TECP 700-700
Materiel Test Procedure 5-2-582
White Sands Missile Range

16 March 1967

U. S. ARMY TEST AND EVALUATION COMMAND
COMMON ENGINEERING TEST PROCEDURE

TEMPERATURE-ALTITUDE TESTS

1. OBJECTIVE

The objective of this procedure is to determine the ability of the equipment under test (test item) to operate and the ability of the equipment material to withstand degradation during and after exposure to various temperature-altitude environments.

2. BACKGROUND

Temperature-altitude tests are one of a series of environmental tests conducted to ensure the reliability of a missile system. These tests indicate the probable extreme temperature-altitude conditions of the natural environment to which a missile system may be exposed. In addition, these tests will permit determination of material degradation, if any.

Natural environment considerations are not limited to those of the intended tactical emplacement of the equipment, but includes those which might be encountered during transportation and storage (without protective packaging).

Military Standard MIL-STD-810 (USAF), "Military Standard, Environmental Test Methods", establishes generally applicable procedures for testing aeronautical equipment under simulated and accelerated environmental conditions. The procedures described herein have been adapted from this standard.

3. REQUIRED EQUIPMENT

a. Adequate Environmental Test Facility

   1) Temperature Range: -62°C to +260°C (-79.6°F to +500°F)
   2) Altitude Simulation to 80,000 feet

b. Wet Bulb Thermometer
c. Pressure Monitoring Transducer
d. Thermocouples or Equivalent Temperature Sensors

4. REFERENCES

A. Military Standard, MIL-STD-810 (USAF), Environmental Test Methods for Aero-Space and Ground Equipment, latest revision
B. Military Specification, MIL-T-5422E (ASG), Testing, Environmental, Aircraft Electronic Equipment, 13 April 1959
C. Applicable QMR, SDR, or TC's

5. SCOPE

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5.1 SUMMARY

This procedure describes the various temperature-altitude conditions at which the different classes of missile/missile subsystem equipment shall be tested.

Test conditions inside the chamber will be varied within the probable pressure extremes from those normally encountered at sea level to those normally encountered at 80,000 feet. The temperature extremes will range from minus 62 to plus 260 degrees Centigrade (minus 79.6 to plus 500 degrees Fahrenheit) Table I is a list of the test environments, pressure (altitude) versus temperature, that might be encountered. The operational status of the test item, as related to the various environments, is also shown.

Table I. Test Environments

Class	Equipment Mode		Temperature	Altitude
	Continuous	Nonoperating		
1	X	X	-54 to 55°C -62 to 85°C	Sea level to 50,000 feet
1A	X	X	-54 to 55°C -62 to 85°C	Sea level to 30,000 feet
2	X	X	-54 to 71°C -62 to 95°C	Sea level to 70,000 feet
3	X	X	-54 to 95°C -62 to 150°C	Sea level to 80,000 feet
4	X	X	-54 to 125°C -62 to 260°C	Sea level to 80,000 feet

5.2 LIMITATIONS

The following items shall not be tested in the environmental facility.

a. Items containing explosive or highly flammable material, unless the test is to be conducted in an area approved specifically for the testing of the aforementioned items.

b. Items not capable of being transported by readily available means.

c. Items of such size capable of affecting or limiting the ability of the environmental facility to achieve or maintain the desired environmental conditions.

6. PROCEDURES

6.1 PREPARATION FOR TEST

6.1.1 Equipment Pre-Test Operation

Prior to conducting the tests described herein the test item shall be

subjected to a comprehensive functional test using its highest specified input voltage, under standard ambient conditions.

NOTE: Ambient conditions, unless otherwise specified, consist of the following:

a. Temperature of 25 ± 10°C (77 ± 18°F)
b. Relative humidity of 90-percent or less
c. Barometric pressure of the test locale

Record all operating characteristics specified in the test item's QMR, SDR or TC's. This data shall be used as a standard for comparing data recorded during and after the environmental tests.

6.1.2 Preparation of the Environmental Test Chamber

a. Arrange the test chamber and accessory equipment to avoid the following:

1) Condensate dripping on the test item
2) Radiant heat directed on the test item (when used as a heat source).

b. Locate instrumentation equipment as follows:

1) Wet bulb thermometer, used for measuring percent of relative humidity - at the mouth of the air inlet duct. The air velocity flowing across the bulb shall not be less than 900 feet per minute.
2) Monitoring transducers - at or near the test points and rigidly attached.
3) Thermocouples, or equivalent temperature sensors, where they shall not be in a direct line with the incoming air and capable of the following measurements:

(a) Temperature at several points inside each major unit of the test item. The number and location of the points to represent as nearly as possible the average temperature inside the unit.
(b) Contact temperature on the largest transformer or inductor (except radio frequency inductors) or other large-mass items in each major unit.
(c) Contact temperature in the component or components where the highest operating temperature is expected, except tubes.
(d) Contact temperature on the component or components whose temperature rise is likely to limit equipment performance.

6.1.3 Test Item Preparation

The test item shall be installed in the test chamber at room temperature in a manner that will simulate usage. Plugs, covers, and inspection

plates used in service will be left in place.

Electrical and mechanical connections which are not used, and are normally protected in service shall be adequately covered.

Items which shall be operated during the test shall be operated at the items highest specified input voltage, after installation in the chamber to insure that no damage occurred during installation. Record all operating characteristics specified in the test items QMR, SDR, or TC's.

6.1.4 Test Chamber Operation

a. Temperature change rates shall be accomplished at the maximum permitted by the test chamber, but shall not exceed 1°C (1.8°F) per second.

b. Pressure change rates shall be accomplished at the maximum permitted by the test chamber, but shall not exceed 0.5 inch of mercury per second.

c. An increase in temperature at low pressure can be accomplished by returning the pressure to ambient conditions before raising the temperature, and then dropping the pressure, to simulate the specified altitude, following temperature stabilization.

6.2 TEST CONDUCT

Unless otherwise specified the testing schedule outlined in Table II shall be followed.

NOTE: Each step of Table II represents a condition which the test item may encounter in service. Therefore, each step may be applied independently of each other.

In addition to the schedule of Table II the test director can require additional test points (temperature-altitude conditions) from Figures 1 through 4. These figures indicate the required hot temperature-altitude operational envelopes, at the various operating modes, for the different classes of equipment.

The test item shall be subject, at a minimum, to the following procedures as indicated in Table II.

If damage occurs to the test item which effects the operational status of the test item, it should be repaired, at least to the extent that normal operation is restored, prior to continuing the test.

6.2.1 Test No. 1

a. Adjust the chamber temperature to, and stabilize it at, the temperature specified in Step 1 of Table II while maintaining locale barometric pressure.

NOTE: Stabilization, unless otherwise specified, is considered to be reached when the temperature of a centrally located part, having the largest mass, does not change more than 2°C per hour.

TABLE II. TEST CHAMBER CONDITIONS FOR TEMPERATURE-ALTITUDE TESTS

CLASS	STEP ⟶	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	TEMP ALT(IN FT) TIME	-62°C ATM 2 HRS	-54°C ATM	-54°C 50,000	-10°C ATM	85°C ATM 16 HRS	55°C ATM 4 HRS	71°C ATM 30 MIN	OMIT	30°C 40,000 4 HRS	47°C 40,000 30 MIN	20°C 50,000 4 HRS	35°C 50,000 30 MIN	OMIT	ROOM AMB- IENT
1A	TEMP ALT(IN FT) TIME	-62°C ATM 2 HRS	-54°C ATM	-54°C 30,000	-10°C ATM	85°C ATM 16 HRS	55°C ATM 4 HRS	71°C ATM 30 MIN	OMIT	48°C 20,000 4 HRS	64°C 20,000 39 MIN	40°C 30,000 4 HRS	57°C 30,000 30 MIN	OMIT	ROOM AMB- IENT
2	TEMP ALT(IN FT) TIME	-62°C ATM 2 HRS	-54°C ATM	-54°C 70,000	-10°C ATM	95°C ATM 16 HRS	71°C ATM 4 HRS	95°C ATM 30 MIN	OMIT	36°C 50,000 4 HRS	60°C 50,000 30 MIN	10°C 70,000 4 HRS	35°C 70,000 30 MIN	OMIT	ROOM AMB- IENT
3	TEMP ALT(IN FT) TIME	-62°C ATM 2 HRS	-54°C ATM	-54°C 80,000	-10°C ATM	150°C ATM 16 HRS	95°C ATM 4 HRS	125°C ATM 30 MIN	150°C ATM 10 MIN	60°C 50,000 4 HRS	90°C 50,000 30 MIN	20°C 80,000 4 HRS	50°C 80,000 30 MIN	75°C 80,000 10 MIN	ROOM AMB- IENT
4	TEMP ALT(IN FT) TIME	-62°C ATM 2 HRS	-54°C ATM	-54°C 80,000	-10°C ATM	260°C ATM 16 HRS	125°C ATM 4 HRS	150°C ATM 30 MIN	260°C ATM 10 MIN	90°C 50,000 4 HRS	115°C 50,000 30 MIN	50°C 80,000 4 HRS	75°C 80,000 30 MIN	185°C 80,000 10 MIN	ROOM AMB- IENT

b. Visually inspect the test item after the chamber temperature has been stabilized for a minimum of two hours.

6.2.2 Test No. 2 .

a. Adjust the chamber temperature to, and stabilize it at, the temperature specified in Step 2 of Table II while maintaining locale barometric pressure.

b. Operate the test item at its lowest specified input voltage and record all operating characteristics specified in the test item's QMR, SDR, and TC's.

NOTES: 1. The test item shall operate satisfactorily within its specified warm up time.
2. The characteristics which are likely to be affected by low temperature should be checked first.
3. If the time required to check the test item exceeds the warm up period by 15 minutes or more, the check shall be halted prior to the 15 minute time period, the temperature chamber again stabilized at the required temperature (Step 2 of Table II), and then the operational check continued.

c. At the completion of the operational check turn off the equipment.
d. Visually inspect the test item.

6.2.3 Test No. 3

a. Adjust the chamber temperature to, and stabilize it at, the temperature specified in Step 3 of Table II.
b. Turn on the test item.
c. Adjust the chamber pressure to simulate the altitude specified in Step 3 of Table II.
d. Operate the test item, at its highest specified input voltage, with the chamber pressure at the specified pressure, and record all operating characteristics specified in the test item's QMR, SDR, or TC's.
e. At the completion of the operational check turn off the equipment.
f. Visually inspect the test item.

6.2.4 Test No. 4

a. Adjust the chamber temperature to, and stabilize it at, the temperature specified in Step 4 of Table II while maintaining locale barometric pressure.

b. Open the test chamber door long enough for frost to form on the test item and then commence to melt. Do not leave the chamber door open long enough to allow the melt to evaporate.

NOTE: If the relative humidity is such that frost will not form, an artificial means shall be used to provide the relative humidity necessary to form frost.

c. Close the test chamber door and turn on the test item using the highest specified input voltage and record all operating characteristics

NOTES:

1. CURVE A: DESIGN AND TEST REQUIREMENTS FOR CONTINUOUS OPERATION.
2. CURVE B: DESIGN AND TEST REQUIREMENTS FOR INTERMITTENT OPERATION.
3. OPERATIONAL REQUIREMENTS FOR CLASS IA EQUIPMENT SAME AS FOR CLASS I EXCEPT THE ALTITUDE LIMIT IS 30,000 FEET.

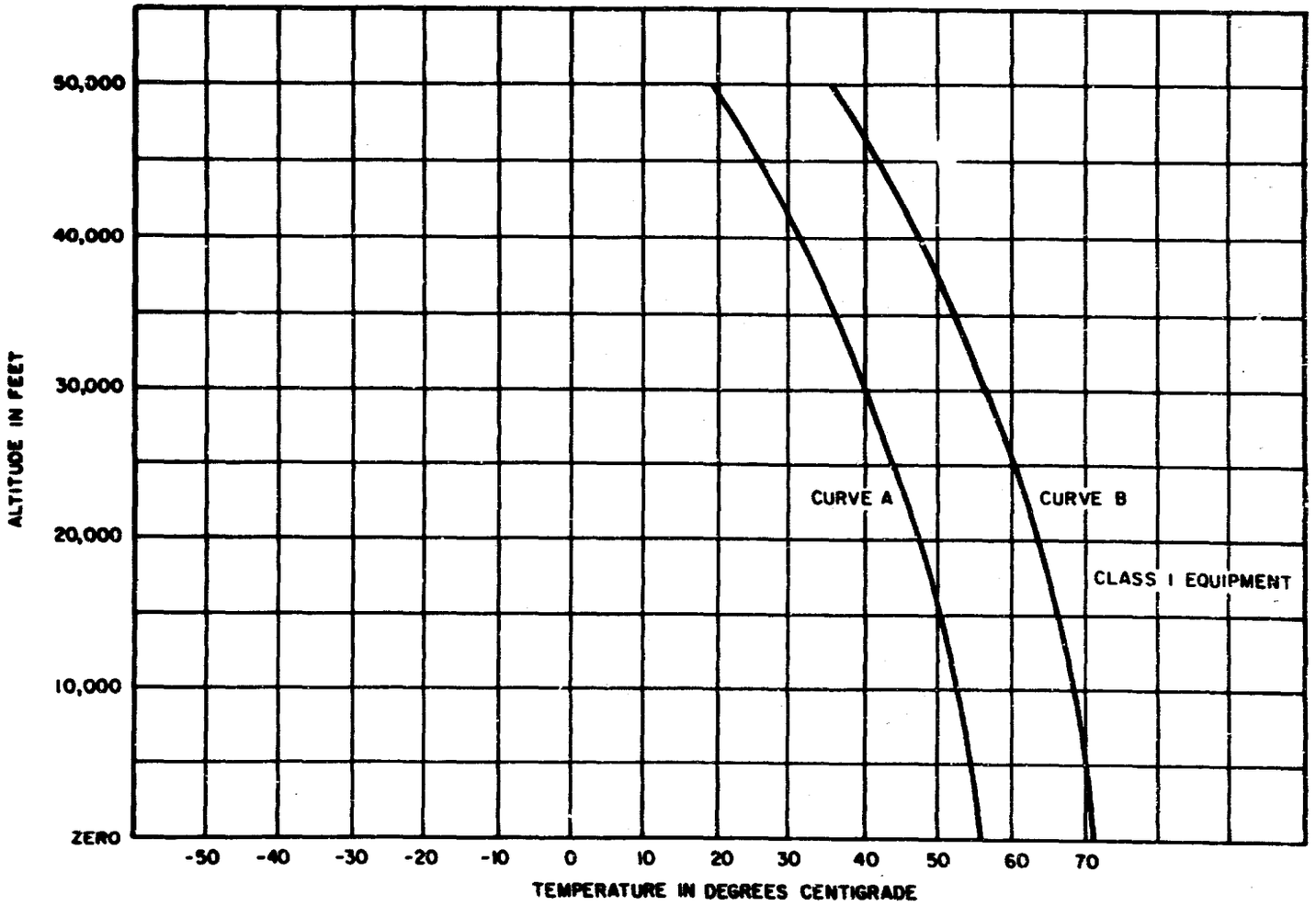

FIGURE I. OPERATIONAL REQUIREMENTS FOR CLASS I AND IA AEROSPACE EQUIPMENT, TEMPERATURE VERSUS ALTITUDE

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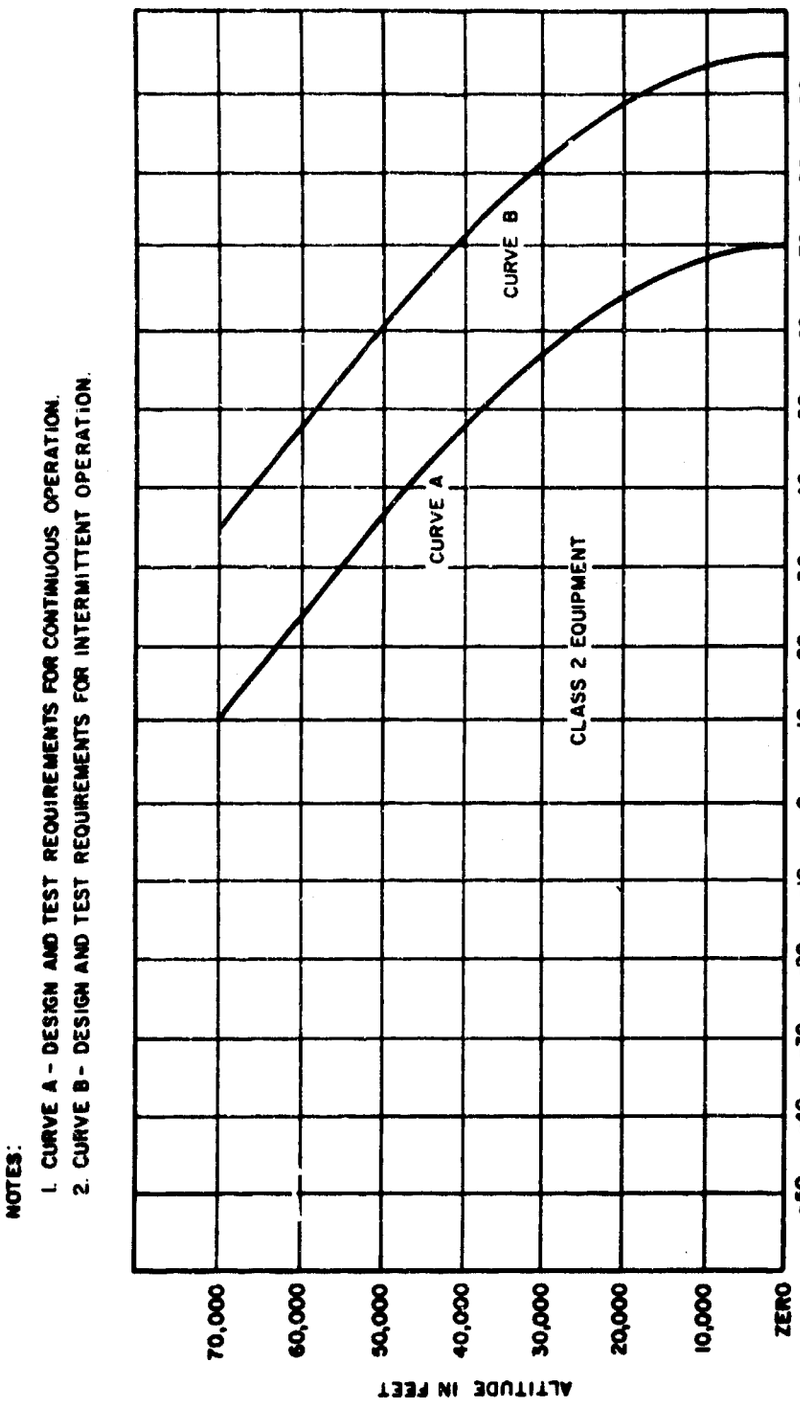

FIGURE 2. OPERATIONAL REQUIREMENTS FOR CLASS 2 AEROSPACE EQUIPMENT TEMPERATURE VERSUS ALTITUDE

NOTES:

1. CURVE A - DESIGN AND TEST REQUIREMENTS FOR CONTINUOUS OPERATION.
2. CURVE B - DESIGN AND TEST REQUIREMENTS FOR INTERMITTENT OPERATION.
3. CURVE C - DESIGN AND TEST REQUIREMENTS FOR SHORT TIME OPERATION.

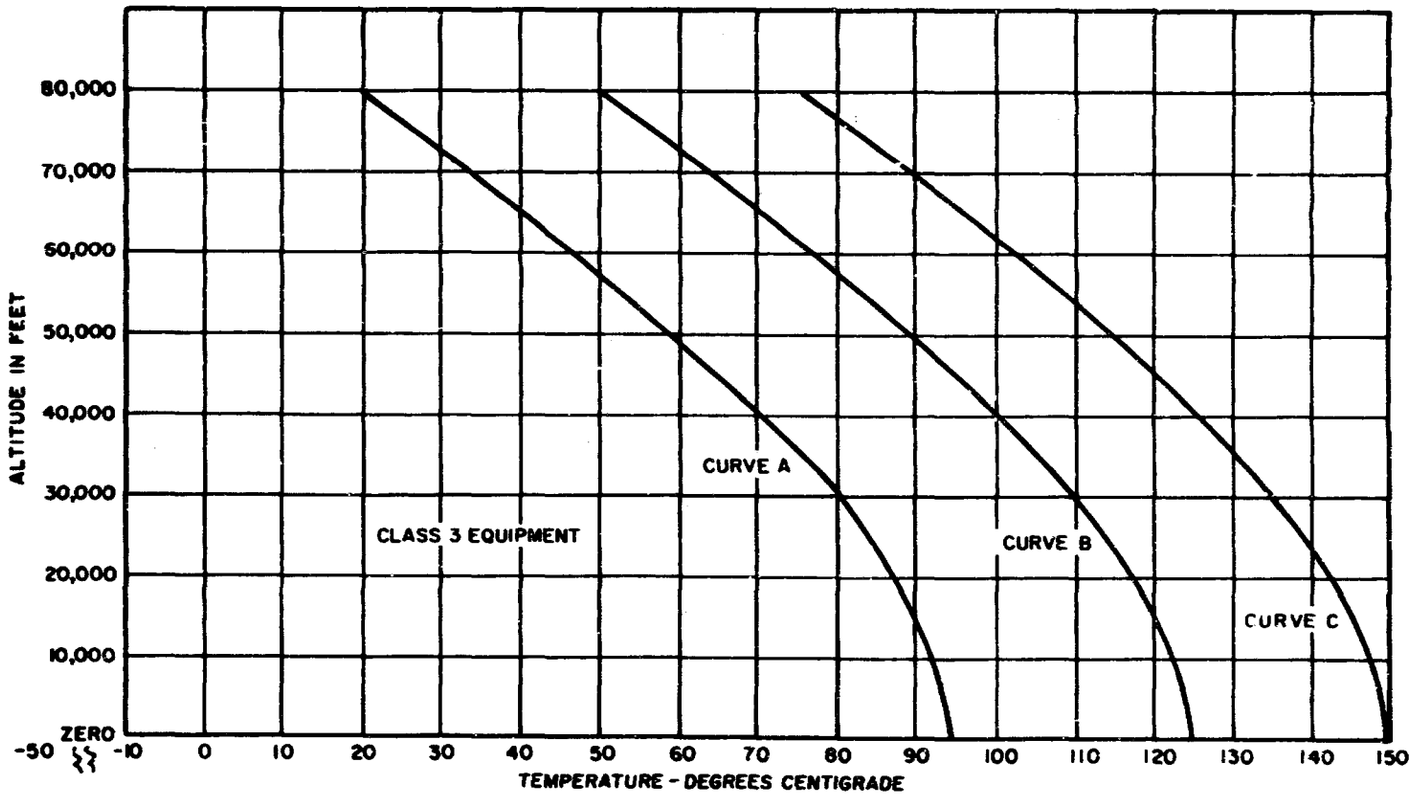

FIGURE 3. OPERATIONAL REQUIREMENTS FOR CLASS 3 AEROSPACE EQUIPMENT TEMPERATURE VERSUS ALTITUDE

NOTES

1. CURVE A - DESIGN AND TEST REQUIREMENTS FOR CONTINUOUS OPERATION.
2. CURVE B - DESIGN AND TEST REQUIREMENTS FOR INTERMITTENT OPERATION.
3. CURVE C - DESIGN AND TEST REQUIREMENTS FOR SHORT TIME OPERATION.

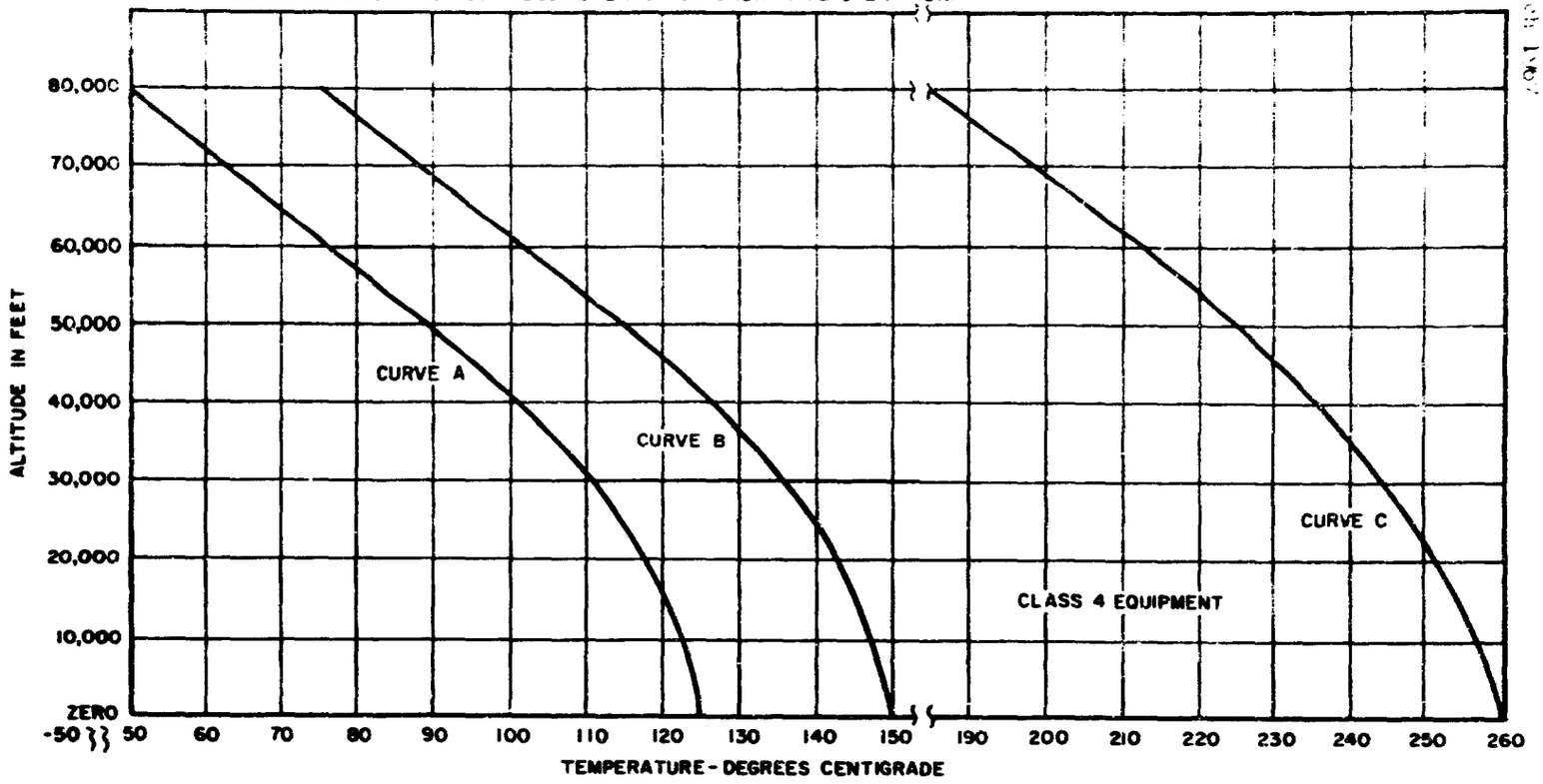

FIGURE 4. OPERATIONAL REQUIREMENTS FOR CLASS 4 AEROSPACE EQUIPMENT
TEMPERATURE VERSUS ALTITUDE

specified in the test items QMR, SDR, and TC's. The test item shall operate satisfactorily within specified warm up time.

NOTE: If the time required to check the test item exceeds the warm up period by 15 minutes or more, the check shall be halted prior to the 15 minute time period. The chamber shall be opened, then closed, to return it to a frost melt condition, and the operational check shall be continued.

d. At the completion of the operational check turn off the equipment.

e. Repeat steps a through d until the test item has been operationally checked a total of three times.

f. Visually inspect the test item.

6.2.5 Ambient Condition Check

a. At the completion of cold temperature tests (paragraph 6.2.1 through 6.2.4) if the tests are to be done in sequence, or at the completion of any individual test, if only one test is to be conducted the test chamber shall be returned to and stabilized at locale ambient conditions.

b. The test item shall be subject to operational tests, at its highest specified voltage and all operating characteristics specified in the test items QMR, SDR or TC's shall be recorded.

c. At the completion of the operational check turn off the equipment.

d. Visually inspect the test item.

6.2.6 Test No. 5

a. Adjust the chamber temperature to, and stabilize it at the temperature specified in Step 5 of Table II while maintaining locale barometric pressure.

b. Visually inspect the test item after the chamber temperature has been stabilized for a minimum of 16 hours.

6.2.7 Test No. 6

a. Adjust the chamber temperature to, and stabilize it at, the temperature specified in Step 6 of Table II while maintaining locale barometric pressure.

b. Turn on the test item, in an operating mode, at its highest specified input voltage for the time indicated in Step 6 (4 hours) and record the test item temperature every 30 minutes starting with equipment turn on (a total of 9 readings during the 4 hours).

c. Operate the test item, at the completion of the temperature checks, and record all operating characteristics specified in the test item's QMR, SDR, or TC's.

d. At the completion of the operational check turn off the equipment.

e. Visually inspect the test item.

6.2.8 Test No. 7

a. Adjust the chamber temperature to, and stabilize it at the temperature specified in Step 7 of Table II while maintaining locale barometric pressure.

b. Operate the test item, at its highest specified input voltage, for the time specified and record all operating characteristics specified in the test items QMR, SDR, or TC's.

c. At the completion of the specified operating period turn the equipment off for a period of 15 minutes.

d. Repeat steps b and c, at the chamber temperature-altitude conditions specified in Step 7 of Table II, until a total of 4 operating periods have been run.

e. Record the test item temperature, in ten minute intervals commencing with the start of step b until the completion of step d.

f. At the completion of the fourth operating period turn off the equipment.

g. Visually inspect the test item.

6.2.9 Test No. 8

a. Adjust the chamber temperature to, and stabilize it at, the temperature specified in Step 8 of Table II while maintaining locale barometric pressure.

b. Operate the test item at its highest specified input voltage for the time specified and record all operating characteristics specified in the items QMP, SDR, and TC's.

c. At the completion of the operational check turn the equipment off for a period of 15 minutes.

d. Repeat step b and c, at the chamber temperature specified in Step 8 of Table II, until a total of 4 operating periods have been run.

e. Record the test item temperature at the beginning and end of each operating period.

f. At the completion of the fourth operating period turn off the equipment.

g. Visually inspect the test item.

6.2.10 Test No. 9

a. Adjust the chamber temperature to, and stabilize it at, the temperature specified in Step 9 of Table II while maintaining locale barometric pressure.

b. Turn on the test item.

c. Adjust the chamber pressure to simulate the altitude specified in Step 9 of Table II.

d. Operate the test item, at its highest specified input voltage for the time indicated in Step 9 (4 hours), and record the test item temperature every 30 minutes starting with equipment turn on (a total of 9 readings during the 4 hours).

e. Operate the test item, at the completion of the temperature checks, and record all operating characteristics specified in the test items QMR, SDR, or TC's.

f. At the completion of the operational check turn off the equipment.

g. Visually inspect the test item.

6.2.11 Test No. 10

a. Adjust the chamber temperature to, and stabilize it at, the temperature specified in Step 10 of Table II while maintaining locale baromet-

ric pressure.

b. Turn on the equipment.

c. Adjust the chamber pressure to simulate the altitude specified in Step 10 of Table II.

d. Operate the test item at its highest specified input voltage for the time specified, and record all operating characteristics specified in the test items QMR, SDR, or TC's.

e. At the completion of the specified operating period turn the equipment off for a period of 15 minutes.

f. Repeat steps b through e, at the specified chamber temperature-altitude conditions specified in Step 10 of Table II until a total of 4 operating periods have been run.

g. Record the test item temperature, in ten minute intervals, during each operating period.

h. At the completion of the fourth operating period turn off the equipment.

i. Visually inspect the test item.

6.2.12 Test No. 11

a. Adjust the chamber temperature to, and stabilize it at, the temperature specified in Step 11 of Table II while maintaining locale barometric pressure.

b. Turn on the test item.

c. Adjust the chamber pressure to simulate the altitude specified in Step 11 of Table II.

d. Operate the test item, at its highest specified input voltage for the time indicated in Step 11 (4 hours) and record the test item temperature every 30 minutes starting with equipment turn on (a total of 9 readings during the 4 hours).

e. Operate the test item, at the completion of the temperature checks, and record all operating characteristics specified in the test items QMR, SDR, or TC's.

f. At the completion of the operational check turn off the equipment.

g. Visually inspect the test item.

6.2.13 Test No. 12

a. Adjust the chamber to, and stabilize it at, the temperature and pressure (for altitude simulation) specified in Step 12 of Table II.

b. Operate the test item at its highest specified input voltage for the time specified and record all operating characteristics specified in the test items QMR, SDR, and TC's.

c. At the completion of the specified operating period turn off the equipment for a period of 15 minutes.

d. Repeat steps b and c, at the chamber temperature-altitude conditions specified in Step 12 of Table II until a total of 4 operating periods have been run.

e. Record the test item temperature, in ten minute intervals during each operating period.

f. At the completion of the fourth operating period turn off the equipment.

g. Visually inspect the test item.

6.2.14 Test No. 13

a. Adjust the chamber to, and stabilize it at, the temperature and pressure (for altitude simulation) specified in Step 13 of Table II.

b. Operate the test item at its highest specified input voltage for the time specified and record all operating characteristics specified in the test items QMR, SDR, or TC's.

c. At the completion of the operational check turn the equipment off for a period of 15 minutes.

d. Repeat steps b and c, at the chamber conditions specified in Step 13 of Table II, until a total of 4 operating periods have been run.

e. Record the test item temperature, in ten minute intervals during each operating period.

f. At the completion of the fourth operating period turn off the equipment.

6.2.15 Test No. 14

a. At the completion of hot temperature tests (paragraphs 6.2.6 through 6.2.14) if the tests are to be run in sequence, or at the completion of any individual test (from paragraph 6.2.6 through 6.2.14), if only one test is to be conducted, the test chamber shall be returned to, and stabilized at, locale ambient conditions while the test item is in an operating mode.

b. After temperature/pressure/relative humidity stabilization the test item shall be subject to operational tests at its highest specified input voltage and all operating characteristics specified in the test items QMR, SDR, or TC's shall be recorded.

c. At the completion of the operational check turn off the equipment.

6.3 TEST DATA

6.3.1 Equipment Pre-Test Operation

Record the following:

a. Locale ambient temperature (±2°C or ±3.6°F)
b. Relative humidity in percent
c. Barometric pressure in inches of mercury:

1) ±5% when using a monometer to measure pressure
2) ±10% when using vacuum ion gauge y-measure pressure

d. Functional data obtained when operating the test item.

6.3.2 Test Item Preparation

Record the following:

a. Chamber ambient temperature (±2°C or ±3.6°F)
b. Relative humidity in percent
c. Barometric pressure, in inches of mercury

1) ±5% when using a monometer to measure pressure
2) ±10% when using a vacuum ion gauge to measure pressure

d. Functional data obtained when operating the test item

6.3.3 Test No. 1

Record the following:

a. Chamber temperature in degrees (±2°C or ±3.6°F)
b. Relative humidity, in percent
c. Barometric pressure, in inches of mercury

1) ±5% if measured with a monometer
2) ±10% if measured with a vacuum ion gauge

d. Congealment of lubricants
e. Cracking or rupture of materials due to contraction
f. Permanent setting of packings and gaskets
g. Tendency of materials to discolor, crack, bulge, check or craze.

6.3.4 Test No. 2

Record the following:

a. Chamber temperature, in degrees (±2°C or ±3.6°F)
b. Relative humidity in percent
c. Barometric pressure, in inches of mercury

1) ±5% if measured with a monometer
2) ±10% if measured with a vacuum ion gauge

d. Test item input voltage
e. Warm-up time required, in minutes
f. Functional data obtained when operating the test item
g. Short circuiting of electrical wires, etc.
h. Arcing from high voltage terminals, etc.
i. Binding of parts due to differential contractions of dissimilar metals.
j. Effectiveness of lubricants

6.3.5 Test No. 3

Record the following:

a. Chamber temperature, in degrees (±2°C or ±3.6°F)
b. Relative humidity, in percent
c. Barometric pressure, in inches of mercury:

1) ±5% if measured with a monometer
2) ±10% if measured with a vacuum ion gauge

d. Test item input voltage
e. Functional data obtained when operating the test item
f. Short circuiting of electrical wires, etc.
g. Arcing from high voltage terminals, etc.
h. Binding of parts due to differential contraction of dissimilar

metals.

i. Leakage of gases or fluids from sealed enclosures
j. Rupture of pressurized containers

6.3.6 Test No. 4

Record the following:

a. Chamber temperature, in degrees (±2°C or ±3.6°F)
b. Relative humidity, in percent
c. Barometric pressure, in inches of mercury

1) ±5% if measured with a monometer
2) ±10% if measured with a vacuum ion gauge

d. Test item input voltage
e. Warm-up period required, in minutes
f. Functional data obtained when operating the test item
g. Short circuiting of electrical wires, etc.
h. Arcing from high voltage terminals, etc.

6.3.7 Ambient Condition Check

Record the following:

a. Chamber temperature in degrees (±2°C or ±3.6°F)
b. Relative humidity, in percent
c. Barometric pressure, in inches of mercury

1) ±5% if measured with a monometer
2) ±10% if measured with a vacuum ion gauge

d. Functional data obtained when operating the test item
e. Short circuiting of electrical wires, etc.
f. Arcing from high voltage terminals, etc.

6.3.8 Test No. 5

Record the following:

a. Chamber temperature, in degrees (±2°C or ±3.6°F)
b. Relative humidity, in percent
c. Barometric pressure, in inches of mercury

1) ±5% if measured with a monometer
2) ±10% if measured with a vacuum ion gauge

d. Leakage of gases or fluids from sealed enclosures
e. Rupture of pressurized containers
f. Cracking or rupture of materials due to expansion
g. Tendency of materials to discolor, crack, check or craze.

6.3.9 Test No. 6

Record the following:

a. Chamber temperature, in degrees (±2°C or ±3.6°F)
b. Relative humidity, in percent
c. Barometric pressure, in inches of mercury

1) ±5% if measured with a monometer
2) ±10% if measured with a vacuum ion gauge

d. Test item input voltage
e. Test item temperature, in degrees ±2°C or ±3.6°F every 30 minutes for the following:

1) Average test item temperature
2) Temperature of largest mass item in the test unit
3) Temperature of component (less tubes) having highest operating temperature
4) Temperature of component whose temperature rise will affect equipment performance

f. Functional data obtained when operating the test item
g. Short circuiting of electrical wires, etc.
h. Arcing from high voltage terminals, etc.
i. Binding of parts due to differential expansion of dissimilar metals
j. Adequacy of test item cooling systems
k. Effectiveness of lubricants
l. Leakage of gases or fluids from sealed enclosures
m. Rupture of pressurized containers

6.3.10 Test No. 7

Record the following:

a. Chamber temperature, in degrees (±2°C or ±3.6°F)
b. Relative humidity in percent
c. Barometric pressure, in inches of mercury

1) ±5% if measured with a monometer
2) ±10% if measured with a vacuum ion gauge

d. Test cycle number
e. Test item input voltage during each cycle
f. Functional data obtained when operating the test item during each cycle
g. Short circuiting of electrical wires, etc.
h. Arcing from high voltage terminals, etc.
i. Binding of parts due to differential expansion of dissimilar metals
j. Test item temperature, in degrees (±2°C or ±3.6°F) every 10 minutes during the test for the following:

1) Average test item temperature
2) Temperature of largest mass item in the test unit

3) Temperature of component (less tubes) having the highest operating temperature
4) Temperature of component whose temperature rise will effect equipment performance

k. Adequacy of test item cooling systems

6.3.11 Test No. 8

Record the following:

a. Chamber temperature, in degrees (±2°C or ±3.6°F)
b. Relative humidity, in percent
c. Barometric pressure, in inches of mercury

1) ±5% if measured with a monometer
2) ±10% if measured with a vacuum ion gauge

d. Test cycle number
e. Test item input voltage, during each cycle
f. Functional data obtained when operating the item during each cycle
g. Short circuiting of electrical wires, etc.
h. Arcing from high voltage terminals, etc.
i. Binding of parts due to differential expansion of dissimilar metals
j. Test item temperature, in degrees (±2°C or ±3.6°F), at the beginning and end of each operating cycle for the following:

1) Average test item temperature
2) Temperature of largest mass item in the test unit
3) Temperature of component (less tubes) having the highest operating temperature
4) Temperature of component whose temperature rise will effect equipment performance

k. Adequacy of test item cooling systems
l. Leakage of gases or fluids from sealed enclosures
m. Rupture of pressurized containers

6.3.12 Test No. 9

Record the following:

a. Chamber temperature, in degrees (±2°C or ±3.6°F)
b. Relative humidity, in percent
c. Barometric pressure, in inches of mercury

1) ±5% if measured with a monometer
2) ±10% if measured with a vacuum ion gauge

d. Test item input voltage
e. Test item temperature, in degrees (±2°C or ±3.6°F), every 30 minutes, for the following:

1) Average test item temperature
2) Temperature of largest mass item in the test unit
3) Temperature of component (less tubes) having the highest operating temperatures
4) Temperature of component whose temperature rise will effect equipment performance

f. Leakage of gases or fluids from sealed enclosures
g. Rupture of pressurized containers
h. Cracking or rupture of materials due to expansion
i. Short circuiting of electrical wires, etc.
j. Arcing from high voltage terminals, etc.
k. Adequacy of test item cooling systems
l. Tendency of materials to discolor, crack, bulge, check, or craze
m. Functional data obtained during operation of the test item
n. Binding of parts due to expansion of dissimilar metals
p. Effectiveness of lubricants

6.3.13 Test No. 10

Record the following:

a. Chamber temperature, in degrees (±2°C or ±3.6°F)
b. Relative humidity, in percent
c. Barometric pressure, in inches of mercury

1) ±5% if measured with a monometer
2) ±10% if measured with a vacuum ion gauge

d. Test cycle number
e. Test item voltage, during each cycle
f. Functional data obtained when operating the item during each cycle
g. Short circuiting of electrical wires, etc.
h. Arcing from high voltage terminals, etc.
i. Binding of parts due to differential expansion of dissimilar metals
j. Cracking or rupture of materials due to expansion
k. Leakage of gases or fluids from sealed enclosures
l. Rupture of pressurized containers
m. Tendency of materials to discolor, crack, bulge, check or craze
n. Test item temperature, in degrees (±2°C or ±3.6°F) every ten minutes during each operating period for the following:

1) Average test item temperature
2) Temperature of largest mass item in the test item
3) Temperature of component (less tubes) having the highest operating temperature
4) Temperature of component whose temperature rise will effect equipment performance

p. Adequacy of test item cooling system
q. Effectiveness of lubricants

6.3.14 Test No. 11

Record the following:

a. Chamber temperature, in degrees (±2°C or ±3.6°F)
b. Relative humidity, in percent
c. Barometric pressure, in inches of mercury

1) ±5% if measured with a monometer
2) ±10% if measured with a vacuum ion gauge

d. Test item input voltage
e. Test item temperature, in degrees (±2°C or ±3.6°F) every 30 minutes, for the following:

1) Average test item temperature
2) Temperature of largest mass item in the test item
3) Temperature of component (less tubes) having the highest operating temperature
4) Temperature of component whose temperature rise will effect equipment performance

f. Leakage of gases or fluids from sealed enclosures
g. Rupture of pressurized containers
h. Cracking or rupture of materials due to expansion
i. Short circuiting of electrical wires, etc.
j. Arcing from high voltage terminals, etc.
k. Adequacy of test item cooling systems
l. Tendency of materials to discolor, crack, bulge, check, or craze
m. Functional data obtained during operation of the test item
n. Binding of parts due to expansion of dissimilar metals
p. Effectiveness of lubricants

6.3.15 Test No. 12

Record the following:

a. Chamber temperature, in degrees (±2°C or ±3.6°F)
b. Relative humidity, in percent
c. Barometric pressure, in inches of mercury

1) ±5% if measured with a monometer
2) ±10% if measured with a vacuum ion gauge

d. Test cycle number
e. Test item input voltage during each cycle
f. Functional data obtained when operating the unit during each cycle
g. Short circuiting of electrical wires, etc.
h. Arcing from high voltage terminals, etc.
i. Binding of parts due to differential expansion of dissimilar metals
j. Cracking or rupture of material due to expansion
k. Leakage of gases or fluids from sealed enclosures
l. Rupture of pressurized containers

m. Tendency of materials to discolor, crack, bulge, check or craze
n. Test item temperature, in degrees (±2°C or ±3.6°F) every 10 minutes during each operating period for the following:

1) Average test item temperature
2) Temperature of largest mass item in the test unit
3) Temperature of component (less tubes) having the highest operating temperature
4) Temperature of component whose temperature rise will effect equipment performance

p. Adequacy of test item cooling system
q. Effectiveness of lubricants

6.3.16 Test No. 13

Record the following:

a. Chamber temperature, in degrees (±2°C or ±3.6°F)
b. Relative humidity, in percent
c. Barometric pressure, in inches of mercury

1) ±5% if measured with a monometer
2) ±10% if measured with a vacuum ion gauge

d. Test cycle number
e. Test item input voltage during each cycle
f. Functional data obtained when operating the item during each cycle
g. Short circuiting of electrical wires, etc.
h. Arcing from high voltage terminals, etc.
i. Binding of parts due to differential expansion of dissimilar metals
j. Test item temperature, in degrees (±2°C or ±3.6°F) at the beginning and end of each operating cycle for the following:

1) Average test item temperature
2) Temperature of largest mass item in the test unit
3) Temperature of component (less tubes) having the highest operating temperature
4) Temperature of component whose temperature rise will effect equipment performance

k. Adequacy of test item cooling system
l. Leakage of gases or fluids from sealed enclosures
m. Rupture of pressurized containers

6.3.17 Test No. 14

Record the following:

a. Chamber temperature, in degrees (±2°C or ±3.6°F)
b. Relative humidity, in percent
c. Barometric pressure, in inches of mercury

1) ±5% if measured with a monometer
2) ±10% if measured with a vacuum ion gauge

d. Functional data obtained when operating the test item
e. Short circuiting of electrical wires, etc.
f. Arcing from high voltage terminals, etc.

6.4 DATA REDUCTION AND PRESENTATION

Test data, both raw and processed, shall be properly marked for identification and correlation with test item. Test personnel shall include their opinions concerning success or failure of the test.

Deterioration or changes in performance of any components which can in any way prevent the test item from meeting functional maintenance and service requirements during service life shall provide reason to consider the test item as having failed to comply with the item requirements.