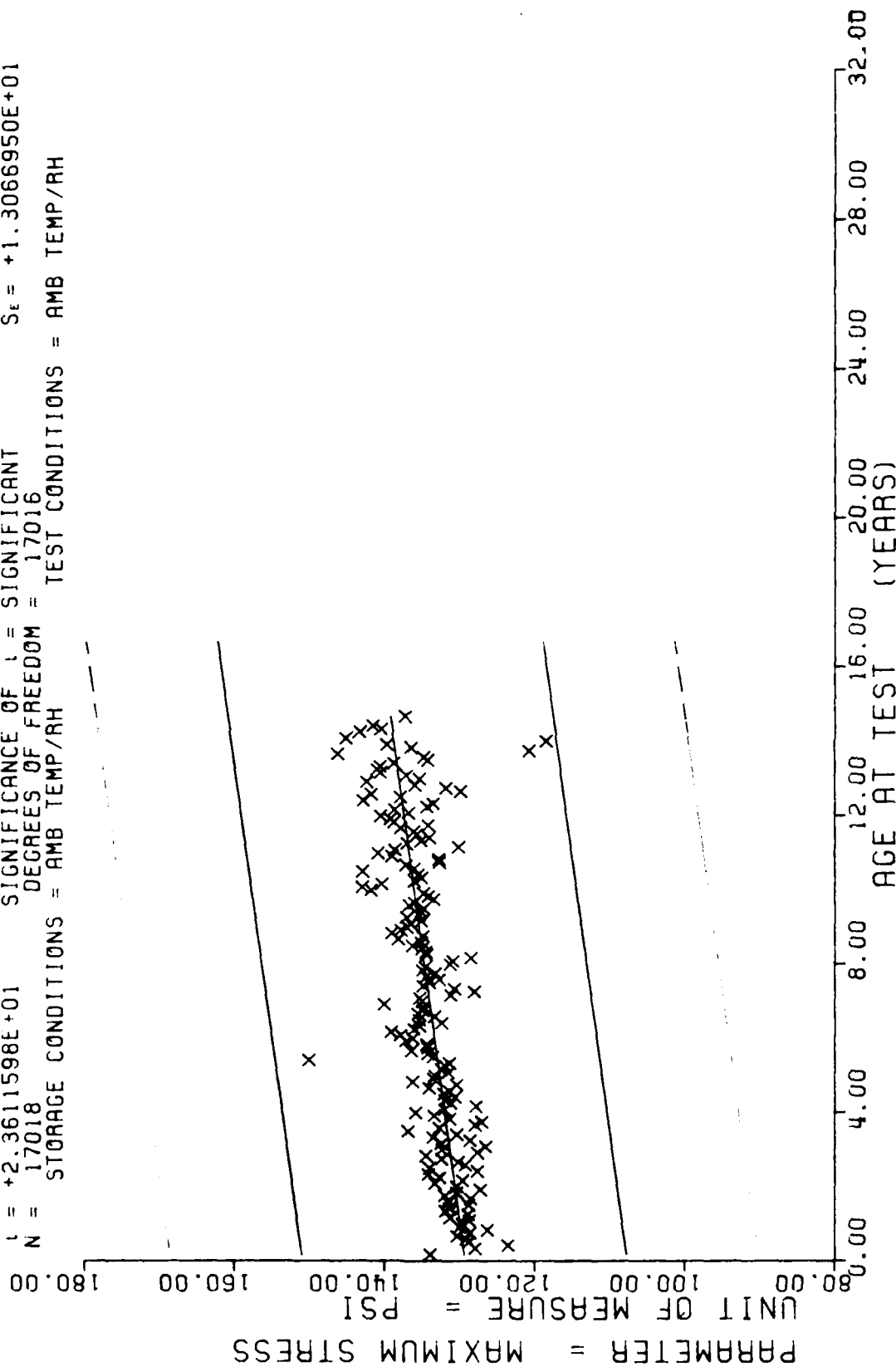
$Y = ((+2.6108868E-01) + (-6.5852230E-05) * X)$
 $F = +3.6318707E+02$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = -1.4456077E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +1.9057467E+01$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 17018$ DEGREES OF FREEDOM = 17016
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



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

Figure 10

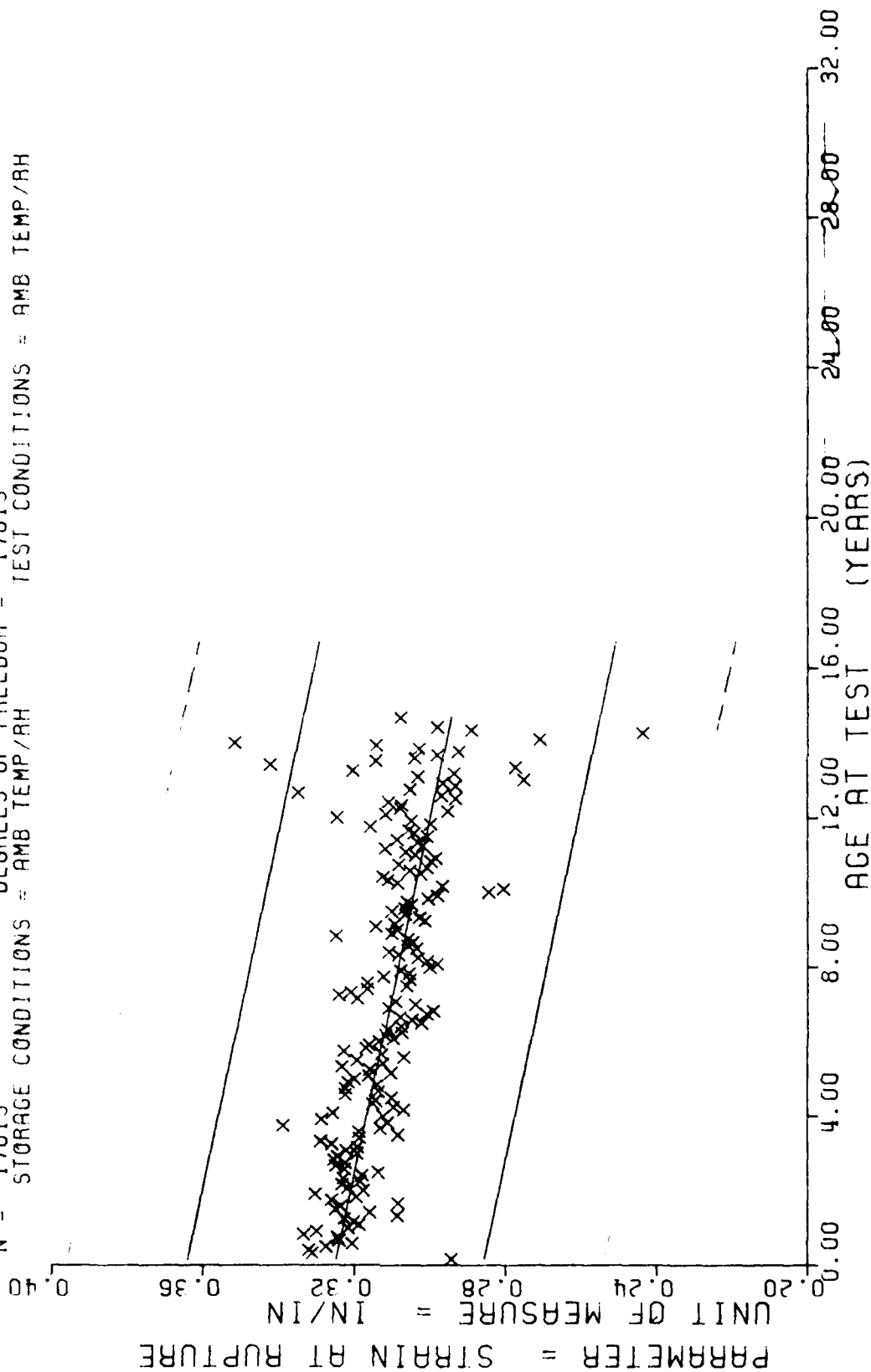
$Y = ((+1.2930846E+02) + (+5.6140396E-02) * X)$
 $F = +5.5750758E+02$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = +1.7811322E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +2.3611598E+01$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 17018$ DEGREES OF FREEDOM = 17016
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



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

Figure 11

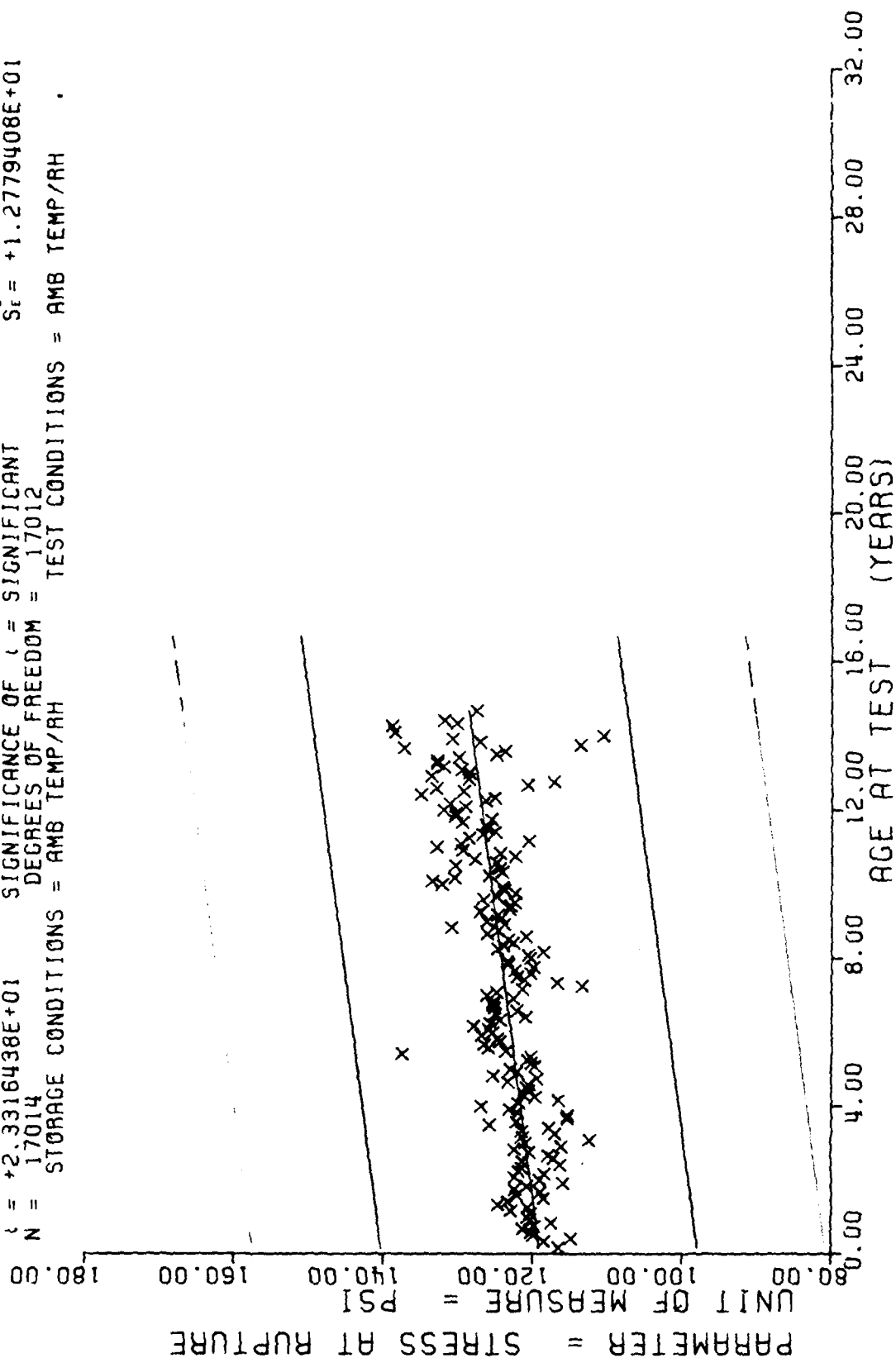
$Y = ((+3.2515152E-01) + (-1.7609231E-04) * X)$
 $F = +1.6741206E+03$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = -2.9931065E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +4.0916019E+01$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 17015$ DEGREES OF FREEDOM = 17013
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



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

Figure 12

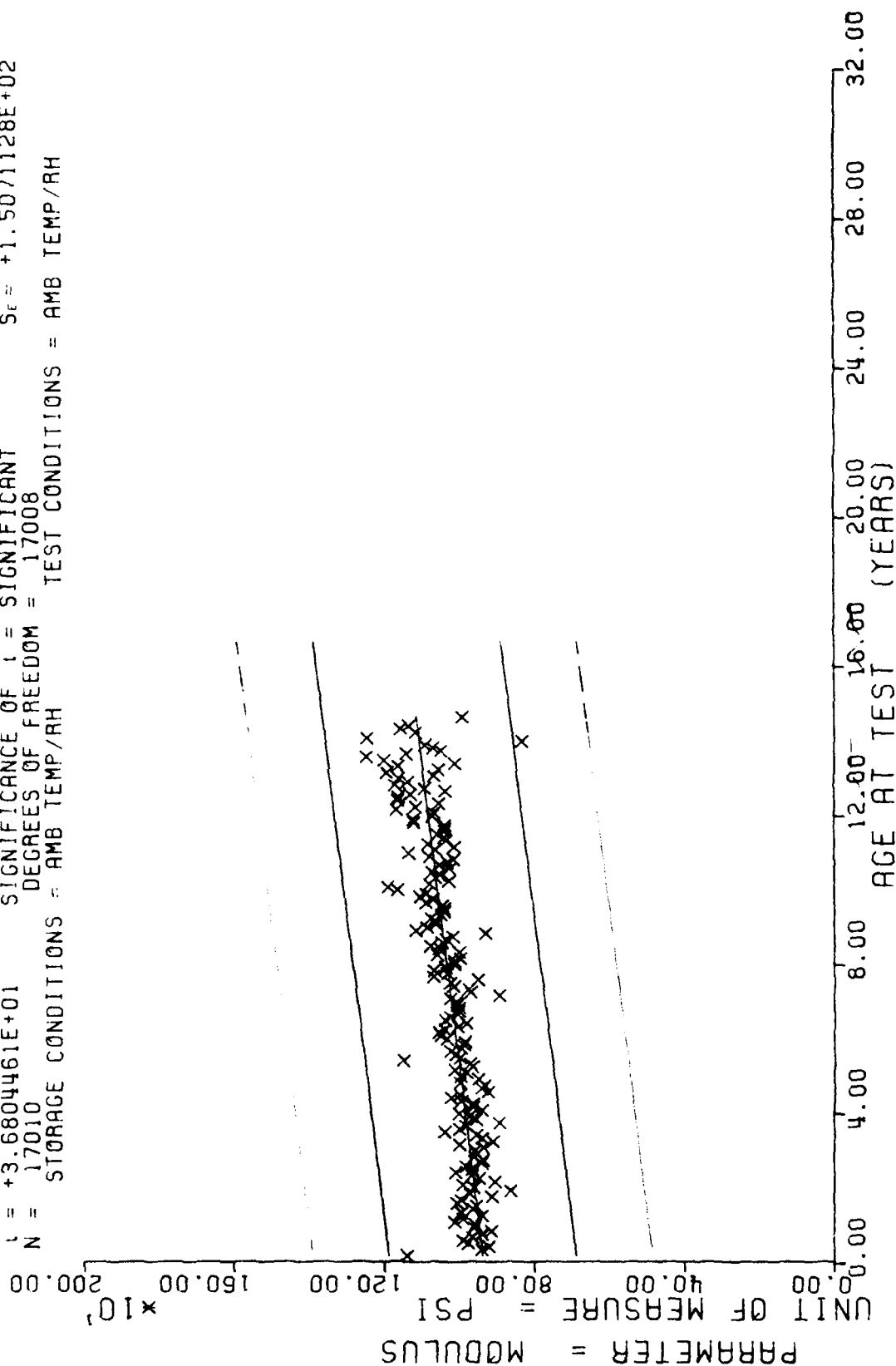
$F = +5.4365631E+02$ SIGNIFICANCE OF F = SIGNIFICANT $\sigma_t = +1.2981617E+01$
 $R = +1.7597609E-01$ SIGNIFICANCE OF R = SIGNIFICANT $S_b = +2.3257105E-03$
 $t = +2.3316438E+01$ SIGNIFICANCE OF t = SIGNIFICANT $S_t = +1.2779408E+01$
 $N = 17014$ DEGREES OF FREEDOM = 17012
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



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

Figure 13

$Y = ((+9.3639373E-02) + (+1.0092992E+00) * X)$
 $F = +1.3545683E+03$ SIGNIFICANCE OF F = SIGNIFICANT $\sigma_f = +1.5659326E+02$
 $R = +2.7160249E-01$ SIGNIFICANCE OF R = SIGNIFICANT $S_b = +2.7423285E-02$
 $t = +3.6804461E+01$ SIGNIFICANCE OF t = SIGNIFICANT $S_e = +1.5071128E+02$
 $N = 17010$ DEGREES OF FREEDOM = 17008
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



WING 6.L.R. TENSILE MODULUS, CHS=2.0 IN/MIN TP-H1011

Figure 14

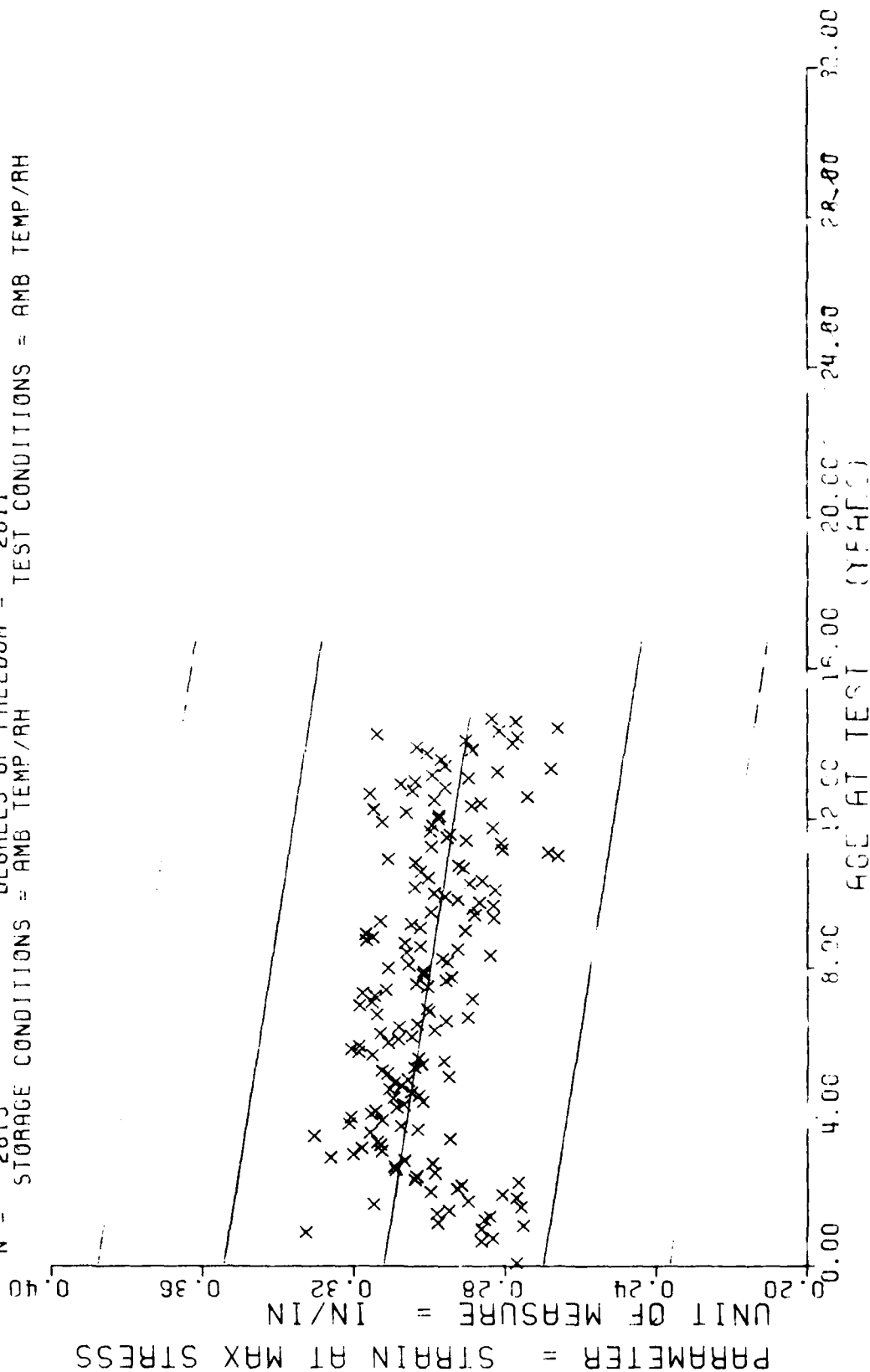
*** SAMPLE SIZE SUMMARY ***

AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP
1	2	33	23	58	30	83	9	108	8	134	18	134	18
8	2	34	22	59	27	84	8	109	21	135	15	135	15
9	4	35	24	60	22	85	14	110	34	136	6	136	6
11	4	36	26	61	36	86	8	111	8	137	10	137	10
12	14	37	16	62	38	87	10	112	8	138	27	138	27
13	17	38	11	63	41	88	16	113	24	139	18	139	18
14	6	39	25	64	42	89	19	114	49	140	6	140	6
15	6	40	10	65	28	90	19	115	55	141	9	141	9
16	8	41	8	66	27	91	27	116	59	142	10	142	10
17	4	42	6	67	28	92	6	117	42	143	6	143	6
18	14	43	2	68	29	93	12	118	23	144	43	144	43
19	11	44	4	69	24	94	16	119	21	145	27	145	27
20	20	45	2	70	59	95	16	120	41	146	8	146	8
21	4	46	6	71	34	96	35	121	8	147	6	147	6
22	10	47	18	72	29	97	37	122	13	148	2	148	2
23	6	48	9	73	44	98	31	123	11	149	5	149	5
24	8	49	34	74	36	99	46	124	2	150	8	150	8
25	23	50	34	75	36	100	20	125	8	151	11	151	11
26	13	51	24	76	26	101	17	127	8	152	4	152	4
27	11	52	42	77	13	102	8	128	2	153	2	153	2
28	17	53	42	78	14	103	6	129	4	154	4	154	4
29	14	54	14	79	27	104	11	130	19	155	4	155	4
30	18	55	30	80	14	105	15	131	18	156	4	156	4
31	16	56	22	81	15	106	10	132	47	157	12	157	12
32	23	57	30	82	22	107	2	133	30	158	1	158	1
										159	4	159	4
										160	6	160	6
										161	8	161	8
										163	2	163	2
										165	2	165	2
										166	3	166	3
										167	4	167	4
										168	7	168	7
										169	2	169	2
										170	3	170	3
										171	2	171	2
										172	4	172	4
										173	2	173	2
										175	2	175	2
										176	4	176	4

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

This sample size summary is applicable to figures 15 thru 18

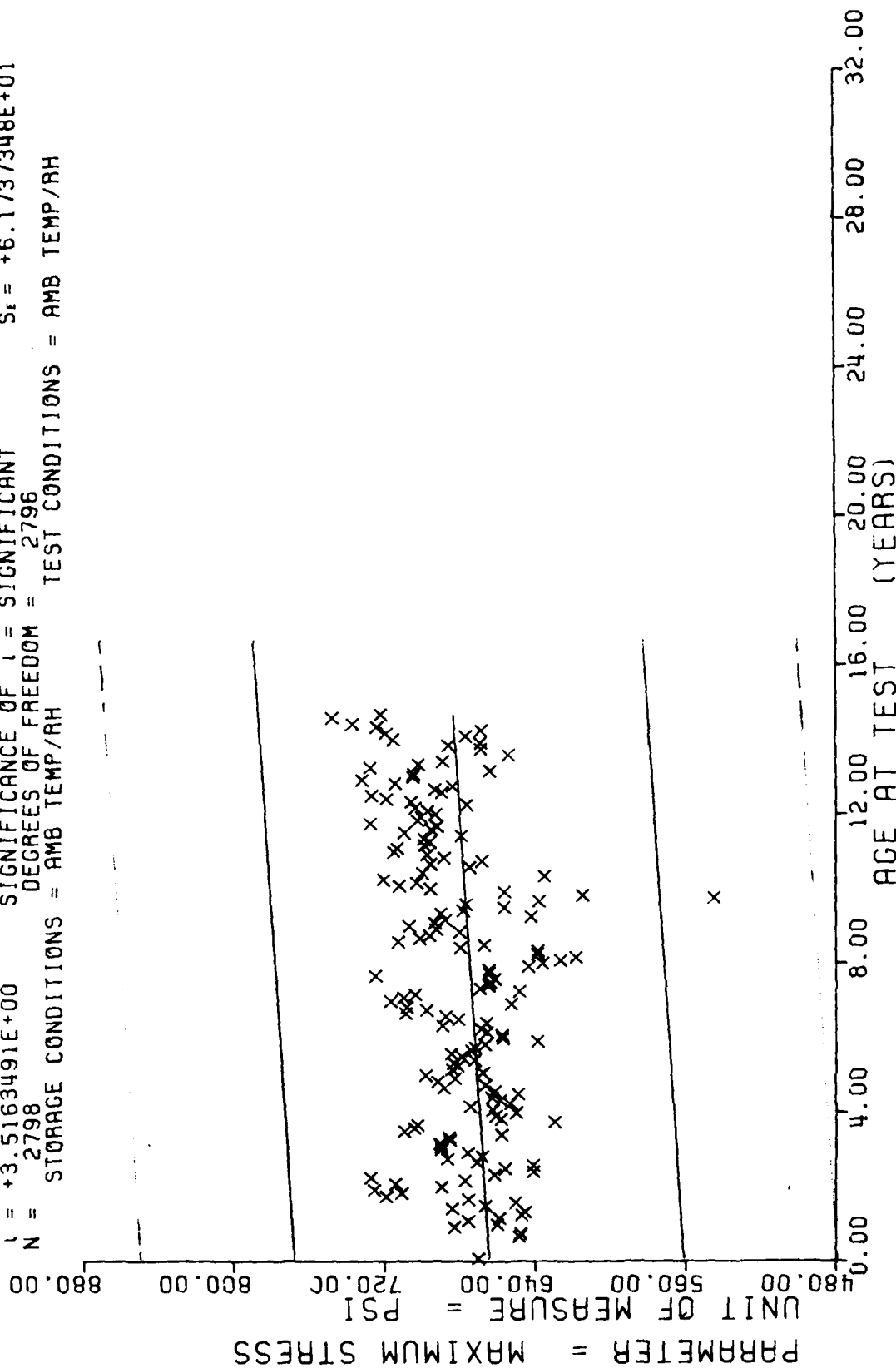
$Y = ((+3.1220550E-01) + (-1.2977395E-04) - X)$
 $F = +1.0856887E+02$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = -1.9283830E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +1.0419638E+01$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 2813$ DEGREES OF FREEDOM = 2811
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



WIND 5.H.R. TRIAXIAL TENSILE STRAIN AT MAX STRESS.CHS=1750 IN/MIN.800 PSI

Figure 15

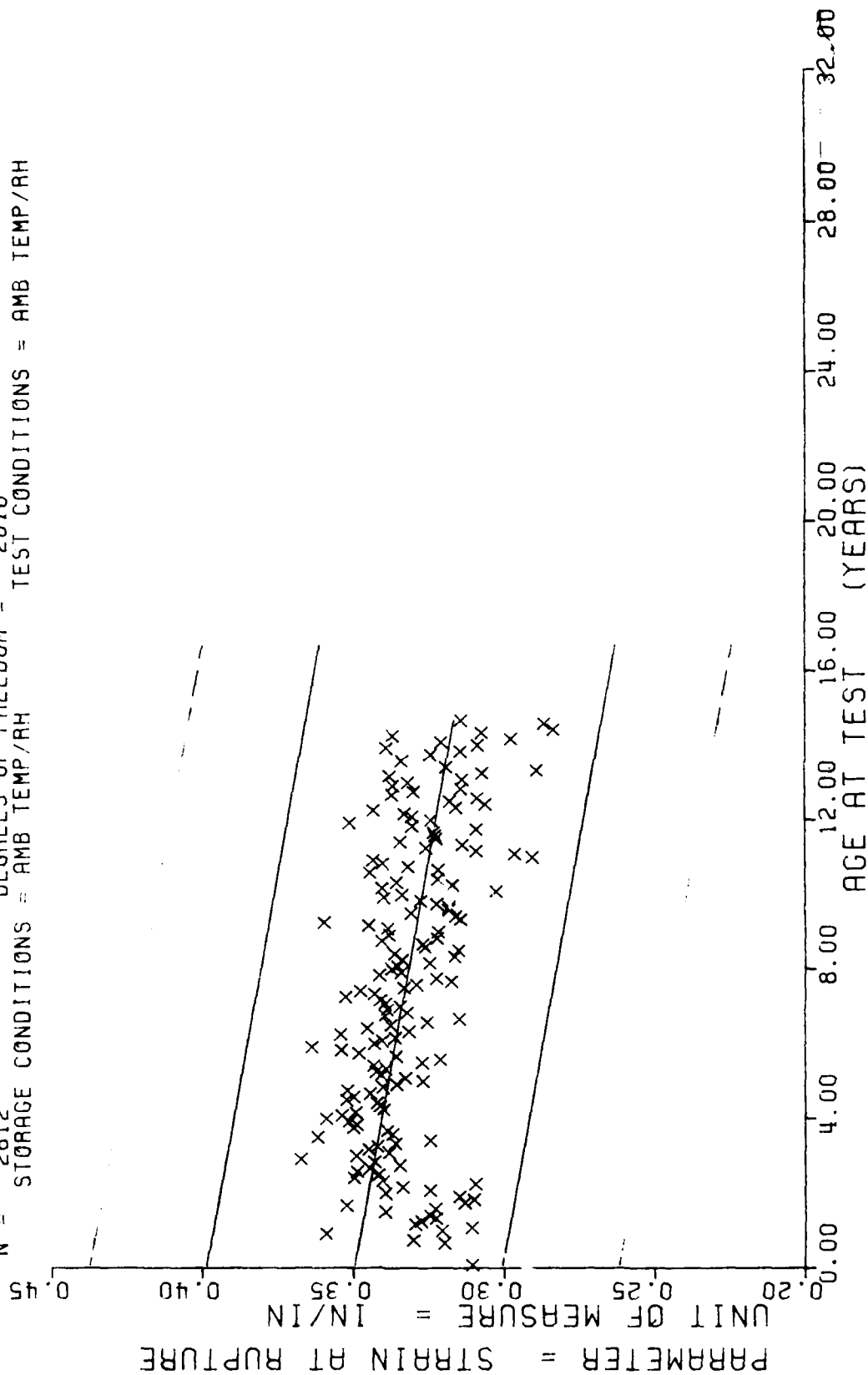
$Y = ((+6.6438585E+02) + (+1.0732841E-01) * X)$
 $F = +1.2364711E+01$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = +6.6353713E-02$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +3.5163491E+00$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 2798$ DEGREES OF FREEDOM = 2796
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



WING 6, H.A. TRIAXIAL TENSILE, MAXIMUM STRESS, CHS=1750 IN/MIN, 800 PSI

Figure 16

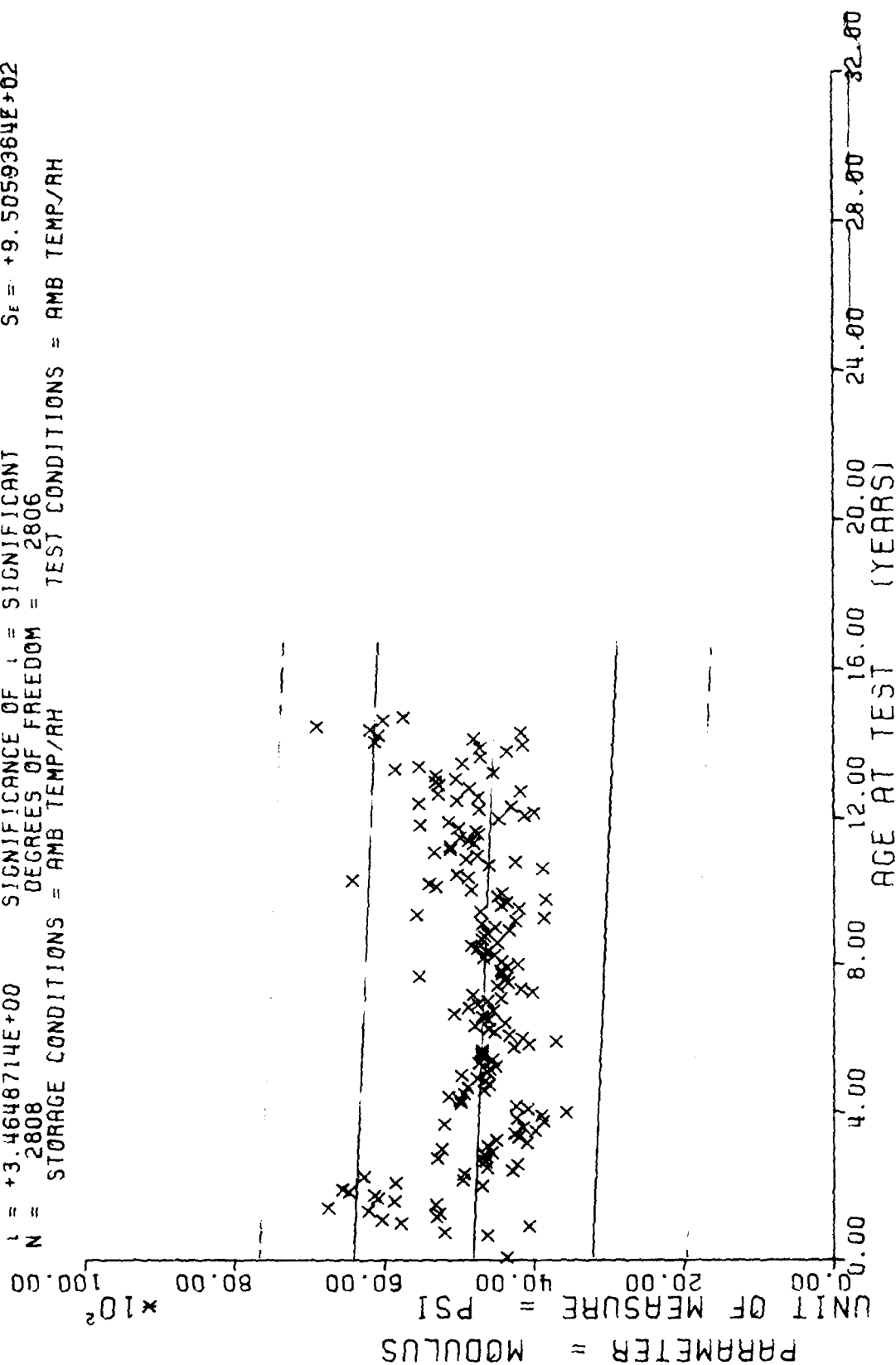
$Y = ((+3.4970321E-01) + (-1.8725069E-04) * X)$
 $F = +1.6796034E+02$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = -2.3746923E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +1.2959951E+01$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 2812$ DEGREES OF FREEDOM = 2810
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



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

Figure 17

$Y = ((+4.8169252E+03) + (-1.6286950E+00) * X)$
 $F = +1.2005334E+01$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = -6.5270392E-02$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +3.4648714E+00$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 2808$ DEGREES OF FREEDOM = 2806
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



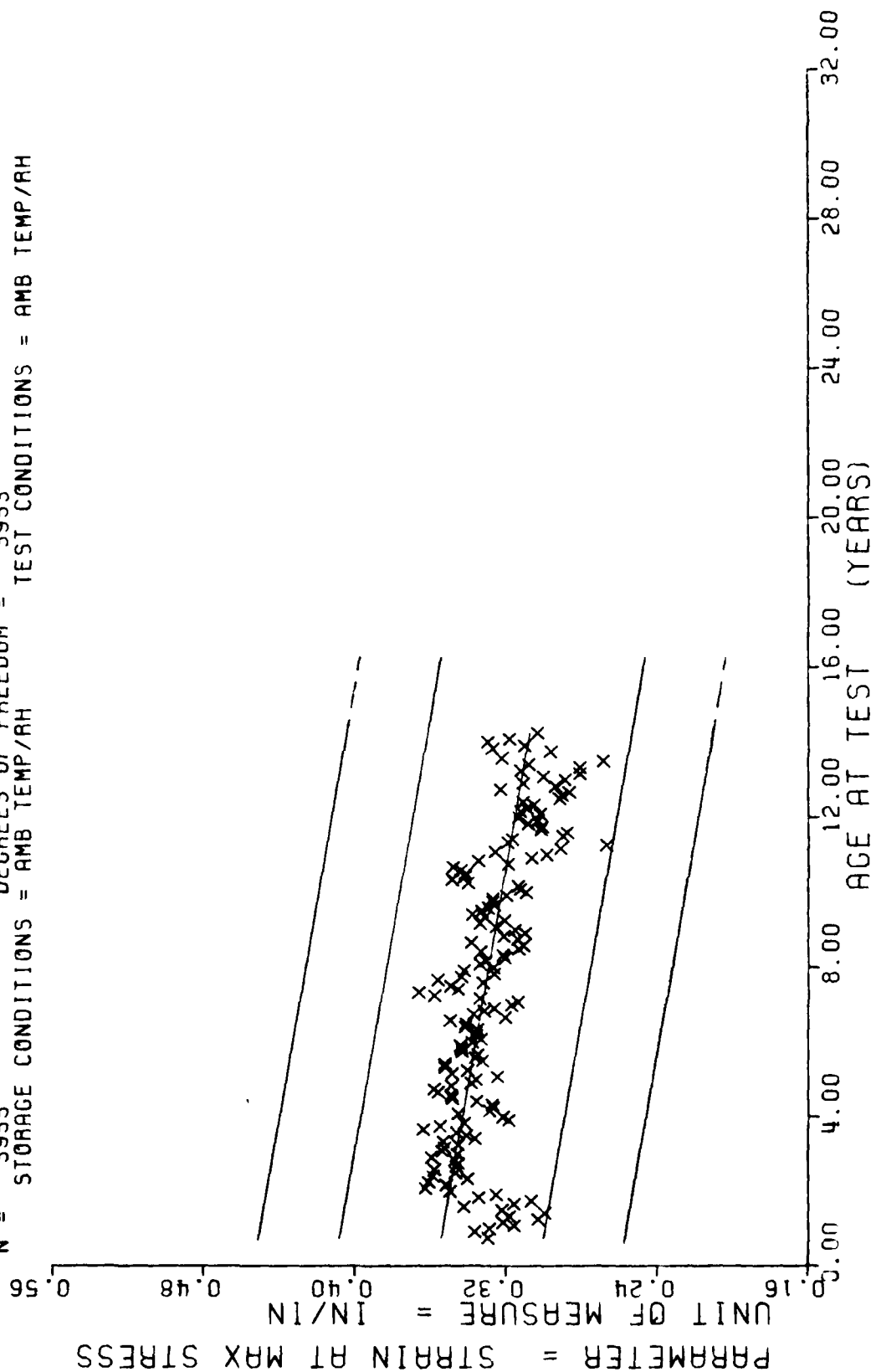
WING 6.H.A. TRIAXIAL TENSILE MODULUS (HS=1750 IN/MIN AT 800 PSI)

[illegible]

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

This sample size summary is applicable to figures 19 thru 23

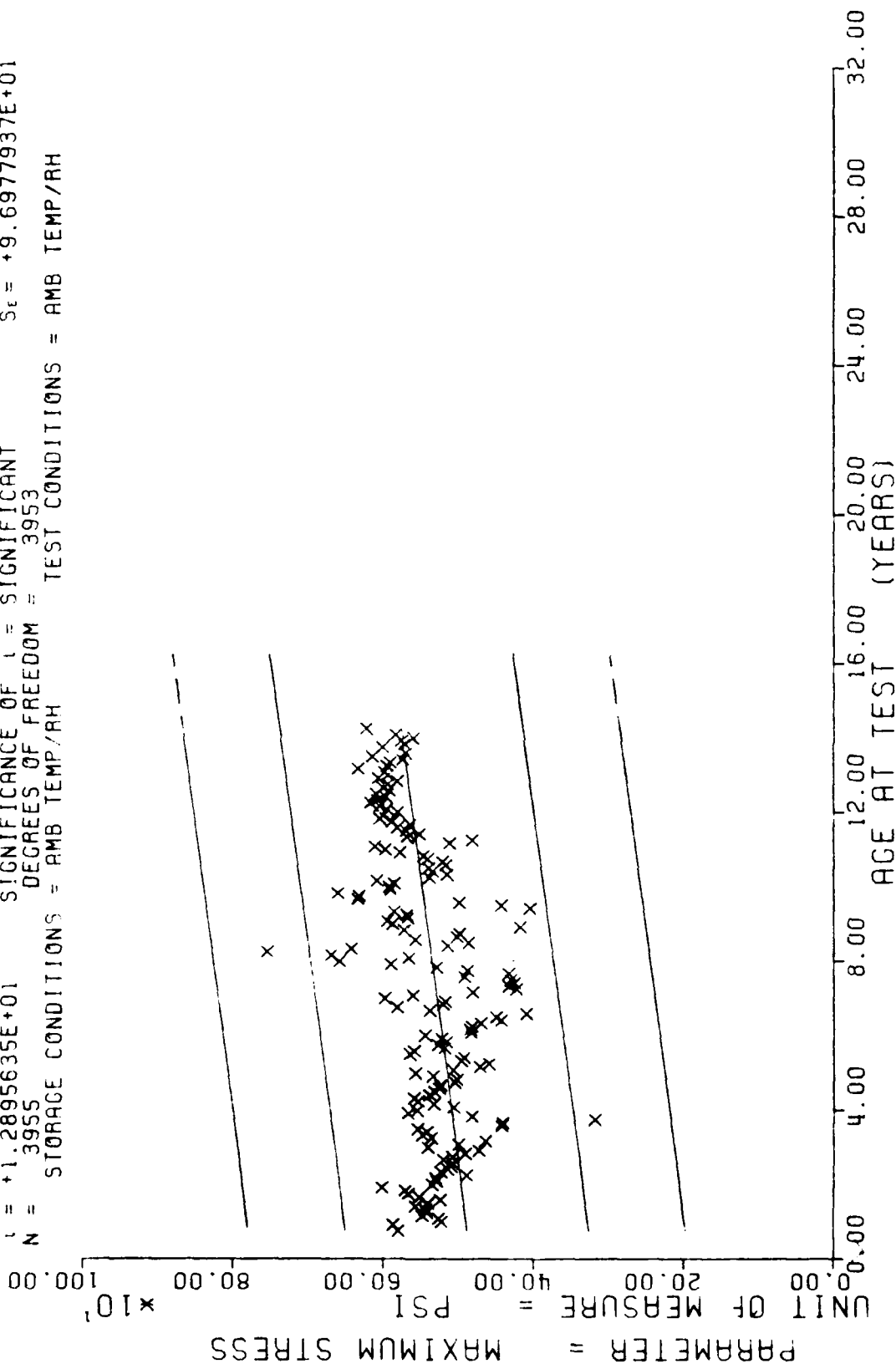
$F = +4.2122145E+02$
 $R = -3.1031649E-01$
 $L = +2.0523680E+01$
 $N = 3955$
 $Y = ((+3.5695798E-01) + (-2.8842105E-04) \times X)$
 SIGNIFICANCE OF F = SIGNIFICANT
 SIGNIFICANCE OF R = SIGNIFICANT
 SIGNIFICANCE OF L = SIGNIFICANT
 DEGREES OF FREEDOM = 3953
 STORAGE CONDITIONS = AMB TEMP/RH
 TEST CONDITIONS = AMB TEMP/RH



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

Figure 19

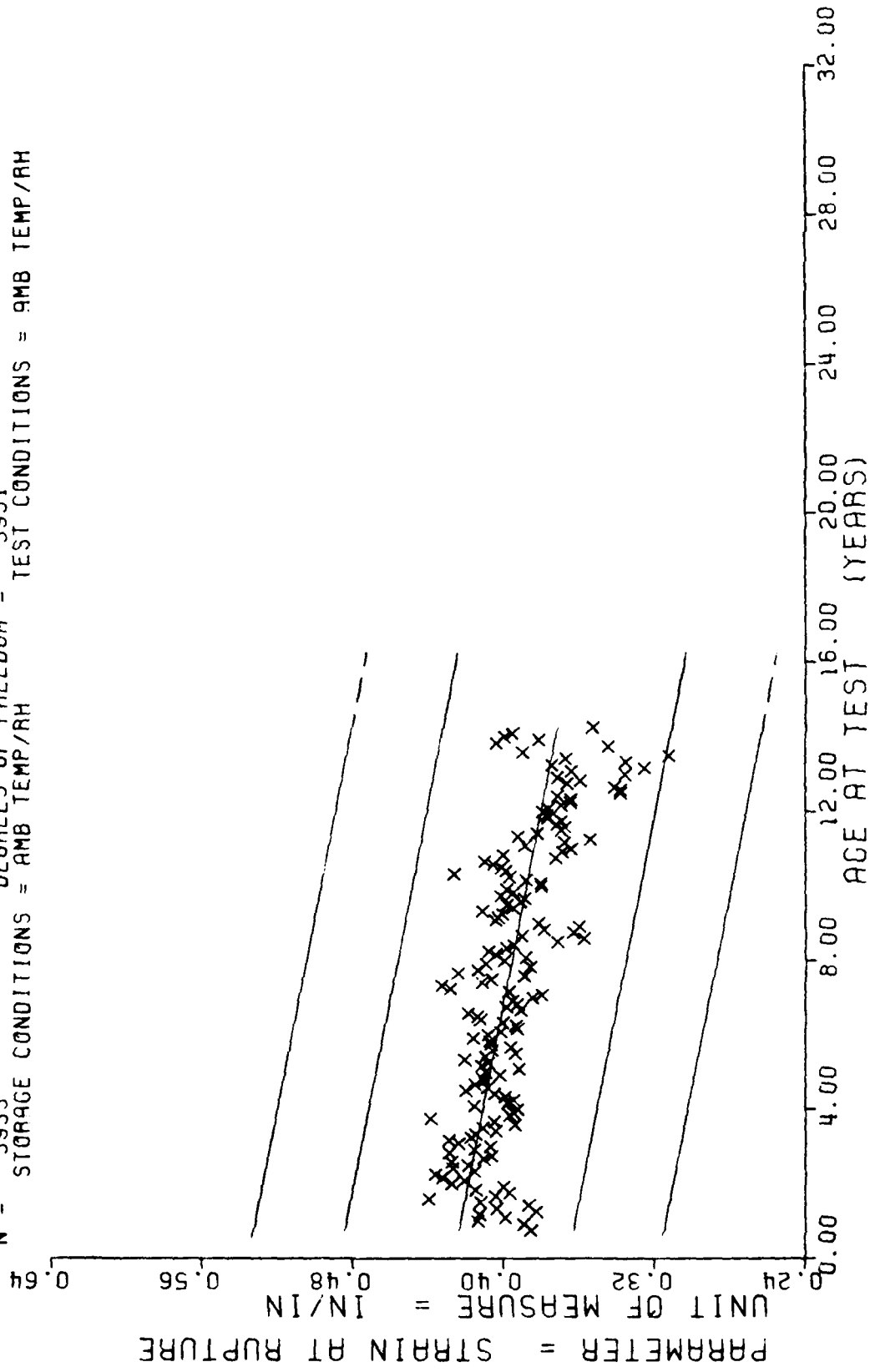
$Y = ((+4.8343152E+02) + (+5.4457676E-01) \times X)$
 $F = +1.6629742E+02$ SIGNIFICANCE OF F = SIGNIFICANT $G_1 = +9.8984270E+01$
 $R = +2.0092370E-01$ SIGNIFICANCE OF R = SIGNIFICANT $S_0 = +4.2229539E-02$
 $t = +1.2895635E+01$ SIGNIFICANCE OF t = SIGNIFICANT $S_t = +9.6977937E+01$
 $N = 3955$ DEGREES OF FREEDOM = 3953
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



WING 6.H.R. HYDROSTATIC, MAXIMUM STRESS, 1750 IN/MIN, 800 PSI

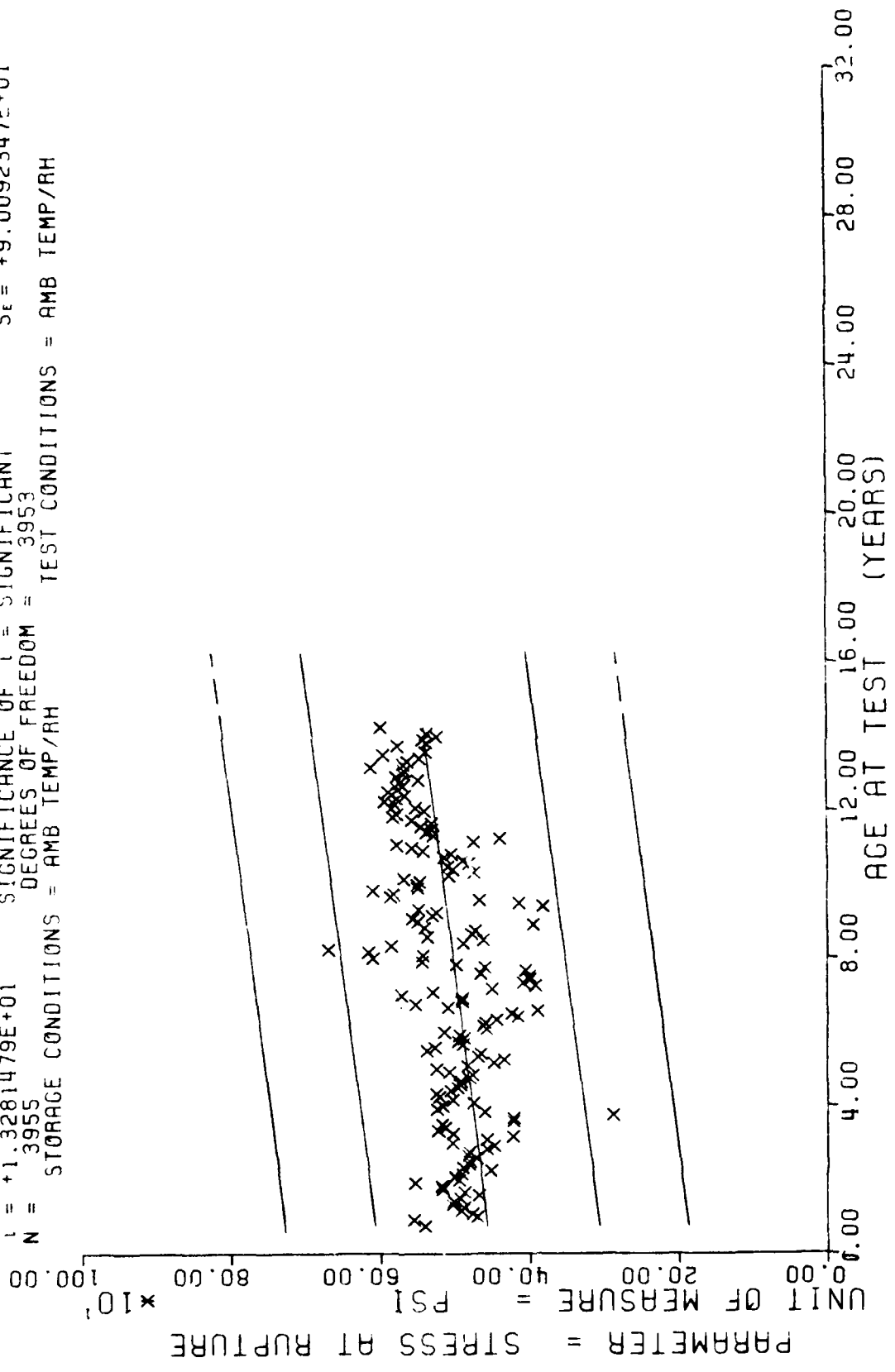
Figure 20

$Y = ((+4.2672434E-01) + (-3.2217247E-04) * X)$
 F = +4.1568720E+02 SIGNIFICANCE OF F = SIGNIFICANT $G_1 = +3.8127301E-02$
 R = -3.0853702E-01 SIGNIFICANCE OF R = SIGNIFICANT $S_1 = +1.5801747E-05$
 t = +2.0388408E+01 SIGNIFICANCE OF t = SIGNIFICANT $S_2 = +3.6271748E-02$
 N = 3953 DEGREES OF FREEDOM = 3951
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



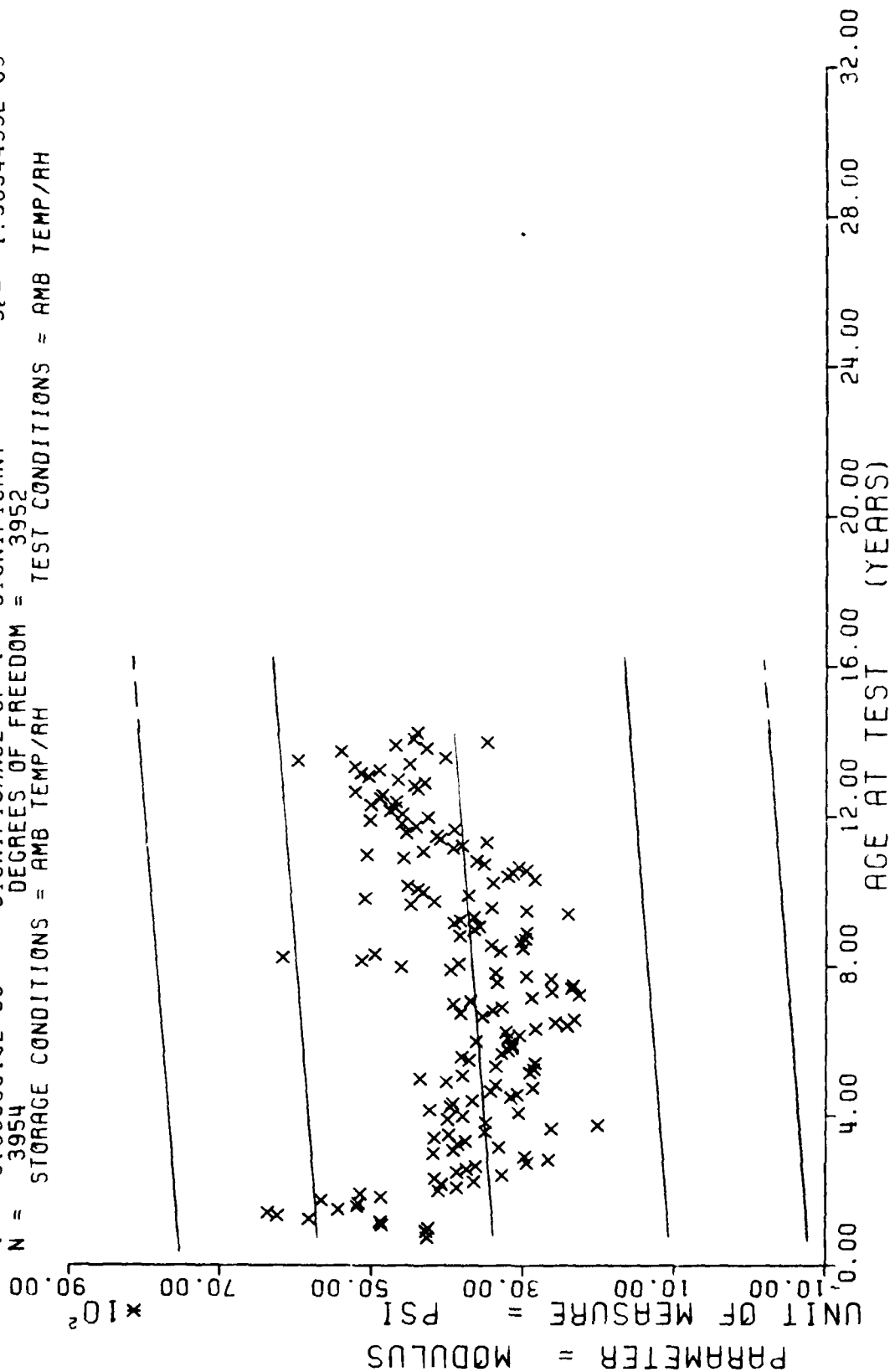
WING 6.H.R. HYDROSTATIC STRAIN AT RUPTURE. 1750 IN/MIN. 800 PSI

$Y = ((+4.5216146E+02) + (+5.2104804E-01) * X)$
 $F = +1.7639770E+02$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = +2.0668221E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +1.3281479E+01$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 3955$ DEGREES OF FREEDOM = 3953
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



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

$F = +2.8954095E+01$
 $R = +8.5282793E-02$
 $I = +5.3809010E+00$
 $N = 3954$
 $Y = ((+3.3615715E+03) + (+3.2558166E+00) * X)$
 SIGNIFICANCE OF F = SIGNIFICANT
 SIGNIFICANCE OF R = SIGNIFICANT
 SIGNIFICANCE OF I = SIGNIFICANT
 DEGREES OF FREEDOM = 3952
 STORAGE CONDITIONS = AMB TEMP/RH
 TEST CONDITIONS = AMB TEMP/RH



WING 6. H. R. HYDROSTATIC. MODULUS. 1750 IN/MIN. 800 PSI

Figure 23

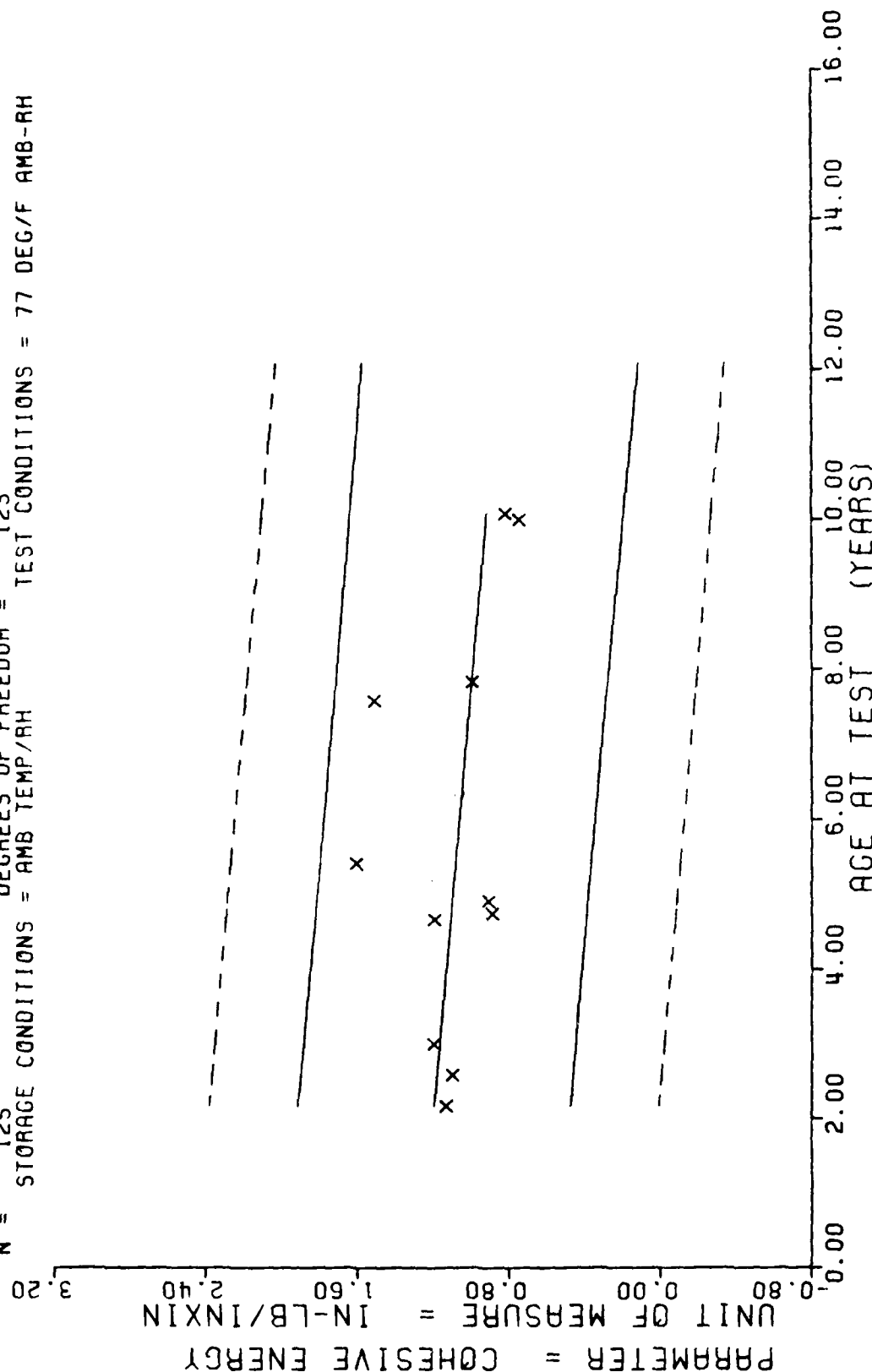
*** SAMPLE SIZE SUMMARY ***

AGE	+
(AGE)	SAF
26	12
31	12
36	11
56	5
57	13
59	14
65	12
91	7
94	14
120	12
121	12

STAGE 1 WING 6 TP-H1011 TEAR ENERGY TEST/TEMP=77 DEG F

This sample size summary is applicable to figure 24

$Y = (1 + 1.2718053E+00) + (-2.9404487E-03) * X$
 $F = +7.3959993E+00$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = -2.3815861E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +2.7195586E+00$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 125$ DEGREES OF FREEDOM = 123
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 77 DEG/F AMB-RH



STAGE I WING 6 TP-H1011 TEAR ENERGY TEST/TEMP=77 DEG F (LT TYPE)

AGE (MUS)	SAMP	AGE (MUS)	NR SAMP	AGE (MUS)	NR SAMP	AGE (MUS)	NR SAMP
12	9	67	9	92	9	117	27
13	9	68	9	93	29	118	21
14	1	69	20	94	26	119	19
15	3	70	30	95	26	120	42
16	3	71	41	96	51	121	21
17	4	72	30	97	54	122	6
18	3	73	39	98	45	123	9
19	4	74	32	99	41	124	27
20	3	75	32	100	23	125	20
21	6	76	17	101	27	126	21
22	6	77	40	102	8	127	18
23	9	78	28	103	18	128	23
24	3	79	15	104	12	129	2
25	3	80	17	105	9	130	36
26	3	81	23	106	9	131	9
27	3	82	35	107	12	132	8
28	6	83	12	108	15	133	21
29	6	84	17	109	12	134	31
30	6	85	18	110	12	135	21
31	19	86	9	111	6	136	2
32	9	87	33	112	20	137	12
33	6	88	19	113	51	138	37
34	9	89	21	114	35	139	48
35	3	90	30	115	49	140	9
36	6	91	14	116	42	141	15
37	9						
38	6						
39	9						
40	3						
41	6						

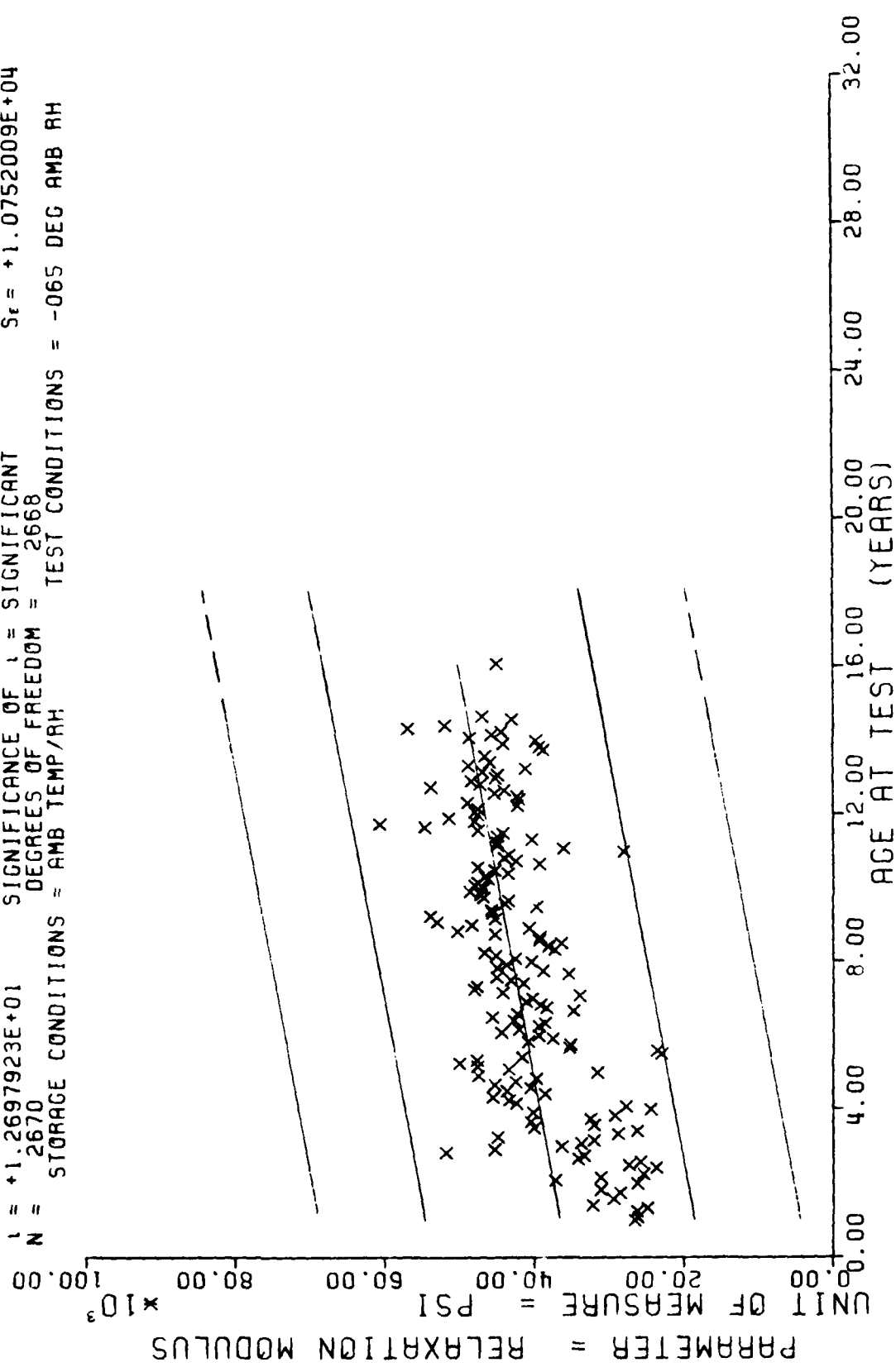
WING C. JIFFES RELAXATION MODULUS, 0.5% STRAIN, 10 SEC., -65 DEG F, TPH-1011

This sample size summary is applicable to figures 25 and 26

WING CRYSTALLINITY RELAXATION MODULUS, 0.5% STRAIN, 10 SEC., -65 DEG F, TPH-1011

This sample size summary is applicable to figures 25 and 26

$F = +1.6123726E+02$
 $R = +2.3872506E-01$
 $t = +1.2697923E+01$
 $N = 2670$
 $Y = ((+3.5705603E+04) + (+7.5200172E+01) * X)$
 SIGNIFICANCE OF F = SIGNIFICANT
 SIGNIFICANCE OF R = SIGNIFICANT
 SIGNIFICANCE OF t = SIGNIFICANT
 DEGREES OF FREEDOM = 2668
 STORAGE CONDITIONS = AMB TEMP/RH
 TEST CONDITIONS = -065 DEG AMB RH



WING 6 STRESS RELAXATION MODULUS, 0.5% STRAIN, 10 SEC., -65 DEG F, TPH-1011

$Y = ((+2.9683988E+04) + (+7.1482576E+01) * X)$
 $F = +1.8839263E+02$ SIGNIFICANCE OF F = SIGNIFICANT $G = +9.7815216E+03$
 $R = +2.5681655E-01$ SIGNIFICANCE OF R = SIGNIFICANT $S_A = +5.2079671E+00$
 $t = +1.3725619E+01$ SIGNIFICANCE OF t = SIGNIFICANT $S_t = +9.4552225E+03$
 $N = 2670$ DEGREES OF FREEDOM = 2668
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = -065 DEG/RH

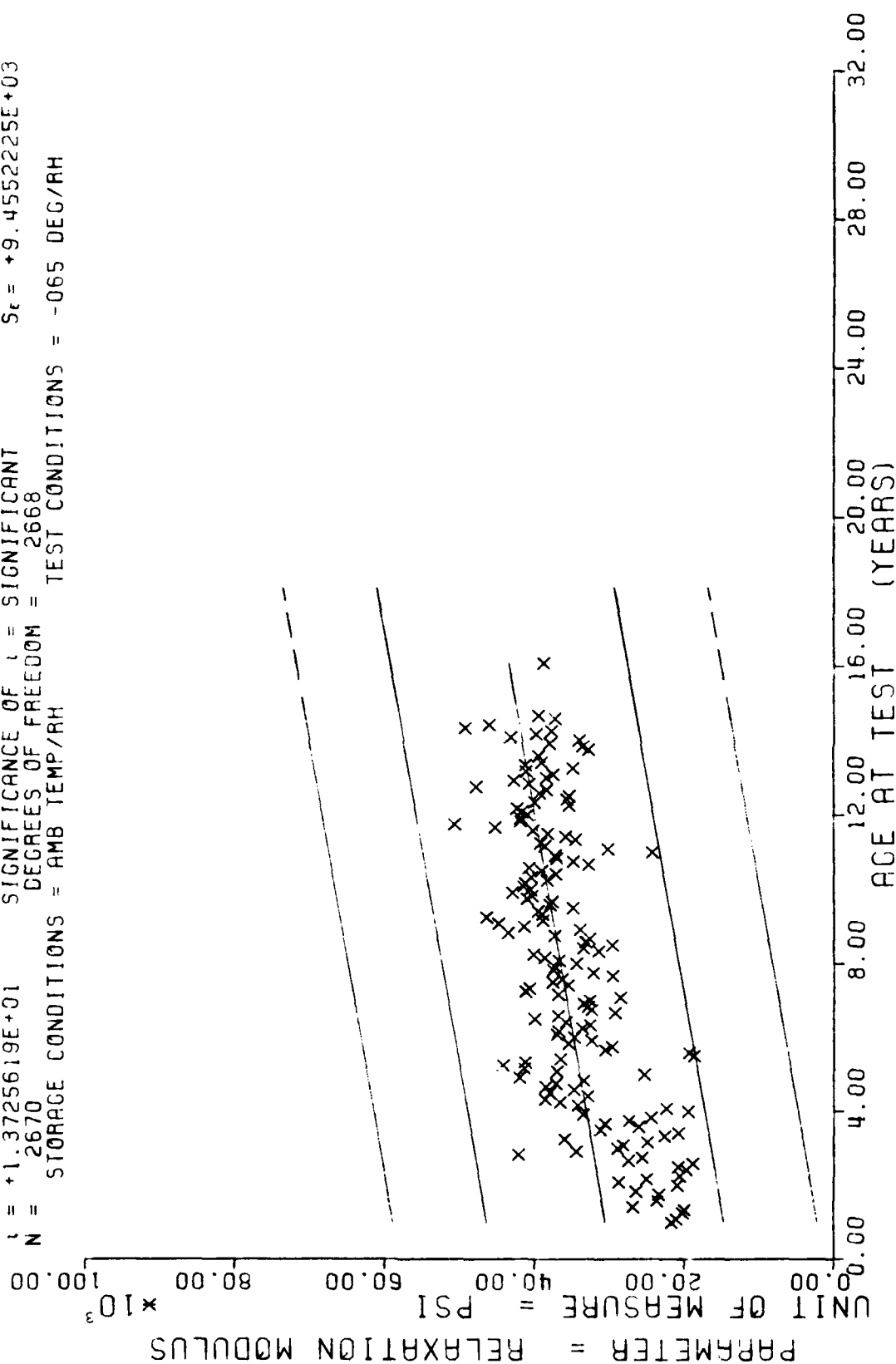


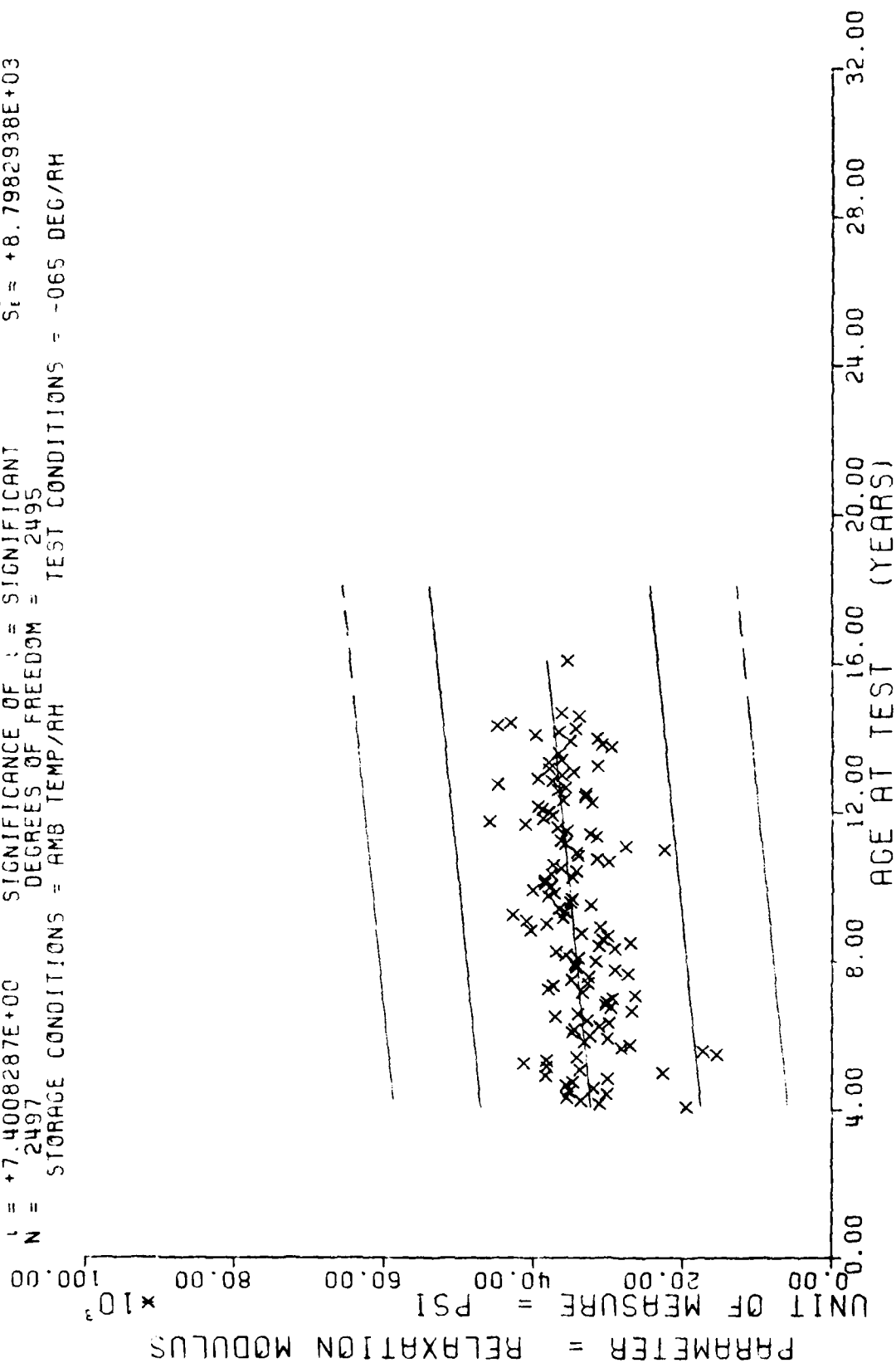
Figure 26

[illegible]

WING 6, STRESS RELAXATION MODULUS, 0.5% STRAIN, 100 SEC., -65 DEG F, TPH-1011

This sample size summary is applicable to figures 27 and 28

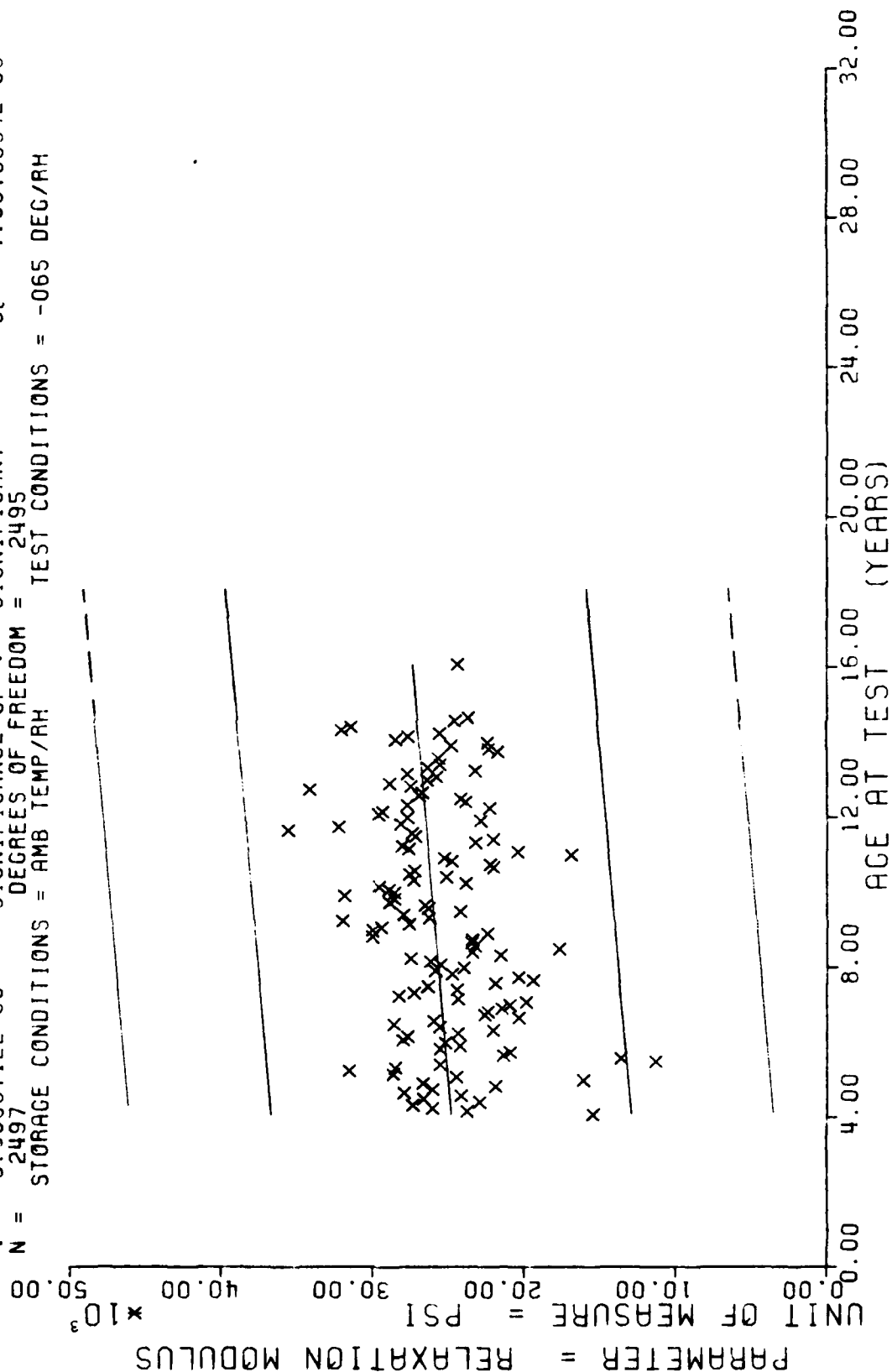
$Y = ((+3.029927E+04) + (+4.0846477E+01) * X)$
 $F = +5.4772265E+01$ SIGNIFICANCE OF F = SIGNIFICANT $\sigma_r = +8.8925612E+03$
 $R = +1.4656479E-01$ SIGNIFICANCE OF R = SIGNIFICANT $S_e = +5.5191761E+00$
 $t = +7.4008287E+00$ SIGNIFICANCE OF t = SIGNIFICANT $S_t = +8.7982938E+03$
 $N = 2497$ DEGREES OF FREEDOM = 2495
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = -065 DEG/RH



WING 5. STRESS RELAXATION MODULUS, 0.5% STRAIN, 100 SEC, -65 DEG F, TPH-1011

Figure 27

$Y = ((+2.3969401E+04) + (+1.7657598E+01) * X)$
 $F = +1.5728135E+01$ SIGNIFICANCE OF F = SIGNIFICANT $G_1 = +7.1186033E+03$
 $R = +7.9147785E-02$ SIGNIFICANCE OF R = SIGNIFICANT $S_0 = +4.4523882E+00$
 $I = +3.9658712E+00$ SIGNIFICANCE OF I = SIGNIFICANT $S_t = +7.0976934E+03$
 $N = 2497$ DEGREES OF FREEDOM = 2495
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = -065 DEG/RH



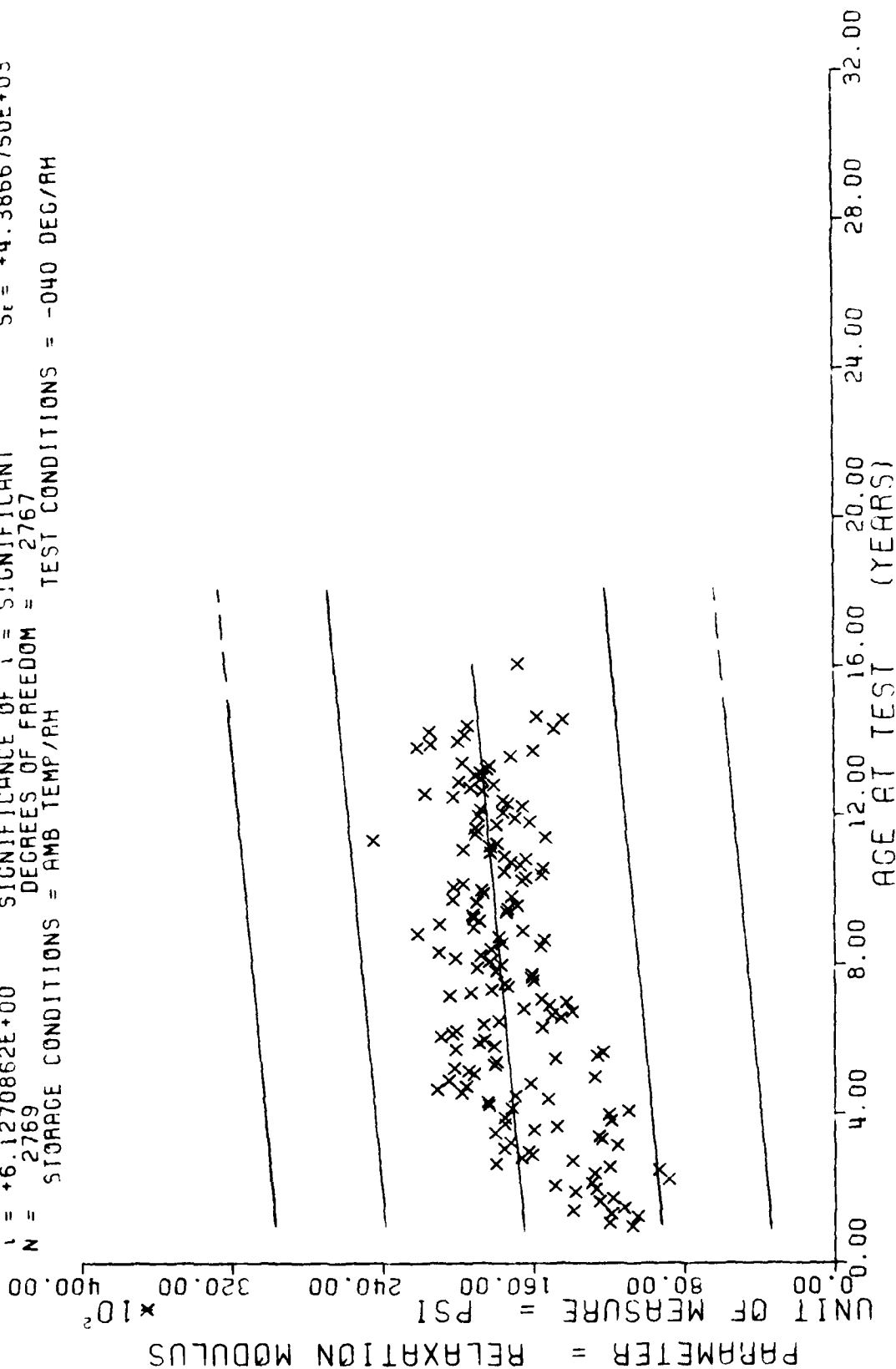
WING 6. STRESS RELAXATION MODULUS, 0.5% STRAIN, 1000 SEC. -65 DEG F, IIPH-1011

[illegible]

RUNNING 6, STRESS RELAXATION MODULUS, 0.5% STRAIN, 10 SEC, -40 DEG F, 7PH-10111

This sample size summary is applicable to figures 29 thru 31

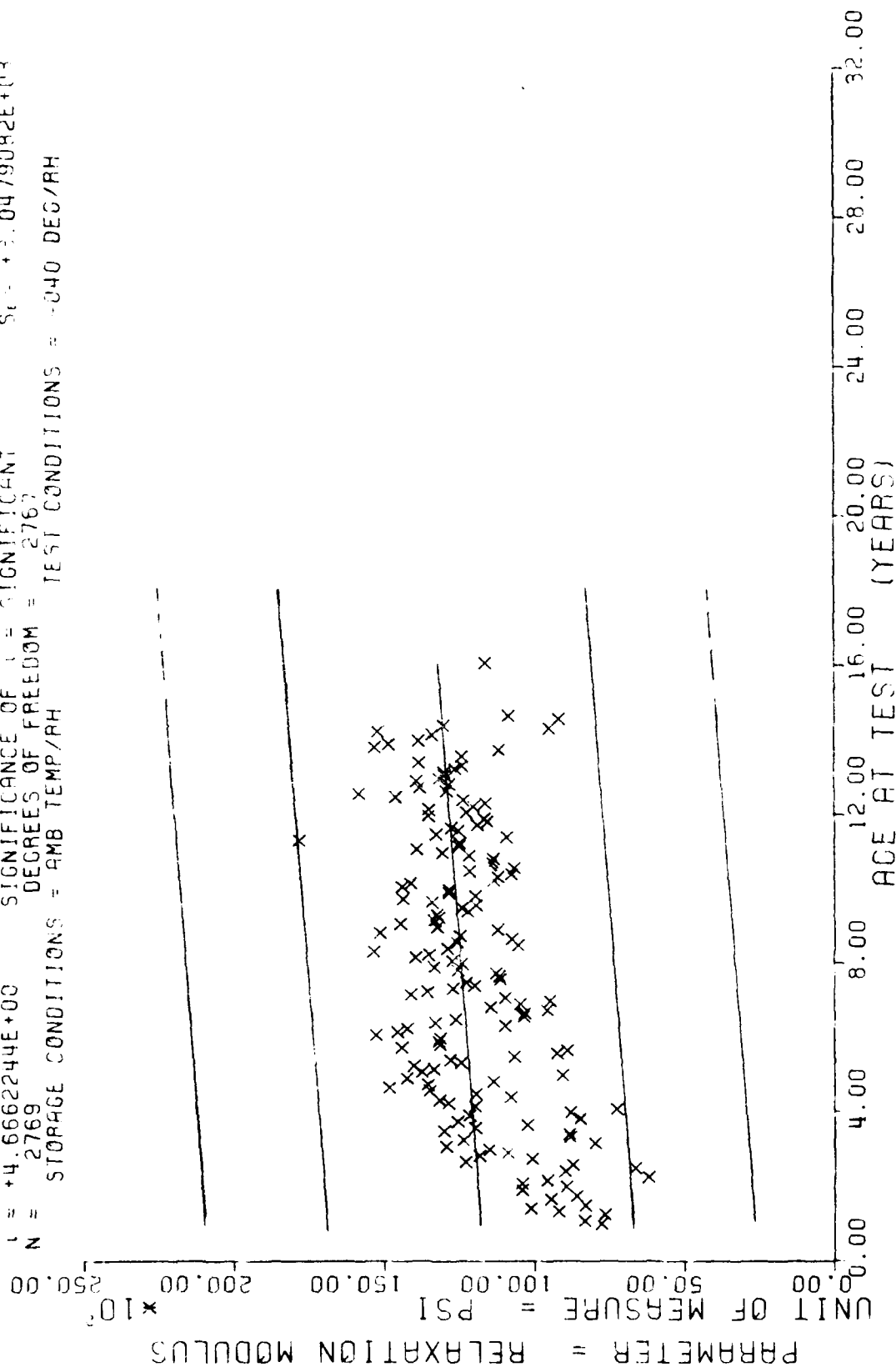
$F = +3.7541185E+01$
 $R = +1.1569726E-01$
 $t = +6.1270862E+00$
 $N = 2769$
 $Y = ((+1.6349144E+04) + (+1.4697235E+01) \times X)$
 SIGNIFICANCE OF $F =$ SIGNIFICANT
 SIGNIFICANCE OF $R =$ SIGNIFICANT
 SIGNIFICANCE OF $t =$ SIGNIFICANT
 DEGREES OF FREEDOM = 2767
 STORAGE CONDITIONS = AMB TEMP/RH
 TEST CONDITIONS = -040 DEG/RH
 $G_1 = +4.4155350E+03$
 $S_0 = +2.3987316E+00$
 $S_1 = +4.3866750E+03$



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

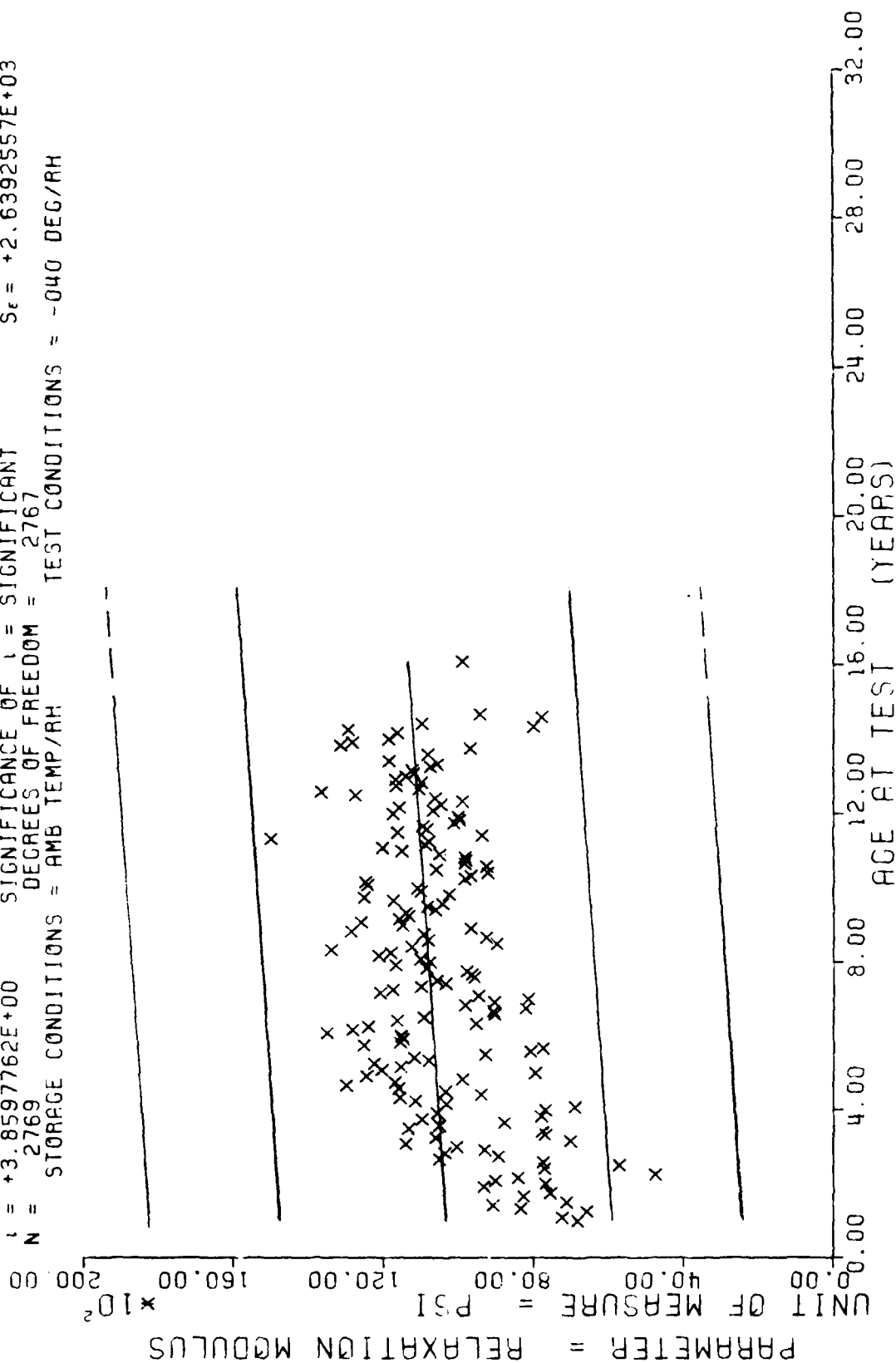
Figure 29

$Y = (1 + 1.1702018E+04) + (1 + 7.7770231E+00) \cdot X$
 $F = +2.1773650E+01$ SIGNIFICANCE OF F = SIGNIFICANT $G = +3.0593240E+03$
 $R = +8.8360667E-02$ SIGNIFICANCE OF R = SIGNIFICANT $S = +1.6666641E+00$
 $t = +4.6662244E+00$ SIGNIFICANCE OF t = SIGNIFICANT $S_t = +3.0479082E+03$
 $N = 2769$ DEGREES OF FREEDOM = 2767
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = -040 DEG/RH



WING 6. STRESS RELAXATION MODULUS. 0.5% STRAIN. 50 SEC. -40 DEG F. TPH-1011

$Y = ((+1.0259006E+04) + (+5.570440E+00) \times X)$
 $F = +1.4897872E+01$ SIGNIFICANCE OF F = SIGNIFICANT $G = +2.6458732E+03$
 $R = +7.3179853E-02$ SIGNIFICANCE OF R = SIGNIFICANT $S_0 = +1.4432038E+00$
 $t = +3.8597762E+00$ SIGNIFICANCE OF t = SIGNIFICANT $S_e = +2.6392557E+03$
 $N = 2769$ DEGREES OF FREEDOM = 2767
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = -040 DEG/RH



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

Figure 31

[illegible]

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

This sample size summary is applicable to figures 32 thru 35

$Y = ((+1.5569620E+03) + (+1.5958848E+00) * X)$
 $F = +1.4089063E+02$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = +2.1571034E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +1.1869736E+01$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 2889$ DEGREES OF FREEDOM = 2887
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +020 DEG/RH

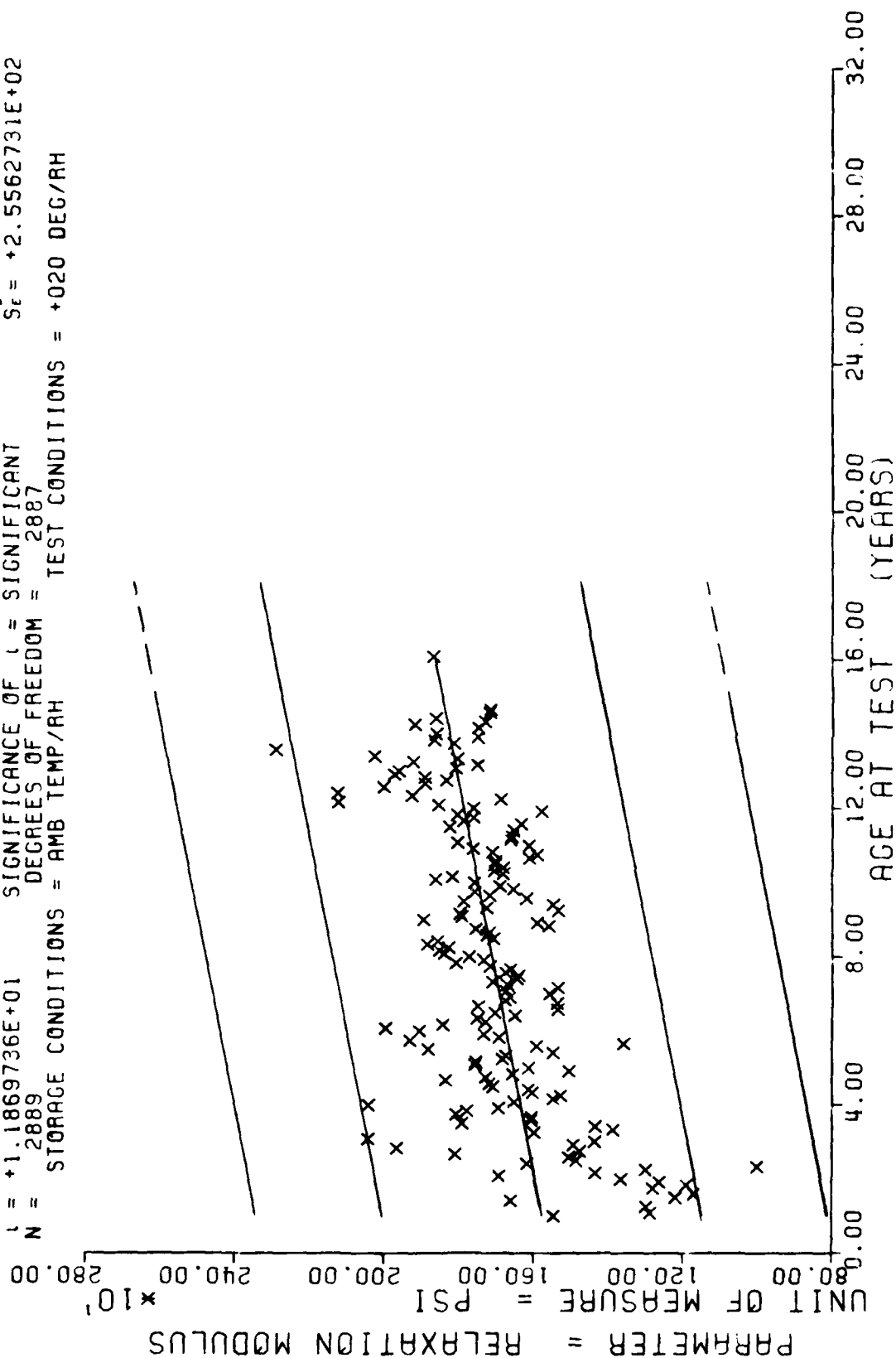
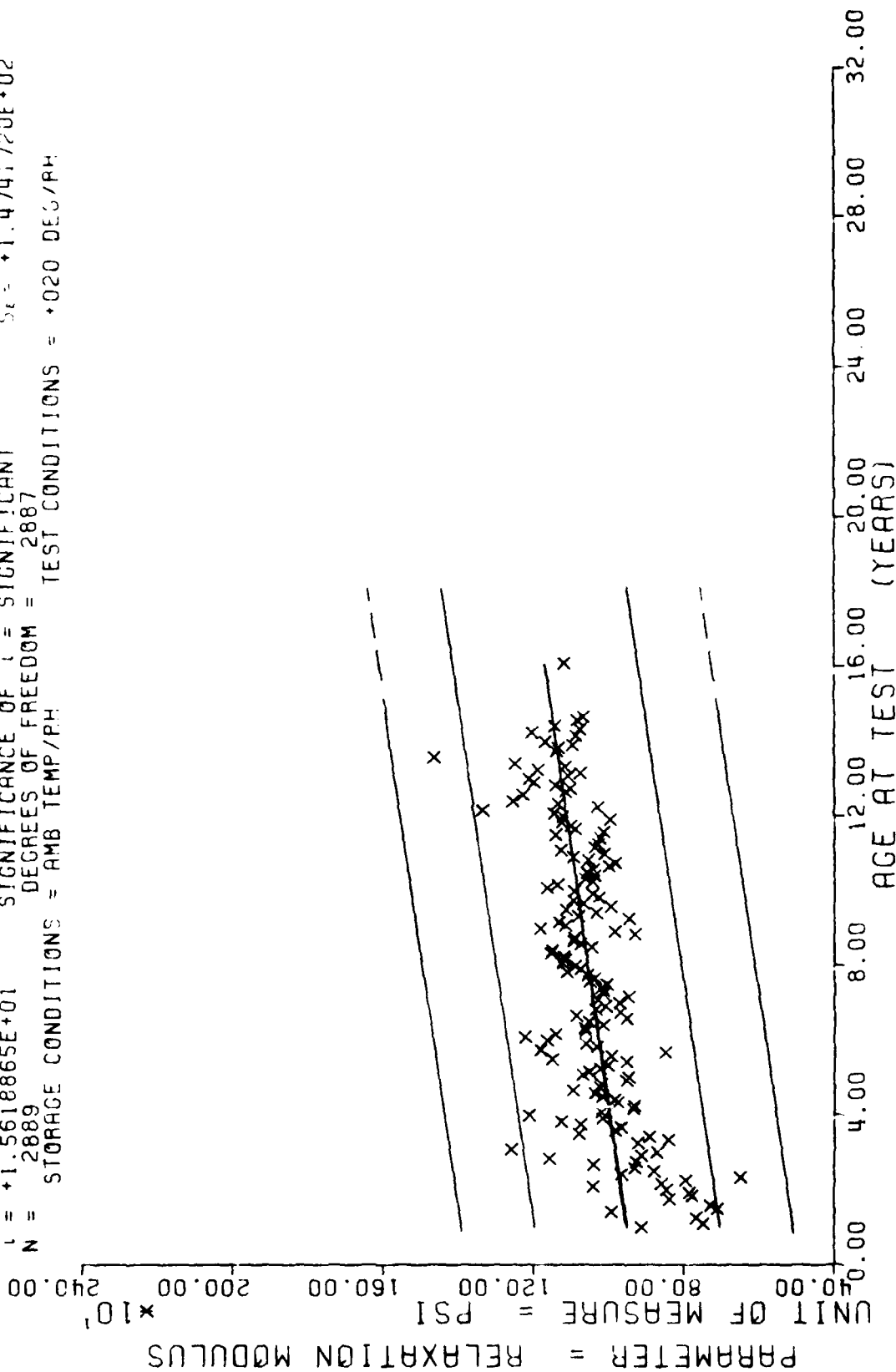


Figure 32

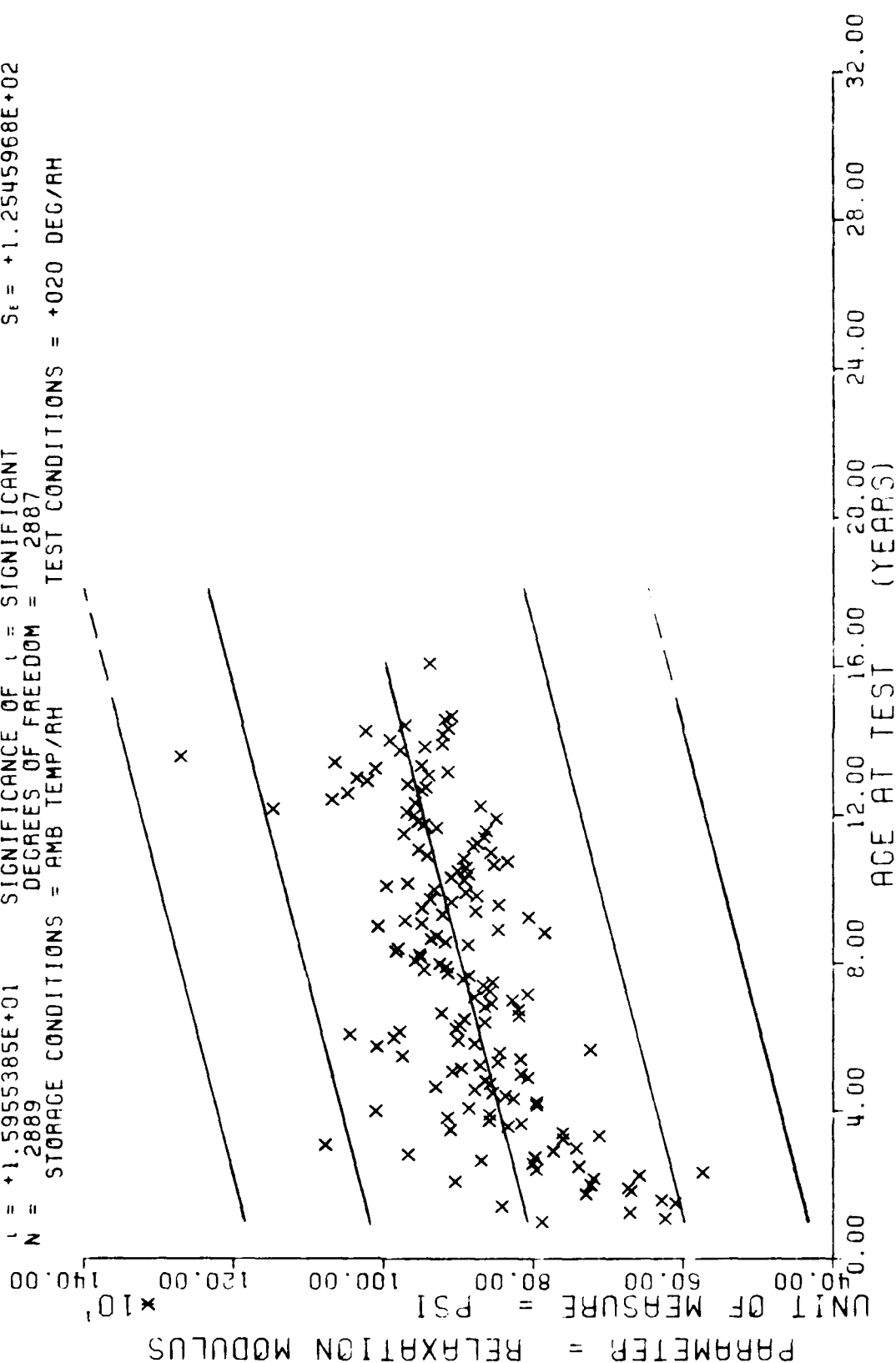
$Y = ((+9.3569020E+02) + (+1.211018E+00) * X)$
 $F = +2.4394897E+02$ SIGNIFICANCE OF F = SIGNIFICANT $G_1 = +1.5349264E+02$
 $R = +2.7913320E-01$ SIGNIFICANCE OF R = SIGNIFICANT $S_0 = +7.7535646E-02$
 $L = +1.5618865E+01$ SIGNIFICANCE OF L = SIGNIFICANT $S_1 = +1.4741720E+02$
 $N = 2889$ DEGREES OF FREEDOM = 2887
 STORAGE CONDITIONS = AMB TEMP/PH TEST CONDITIONS = +020 DEG/PH



WING 6. STRESS RELAXATION MODULUS, 3.0% STRAIN, 50 SEC. 20 DEG F. TPH-1011

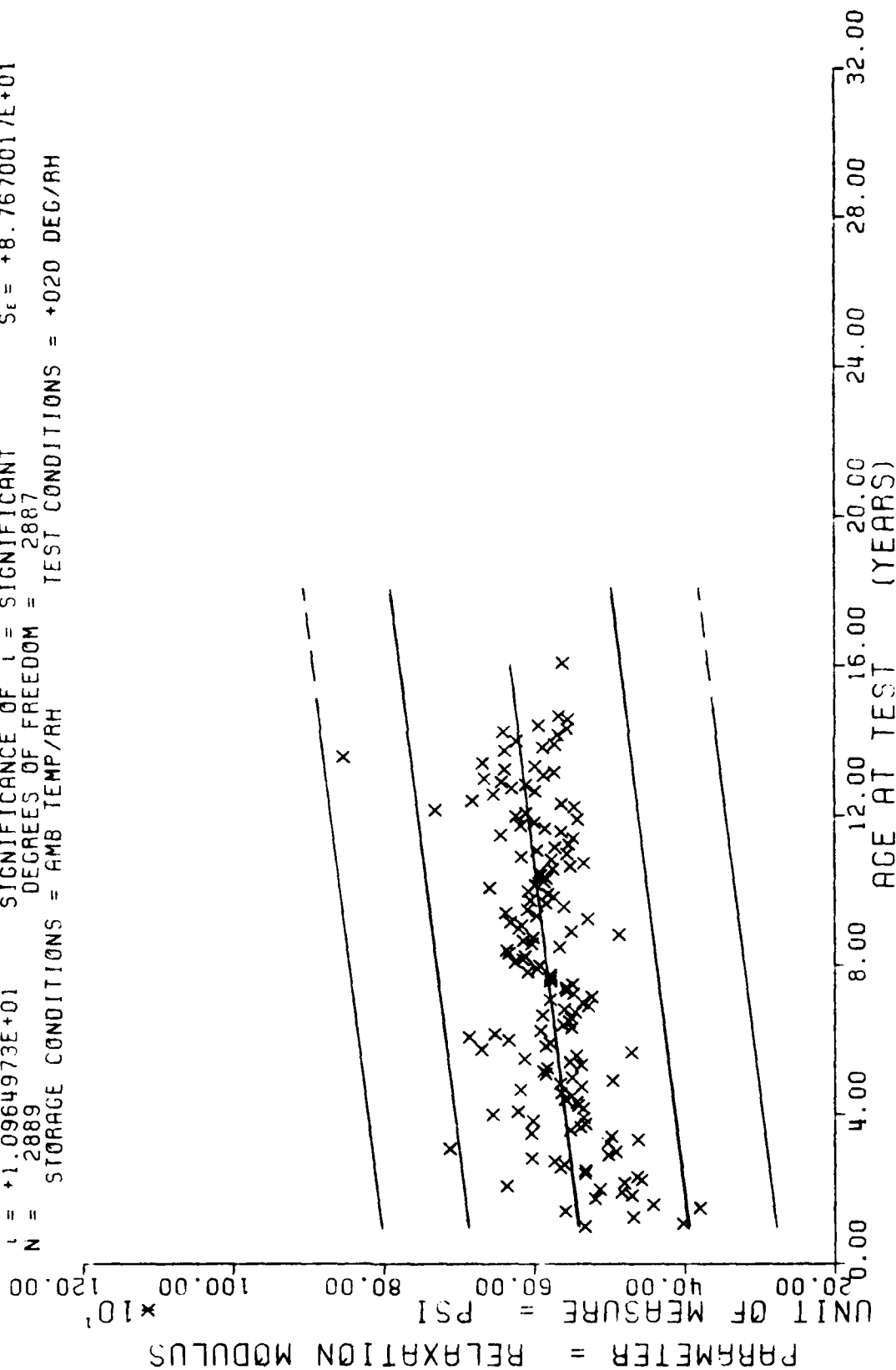
Figure 33

$Y = ((+7.9507816E+02) + (+1.0528457E+00) * X)$
 $F = +2.5457433E+02$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = +2.8466471E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +1.5955385E+01$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 2889$ DEGREES OF FREEDOM = 2887
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +020 DEG/RH



WING 5.5 STRESS RELAXATION MODULUS, 3.0% STRAIN, 100 SEC. 20 DEG F. TPH-1011

$Y = ((+5.3405875E+02) + (+5.0560564E-01) * X)$
 $F = +1.2023064E+02$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = +1.9995129E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +1.0964973E+01$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 2889$ DEGREES OF FREEDOM = 2887
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +020 DEG/RH



WING 6. STRESS RELAXATION MODULUS. 3.0% STRAIN. 1000 SEC. 20 DEG F. TPH-1011

*** SAMPLE SIZE SUMMARY ***

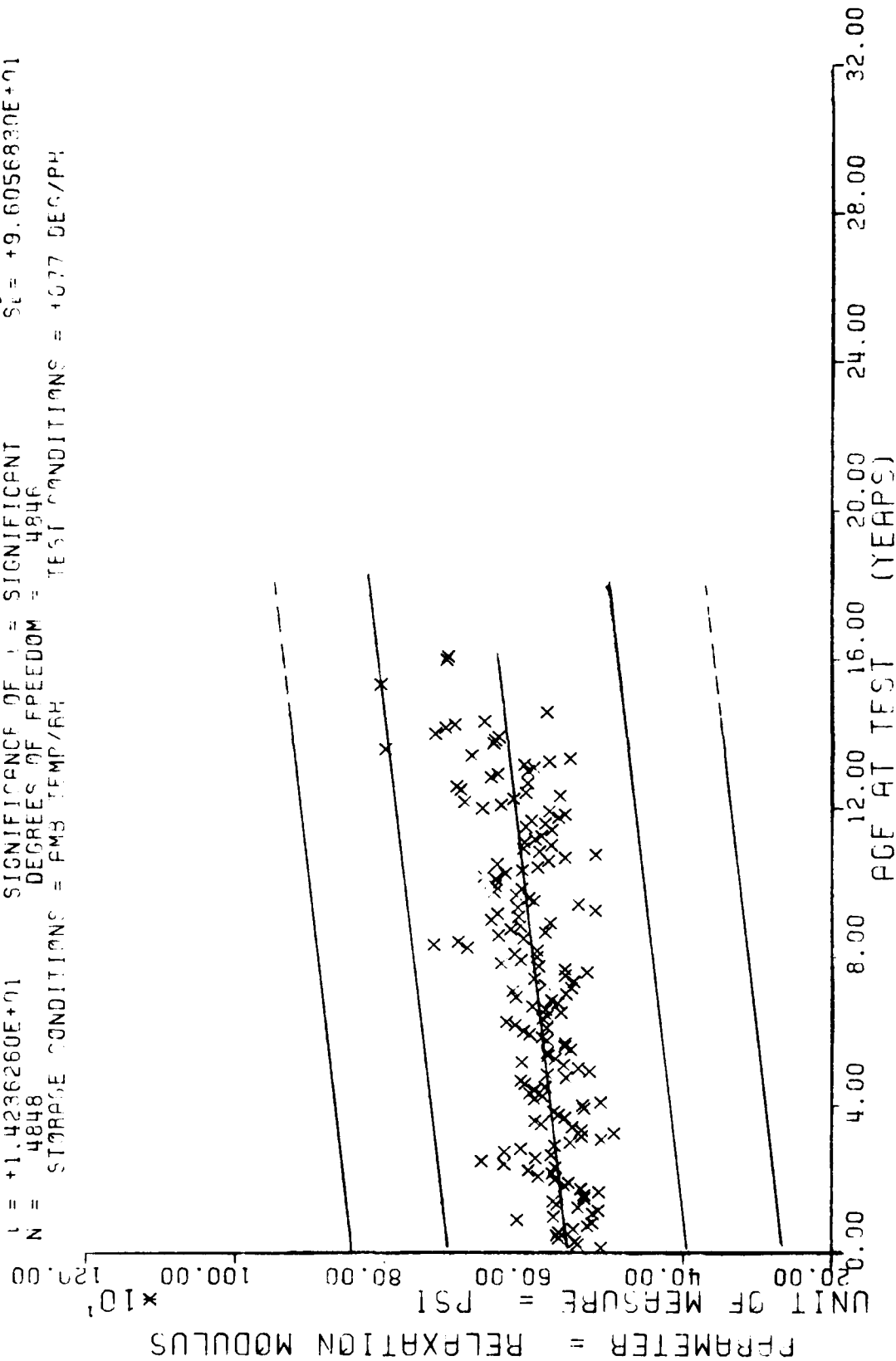
AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP
2	3	27	24	52	72	77	33	102	15	127	18	133	12
3	5	28	27	53	18	78	39	103	26	128	24	134	39
4	10	29	48	54	39	79	21	104	12	129	3	135	15
5	22	30	43	55	22	80	21	105	6	130	42	136	18
6	21	31	30	56	36	81	45	106	3	131	45	137	15
7	35	32	60	57	51	82	21	107	10	132	14	138	45
8	30	33	29	58	45	83	15	108	24	133	14	139	12
9	45	34	51	59	39	84	21	109	9	134	39	140	12
10	38	35	36	60	74	85	15	110	9	135	15	141	39
11	37	36	58	61	66	86	21	111	9	136	18	142	15
12	65	37	18	62	82	87	36	112	30	137	18	143	15
13	51	38	24	63	63	88	21	113	62	138	45	144	12
14	46	39	42	64	51	89	30	114	44	139	48	145	27
15	57	40	18	65	36	90	42	115	30	140	15	146	33
16	36	41	24	66	39	91	14	116	71	141	12	147	6
17	46	42	12	67	36	92	23	117	18	142	27	148	6
18	13	43	9	68	51	93	19	118	21	143	33	149	6
19	10	44	9	69	75	94	18	119	21	144	6	150	12
20	4	45	6	70	99	95	39	120	36	145	6	151	3
21	27	46	18	71	62	96	96	121	15	146	12	152	6
22	3	47	30	72	66	97	90	122	9	147	3	153	6
23	6	48	36	73	51	98	96	123	12	148	6	154	15
24	34	49	42	74	66	99	42	124	24	149	6	155	3
25	27	50	30	75	45	100	20	125	18	150	6	156	9
26	30	51	82	76	27	101	34	126	22	151	15	157	9

Age	Nr	Age	Nr
154	12	166	6
155	3	167	12
156	9	168	3
157	9	170	3
158	9	171	6
159	3	172	3
160	6	175	3
161	5	184	3
163	3	192	1
165	3	193	2

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

This sample size summary is applicable to figures 36 thru 39

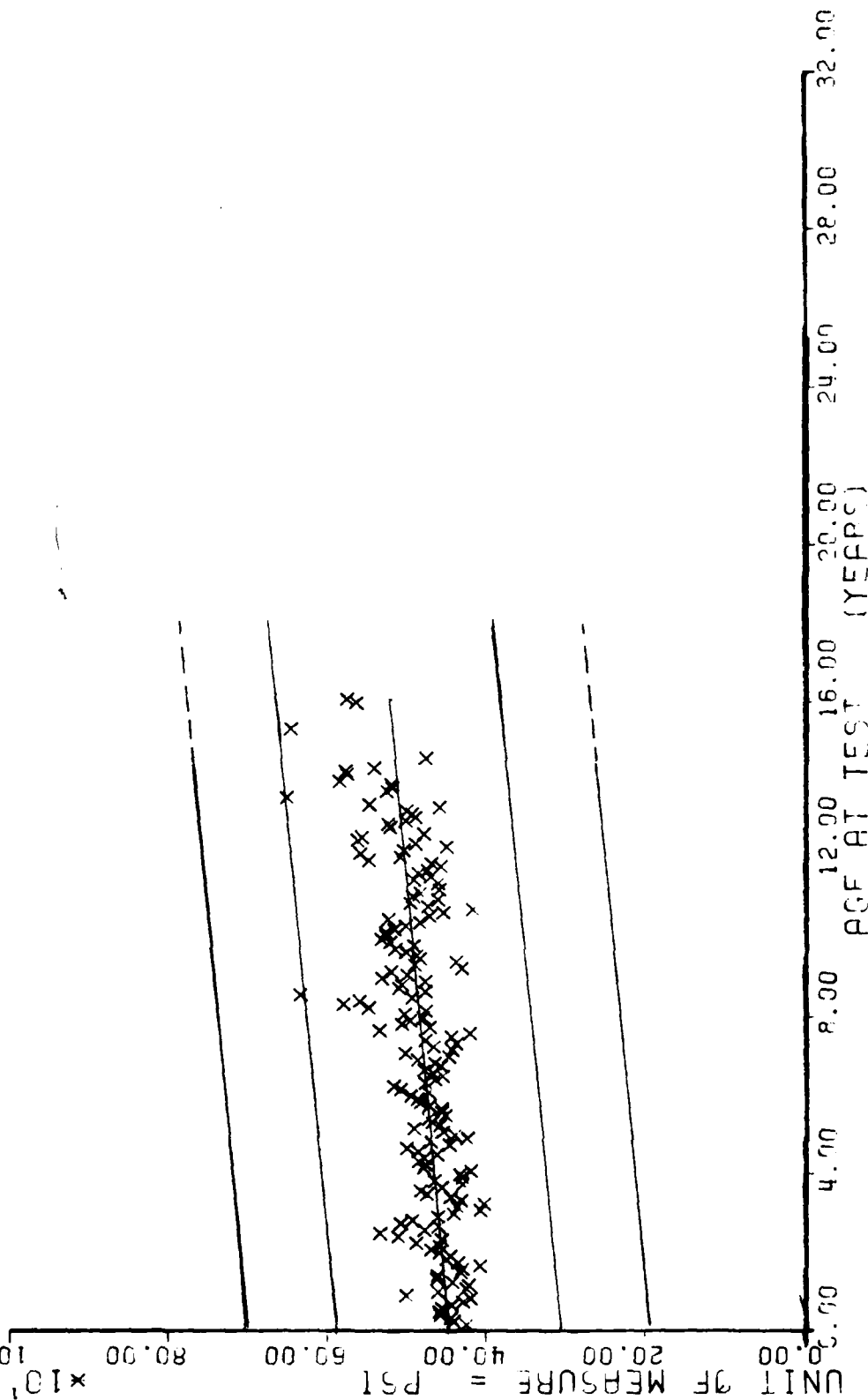
$t = (1 + 5.5408901E+02) + (1 + 4.8654009E-01) * X$
 SIGNIFICANCE OF F = SIGNIFICANT
 $\sigma_1 = +9.8034803E+01$
 $R = +2.0035831E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $S_b = +3.4183836E-02$
 $t = +1.4236260E+01$ SIGNIFICANCE OF t = SIGNIFICANT
 $S_t = +9.6056830E+01$
 N = 4848 DEGREES OF FREEDOM = 4846
 STORAGE CONDITIONS = FMS TEMP/RH TEST CONDITIONS = +077 DEG/PH



WING 5, STRESS RELAXATION MODULUS, 3.0% STRAIN, 17 SEC. 77 DEG F, TPH-1011

$t = ((+4.4513757E+02) + (+3.9634122E-01) * X)$
 F = +1.7414528E+02 SIGNIFICANCE OF F = SIGNIFICANT $G_1 = +8.6019956E+01$
 R = +1.8625061E-01 SIGNIFICANCE OF R = SIGNIFICANT $S_0 = +3.0079466E-02$
 U = +1.3196411E+01 SIGNIFICANCE OF U = SIGNIFICANT $S_t = +8.4523522E+01$
 N = 4848 DEGREES OF FREEDOM = 4846
 STORAGE CONDITIONS = PMB TEMP/RH TEST CONDITIONS = +077 DEG/RH

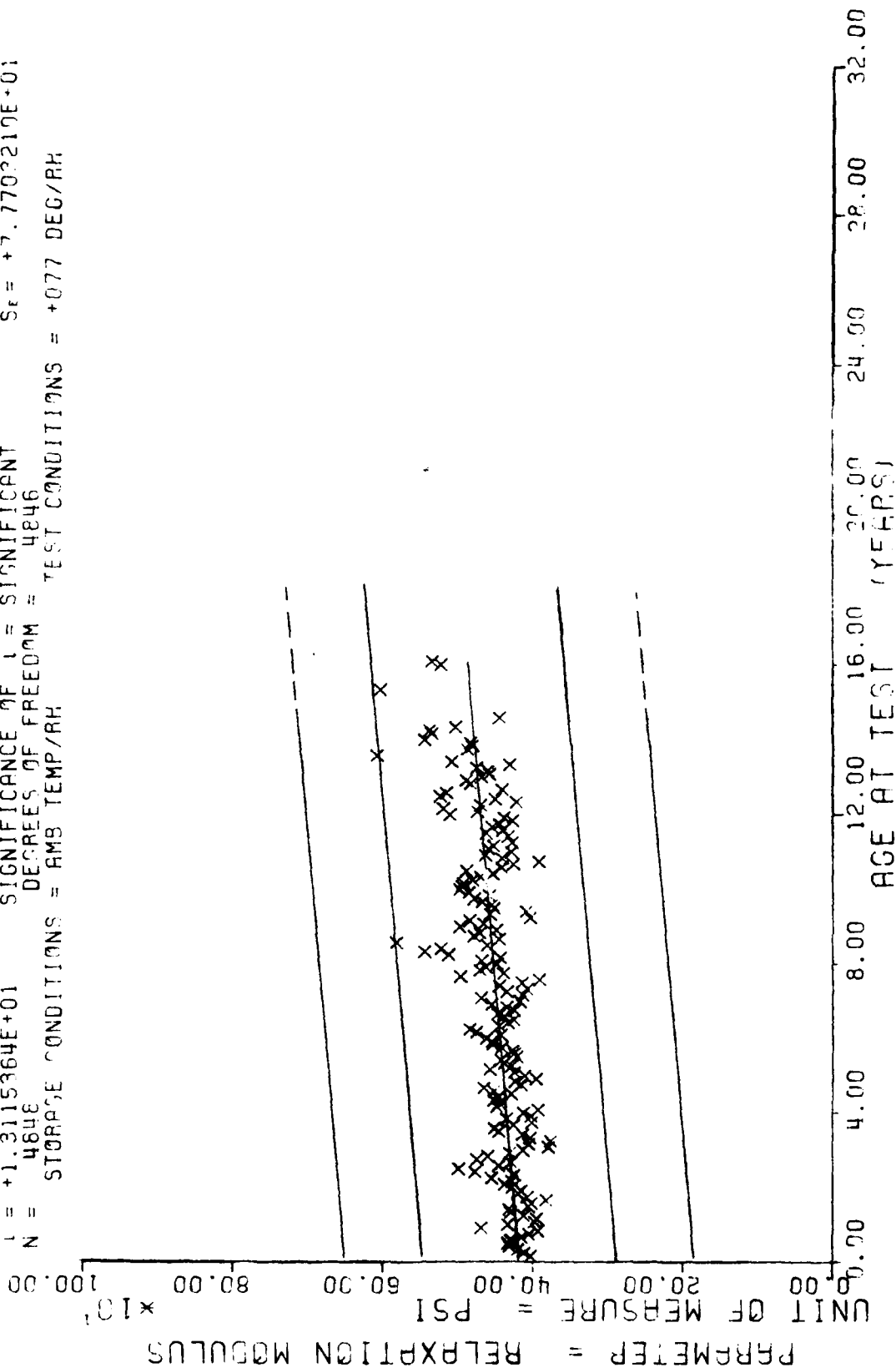
PARAMETER = RELAXATION MODULUS
 UNIT OF MEASURE = PSI
 $\times 10^1$



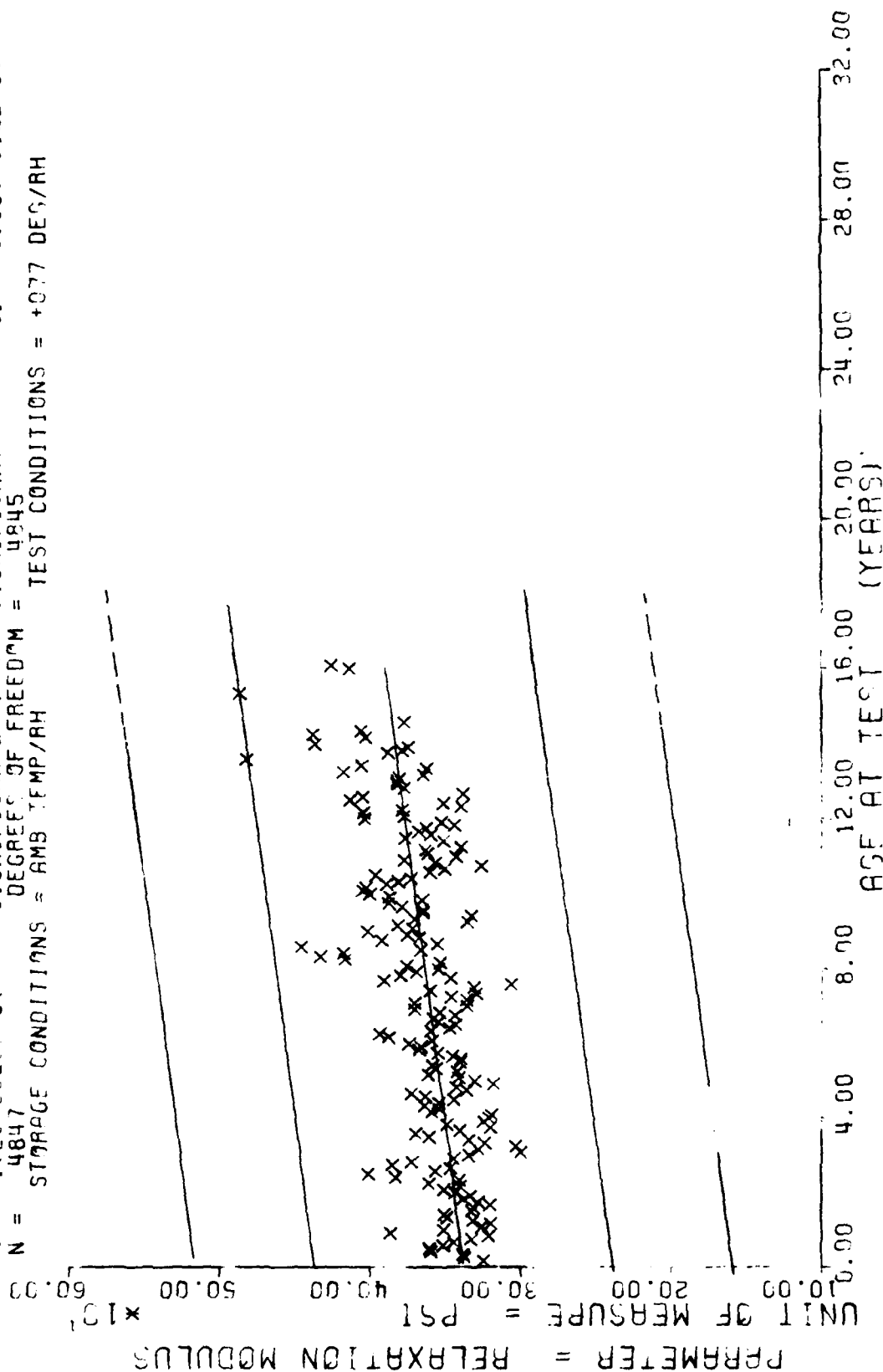
WING 6. STRESS RELAXATION MODULUS, 3.0% STRAIN, 50 SEC, 77 DEG F, TPH-1011

Figure 37

$Y = ((+4.172082E+02) + (+2.6267921E-01) * X)$
 $F = +1.7201279E+02$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = +1.8514606E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +1.3115364E+01$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 4846$ DEGREES OF FREEDOM = 4846
 STORAGE CONDITIONS = RMS TEMP/RH TEST CONDITIONS = +077 DEG/RH



$Y = ((+3.3716019E+02) + (+2.7294827E-01) * X)$
 F = +1.6612176E+02 SIGNIFICANCE OF F = SIGNIFICANT
 R = +1.8207310E-01 SIGNIFICANCE OF R = SIGNIFICANT
 t = +1.2888823E+01 SIGNIFICANCE OF t = SIGNIFICANT
 N = 4847 DEGREES OF FREEDOM = 4845
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +077 DEG/RH



WIND 6. STRESS RELAXATION MODULUS, 3.0% STRAIN, 1000 SEC. 77 DEG F. IPH-1011

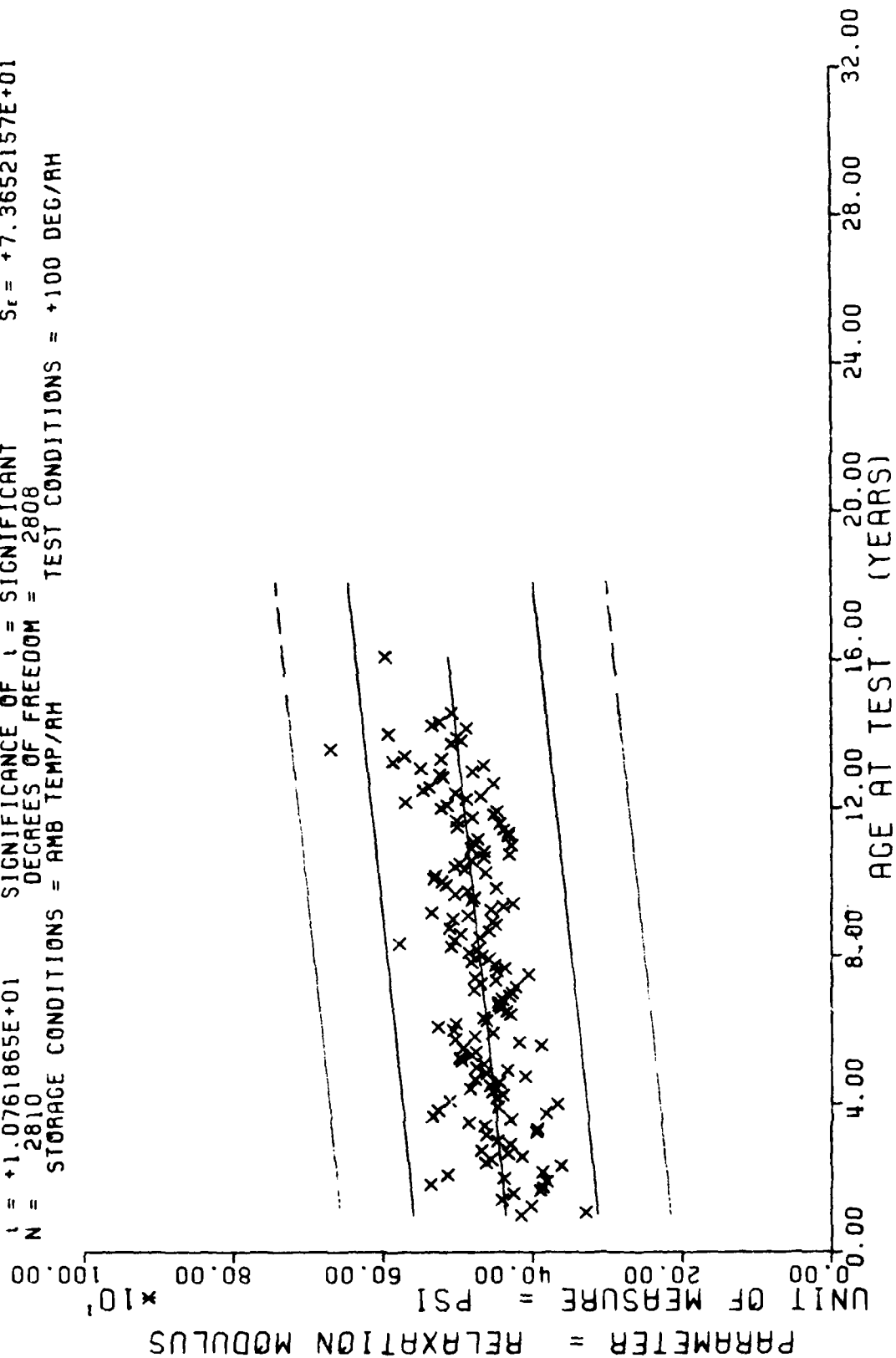
Figure 39

[illegible]

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

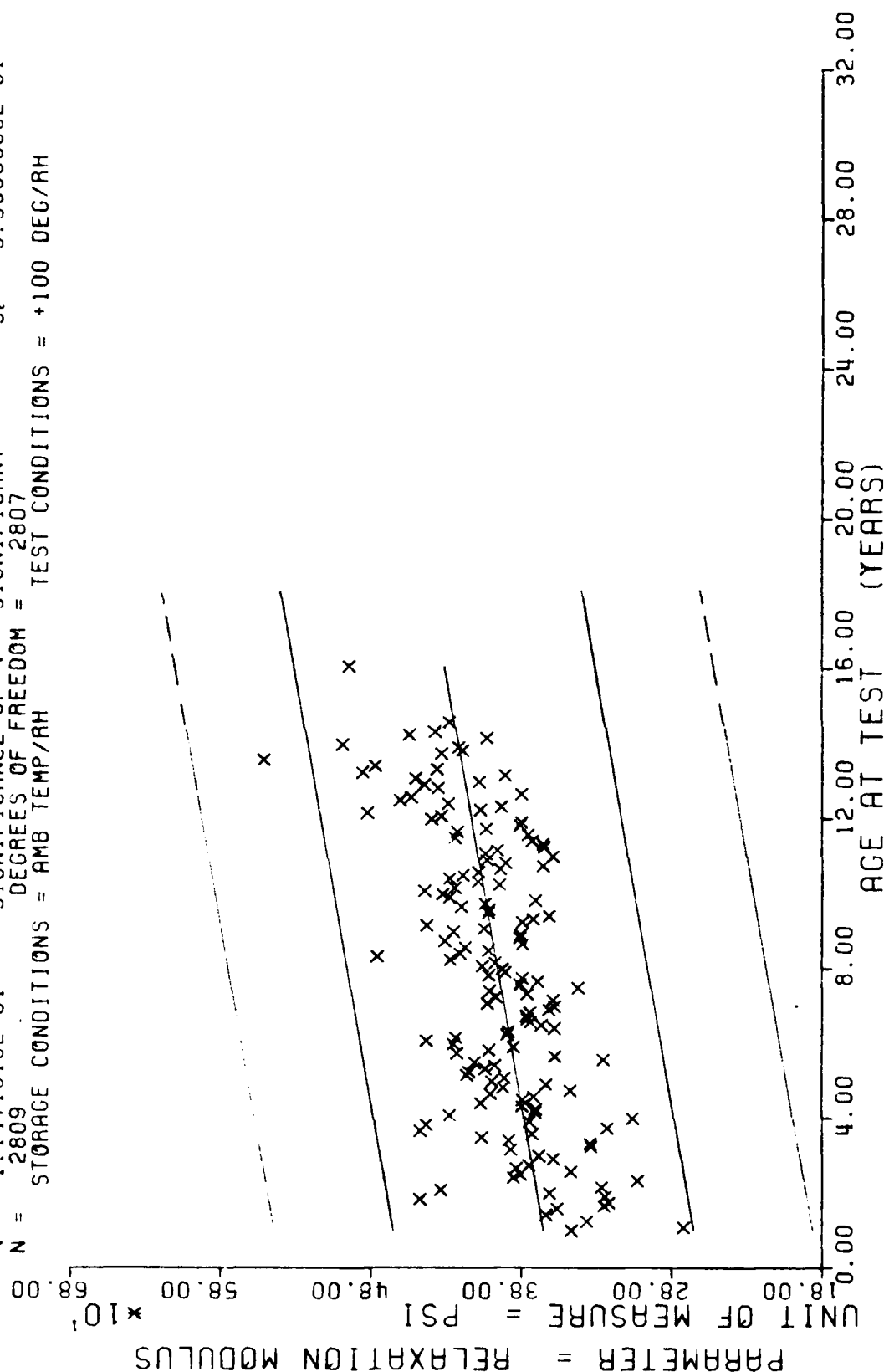
This sample size summary is applicable to figures 40 thru 43

$Y = ((+4.3090804E+02) + (+4.2187122E-01) * X)$
 $F = +1.1581774E+02$ SIGNIFICANCE OF F = SIGNIFICANT $\sigma_r = +7.5142346E+01$
 $R = +1.9902718E-01$ SIGNIFICANCE OF R = SIGNIFICANT $S_b = +3.9200566E-02$
 $t = +1.0761865E+01$ SIGNIFICANCE OF t = SIGNIFICANT $S_r = +7.3652157E+01$
 $N = 2810$ DEGREES OF FREEDOM = 2808
 STORAGE CONDITIONS = AMB TEMP/AM TEST CONDITIONS = +100 DEG/AM



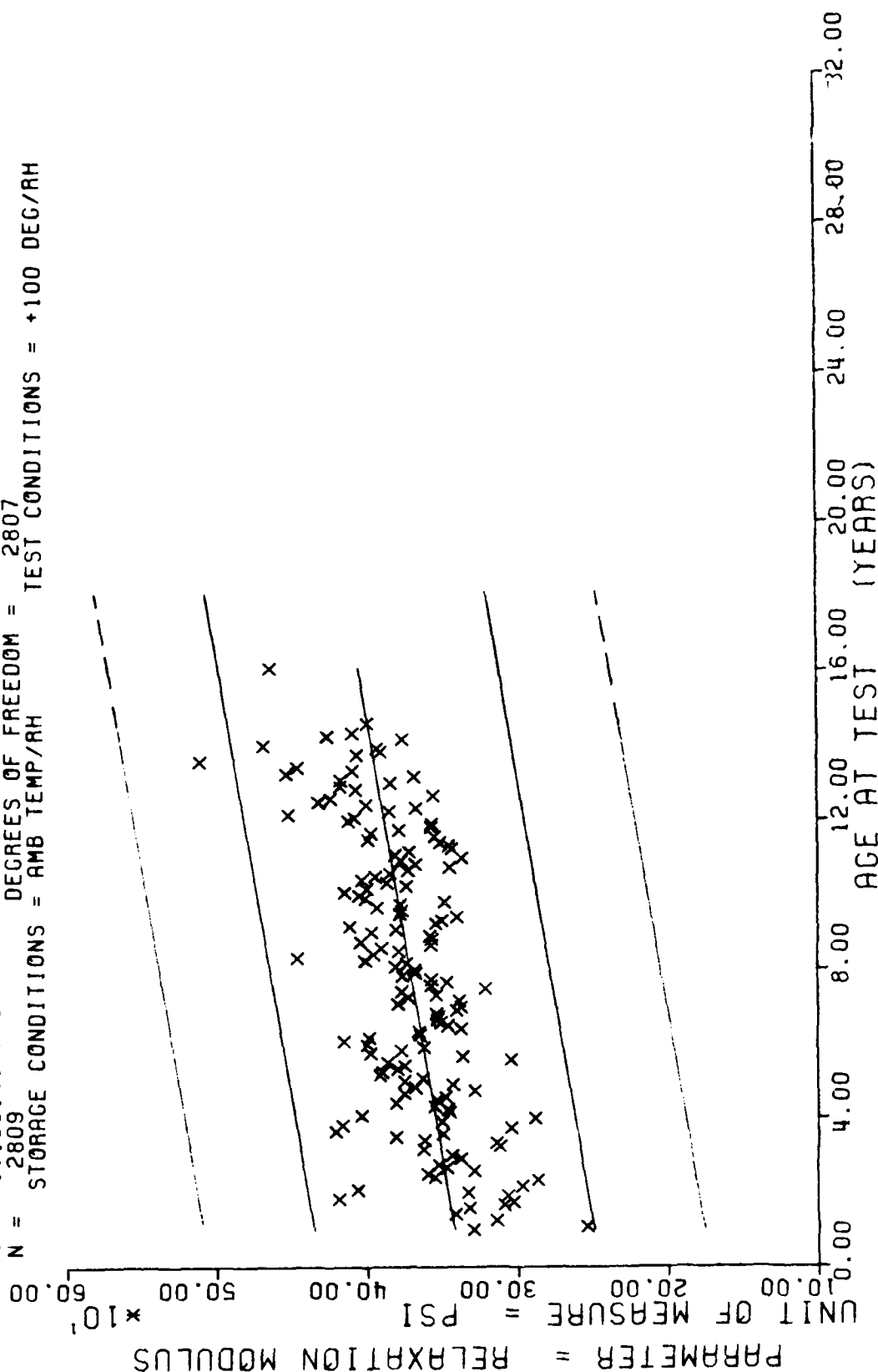
WING 6. STRESS RELAXATION MODULUS, 3.0% STRAIN, 10 SEC, 100 DEG F, TPH-1011

$Y = ((+3.6086285E+02) + (+3.6461187E-01) * X)$
 $F = +1.3159805E+02$ SIGNIFICANCE OF F = SIGNIFICANT $\sigma_t = +6.1061072E+01$
 $R = +2.1161898E-01$ SIGNIFICANCE OF R = SIGNIFICANT $S_b = +3.1783819E-02$
 $t = +1.1471619E+01$ SIGNIFICANCE OF t = SIGNIFICANT $S_t = +5.9688805E+01$
 $N = 2809$ DEGREES OF FREEDOM = 2807
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +100 DEG/RH



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

$F = +1.3645550E+02$
 $R = +2.1531128E-01$
 $I = +1.1681417E+01$
 $N = 2809$
 $Y = ((+3.3808761E+02) + (+3.4550509E-01) * X)$
 SIGNIFICANCE OF F = SIGNIFICANT
 SIGNIFICANCE OF R = SIGNIFICANT
 SIGNIFICANCE OF I = SIGNIFICANT
 DEGREES OF FREEDOM = 2807
 STORAGE CONDITIONS = AMB TEMP/RH
 TEST CONDITIONS = +100 DEG/RH



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

$Y = ((+2.7198106E+02) + (+2.3085690E-01) * X)$
 SIGNIFICANCE OF F = SIGNIFICANT
 SIGNIFICANCE OF R = SIGNIFICANT
 SIGNIFICANCE OF t = SIGNIFICANT
 DEGREES OF FREEDOM = 2801
 TEST CONDITIONS = +100 DEG/RH
 WING 6. STRESS RELAXATION MODULUS, 3.0% STRAIN, 1000 SEC, 100 DEG F, TPH-1011

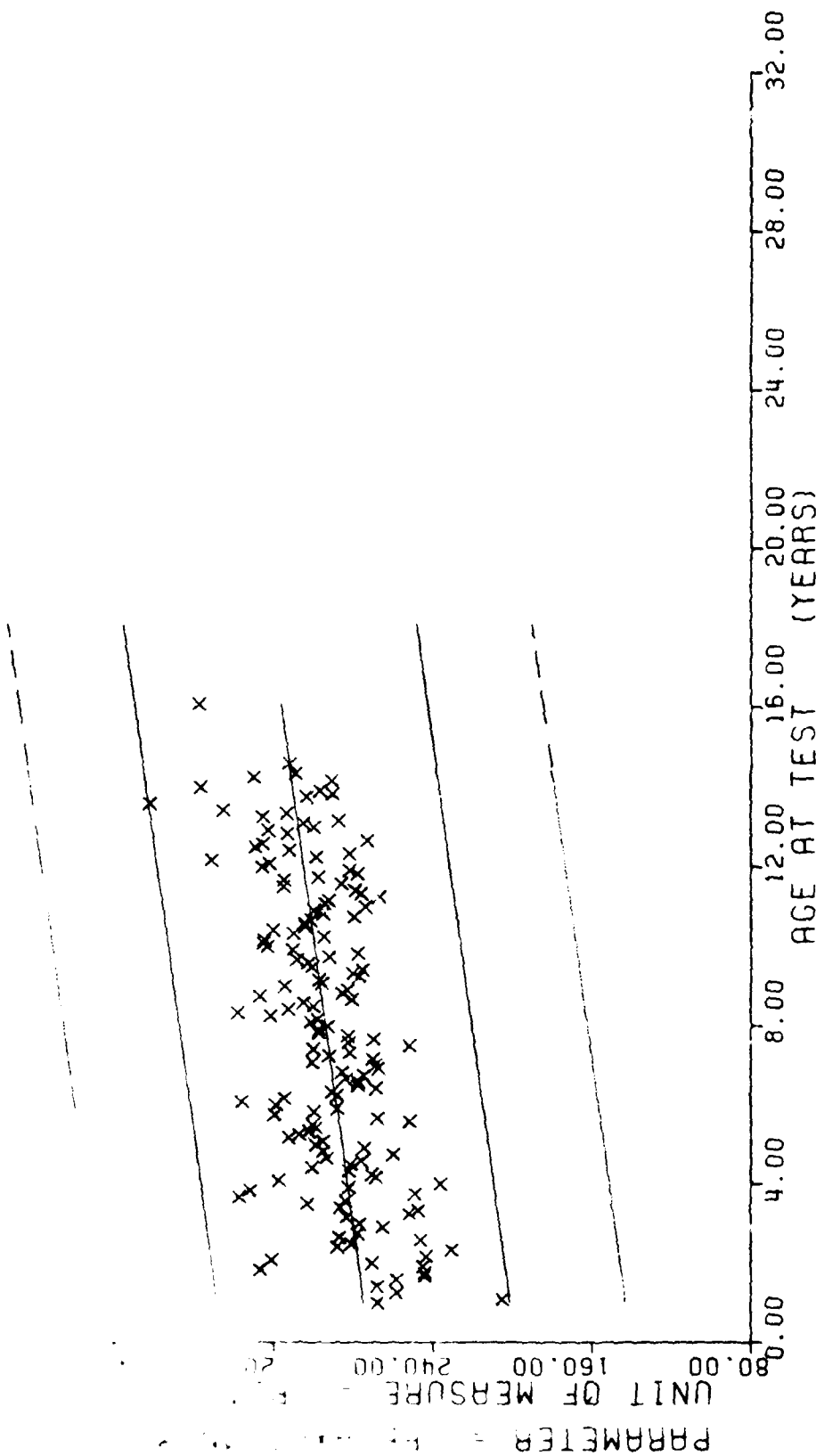


Figure 43

AGE (HRS)	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP
3	34	57	59	42	84	21	109	9	134	39
4	35	36	60	65	85	12	110	12	135	12
10	36	51	61	75	86	18	111	9	136	6
12	37	21	62	72	87	24	112	30	137	21
13	38	18	63	60	88	15	113	51	138	42
14	39	48	64	57	89	21	114	44	139	54
15	40	18	65	33	90	24	115	27	140	12
16	41	21	66	45	91	27	116	39	141	15
17	42	15	67	30	92	18	117	21	142	27
18	43	9	68	48	93	24	118	27	143	33
19	44	9	69	78	94	24	119	21	144	9
20	45	3	70	84	95	32	120	33	145	6
21	46	12	71	69	96	90	121	21	146	6
22	47	30	72	69	97	77	122	9	147	12
23	48	39	73	45	98	93	123	15	148	3
24	49	39	74	62	99	42	124	21	149	9
25	50	36	75	46	100	21	125	15	150	6
26	51	60	76	36	101	21	126	24	151	15
27	52	69	77	36	102	8	127	17	152	6
28	53	27	78	36	103	21	128	18	153	3
29	54	30	79	17	104	6	129	2	154	9
30	55	33	80	23	105	9	130	36	155	3
31	56	42	81	33	106	3	131	54	156	9
32	57	51	82	27	107	6	132	9	157	9
33	58	57	83	18	108	24	133	15	158	9
									159	3
									160	6
									161	19
									163	3
									165	3
									166	6
									167	12
									168	3
									170	3
									171	6
									172	3
									175	3
									193	3

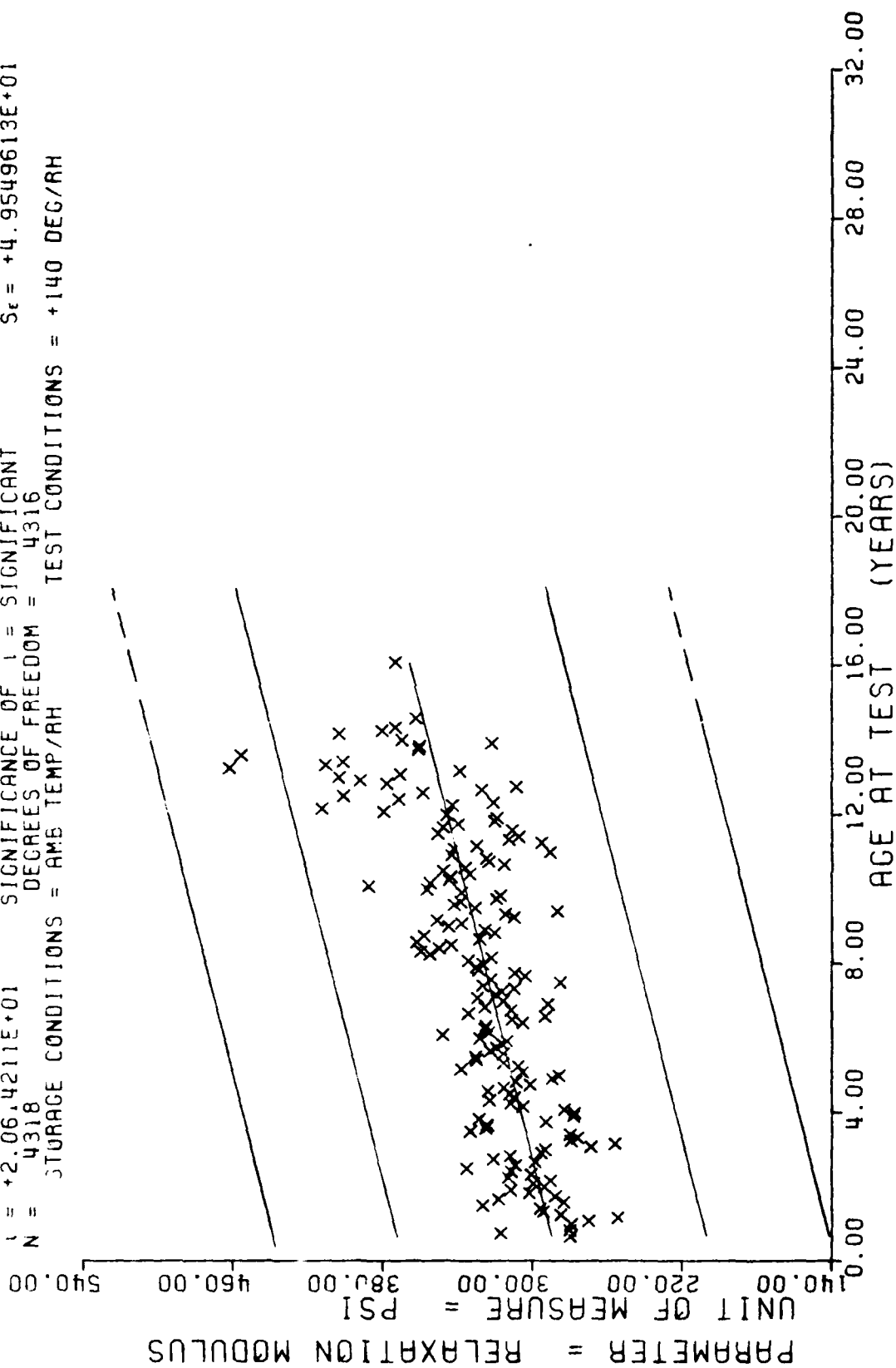
*145 6% STRESS RELAXATION MODULUS, 3.0% STRAIN, 10 SEC, 140 DEG F, TPH-1011

This sample size summary is applicable to figures 44 thru 47

TABLE I. STRESS RELAXATION MODULUS, 3.0% STRAIN, 10 SEC, 140 DEG F, TPH-1011

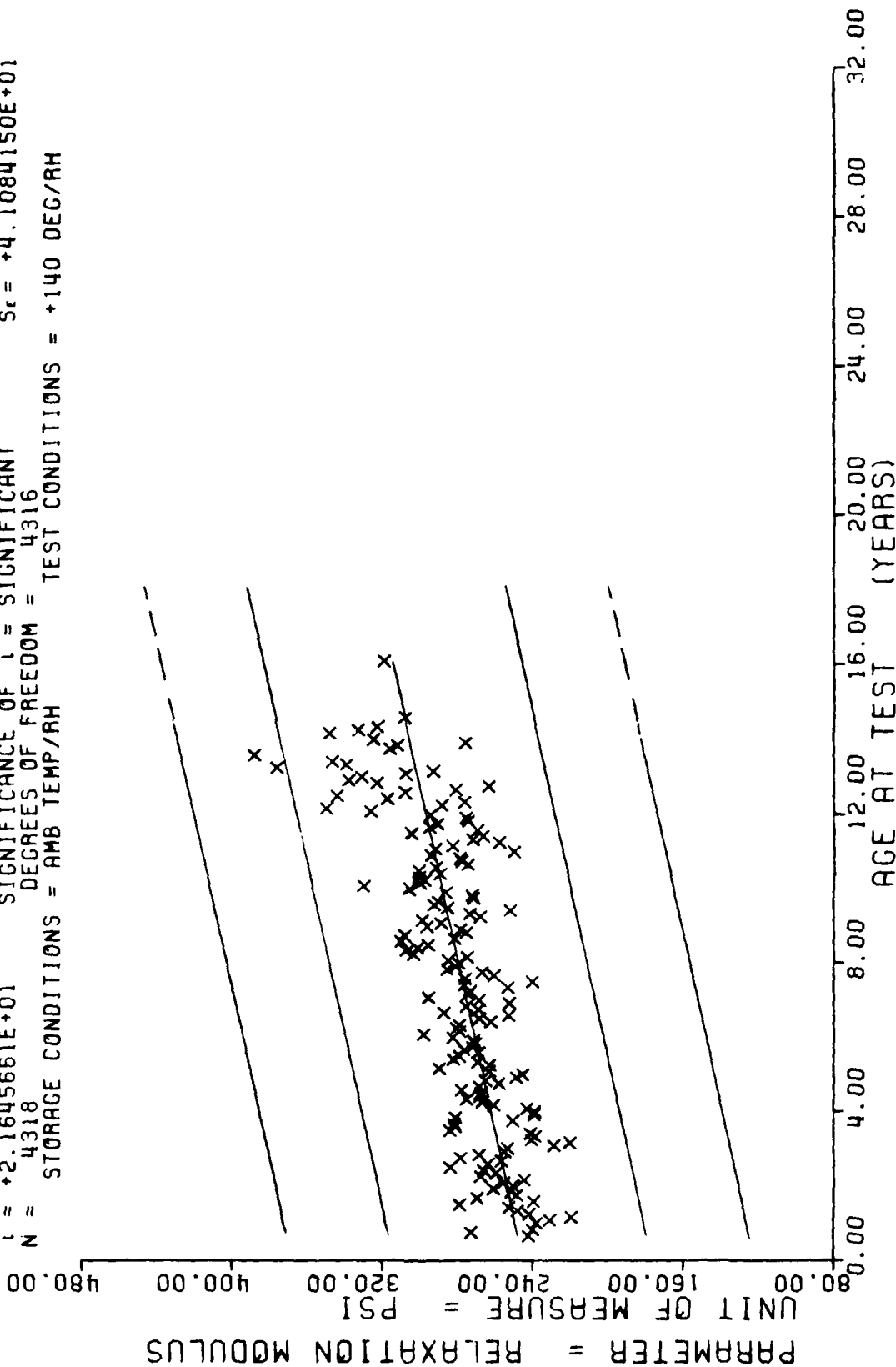
This sample size summary is applicable to figures 44 thru 47

$F = +4.2494572E+02$
 $R = +2.9938789E-01$
 $t = +2.064211E+01$
 $N = 4318$
 $Y = ((+2.8646654E+02) + (+4.1242284E-01) * X)$
 SIGNIFICANCE OF F = SIGNIFICANT
 SIGNIFICANCE OF R = SIGNIFICANT
 SIGNIFICANCE OF t = SIGNIFICANT
 DEGREES OF FREEDOM = 4316
 STORAGE CONDITIONS = AMB TEMP/RH
 TEST CONDITIONS = +140 DEG/RH



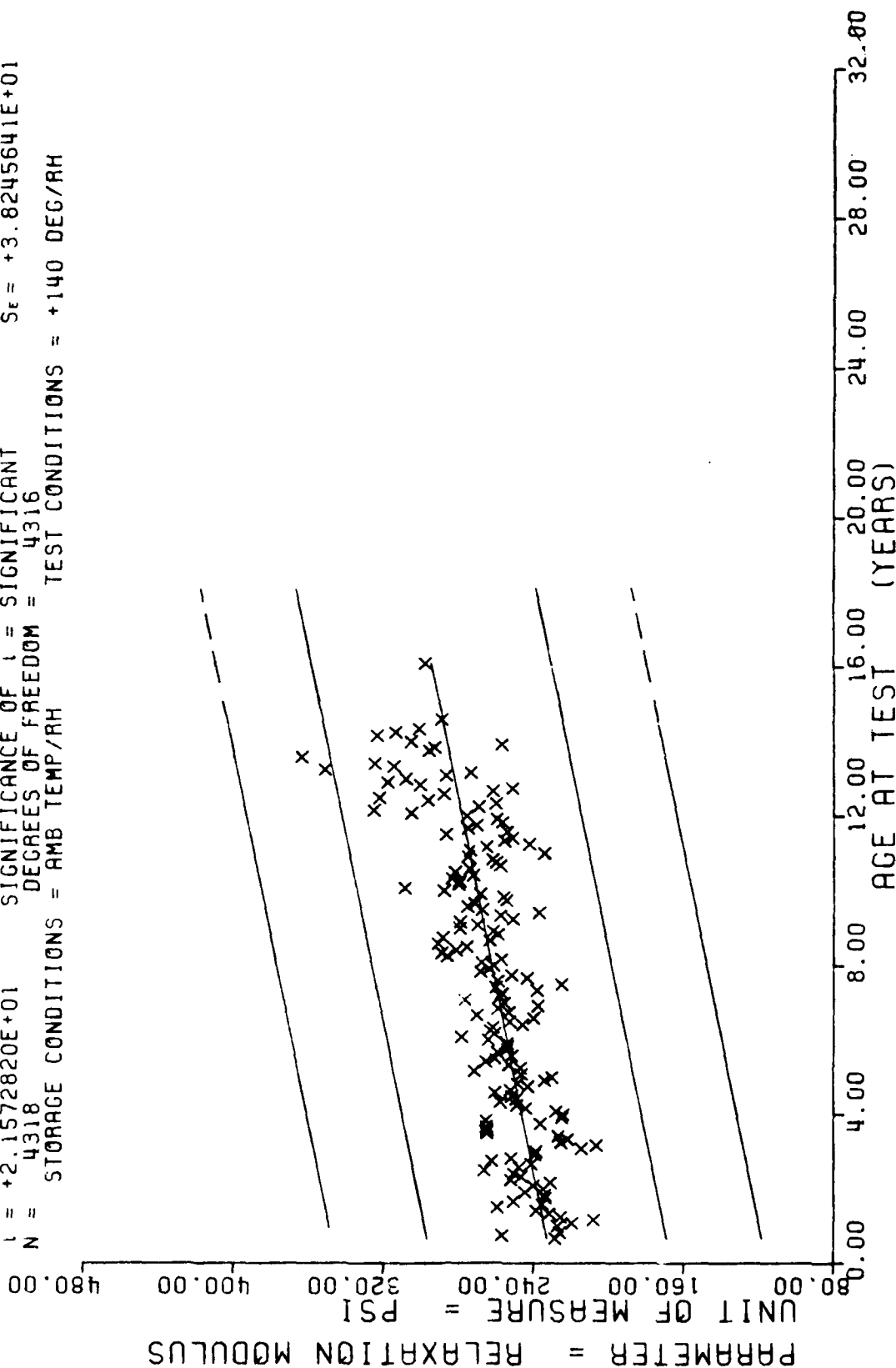
WING 6. STRESS RELAXATION MODULUS. 3.0% STRAIN. 10 SEC. 140 DEG F. TPH-1011

$Y = ((+2.4523825E+02) + (+3.5907145E-01) * X)$
 $F = +4.6853467E+02$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = +3.1293274E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +2.1645661E+01$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 4318$ DEGREES OF FREEDOM = 4316
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +140 DEG/RH



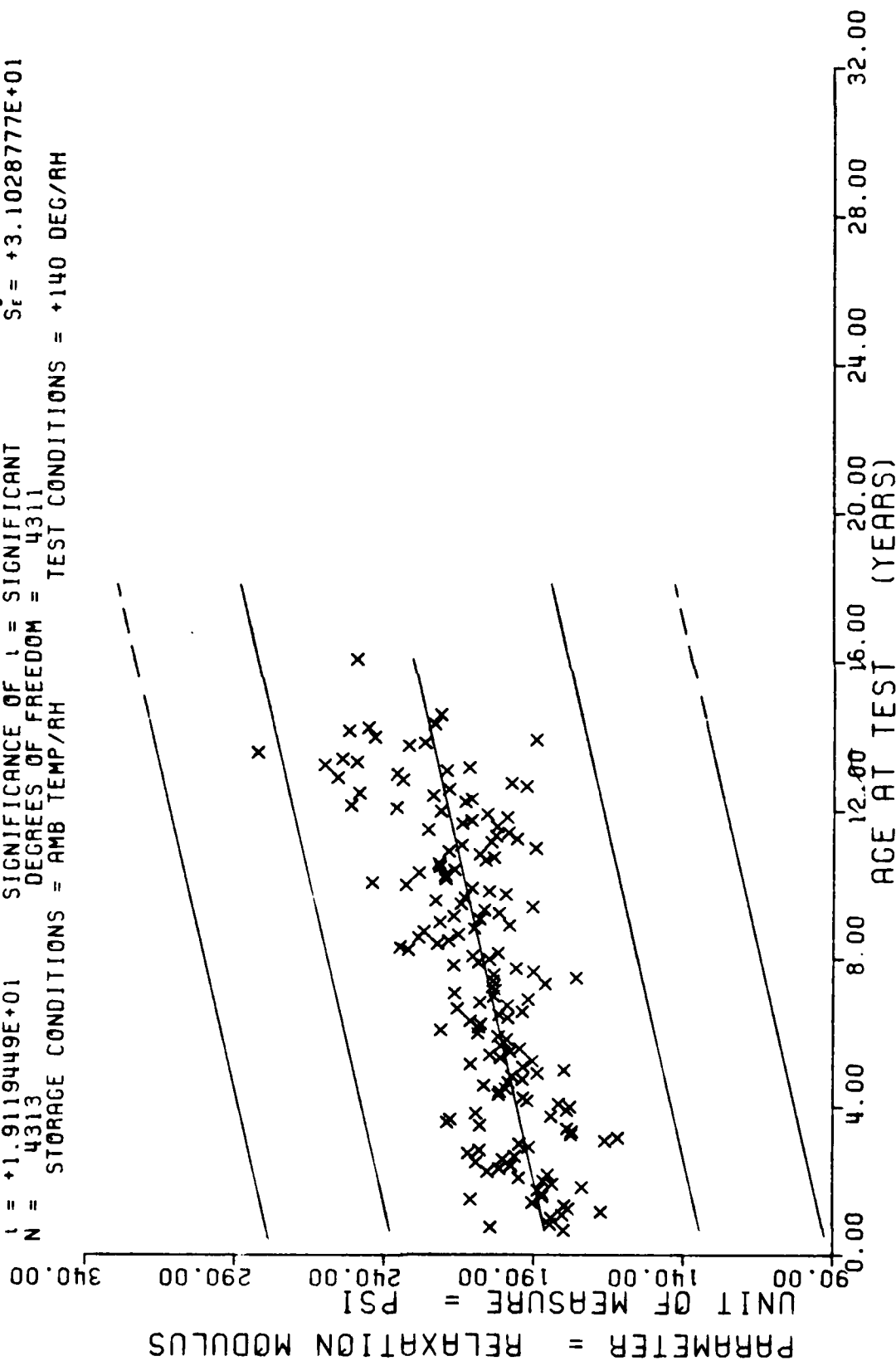
WING 6. STRESS RELAXATION MODULUS. 3.0% STRAIN. 50 SEC. 140 DEG F. IPH-1011

$Y = ((+2.3039510E+02) + (+3.3313831E-01) * X)$
 $F = +4.6538657E+02$ SIGNIFICANCE OF F = SIGNIFICANT $\sigma_e = +4.0250182E+01$
 $R = +3.1198233E-01$ SIGNIFICANCE OF R = SIGNIFICANT $S_b = +1.5442501E-02$
 $t = +2.1572820E+01$ SIGNIFICANCE OF t = SIGNIFICANT $S_e = +3.8245641E+01$
 $N = 4318$ DEGREES OF FREEDOM = 4316
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +140 DEG/RH



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

$Y = ((+1.8426948E+02) + (+2.3958143E-01) * X)$
 $F = +3.6555335E+02$ SIGNIFICANCE OF F = SIGNIFICANT $\sigma_1 = +3.2313815E+01$
 $R = +2.7958408E-01$ SIGNIFICANCE OF R = SIGNIFICANT $S_e = +1.2530770E-02$
 $t = +1.9119449E+01$ SIGNIFICANCE OF t = SIGNIFICANT $S_t = +3.1028777E+01$
 $N = 4313$ DEGREES OF FREEDOM = 4311
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +140 DEG/RH



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

*** SAMPLE SIZE SUMMARY ***

AGE (HRS)	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP
3	54	51	59	42	84	24	109	9	134	27
9	36	33	60	63	85	9	110	9	135	12
10	36	57	61	69	36	21	111	6	136	6
12	37	21	62	73	87	27	112	36	137	21
13	36	18	63	66	88	30	113	54	138	60
14	39	48	64	51	89	30	114	41	139	50
15	40	18	65	36	90	39	115	24	140	12
16	41	21	66	45	91	27	116	39	141	15
17	42	18	67	30	92	18	117	21	142	26
18	43	9	68	51	93	24	118	20	143	39
19	44	6	69	78	94	23	119	15	144	12
20	45	6	70	80	95	30	120	32	145	3
21	46	6	71	45	96	102	121	12	146	6
22	47	30	72	75	97	78	122	9	147	9
23	48	42	73	50	98	99	123	15	148	6
24	49	42	74	54	99	42	124	21	149	12
25	50	36	75	51	100	20	125	15	150	6
26	51	57	76	39	101	19	126	24	151	15
27	52	62	77	27	102	9	127	17	152	6
28	53	27	78	42	103	21	128	15	153	3
29	54	33	79	18	104	6	129	6	154	6
30	55	53	80	24	105	12	130	30	155	6
31	56	42	81	36	106	3	131	54	156	12
32	57	54	82	27	107	6	132	12	157	9
33	58	57	83	18	108	27	133	15	158	9
									159	3
									160	9
									161	18
									165	3
									166	6
									167	12
									168	3
									170	3
									171	6
									172	3
									175	3
									193	3

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

This sample size summary is applicable to figures 48 thru 51

$Y = ((+2.3449629E+02) + (+3.3422692E-01) * X)$
 $F = +5.0975848E+02$ SIGNIFICANCE OF F = SIGNIFICANT $\sigma_t = +3.8851649E+01$
 $R = +3.2393977E-01$ SIGNIFICANCE OF R = SIGNIFICANT $S_o = +1.4803322E-02$
 $t = +2.2577831E+01$ SIGNIFICANCE OF t = SIGNIFICANT $S_e = +3.6760906E+01$
 $N = 4350$ DEGREES OF FREEDOM = 4348
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +180 DEG/RH

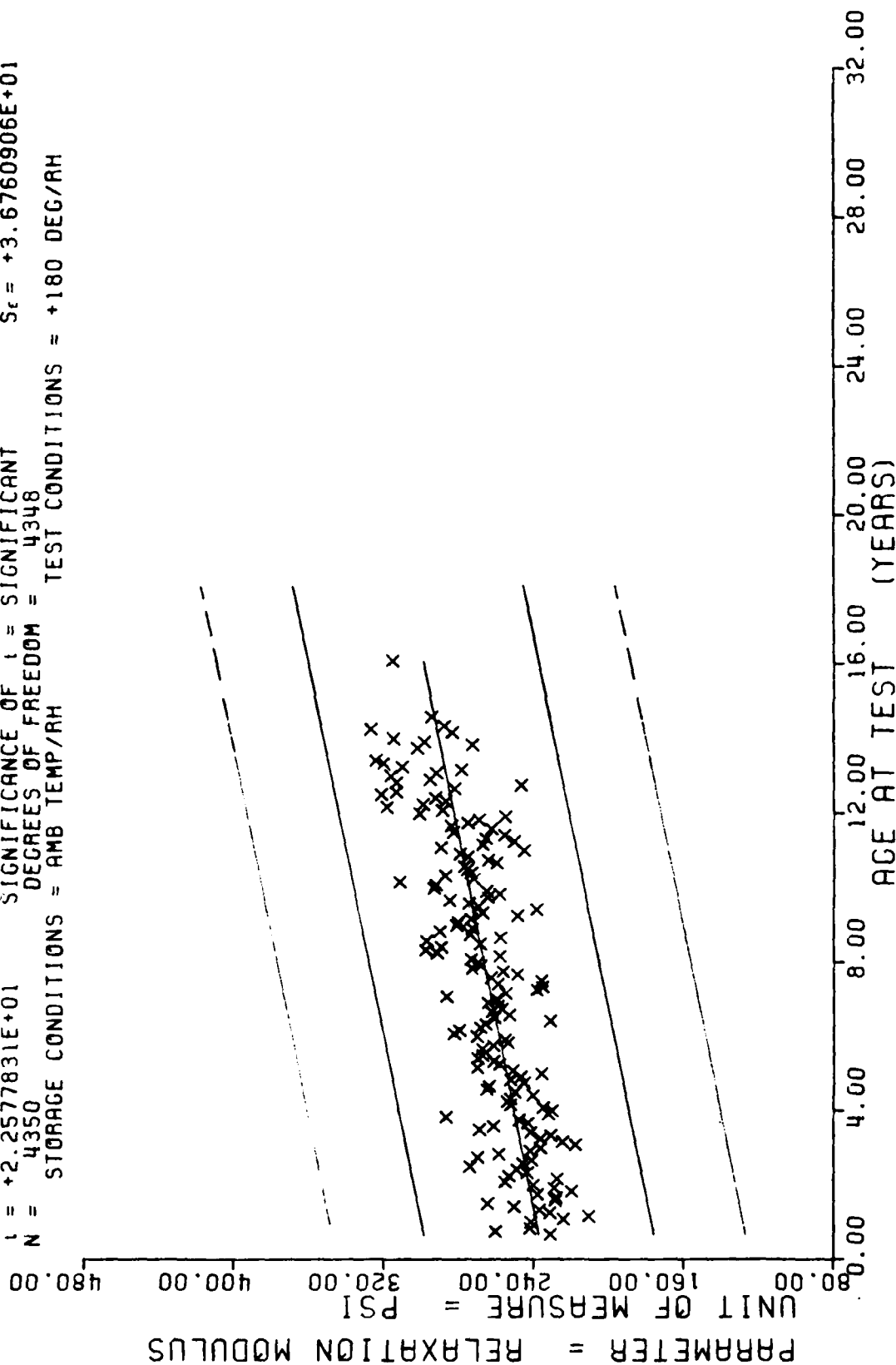
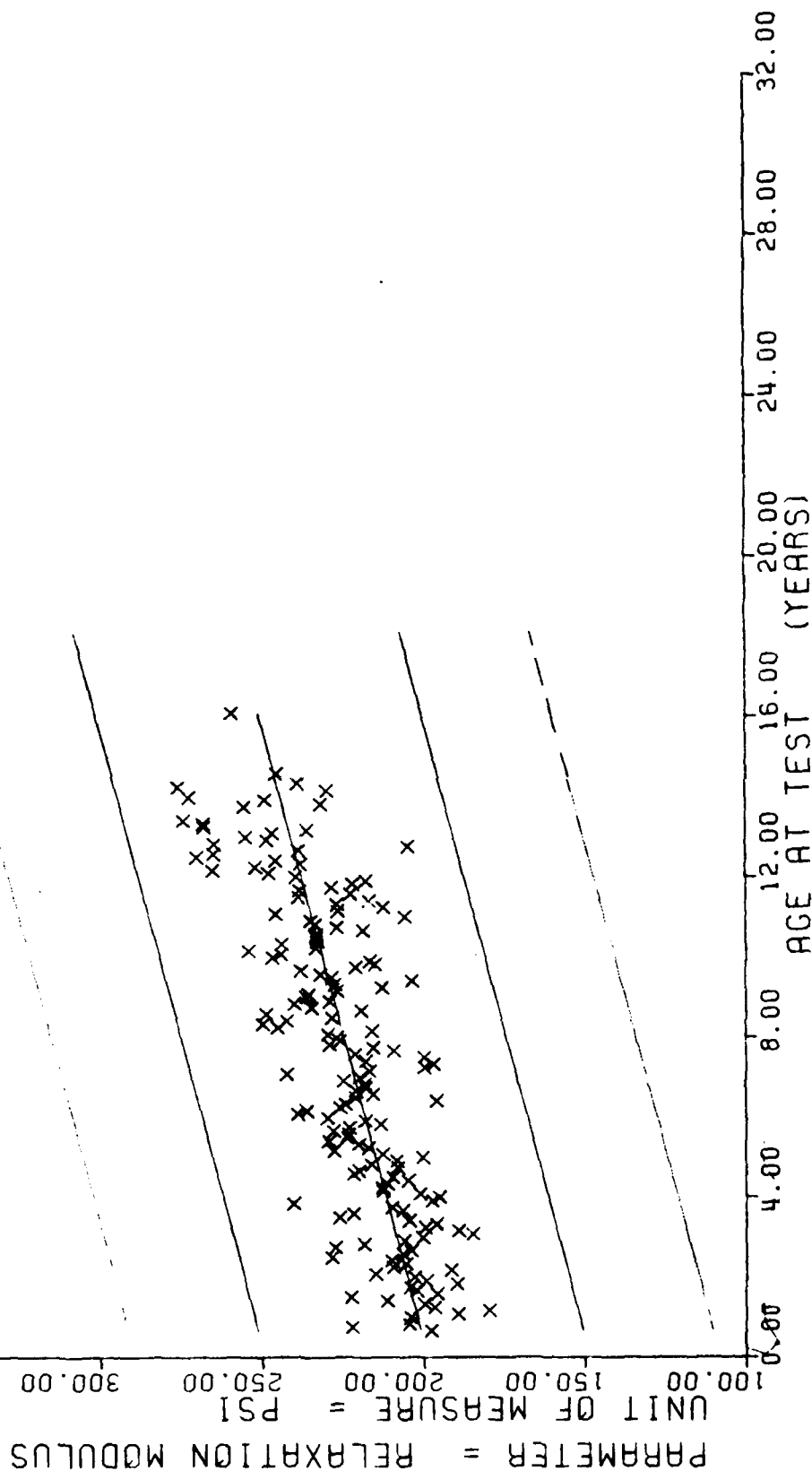


Figure 48

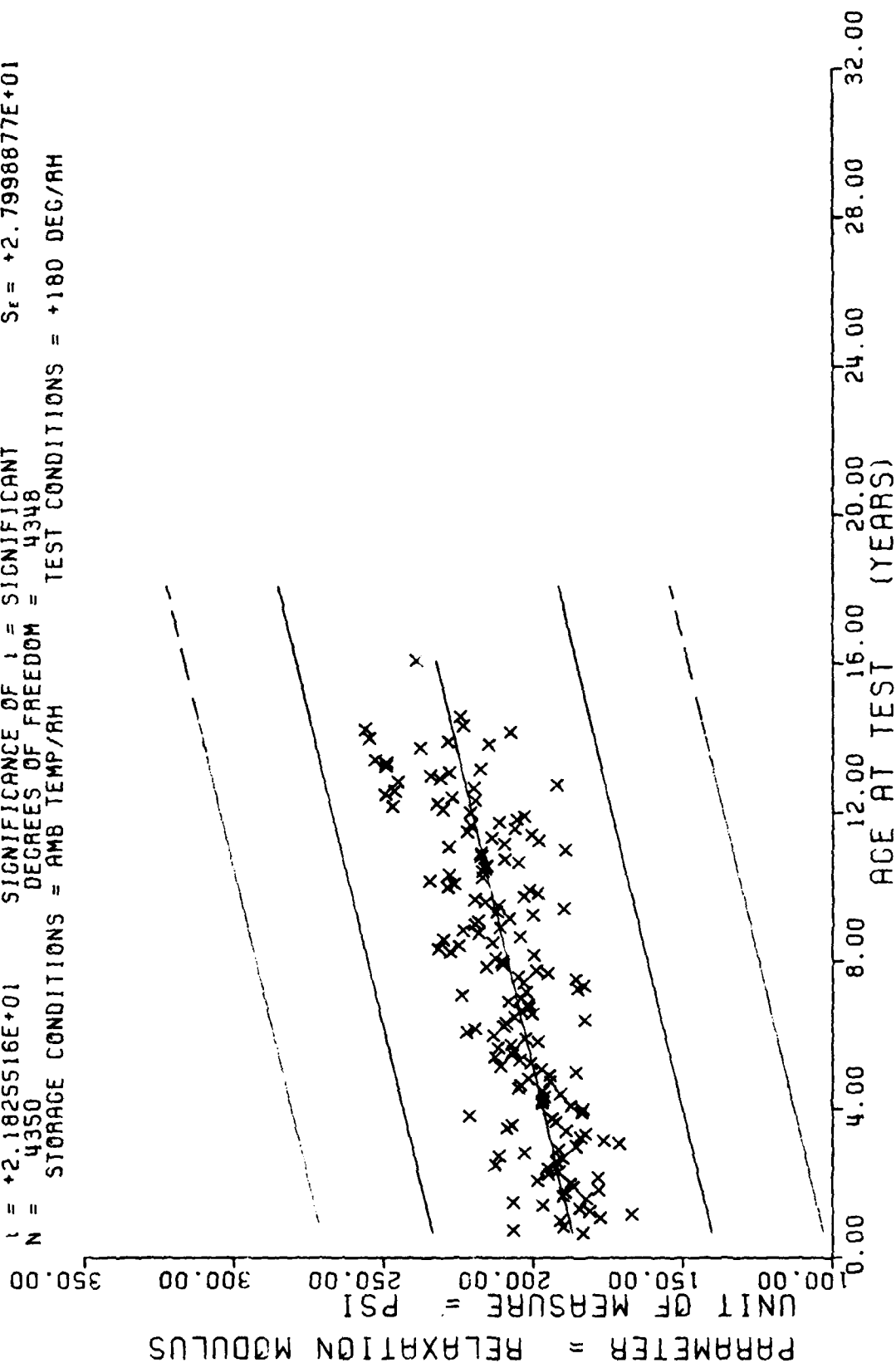
$Y = ((+1.9879571E+02) + (+2.7004416E-01) * X)$
 F = +4.9308537E+02 SIGNIFICANCE OF F = SIGNIFICANT $\sigma_r = +3.1862322E+01$
 R = +3.1914620E-01 SIGNIFICANCE OF R = SIGNIFICANT $S_e = +1.2161124E-02$
 t = +2.2205525E+01 SIGNIFICANCE OF t = SIGNIFICANT $S_f = +3.0199569E+01$
 N = 4350 DEGREES OF FREEDOM = 4348
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +180 DEG/RH



WING 6. STRESS RELAXATION MODULUS. 3.0% STRAIN. 50 SEC. 180 DEG F. TPH-1011

Figure 49

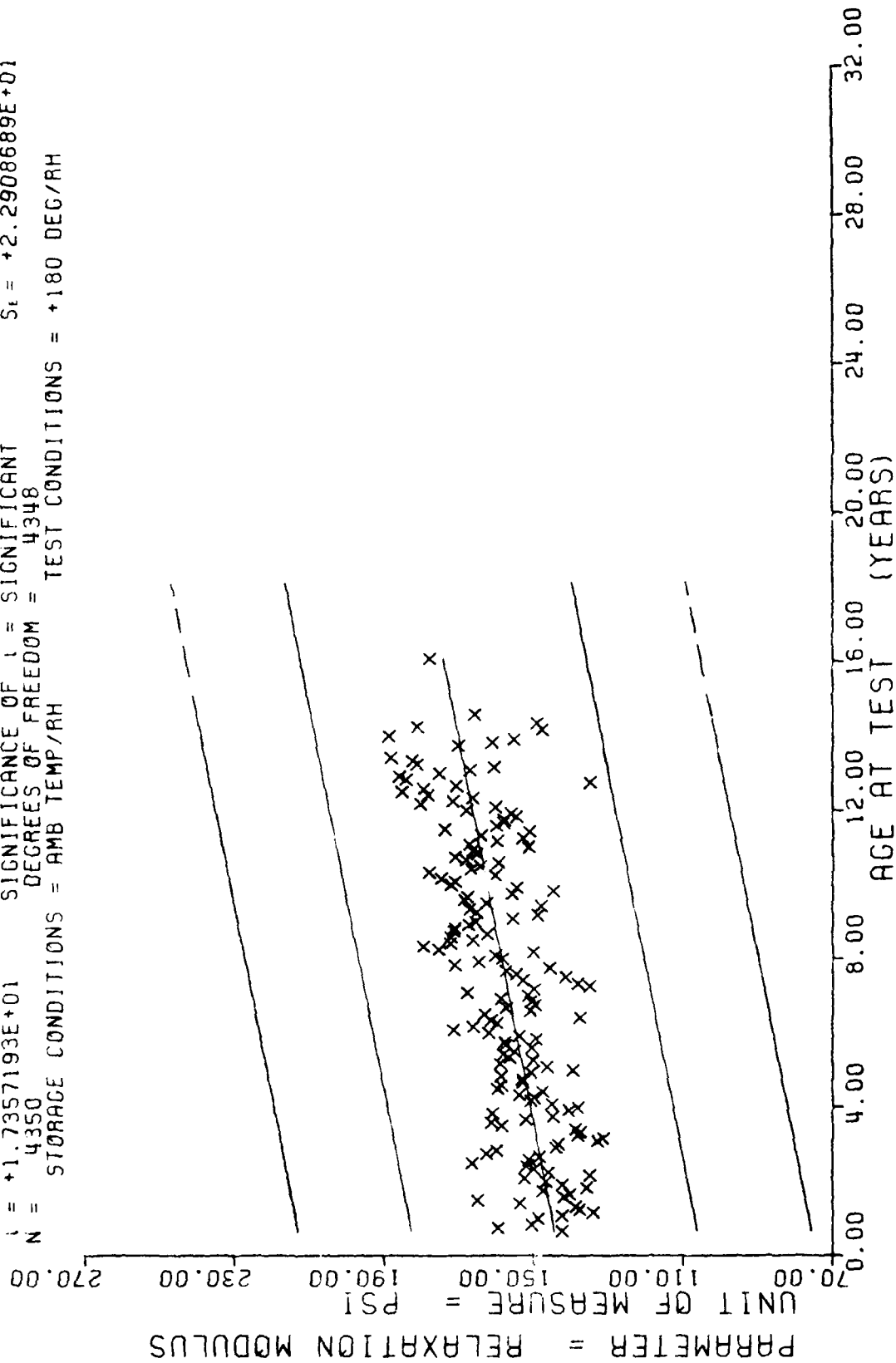
$Y = ((+1.8499090E+02) + (+2.4608102E-01) * X)$
 $F = +4.7635316E+02$ SIGNIFICANCE OF F = SIGNIFICANT $\sigma_r = +2.9489367E+01$
 $R = +3.1422807E-01$ SIGNIFICANCE OF R = SIGNIFICANT $S_e = +1.1274923E-02$
 $t = +2.1825516E+01$ SIGNIFICANCE OF t = SIGNIFICANT $S_r = +2.7998877E+01$
 $N = 4350$ DEGREES OF FREEDOM = 4348
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +180 DEG/RH



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

Figure 50

$Y = ((+1.4319276E+02) + (+1.6012263E-01) * X)$
 $F = +3.0127215E+02$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = +2.5455815E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +1.7357193E+01$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 4350$ DEGREES OF FREEDOM = 4348
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = +180 DEG/RH



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

Figure 51

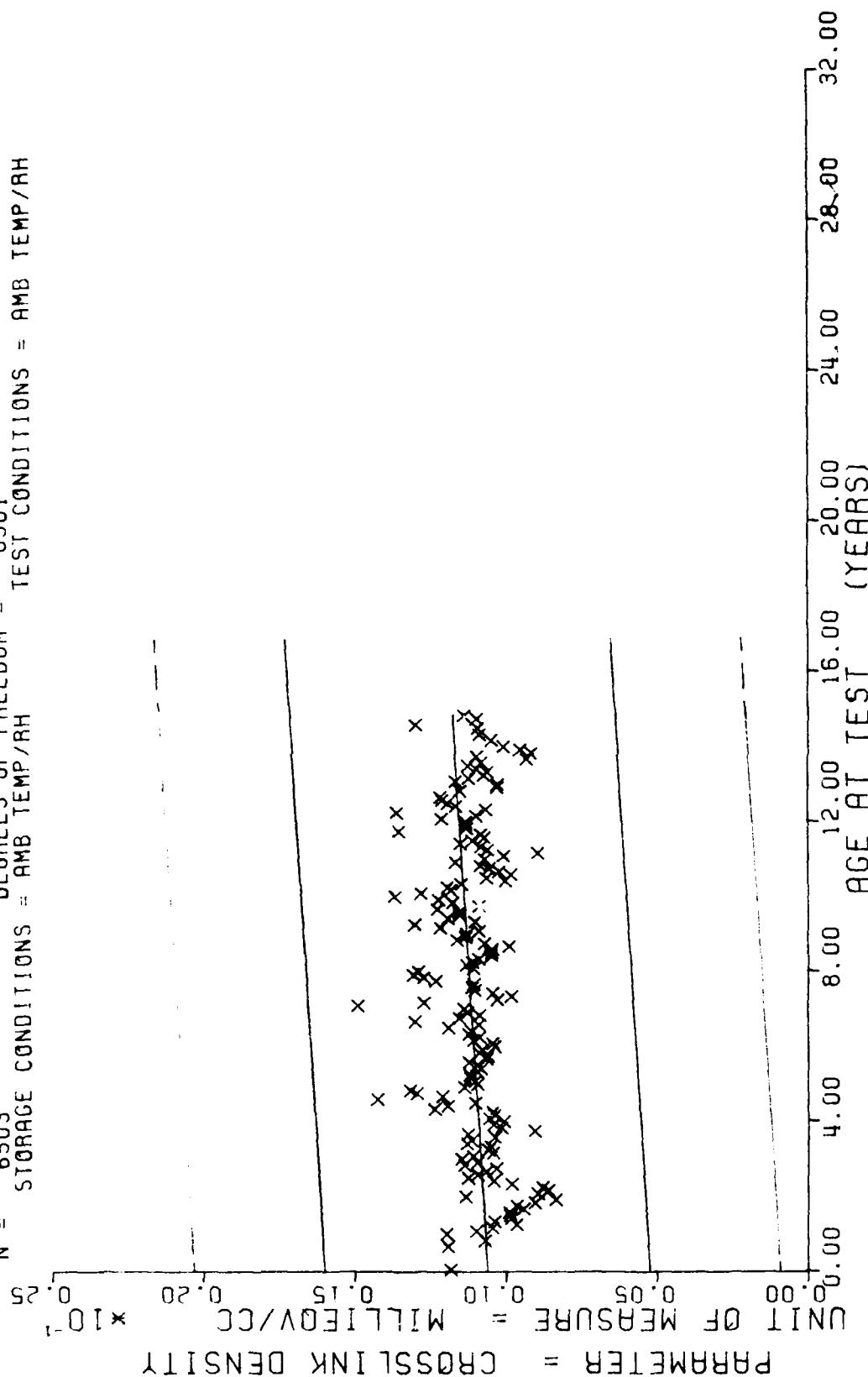
*** SAMPLE SIZE SUMMARY ***

AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP
1	3	34	48	59	44	84	16	109	4	134	44	134	44
8	4	35	64	60	73	85	13	110	24	135	28	135	28
10	24	36	47	61	64	86	16	111	60	136	32	136	32
12	12	37	56	62	74	87	16	112	24	137	15	137	15
13	32	38	47	63	74	88	28	113	31	138	34	138	34
14	36	39	36	64	79	89	44	114	80	139	66	139	66
15	20	40	45	65	90	90	44	115	88	140	29	140	29
16	20	41	36	66	39	91	48	116	71	141	8	141	8
17	28	42	26	67	52	92	32	117	40	142	16	142	16
18	32	43	20	68	64	93	23	118	124	143	12	143	12
19	52	44	4	69	67	94	36	119	106	144	15	144	15
20	12	45	12	70	56	95	39	120	108	145	15	145	15
21	32	46	19	71	84	96	44	121	76	146	7	146	7
22	28	47	36	72	100	97	47	122	64	147	4	147	4
23	24	48	36	73	60	98	47	123	12	148	20	148	20
24	8	49	44	74	122	99	126	124	12	149	12	149	12
25	40	50	24	75	75	100	110	125	4	150	16	150	16
26	56	51	60	76	70	101	98	126	11	151	15	151	15
27	32	52	103	77	55	102	54	127	28	152	12	152	12
28	44	53	112	78	62	103	40	128	20	154	20	154	20
29	43	54	14	79	38	104	16	129	52	155	4	155	4
30	44	55	42	80	50	105	4	130	28	156	15	156	15
31	72	56	70	81	40	106	28	131	74	157	4	157	4
32	64	57	43	82	20	107	20	132	132	158	12	158	12
33	52	58	86	83	39	108	28	133	86	159	7	159	7

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

This sample size summary is applicable to figure 52

$Y = ((+1.0621727E-02) + (+6.4172132E-06) * X)$
 $F = +3.8065612E+01$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = +7.6297193E-02$ SIGNIFICANCE OF R = SIGNIFICANT
 $L = +6.1697335E+00$ SIGNIFICANCE OF L = SIGNIFICANT
 $N = 6503$ DEGREES OF FREEDOM = 6501
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



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

*** SAMPLE SIZE SUMMARY ***

AGE (MUS)	IF SAMP	AGE (MUS)	NK SAMP	AGE (MUS)	TP SAMP	AGE (MUS)	NK SAMP	AGE (MUS)	NK SAMP	AGE (MUS)	NK SAMP
2	3	27	29	53	72	76	75	103	12	128	15
3	15	28	34	54	42	79	20	104	15	129	9
4	10	29	59	55	34	80	54	105	6	130	60
5	11	30	31	56	74	81	51	106	15	131	102
6	25	31	51	57	84	82	32	107	15	132	21
7	18	32	67	58	60	83	38	108	9	133	24
8	24	33	56	59	40	84	25	109	39	134	39
9	24	34	61	60	53	85	33	110	36	135	24
10	40	35	39	61	72	86	27	111	18	136	12
11	24	36	32	62	99	87	35	112	28	137	30
12	40	37	43	63	94	88	32	113	114	138	87
13	51	38	29	64	92	89	55	114	53	139	63
14	52	39	48	65	37	90	57	115	57	140	29
15	52	40	36	66	37	91	48	116	51	141	21
16	63	41	12	67	62	92	32	117	110	142	24
17	15	42	24	68	82	93	19	118	37	143	75
18	65	43	24	69	65	94	40	119	63	144	9
19	28	44	16	70	83	95	45	120	84	145	13
20	28	46	31	71	40	96	50	121	51	146	18
21	17	47	30	72	39	97	98	122	12	147	6
22	22	48	37	73	85	98	75	123	9	148	6
23	11	49	64	74	72	99	47	124	3	149	17
24	19	50	17	75	74	100	39	125	9	150	3
25	64	51	60	76	70	101	27	126	3	151	9
26	22	52	90	77	43	102	14	127	3	152	9

STAGE 1	WING 6	TP-H 1011	CUNSTANT STRAIN	Age	Nr
				153	6
				154	9
				155	6
				156	5
				157	12
				158	3
				159	12
				160	9
				161	12
				162	3
				165	3
				166	9
				167	9
				168	9
				169	9
				170	3
				171	3
				172	9
				175	9

This sample size summary is applicable to figure 53

10-A100 361

OGDEN AIR LOGISTICS CENTER HILL AFB UT PROPELLANT AN--ETC F/G 21/9.2
PROPELLANT SURVEILLANCE REPORT, LGM-30F & 6 STAGE I. PHASE 6, S--ETC(U)
MAY 81 J A THOMPSON
MANPA-458(81)

UNCLASSIFIED

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END
DATE
FILMED
7 81
DTIC

$F = +3.8022848E+02$
 $R = -2.4118967E-01$
 $t = +1.9499448E+01$
 $N = 6158$
 $Y = ((+2.5867539E+01) + (-1.6342077E-02) * X)$
 SIGNIFICANCE OF F = SIGNIFICANT
 SIGNIFICANCE OF R = SIGNIFICANT
 SIGNIFICANCE OF t = SIGNIFICANT
 DEGREES OF FREEDOM = 6156
 STORAGE CONDITIONS = AMB TEMP/RH
 TEST CONDITIONS = AMB TEMP/RH

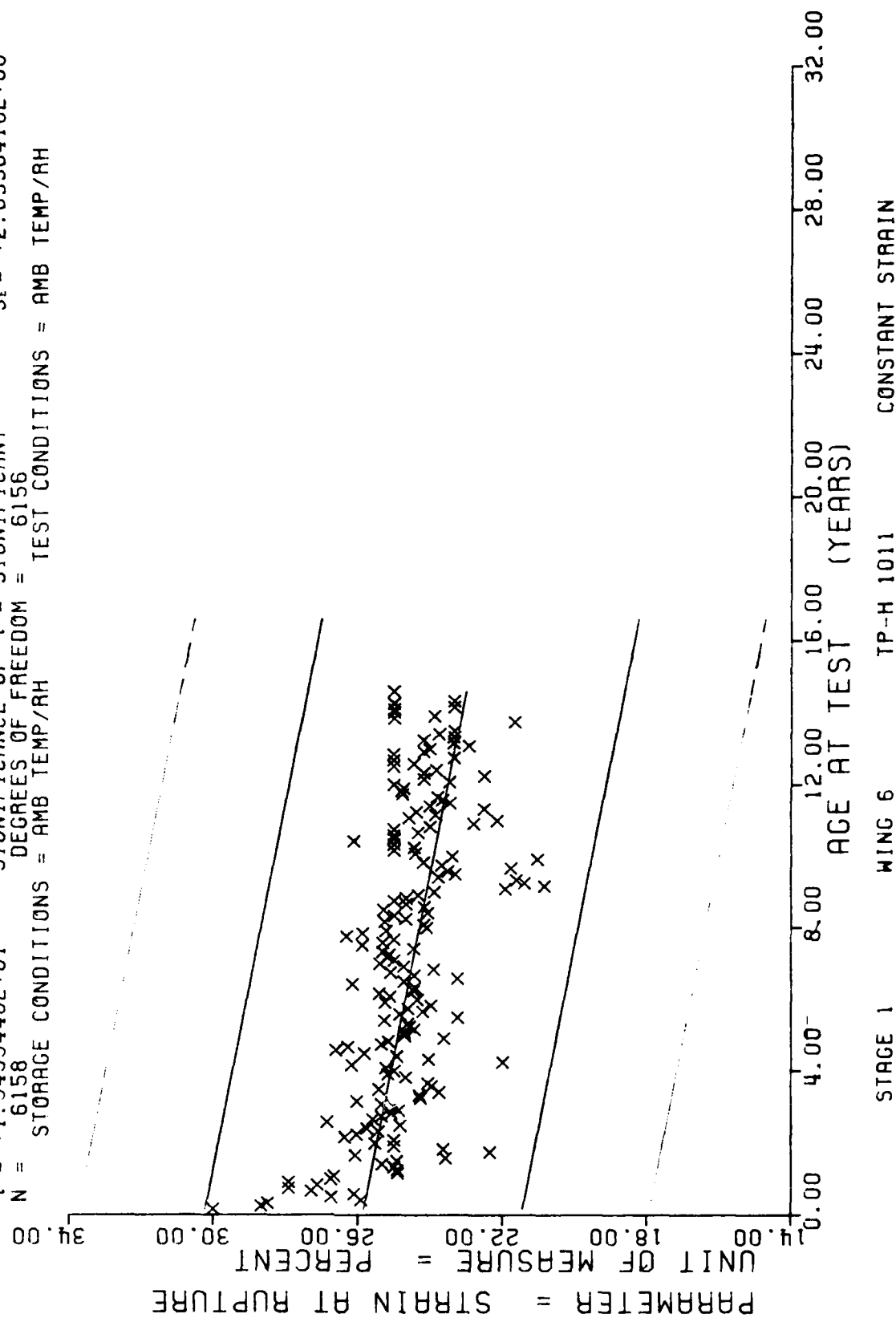


Figure 53

[illegible]

STAGE	1	WING	6	TP-H	1011	SHRE A.	10	SECOND	HARDNESS
-------	---	------	---	------	------	---------	----	--------	----------

This sample size summary is applicable to figure 54

$Y = ((+6.4353471E+01) + (+1.5819392E-02) * X)$
 $F = +4.0150116E+02$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = +2.9808917E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +2.0037494E+01$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 4119$ DEGREES OF FREEDOM = 4117
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH

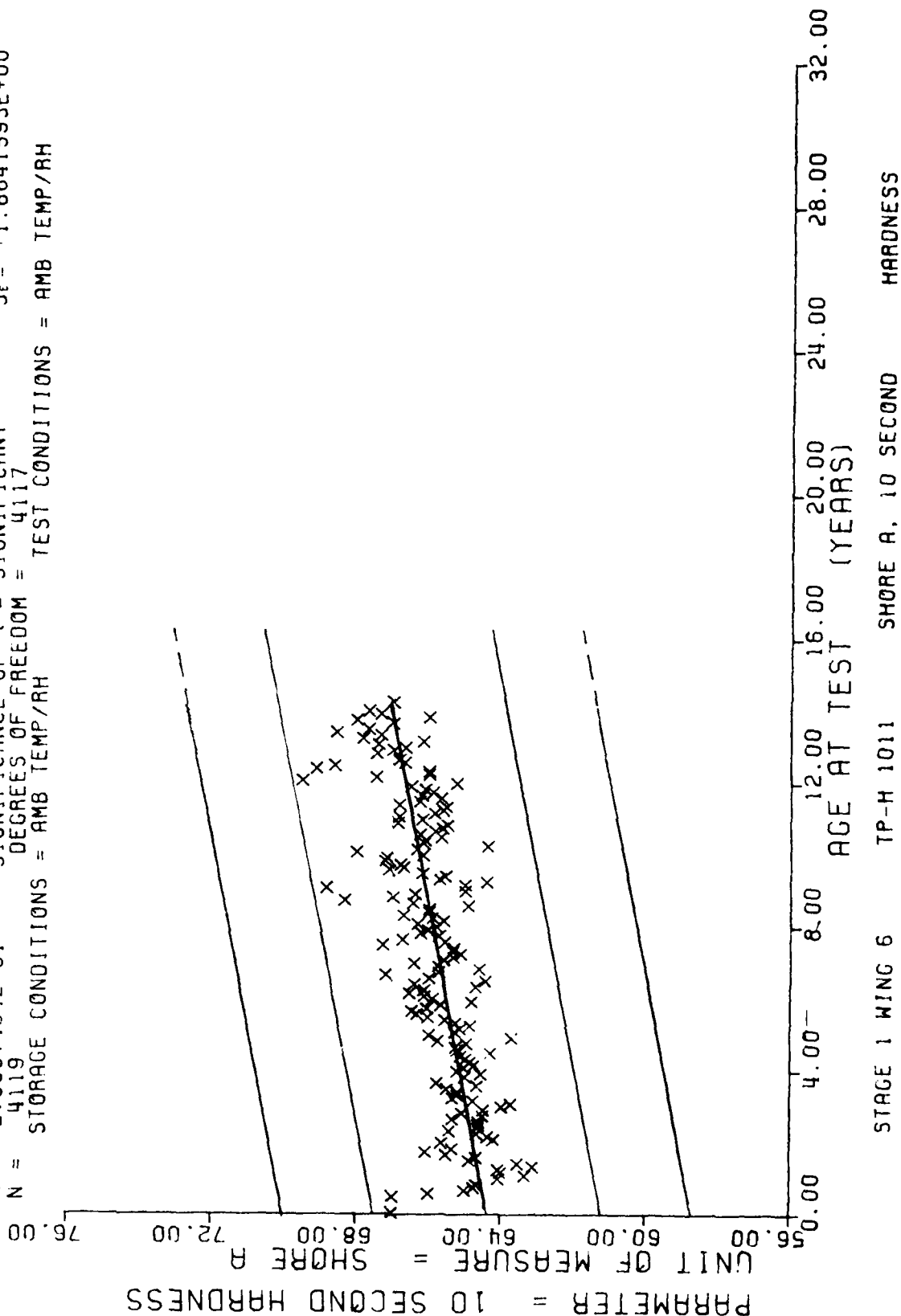


Figure 54

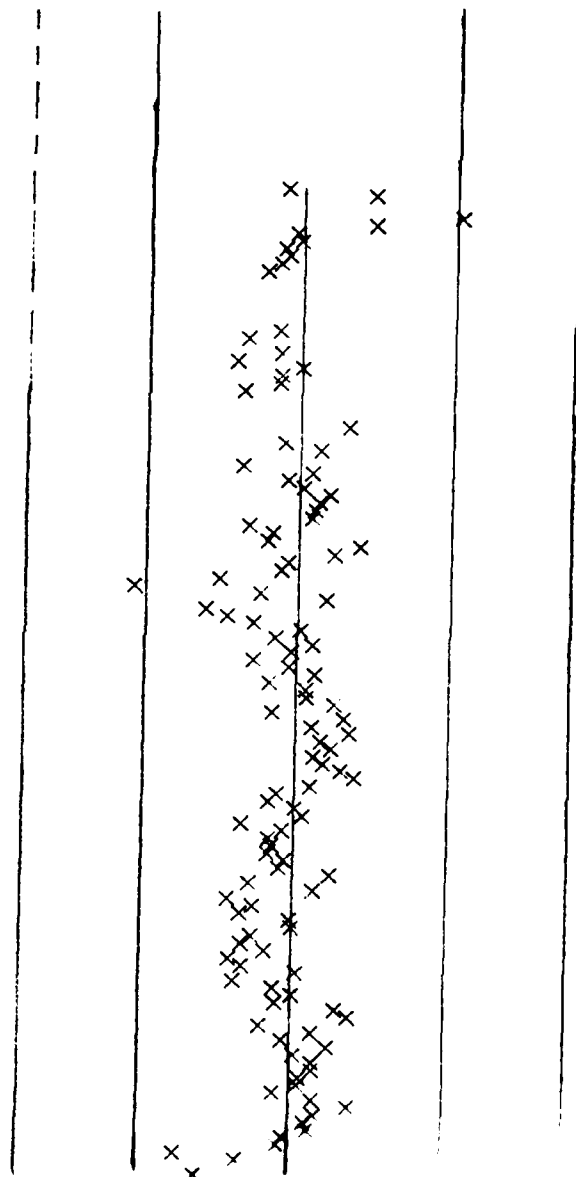
AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP
9	3	34	39	59	57	84	9	115	56
10	15	35	50	60	43	85	3	116	55
11	1	36	39	61	34	86	3	117	7
12	6	37	13	62	79	87	3	118	10
13	15	38	11	63	46	88	12	120	39
14	13	39	16	64	90	89	24	121	12
15	16	40	11	65	72	90	36	129	3
16	17	41	13	66	38	91	24	130	36
17	18	42	30	67	59	92	9	131	33
18	19	43	4	68	38	93	17	132	5
19	22	44	10	69	40	94	15	133	6
20	35	45	7	70	46	95	19	134	18
21	16	46	12	71	11	96	33	135	25
22	19	47	16	72	24	97	77	136	3
23	21	48	4	73	17	98	64	139	12
24	19	49	36	74	28	99	49	140	12
25	25	50	13	75	51	100	26		
26	27	51	38	76	26	101	21		
27	36	52	39	77	22	102	8		
28	38	53	37	78	13	103	6		
29	43	54	47	79	7	105	9		
30	24	55	25	80	21	106	6		
31	51	56	21	81	24	108	3		
32	42	57	25	82	7	113	3		
33	54	58	22	83	9	114	11		

STAGE	WING	TP-H	1011	MAXIMUM PRESSURE	PRESSURE TIME
1	6				

This sample size summary is applicable to figures 55 and 56

$Y = ((+3.5829012E+03) + (-1.9394636E-01) * X)$
 F = +1.0950695E+01 SIGNIFICANCE OF F = SIGNIFICANT
 R = -6.1492941E-02 SIGNIFICANCE OF R = SIGNIFICANT
 t = +3.3091834E+00 SIGNIFICANCE OF t = SIGNIFICANT
 N = 2887 DEGREES OF FREEDOM = 2885
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 500 PSI INT PRES

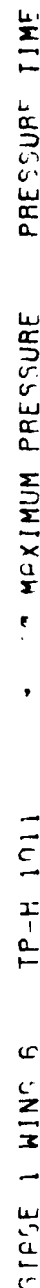
PARAMETER - MAXIMUM
 UNIT OF MEASURE
 0.0
 20.00
 40.00
 60.00
 80.00
 100.00
 120.00
 140.00
 160.00
 180.00
 200.00
 220.00
 240.00
 260.00
 280.00
 300.00
 320.00
 340.00
 360.00
 380.00
 400.00
 420.00
 440.00
 460.00
 480.00
 500.00



2.00 4.00 6.00 8.00 10.00 12.00 14.00 16.00
 AGE AT TEST (YEARS)
 WING 5 TP-H 1011 MAXIMUM PRESSURE PRESSURE TIME

Figure 55

PARAMETER = TIME TO MAX PRESS UNIT OF MEASURE = SECONDS



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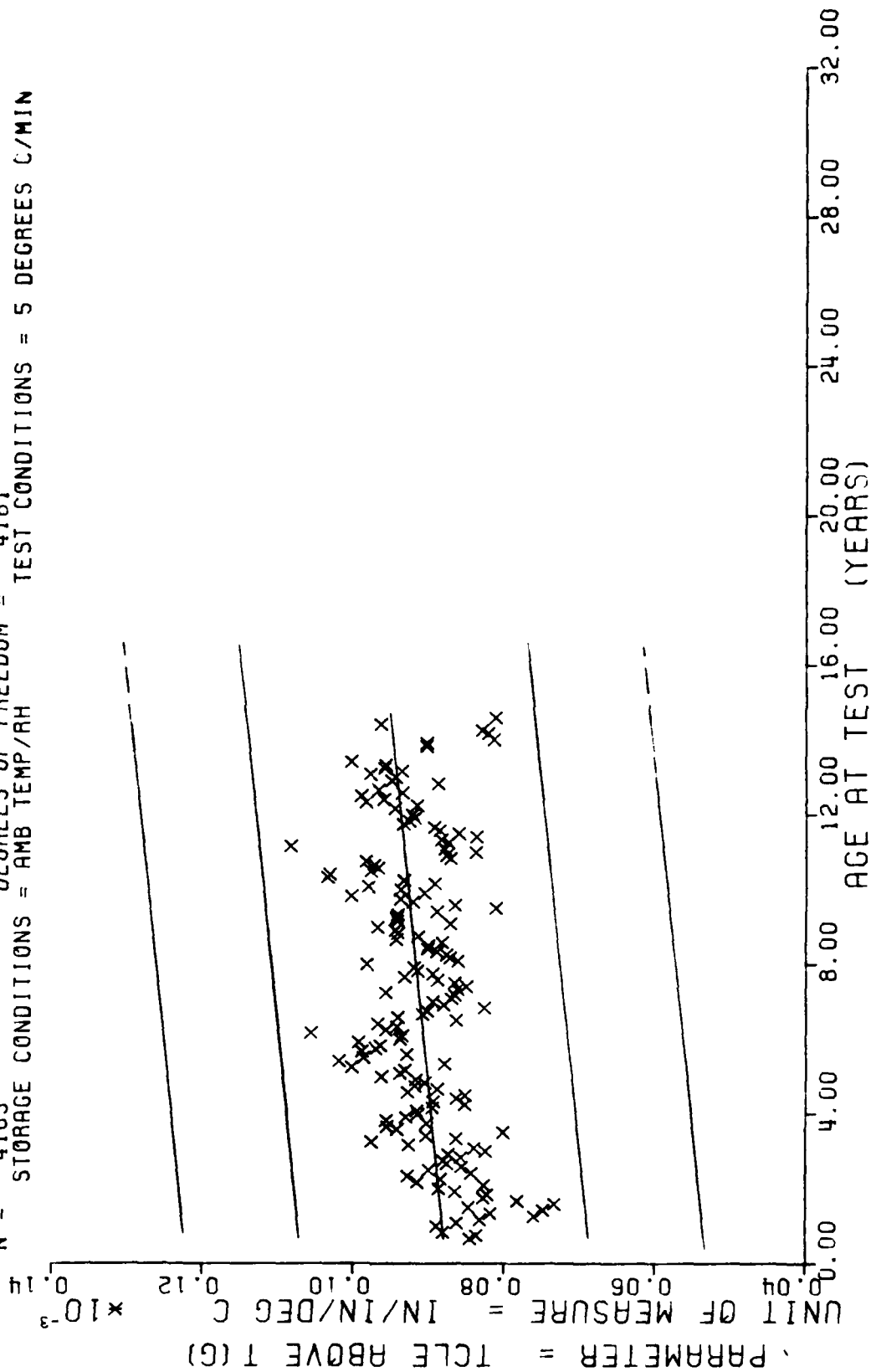
...

[illegible]

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

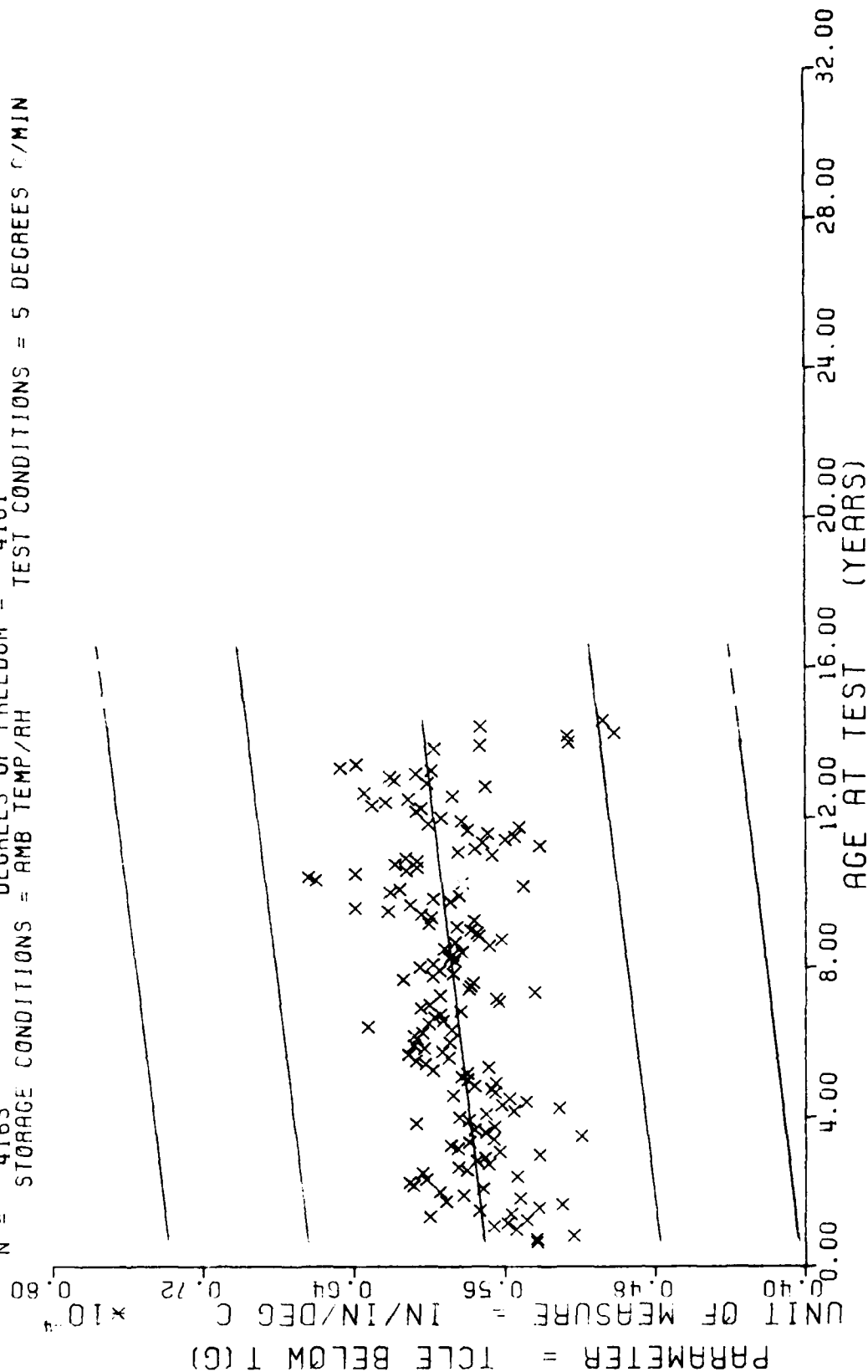
This sample size summary is applicable to figures 57 and 58

$F = +8.2929358E+01$
 $R = +1.3978806E-01$
 $L = +9.1065557E+00$
 $N = 4163$
 $Y = ((+8.7632697E-05) + (+4.2800659E-08) * X)$
 SIGNIFICANCE OF F = SIGNIFICANT
 SIGNIFICANCE OF R = SIGNIFICANT
 SIGNIFICANCE OF L = SIGNIFICANT
 DEGREES OF FREEDOM = 4161
 STORAGE CONDITIONS = AMB TEMP/RH
 TEST CONDITIONS = 5 DEGREES C/MIN
 $\sigma_e = +1.1600406E-01$
 $S_e = +4.6999832E-03$
 $S_t = +1.1487887E-03$



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

$Y = ((+5.6930251E-05) + (1.9695696E-08) * X)$
 $F = +7.4001436E+01$ SIGNIFICANCE OF F = SIGNIFICANT $G = +5.6450901E-06$
 $R = +1.3218838E-01$ SIGNIFICANCE OF R = SIGNIFICANT $S = +2.2895559E-09$
 $t = +8.6024087E+00$ SIGNIFICANCE OF t = SIGNIFICANT $S_e = +5.5962246E-06$
 $N = 4163$ DEGREES OF FREEDOM = 4161
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 5 DEGREES C/MIN



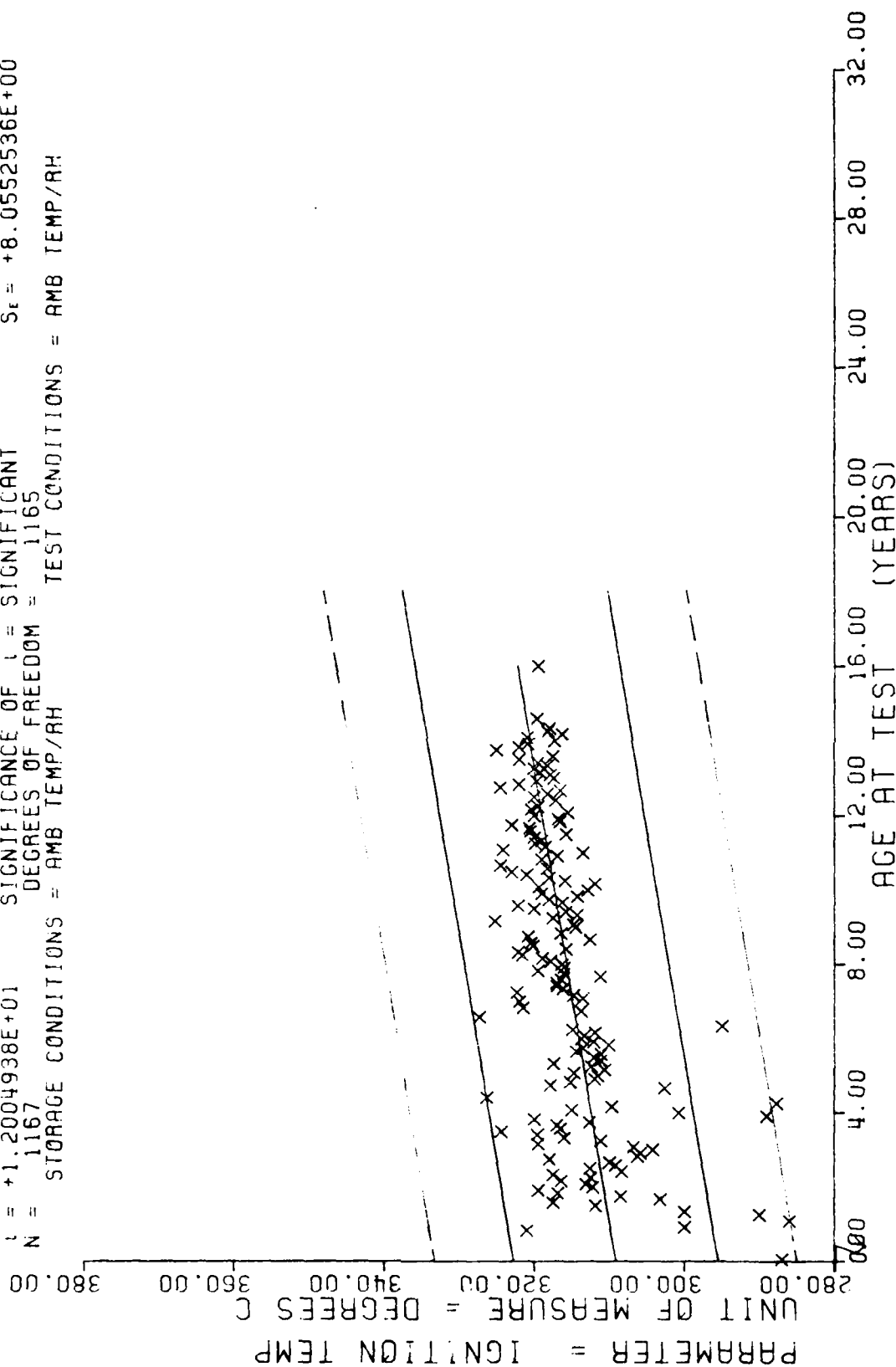
STAGE 1. WING 6. IP-H1011 THERMAL COEFFICIENT OF LINEAR EXPANSION BELOW TC

AGE (MOS)	Nr SAMP	AJL (MOS)	NR SAMP	AGE (MOS)	VR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP
1	3	37	13	65	14	94	4	121	16
10	1	38	4	66	23	95	9	122	16
11	1	39	7	67	34	96	20	123	8
13	1	40	5	68	20	97	22	124	2
15	1	41	17	69	16	98	28	125	2
16	1	42	5	70	31	99	25	126	2
18	7	43	2	71	10	100	8	127	2
19	2	44	2	72	14	101	4	128	2
20	4	45	3	73	20	102	5	130	4
21	4	46	3	74	14	103	10	131	12
22	20	47	1	75	14	104	11	132	8
23	4	48	4	76	1	105	6	133	7
24	1	49	3	79	6	106	4	134	8
25	0	50	3	81	8	108	4	135	4
26	14	51	3	82	2	109	2	136	4
27	2	53	3	84	2	110	2	137	4
28	4	56	3	85	4	111	4	138	2
29	14	57	9	86	8	112	2	139	4
30	12	58	4	87	3	113	8	140	4
31	10	59	13	88	6	114	2	141	6
32	2	60	18	89	2	115	6	142	2
33	0	61	23	90	4	116	4	143	12
34	10	62	21	91	5	117	4	144	4
35	0	63	32	92	6	118	4	145	2
36	22	64	23	93	2	120	8	146	8

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

This sample size summary is applicable to figures 59 and 60

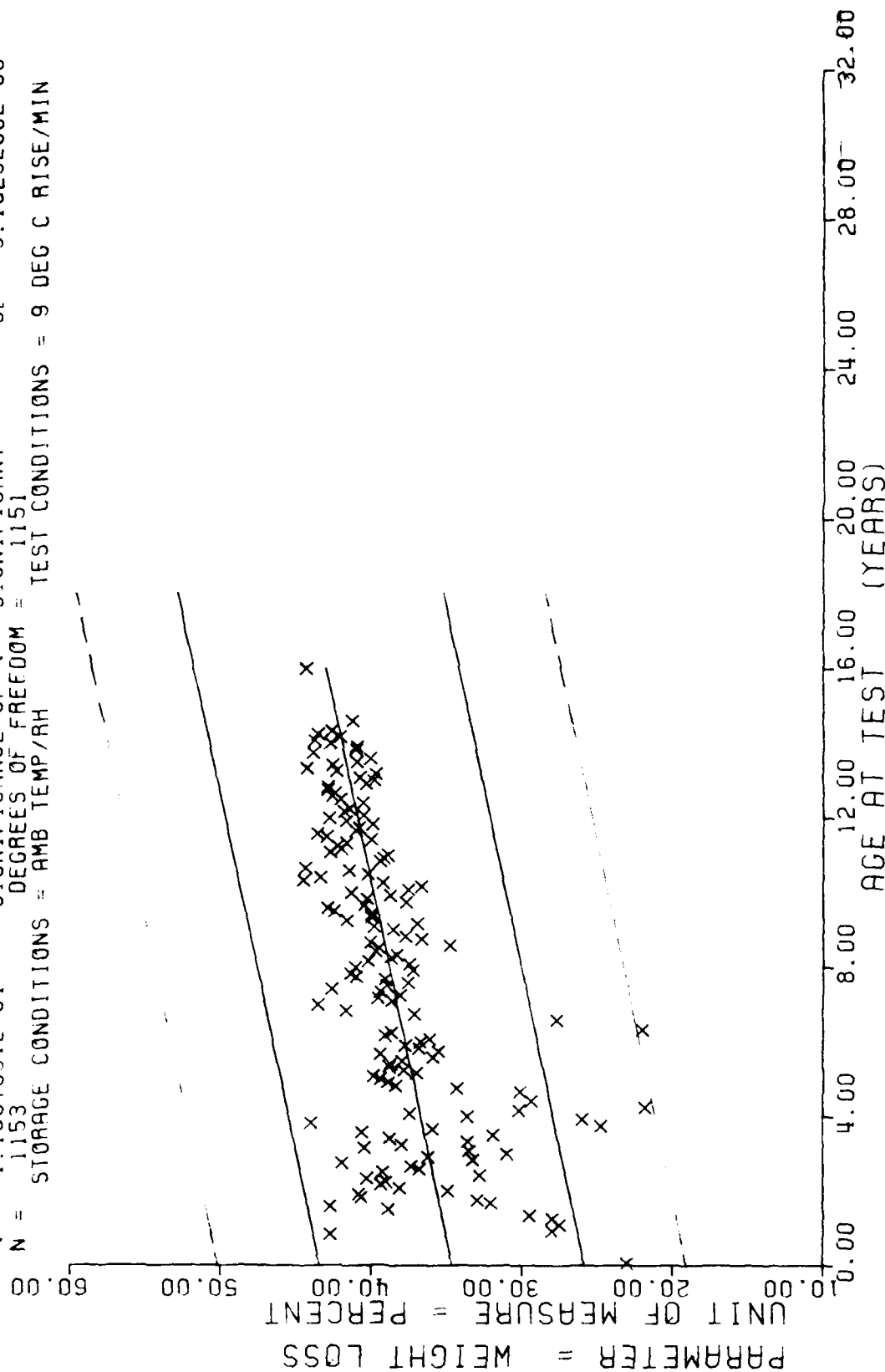
$Y = ((+3.0916482E+02) + (+6.3105595E-02) \times X)$
 $F = +1.4411853E+02$ SIGNIFICANCE OF F = SIGNIFICANT $\sigma^2 = +8.5353125E+00$
 $R = +3.3179545E-01$ SIGNIFICANCE OF R = SIGNIFICANT $S_b = +5.6731317E-03$
 $t = +1.2004938E+01$ SIGNIFICANCE OF t = SIGNIFICANT $S_e = +8.0552536E+00$
 $N = 1167$ DEGREES OF FREEDOM = 1165
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



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

Figure 59

$Y = ((+3.4614555E+01) + (+4.3519746E-02) * X)$
 $F = +1.4131620E+02$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = +3.3068284E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $L = +1.1887651E+01$ SIGNIFICANCE OF L = SIGNIFICANT
 $N = 1153$ DEGREES OF FREEDOM = 1151
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 9 DEG C RISE/MIN



STAGE I WING 6
 TGA PERCENT WEIGHT LOSS AT IGNITION, 9 DEG C RISE/MIN

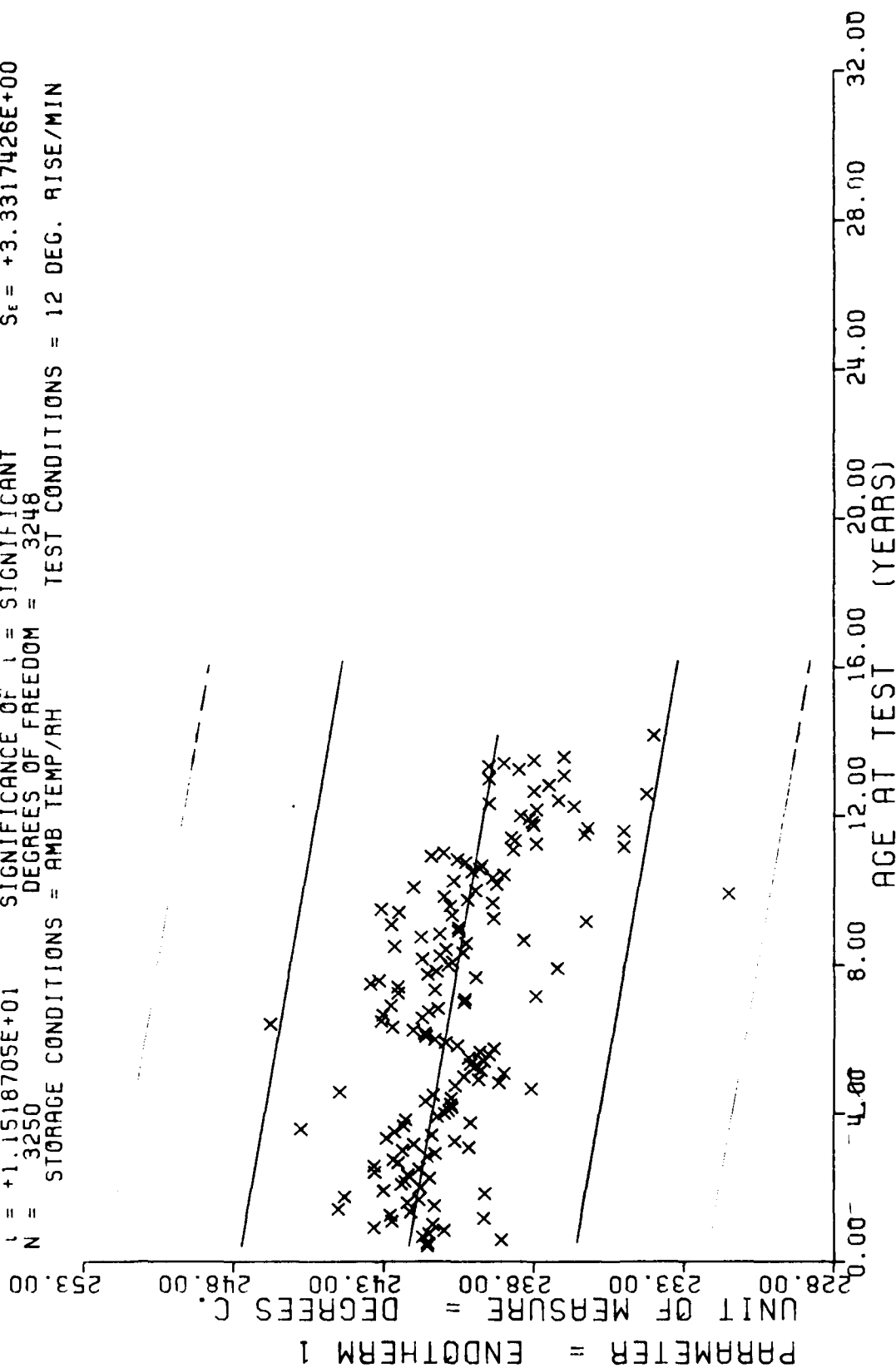
Figure 60

[illegible]

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

This sample size summary is applicable to figures 61 and 62

$Y = ((+2.4225804E+02) + (-1.7962591E-02) * X)$
 $F = +1.3268058E+02$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = -1.9810782E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +1.1518705E+01$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 3250$ DEGREES OF FREEDOM = 3248
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 12 DEG. RISE/MIN



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

Figure 61

$F = +3.3501921E+02$
 $R = -3.0625131E-01$
 $t = +1.6303530E+01$
 $N = 3239$
 $Y = ((+3.0124951E+02) + (-5.4636974E-02) * X)$
 SIGNIFICANCE OF F = SIGNIFICANT
 SIGNIFICANCE OF R = SIGNIFICANT
 SIGNIFICANCE OF t = SIGNIFICANT
 DEGREES OF FREEDOM = 3237
 STORAGE CONDITIONS = AMB TEMP/RH
 TEST CONDITIONS = 12 DEG. RISE/MIN
 $\sigma_r = +6.6950831E+00$
 $s_e = +2.9850511E-03$
 $s_t = +6.3743734E+00$

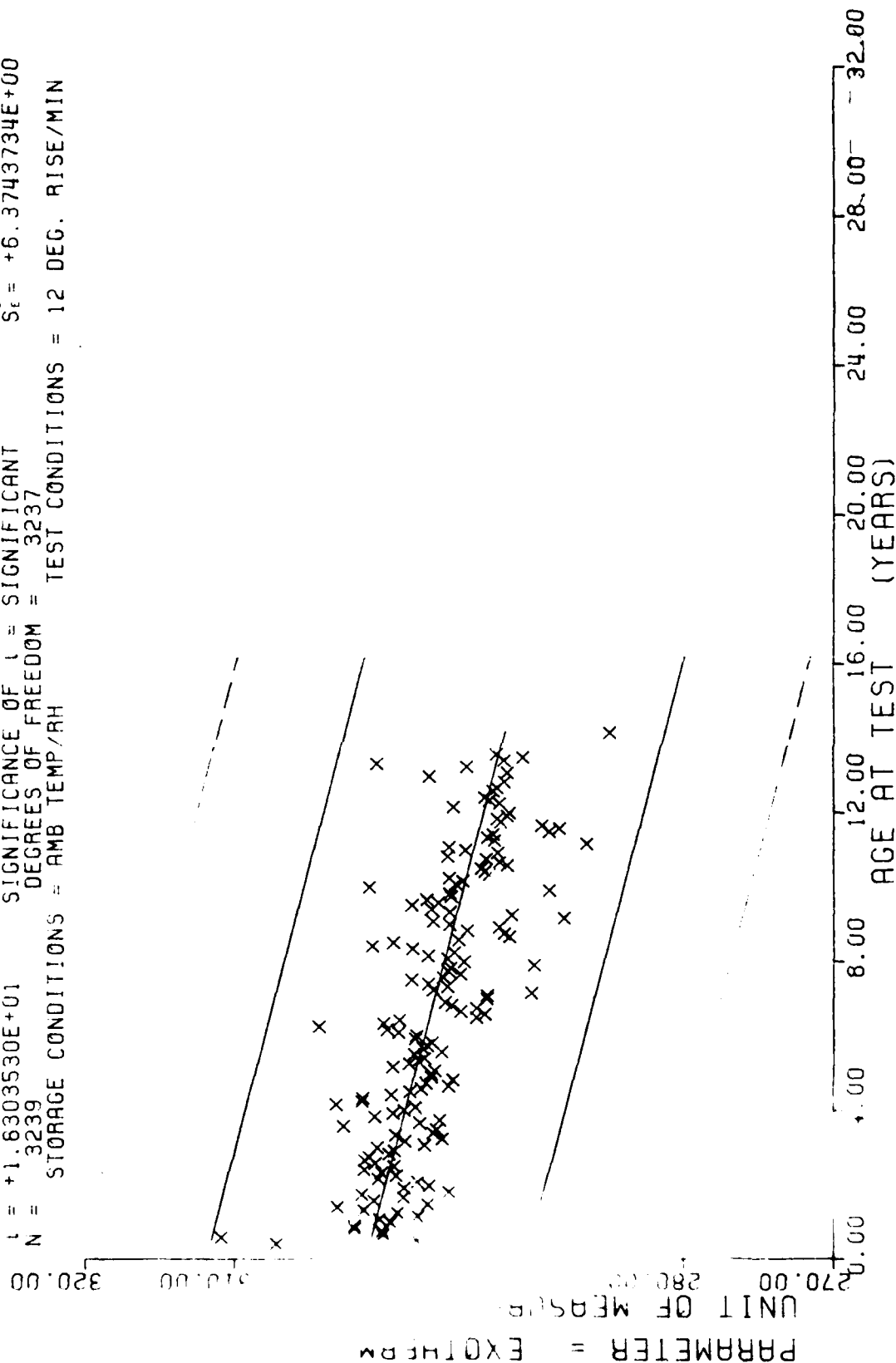


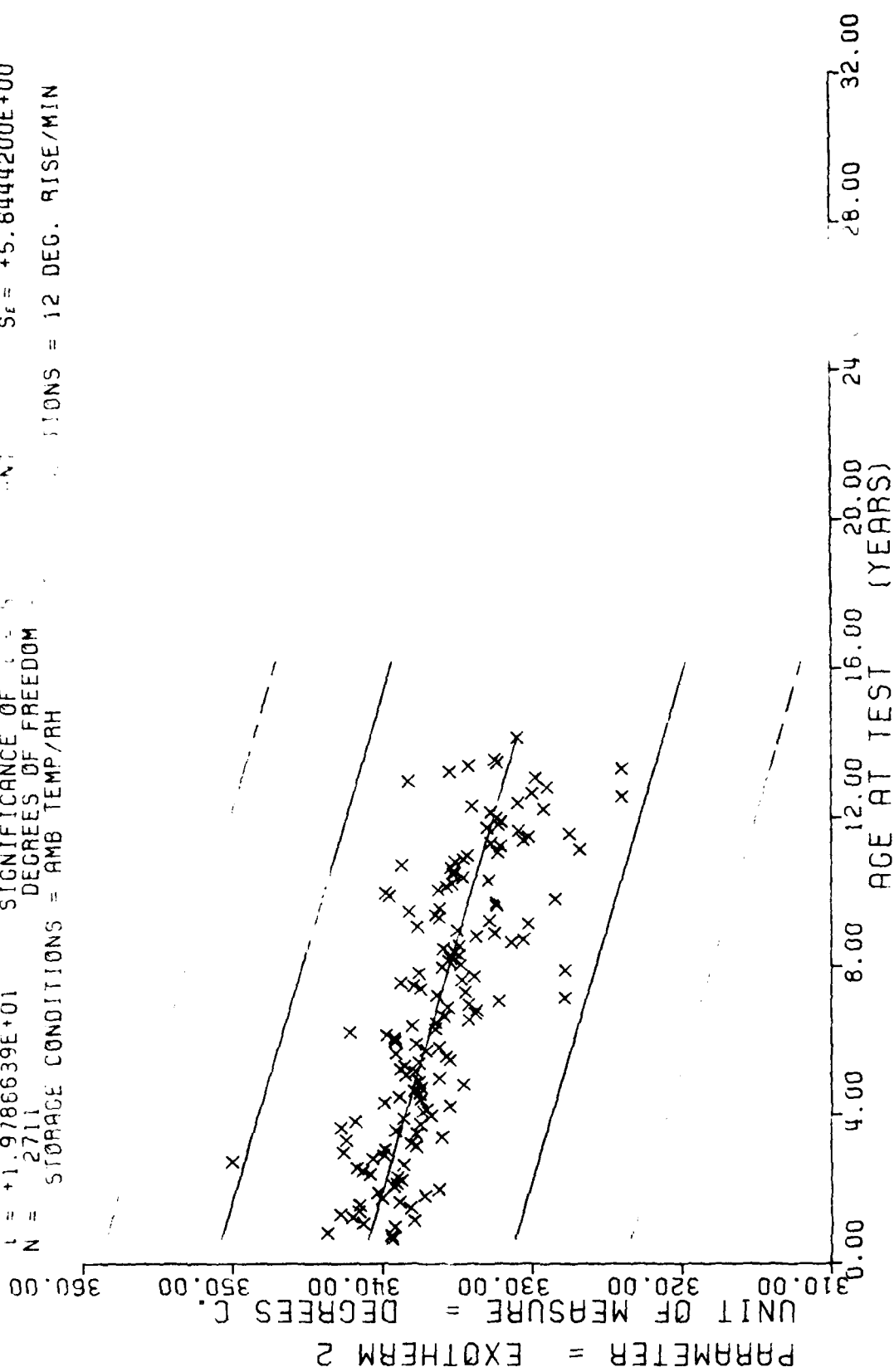
Figure 62

[illegible]

STAGE	WING C.	TP-H	1011.	DIA.	1/2	12 DEGREE	CENTIGRADE	RISE/MIN
1	10	10	10	10	10	10	10	10
2	10	10	10	10	10	10	10	10
3	10	10	10	10	10	10	10	10
4	10	10	10	10	10	10	10	10
5	10	10	10	10	10	10	10	10
6	10	10	10	10	10	10	10	10
7	10	10	10	10	10	10	10	10
8	10	10	10	10	10	10	10	10
9	10	10	10	10	10	10	10	10
10	10	10	10	10	10	10	10	10
11	10	10	10	10	10	10	10	10
12	10	10	10	10	10	10	10	10
13	10	10	10	10	10	10	10	10
14	10	10	10	10	10	10	10	10
15	10	10	10	10	10	10	10	10
16	10	10	10	10	10	10	10	10
17	10	10	10	10	10	10	10	10
18	10	10	10	10	10	10	10	10
19	10	10	10	10	10	10	10	10
20	10	10	10	10	10	10	10	10
21	10	10	10	10	10	10	10	10
22	10	10	10	10	10	10	10	10
23	10	10	10	10	10	10	10	10
24	10	10	10	10	10	10	10	10
25	10	10	10	10	10	10	10	10
26	10	10	10	10	10	10	10	10
27	10	10	10	10	10	10	10	10
28	10	10	10	10	10	10	10	10
29	10	10	10	10	10	10	10	10
30	10	10	10	10	10	10	10	10
31	10	10	10	10	10	10	10	10
32	10	10	10	10	10	10	10	10
33	10	10	10	10	10	10	10	10
34	10	10	10	10	10	10	10	10
35	10	10	10	10	10	10	10	10
36	10	10	10	10	10	10	10	10
37	10	10	10	10	10	10	10	10
38	10	10	10	10	10	10	10	10
39	10	10	10	10	10	10	10	10
40	10	10	10	10	10	10	10	10
41	10	10	10	10	10	10	10	10
42	10	10	10	10	10	10	10	10
43	10	10	10	10	10	10	10	10
44	10	10	10	10	10	10	10	10
45	10	10	10	10	10	10	10	10
46	10	10	10	10	10	10	10	10
47	10	10	10	10	10	10	10	10
48	10	10	10	10	10	10	10	10
49	10	10	10	10	10	10	10	10
50	10	10	10	10	10	10	10	10
51	10	10	10	10	10			

This sample size summary is applicable to five

$t = ((+3.4143255E+02) \times X)$
 $F = +3.9151109E+02$ SIGNIFICANCE OF F
 $R = -3.5534924E-01$ SIGNIFICANCE OF R
 $t = +1.9786639E+01$ SIGNIFICANCE OF t
 $N = 2711$ DEGREES OF FREEDOM
 STORAGE CONDITIONS = AMB TEMP/RH
 G₁ = +6.2513443E+00
 S₀ = +3.1028727E-03
 S₁ = +5.6444200E+00
 RISES = 12 DEG. RISE/MIN



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

Figure 63

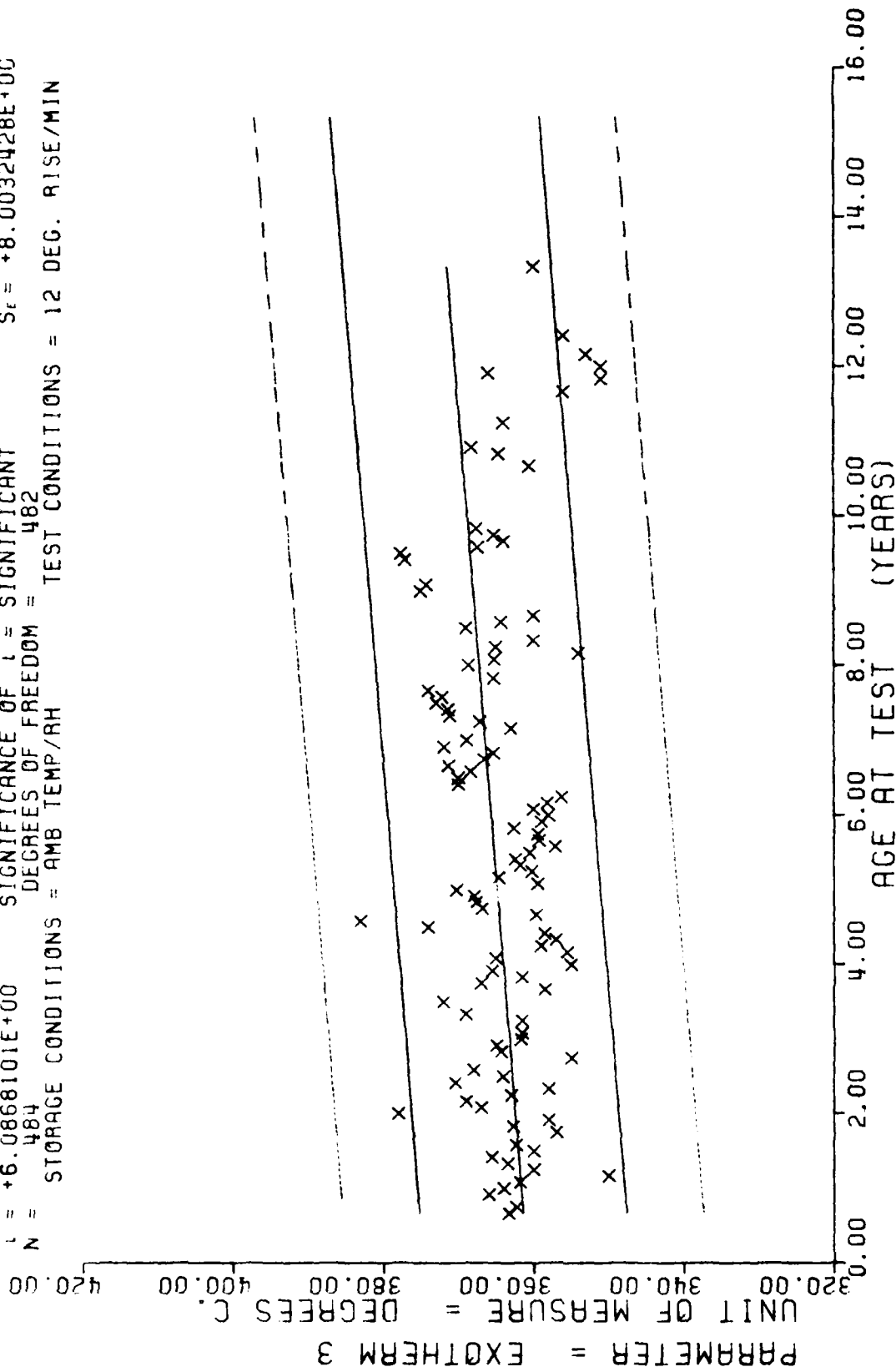
*** SAMPLE SIZE SUMMARY ***

AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP
8	7	36	4	64	4	91	6
9	7	37	5	65	7	92	2
11	3	39	2	66	4	94	3
12	4	40	5	67	9	96	6
13	5	42	3	68	4	97	4
14	3	44	2	69	7	98	1
15	1	45	1	70	3	99	1
16	4	46	5	71	2	100	1
17	5	47	7	72	4	104	1
18	5	48	8	73	4	108	3
19	6	49	2	74	6	109	4
21	2	50	2	75	8	110	1
22	4	51	1	77	1	113	11
23	1	52	3	78	3	114	21
24	1	53	4	79	18	115	7
25	1	54	1	80	12	116	2
26	2	55	1	81	10	117	3
27	4	56	3	82	8	118	3
28	3	57	7	83	8	128	2
29	5	58	5	84	7	130	9
30	9	59	7	86	1	131	4
31	4	60	4	87	8	135	3
33	4	61	7	88	8	140	1
34	5	62	6	89	16	142	2
35	4	63	5	90	12	143	4

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

This sample size summary is applicable to figure 64

$Y = ((+3.6090766E+02) + (+6.5739519E-02) * X)$
 $F = +3.7049258E+01$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = +2.6716863E-01$ SIGNIFICANCE OF R = SIGNIFICANT
 $L = +6.0868101E+00$ SIGNIFICANCE OF L = SIGNIFICANT
 $N = 484$ DEGREES OF FREEDOM = 482
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 12 DEG. RISE/MIN



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

Figure 64

AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP
1	33	70	33	95	38	120	79	145	33
15	6	71	25	96	54	121	30	146	45
16	19	72	60	97	35	122	24	147	12
17	3	73	57	98	71	123	9	148	3
18	9	74	83	99	60	124	11	149	12
19	12	75	84	100	25	125	6	150	9
20	12	76	51	101	11	126	12	151	9
21	22	77	21	102	18	127	22	152	12
22	24	78	6	103	6	128	15	153	6
24	26	79	39	104	12	129	39	154	9
25	24	80	15	105	12	130	57	155	6
26	17	81	34	106	3	131	89	156	3
27	27	82	24	107	6	132	30	157	12
28	45	83	15	108	15	133	17	158	12
29	42	84	9	109	8	134	18	159	6
30	44	85	18	110	3	135	27	160	6
31	44	86	12	111	12	136	18	161	12
32	79	87	6	112	20	137	9	162	8
33	66	88	15	113	24	138	18	164	3
34	59	89	16	114	63	139	50	166	3
35	43	90	28	115	61	140	24	167	6
36	18	91	22	116	25	141	39	168	6
37	24	92	32	117	30	142	21	170	6
38	30	93	9	118	28	143	15	171	6
39	33	94	6	119	27	144	36	172	6
								173	6
								174	3
								175	6
								178	3
								179	5
								192	3

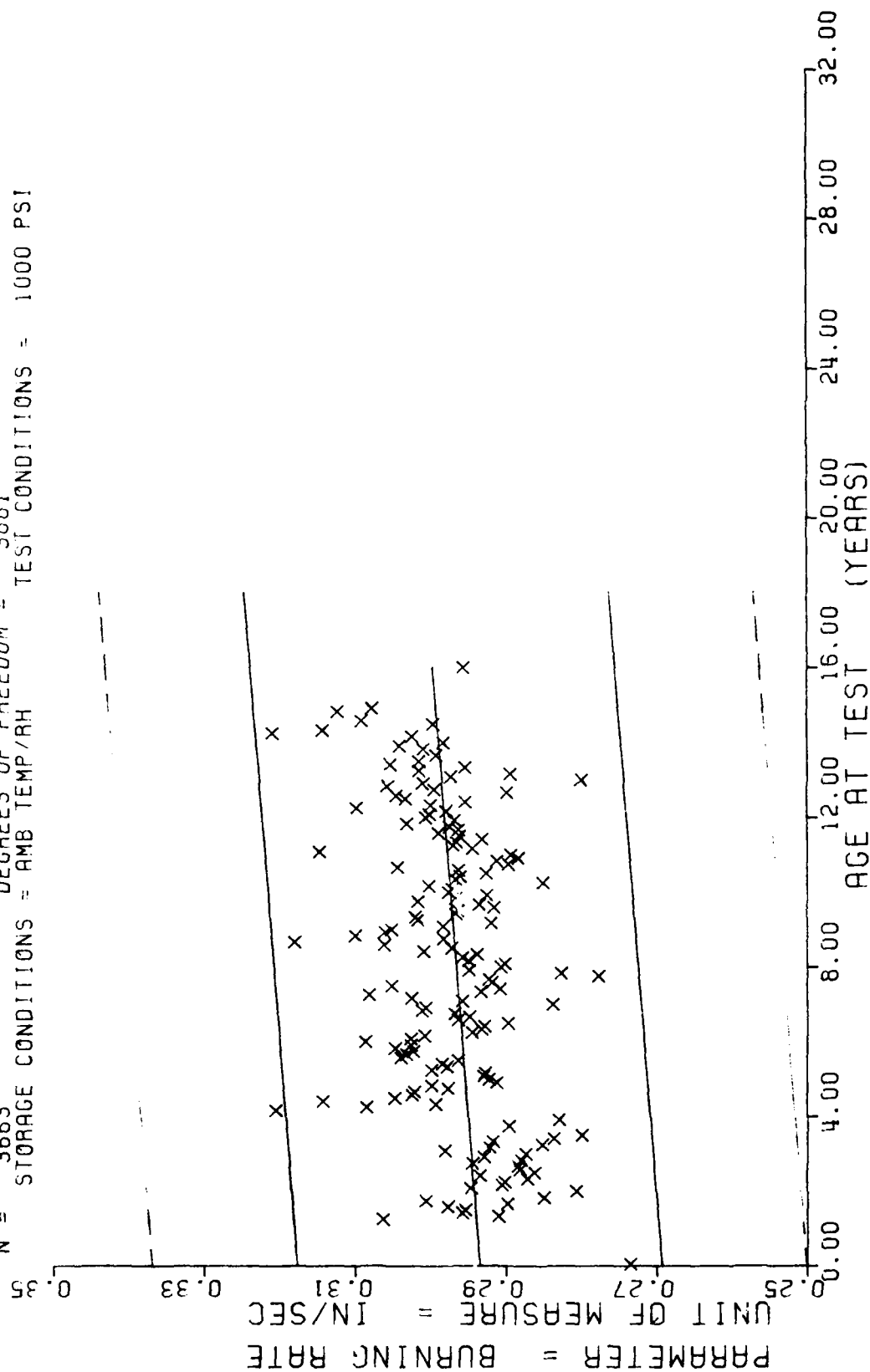
STAGE 1 WING 6 TP-H1011 BURNING RATE AT 1000 PSI

This sample size summary is applicable to Stage 1 of the test.

STAGE 1 WING 6 TP-H1011 BURNING RATE AT 1000 PSI

This sample size summary is applicable to figure 65

$Y = ((+2.9348218E-01) + (+3.2576083E-05) * X)$
 $F = +2.7466507E+01$ SIGNIFICANCE OF F = SIGNIFICANT
 $R = +8.6293641E-02$ SIGNIFICANCE OF R = SIGNIFICANT
 $t = +5.2408498E+00$ SIGNIFICANCE OF t = SIGNIFICANT
 $N = 3663$ DEGREES OF FREEDOM = 3661
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 1000 PSI



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

Figure 65

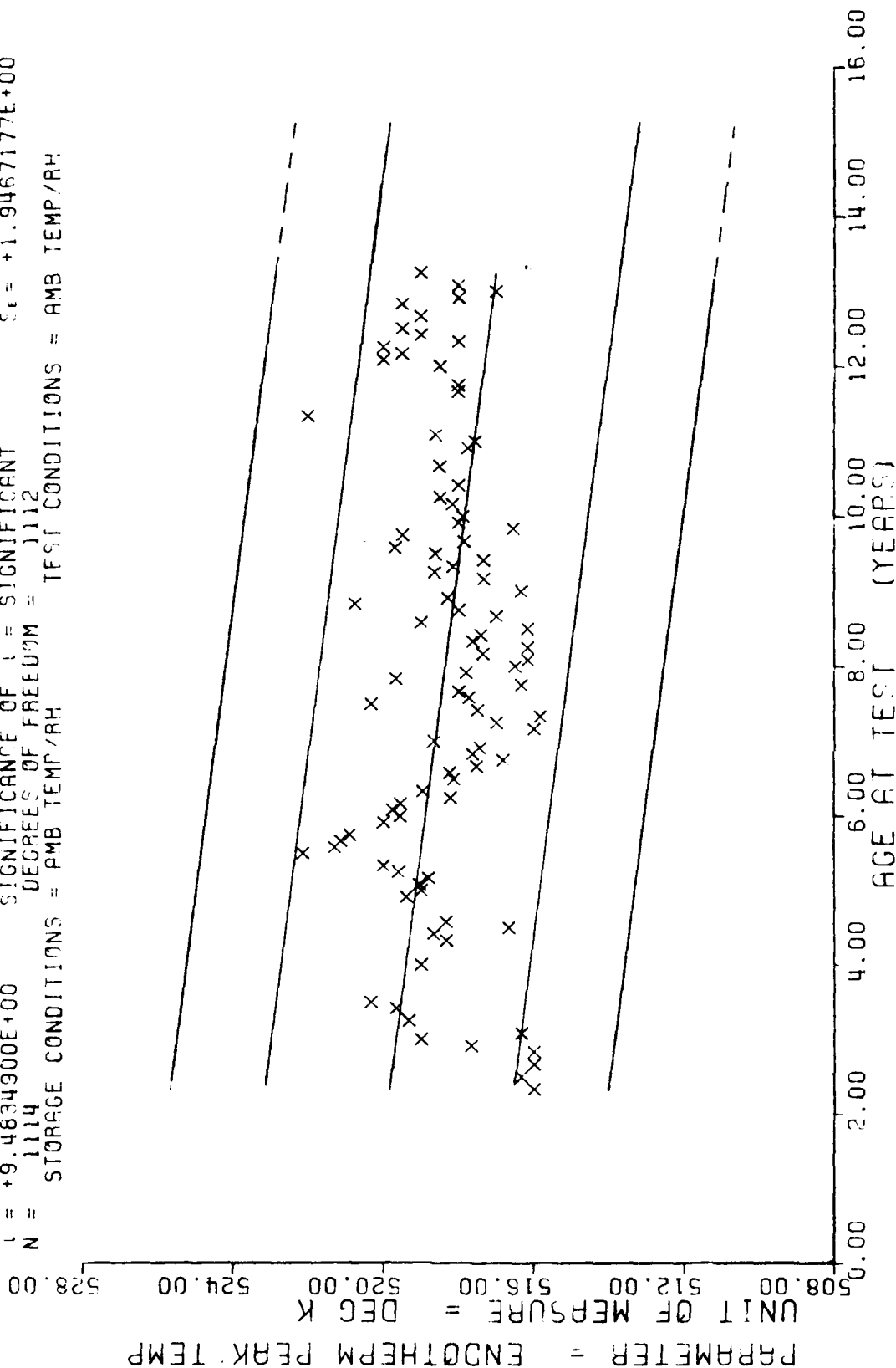
*** SAMPLE SIZE SUMMARY ***

AGE (MOS)	NO SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP	AGE (MOS)	NR SAMP
28	1	71	17	98	14	128	2
30	3	72	16	99	18	131	9
32	2	73	21	100	8	132	54
34	2	74	11	101	5	133	5
35	3	75	14	102	6	136	2
36	7	76	20	103	3	140	2
37	3	78	30	104	7	141	2
39	6	79	42	105	8	144	2
41	3	80	56	106	4	145	2
42	3	81	42	107	7	146	2
43	3	82	32	108	3	147	2
52	3	83	50	110	3	148	2
53	3	84	3	111	34	149	2
54	3	86	5	112	13	150	2
55	3	87	2	113	6	152	2
59	10	88	6	114	13	154	2
60	18	89	2	115	23	155	2
61	21	90	3	116	14	156	5
62	15	91	15	117	6	157	2
63	5	92	5	118	44	159	2
64	7	93	6	119	22		
66	14	94	3	120	8		
67	54	95	5	122	6		
68	78	96	12	123	2		
69	36	97	6	125	2		

STAGE I WING 6 DIFFERENTIAL SCANNING CALCRIMETER ENDOTHERM PEAK TEMP

This sample size summary is applicable to figures 66 thru 68

$Y = ((+5.2045459E+02) + (-2.1667973E-02) * X)$
 F = +6.9936583E+01 SIGNIFICANCE OF F = SIGNIFICANT $G_1 = +2.0230013E+00$
 R = -2.7354414E-01 SIGNIFICANCE OF R = SIGNIFICANT $S_1 = +2.2848100E-03$
 L = +9.4634900E+00 SIGNIFICANCE OF L = SIGNIFICANT $S_2 = +1.9467177E+00$
 N = 1114 DEGREES OF FREEDOM = 1112
 STORAGE CONDITIONS = PMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



STAGE 1 WING 6 DIFFERENTIAL SCANNING CALORIMETER ENDOTHERM PEAK TEMP

$F = +5.3128795E+00$
 $R = -7.2726922E-02$
 $t = +2.4316394E+00$
 $N = 1114$
 STORAGE CONDITIONS = PMB TEMP/RH
 $t = ((+5.6008076E+02) + (-3.1491413E-02) * X)$
 SIGNIFICANCE OF F = SIGNIFICANT
 SIGNIFICANCE OF R = SIGNIFICANT
 SIGNIFICANCE OF t = SIGNIFICANT
 DEGREES OF FREEDOM = 1112
 TEST CONDITIONS = PMB TEMP/RH
 $S_e = +1.1058653E+01$
 $S_b = +1.2957691E-02$
 $S_c = +1.1034326E+01$

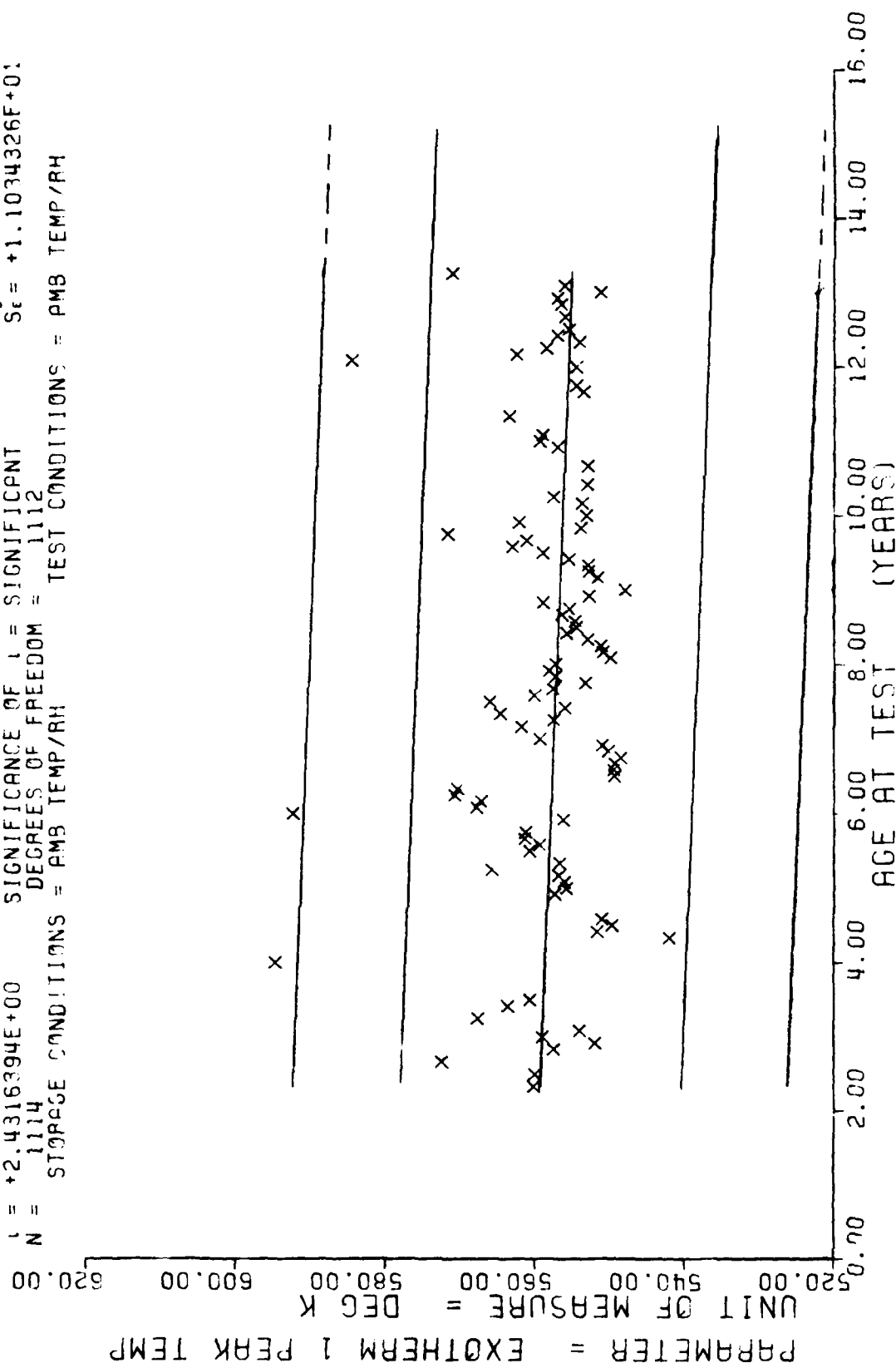
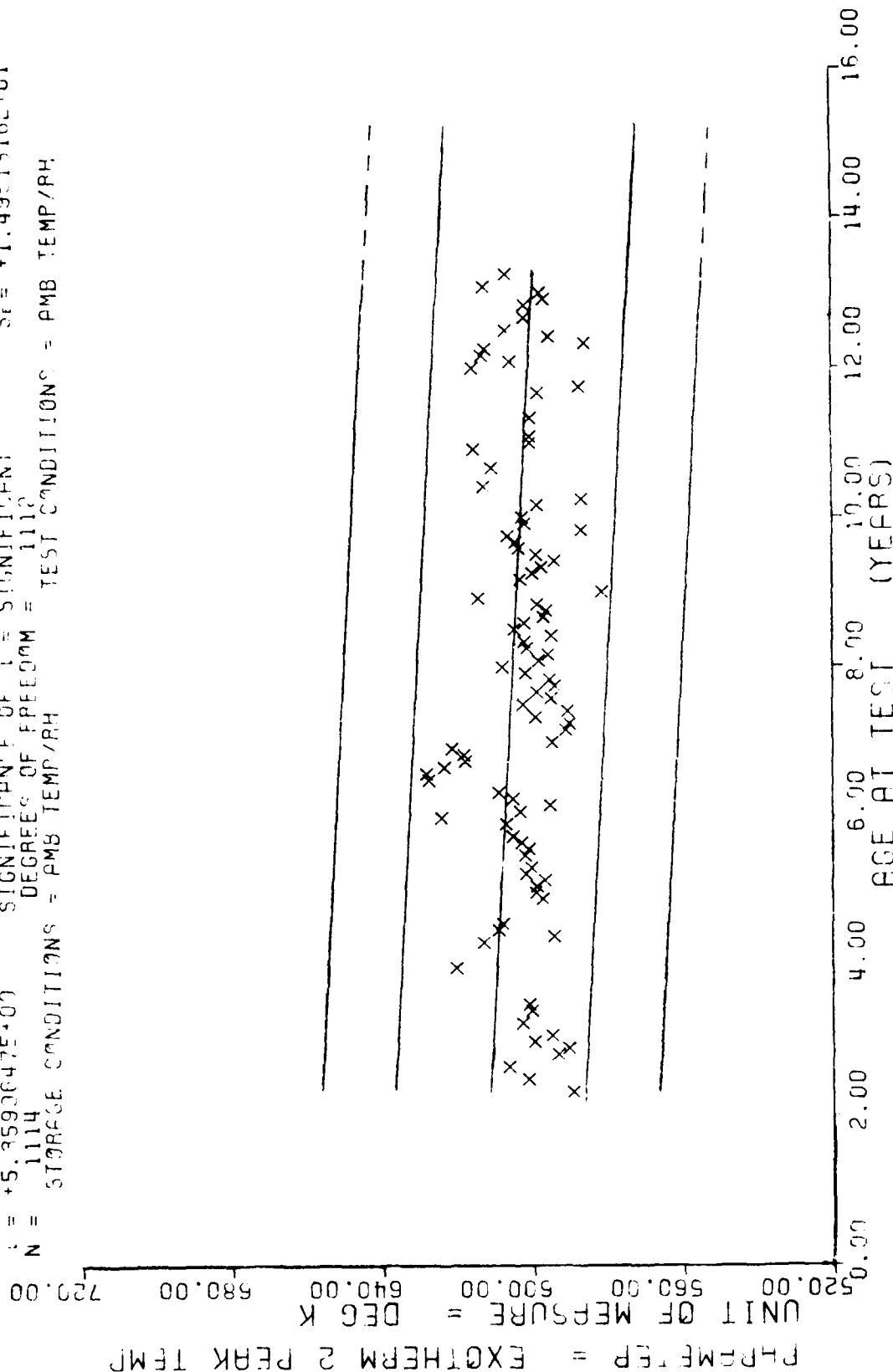


Figure 67

$F = +2.87292225+01$
 $R = -1.5869770E-01$
 $t = +5.3593647E+00$
 $N = 1114$
 $Y = ((+6.1417125E+02) + (-9.4056421E-02) * X)$
 SIGNIFICANCE OF F = SIGNIFICANT
 SIGNIFICANCE OF P = SIGNIFICANT
 SIGNIFICANCE OF t = SIGNIFICANT
 DEGREES OF FREEDOM = 1112
 STORAGE CONDITIONS = PMB TEMP/RH
 TEST CONDITIONS = PMB TEMP/RH



GRAPH 1 WING 6 DIFFERENTIAL SCANNING CALORIMETER EXOTHERM 2 PEAK TEMP

Figure 68

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4. TITLE (and Subtitle) Propellant Surveillance Report LGM-30 F & G Stage I, Phase G, Series 1 TP-H1011		5. TYPE OF REPORT & PERIOD COVERED Test Results - Semi Annual
7. AUTHOR(s) John A. Thompson		6. PERFORMING ORGANIZATION NAME
9. PERFORMING ORGANIZATION NAME AND ADDRESS Propellant Analysis Directorate OOALC AFB, Utah 84056		PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS MMWRBM Project M04046C- WNL01529
12. REPORT DATE May 1981		13. NUMBER OF PAGES 126
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report) Unclassified
16. DISTRIBUTION STATEMENT (of this Report) Approved for Public Release, Distribution Unlimited		15a. DECLASSIFICATION DOWNGRADING SCHEDULE
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
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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-30F & G First Stage Minuteman Motors. This report uses a statistical approach to analyze the bulk propellant data. Testing was accomplished in accordance with MMWRBM Project M04046C-WNL01529. 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 (fifteen years for		

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 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.