

NAVAL RESEARCH LABORATORY
Washington, D. C.

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AIRCRAFT ELECTRICAL RESEARCH DIVISION
ENGINEERING AND EVALUATION SECTION

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THE DETERMINATION OF THERMAL
CHARACTERISTICS OF STANDARD TYPE
NAVAL AIRBORNE GENERATORS.

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ABSTRACT

A study of the loading of aircraft generators indicates that loads of short duration but of high magnitude occur. In order to be able to recommend, with reasonable accuracy, the power generation system for an aircraft, it is necessary to know the thermal characteristics of the generators as well as the type of loading to be expected. Studies were made to determine these characteristic curves for several standard aircraft generators. The results of this investigation indicate that the brushes will, to a large extent, govern the magnitude and duration of the overload which a generator can safely stand. This is due to the high initial rate of rise of the temperature of the brushes, as compared with that of other parts of the generator.

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AUTHORIZATION

1. The studies covered in this report were initiated by reference (a).

INTRODUCTION

2. Studies and analysis of the electrical loads on naval aircraft have shown that, at certain times during flight, the total current demand may reach high values for only a short time. Loads equal to twice the maximum continuous load, lasting one to two minutes, have been experienced and even higher values for shorter time periods. If the most economical size generator or generators are to be selected for a system, it will be necessary to know their thermal characteristics. This should include the initial rate of change of temperature as well as final operating temperature of the generator.
3. An examination of the generators revealed that the temperatures of the following parts would be critical in the determination of loading: commutator, brushes, armature winding, field windings and bearings. Because of limitations of the measuring techniques, the armature and commutator temperatures were not obtained. Certain other temperatures, such as that of air blast, poles and yoke, were obtained for correlation purposes.
4. The work done has not been to write the theoretical equations for the thermal characteristics, but has been undertaken with the object of obtaining the thermal characteristics of several standard aircraft generators.

TEMPERATURE MEASUREMENTS

5. A Lewis Engineering Company potentiometer pyrometer, with copper-constantan thermocouples and a multiple contact switch, was used to obtain the room ambient, frame, brush, pigtail, bearings, field pole, input air and output air temperatures. These temperatures were taken while the generators were running.
6. The thermocouple, for measuring the bearing temperature, was inserted in a drilled hole in the bearing housing. A wooden wedge was used to retain the thermocouples. The thermocouples used to measure brush temperatures were inserted in a hole drilled into the side of the brush near to and parallel with the riding surface. The thermocouple was wedged in with wood.
7. At the conclusion of each running test, final shutdown resistance of the field winding was taken with a Kelvin Bridge. These readings were taken for two minutes at half minute intervals, so that the resistance at shutdown time could be obtained by extrapolation. Final temperature of the field was then calculated.

A contact pyrometer was used to measure commutator temperature after shutdown time. These readings were also taken for two minutes at approximately half minute intervals so that the reading at shutdown time could be obtained by extrapolation. Difficulty was encountered in the extrapolation calculations, due to the particular cooling characteristics of each generator. The temperature of certain parts of the generator would continue to rise for a brief period after shutdown, thus reducing the accuracy of extrapolation.

8. The values of field winding temperatures during the temperature runs, obtained by calculation from winding resistance, were very erratic and, as a result, were not presented on the curve sheets. The poor results can probably be attributed to metering inaccuracies and inability to read the meters to sufficient number of places.

9. The temperature runs at each load were concluded when the temperature rise of the shunt field was no more than 1 degree Centigrade for a five minute period, or when the shunt field temperature had reached 120 degrees Centigrade. Because of the number of readings that had to be taken, and the fact that visual observations were used, readings could not be taken any more often than every two minutes. This was not sufficient to give the greatest possible degree of accuracy for the initial rate of rise of temperature. Due to these limitations in accuracy, no runs were taken at loads greater than 150 per cent rated generator load.

TEMPERATURE CHARACTERISTICS OF D.C. GENERATORS

10. The thermal characteristics of several direct current generators are presented in Figures 1 to 7. The brush temperature is the average of two brushes, the one nearest to and the one farthest from the airblast tube. The temperature of the mounting flange bearing is presented since it was the hotter of the two bearings. It will be noted that the temperature of this bearing is influenced by the variation in output air temperature.

TEMPERATURE CHARACTERISTICS OF A.C.-D.C. GENERATORS

11. The thermal characteristics of the standard A.C.-D.C. generators used on naval aircraft are presented in Figures 8 to 11. The same percentage load for the A.C. and D.C. part of the generator were used throughout this investigation. Certain overload conditions were eliminated, since it was found to be impossible to maintain rated voltage using the value of series compensation that was selected. All A.C. loads were at unity power factor.

CONCLUSIONS

12. Results of this study indicate that, under continuous loading, the temperature of the shunt field will usually determine the maximum loading of present standard naval aircraft generators.

13. The initial rate of rise of temperature for commutator and brush is much greater than for other parts of the generator.

14. The maximum short time overloads on A.C. generators will be limited largely by the ability of the regulator to maintain rated voltage (due to series compensation).

RECOMMENDATIONS

15. It is recommended that the initial rate of change of brush and commutator temperature be considered in short time overload ratings of direct current generators.

REFERENCES

16. (a) BuAer ltr to NRL Aer-E-3121-WCB, F36-1, Serial No. 48244, dated 23 March 1945.

D.C. GENERATOR
ECLIPSE AVIATION CORPORATION
TYPE 1298-1-A SERIAL NO. A1403
TEMPERATURE AS A FUNCTION OF TIME
FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE
CONSTANT GENERATOR SPEED - 6000 R.P.M.
AVERAGE TERMINAL VOLTAGE - 27.7 VOLTS
0% RATED LOAD CURRENT- OPEN CIRCUIT

- 1 - Brushes Average
- 2 - Pigtaills Average
- 3 - Field Poles
- 4 - Bearing
- 5 - Frame
- 6 - Output Air
- 7 - Input Air
- 8 - Room Ambient
- 9 - Final Commutator
- 10 - Final Field Winding(Kelvin Bridge)
- 11 - Final Field Winding(Volt-ammeter)

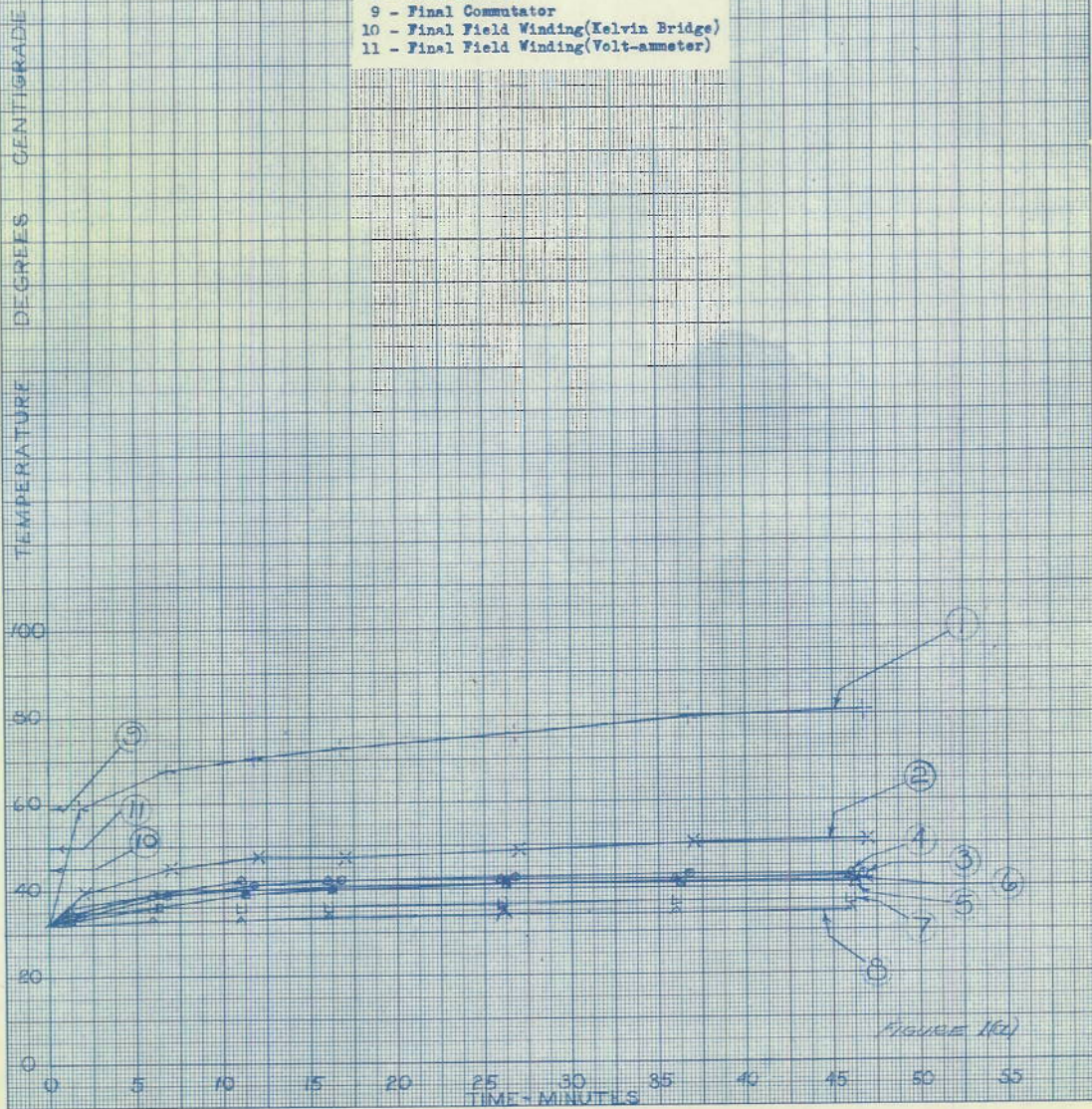
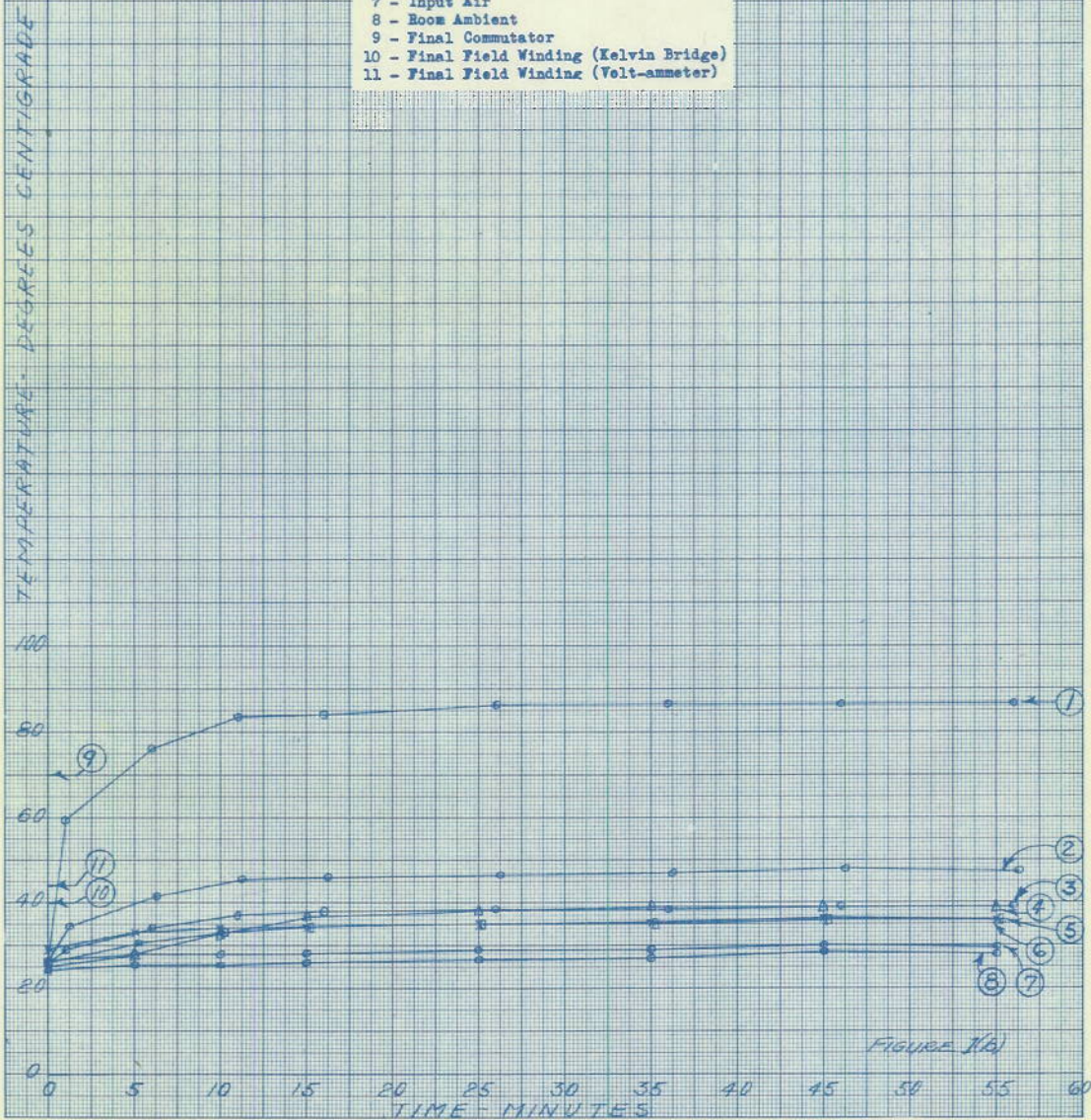


FIGURE 164

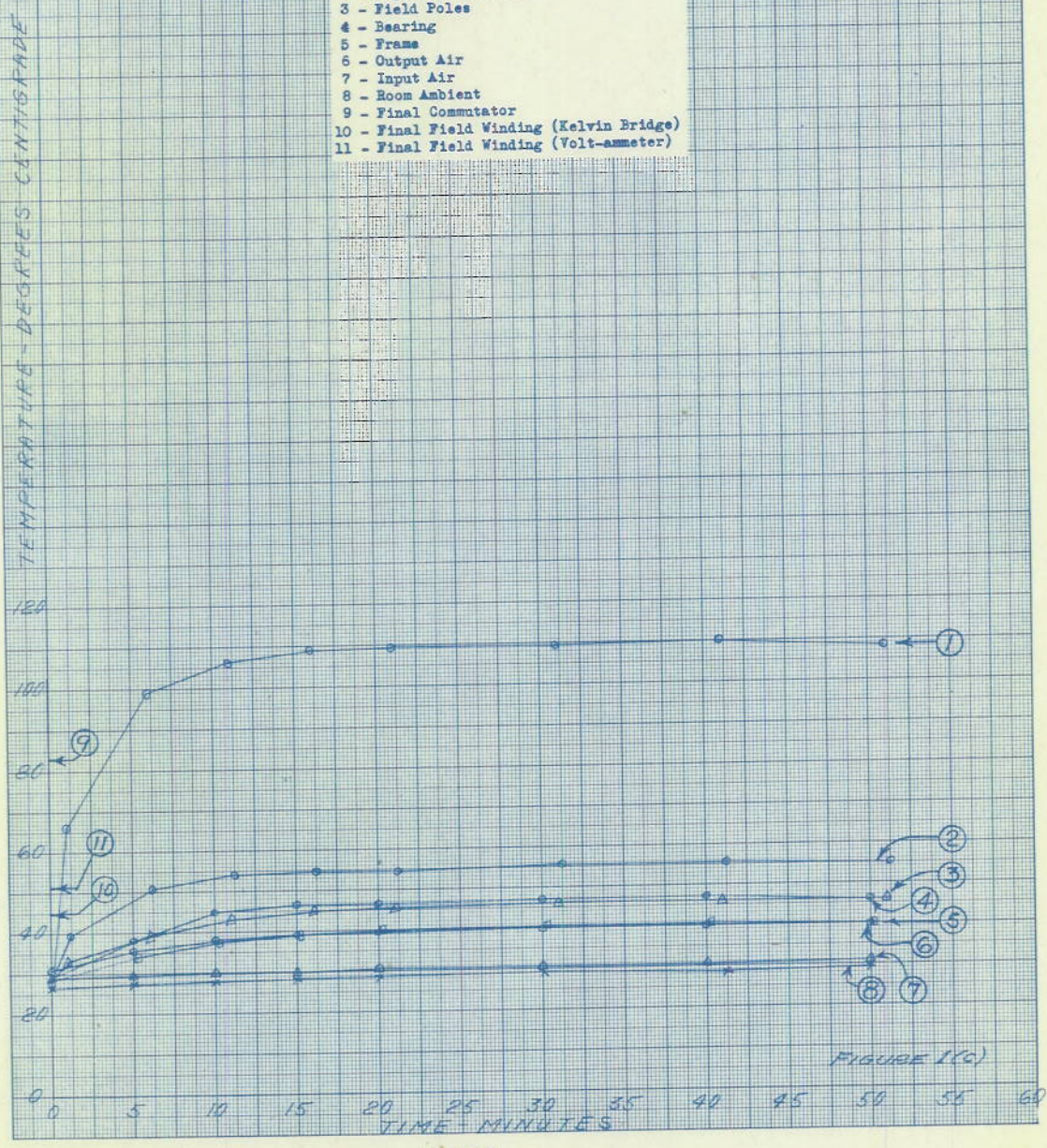
D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 TYPE 1298-1-A SERIAL NO. A1403
 TEMPERATURE AS A FUNCTION OF TIME
 FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 AVERAGE TERMINAL VOLTAGE - 27.7 VOLTS
 25% RATED LOAD CURRENT - 18.75 AMPERES

- 1 - Brushes - Average
- 2 - Pigtaills - Average
- 3 - Field Poles
- 4 - Bearing
- 5 - Frame
- 6 - Output Air
- 7 - Input Air
- 8 - Room Ambient
- 9 - Final Commutator
- 10 - Final Field Winding (Kelvin Bridge)
- 11 - Final Field Winding (Volt-ammeter)



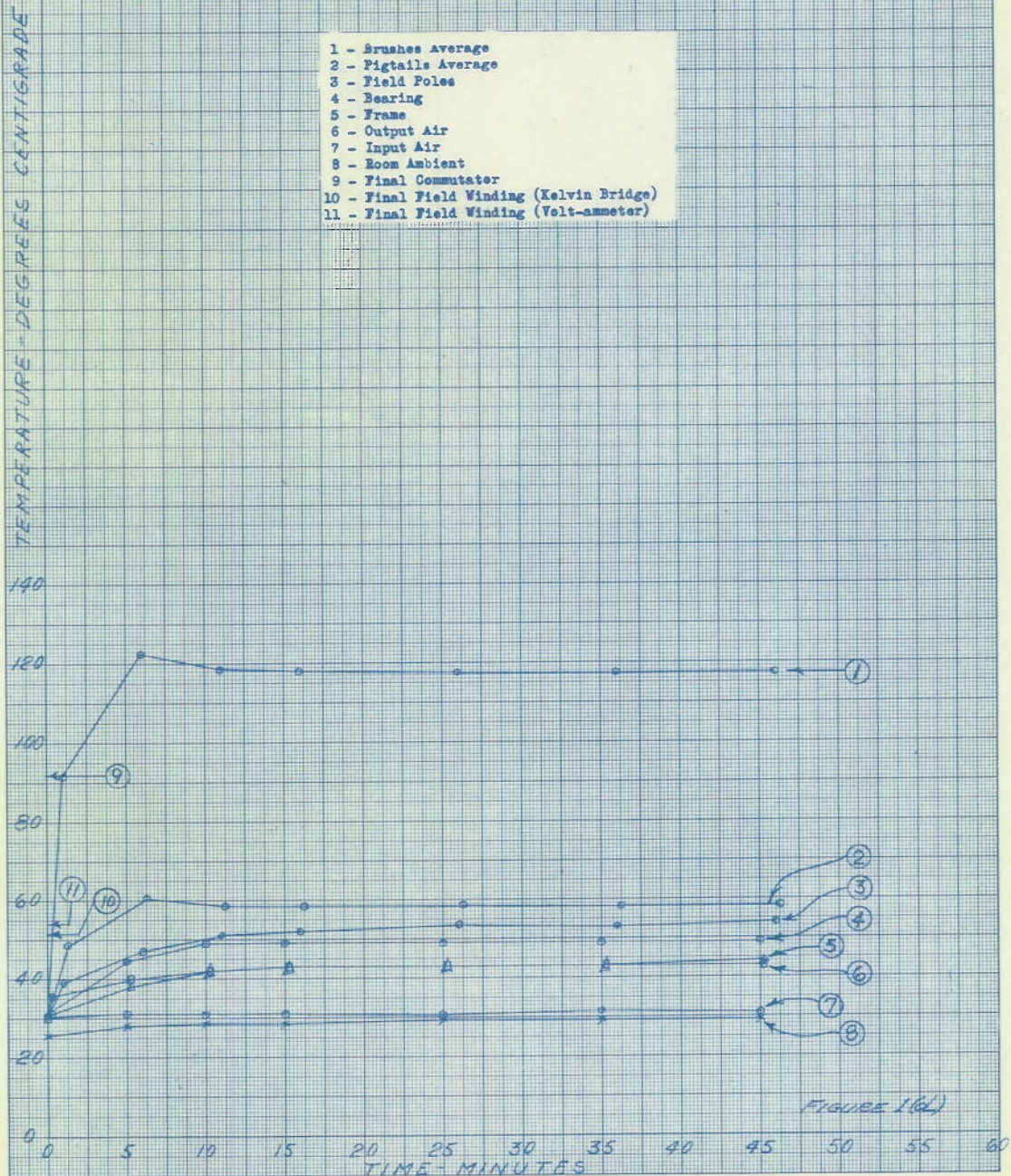
D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 TYPE 1298-1-A SERIAL NO. A1403
 TEMPERATURE AS A FUNCTION OF TIME
 FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 AVERAGE TERMINAL VOLTAGE - 27.7 VOLTS
 50% RATED LOAD CURRENT - 37.5 AMPERES

- 1 - Brushes - Average
- 2 - Pigtaills - Average
- 3 - Field Poles
- 4 - Bearing
- 5 - Frame
- 6 - Output Air
- 7 - Input Air
- 8 - Room Ambient
- 9 - Final Commutator
- 10 - Final Field Winding (Kelvin Bridge)
- 11 - Final Field Winding (Volt-ammeter)



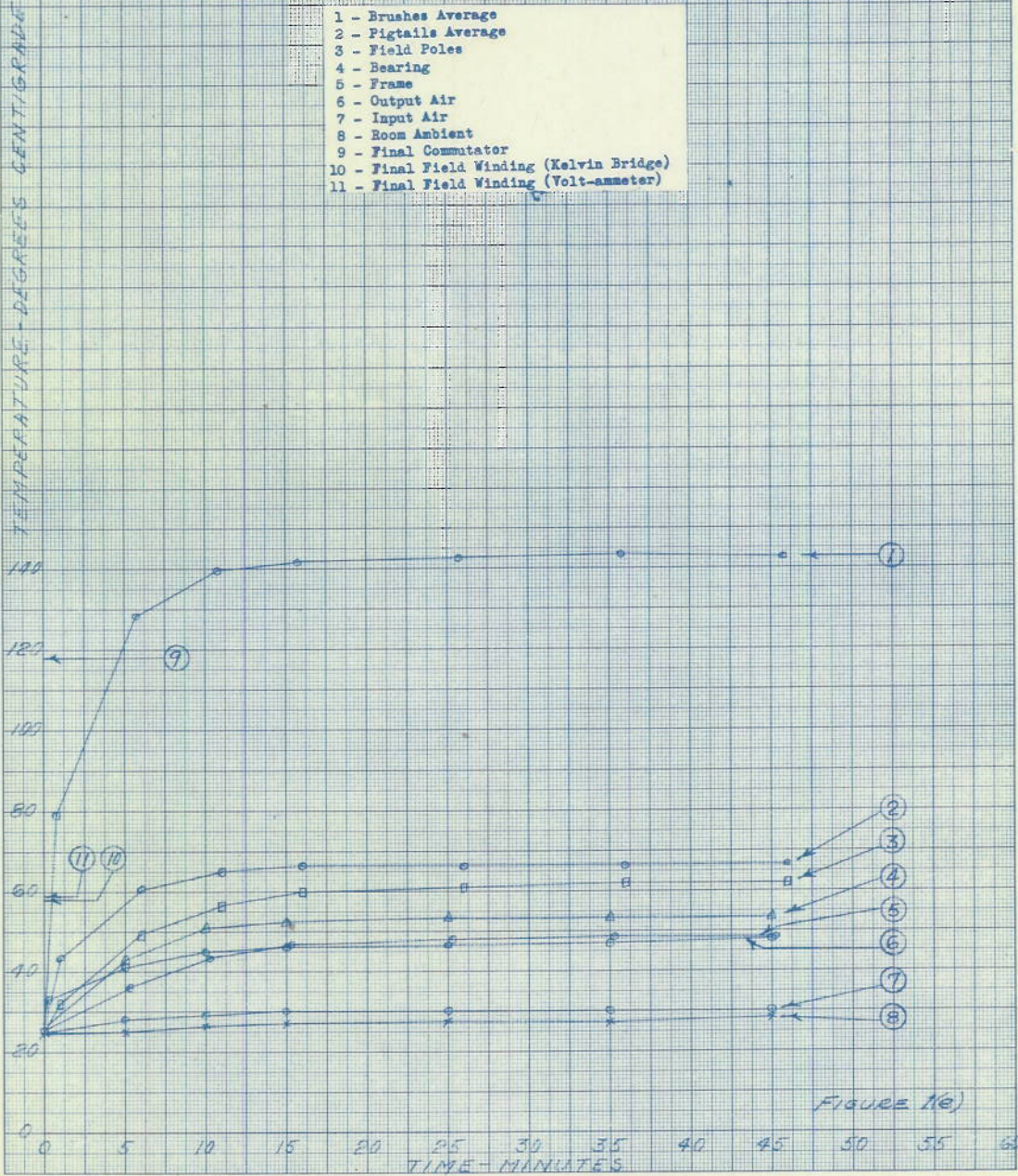
D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 TYPE 1298-1-A SERIAL NO A1403
 TEMPERATURE AS A FUNCTION OF TIME
 FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 AVERAGE TERMINAL VOLTAGE - 27.7 VOLTS
 75% RATED LOAD CURRENT - 56.25 AMPERES

- 1 - Brushes Average
- 2 - Pigtaills Average
- 3 - Field Poles
- 4 - Bearing
- 5 - Frame
- 6 - Output Air
- 7 - Input Air
- 8 - Room Ambient
- 9 - Final Commutator
- 10 - Final Field Winding (Kelvin Bridge)
- 11 - Final Field Winding (Volt-ammeter)



D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 TYPE 1298-1-A SERIAL NO. A1403
 TEMPERATURE AS A FUNCTION OF TIME
 FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 AVERAGE TERMINAL VOLTAGE - 27.7 VOLTS
 100% RATED LOAD CURRENT - 75 AMPERES

- 1 - Brushes Average
- 2 - Pigtaile Average
- 3 - Field Poles
- 4 - Bearing
- 5 - Frame
- 6 - Output Air
- 7 - Input Air
- 8 - Room Ambient
- 9 - Final Commutator
- 10 - Final Field Winding (Kelvin Bridge)
- 11 - Final Field Winding (Volt-ammeter)



D.C. GENERATOR
ECLIPSE AVIATION CORPORATION
TYPE 1298-1-A SERIAL NO. A1403
TEMPERATURE AS A FUNCTION OF TIME
FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE
CONSTANT GENERATOR SPEED - 6000 R.P.M.
AVERAGE TERMINAL VOLTAGE - 27.7 VOLTS
125% RATED LOAD CURRENT - 93.75 AMPERES

- 1 - Brushes Average
- 2 - Pigtaile Average
- 3 - Field Poles
- 4 - Bearing
- 5 - Frame
- 6 - Output Air
- 7 - Input Air
- 8 - Room Ambient
- 9 - Final Commutator
- 10 - Final Field Winding (Kelvin Bridge)
- 11 - Final Field Winding (Volt-ammeter)

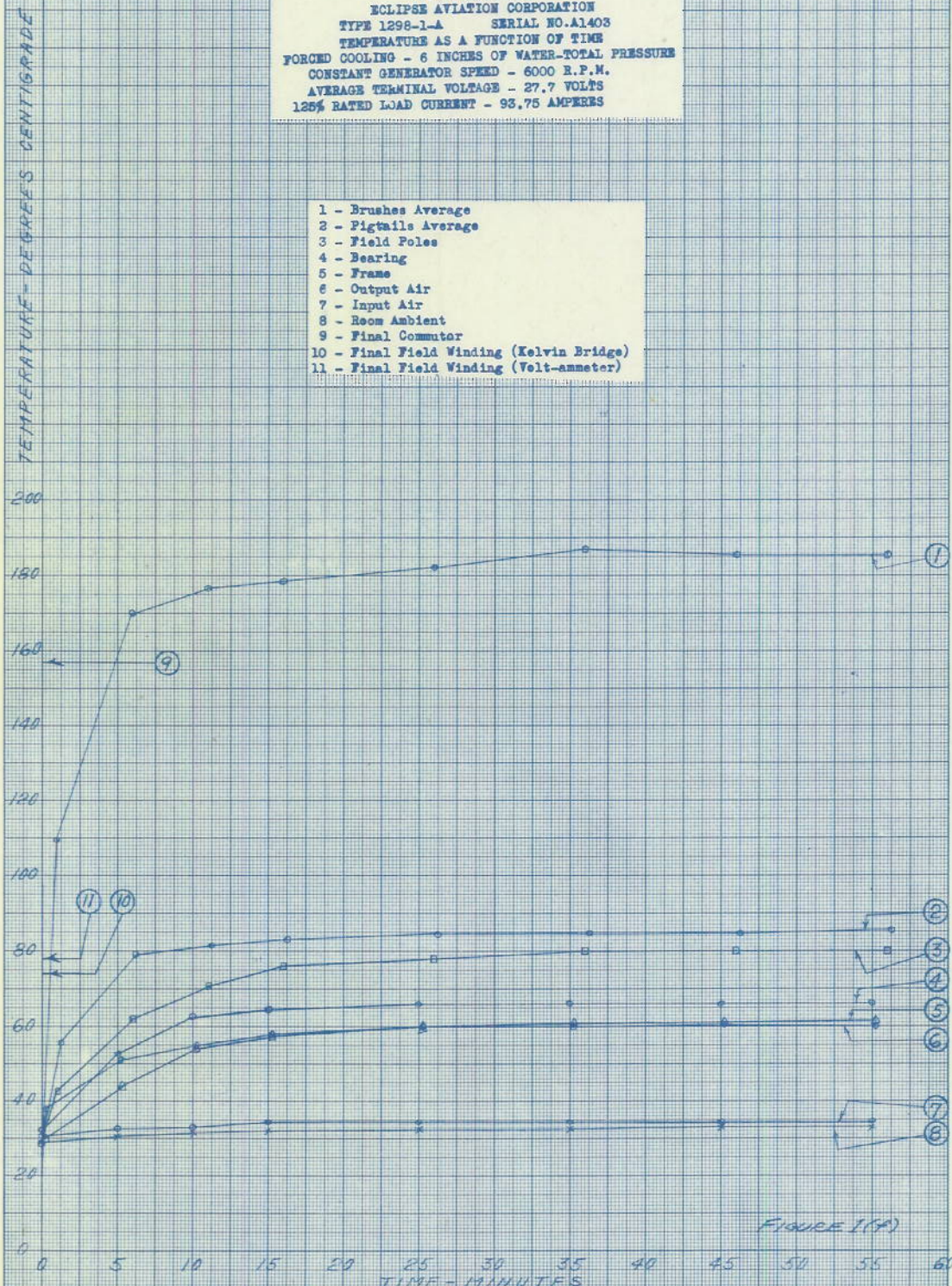
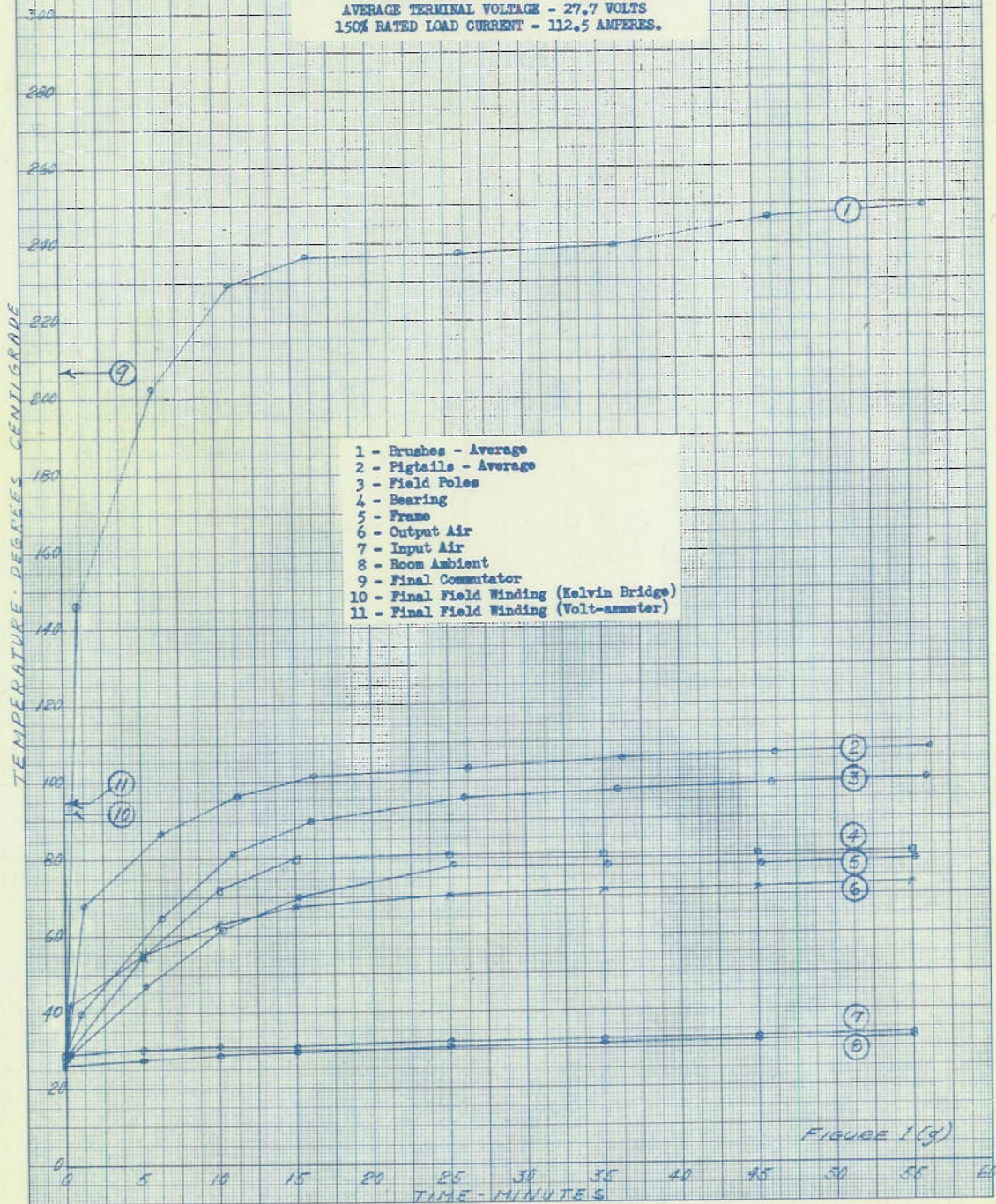


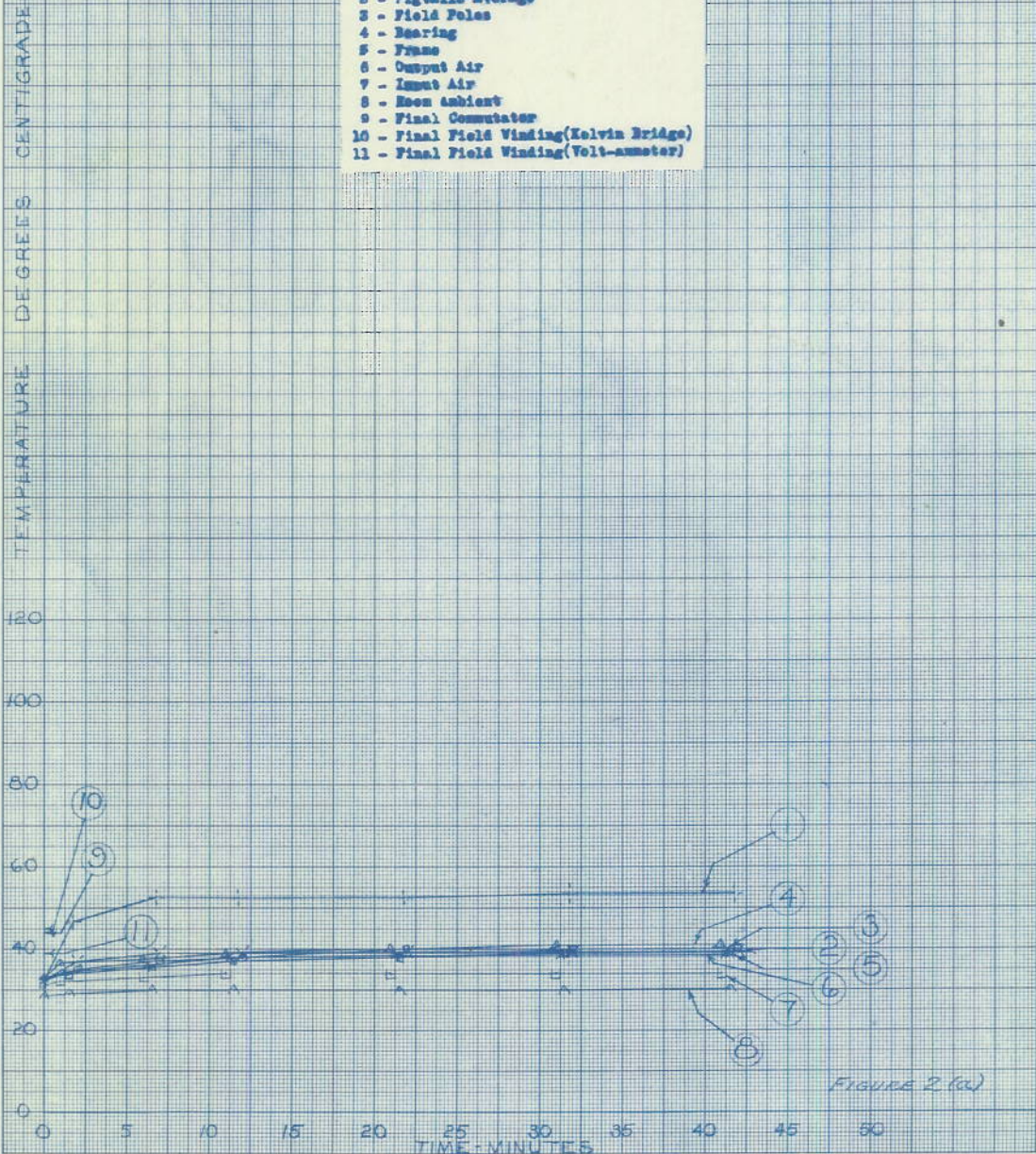
FIGURE 1(A)

D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 TYPE 1298-1-A SERIAL NO. A1403
 TEMPERATURE AS A FUNCTION OF TIME
 FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE.
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 AVERAGE TERMINAL VOLTAGE - 27.7 VOLTS
 150% RATED LOAD CURRENT - 112.5 AMPERES.



D.C. GENERATOR
 ELECTRIC AUTO-LITE COMPANY
 TYPE 20M70B9 SERIAL NO. 4Y041
 TEMPERATURE AS A FUNCTION OF TIME
 FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE
 CONSTANT GENERATOR SPEED - 3400 R.P.M.
 AVERAGE TERMINAL VOLTAGE - 27.7 VOLTS
 % RATED LOAD CURRENT - OPEN CIRCUIT

- 1 - Brushes-Average
- 2 - Figtails-Average
- 3 - Field Poles
- 4 - Bearing
- 5 - Frame
- 6 - Output Air
- 7 - Input Air
- 8 - Room Ambient
- 9 - Final Commutator
- 10 - Final Field Winding(Kelvin Bridge)
- 11 - Final Field Winding(Volt-ammeter)



D.C. GENERATOR
 ELECTRIC AUTO-LITE COMPANY
 TYPE 2CM70B9 SERIAL NO. 4Y041
 TEMPERATURE AS A FUNCTION OF TIME
 FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE
 CONSTANT GENERATOR SPEED - 3400 R.P.M.
 AVERAGE TERMINAL VOLTAGE - 27.7 VOLTS
 25% RATED LOAD CURRENT - 45 AMPERES

- 1 - Brushes-Average
- 2 - Pigtails-Average
- 3 - Field Poles
- 4 - Bearing
- 5 - Frame
- 6 - Output Air
- 7 - Input Air
- 8 - Room Ambient
- 9 - Final Commutator
- 10 - Final Field Winding (Kelvin Bridge)
- 11 - Final Field Winding (Volt-ammeter)

TEMPERATURE - DEGREES CENTIGRADE

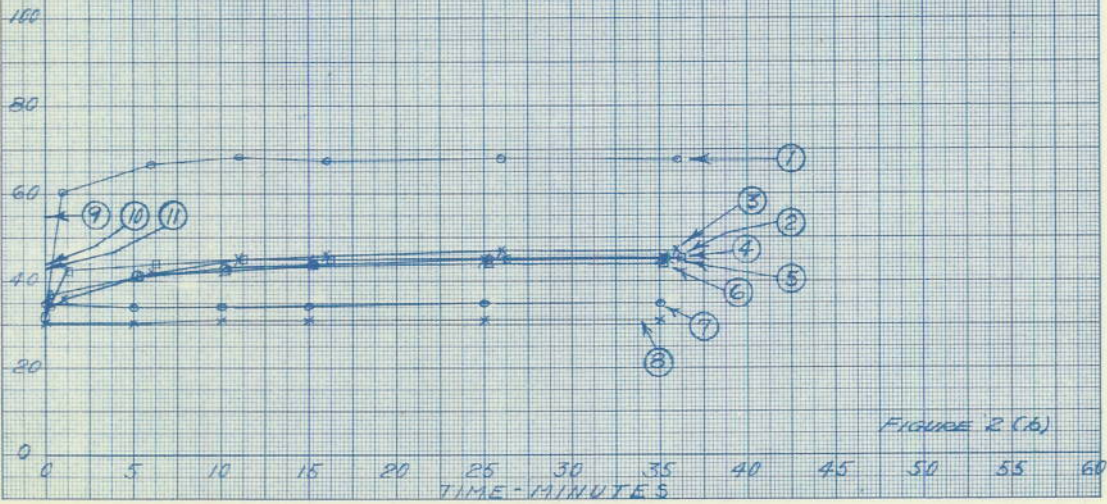
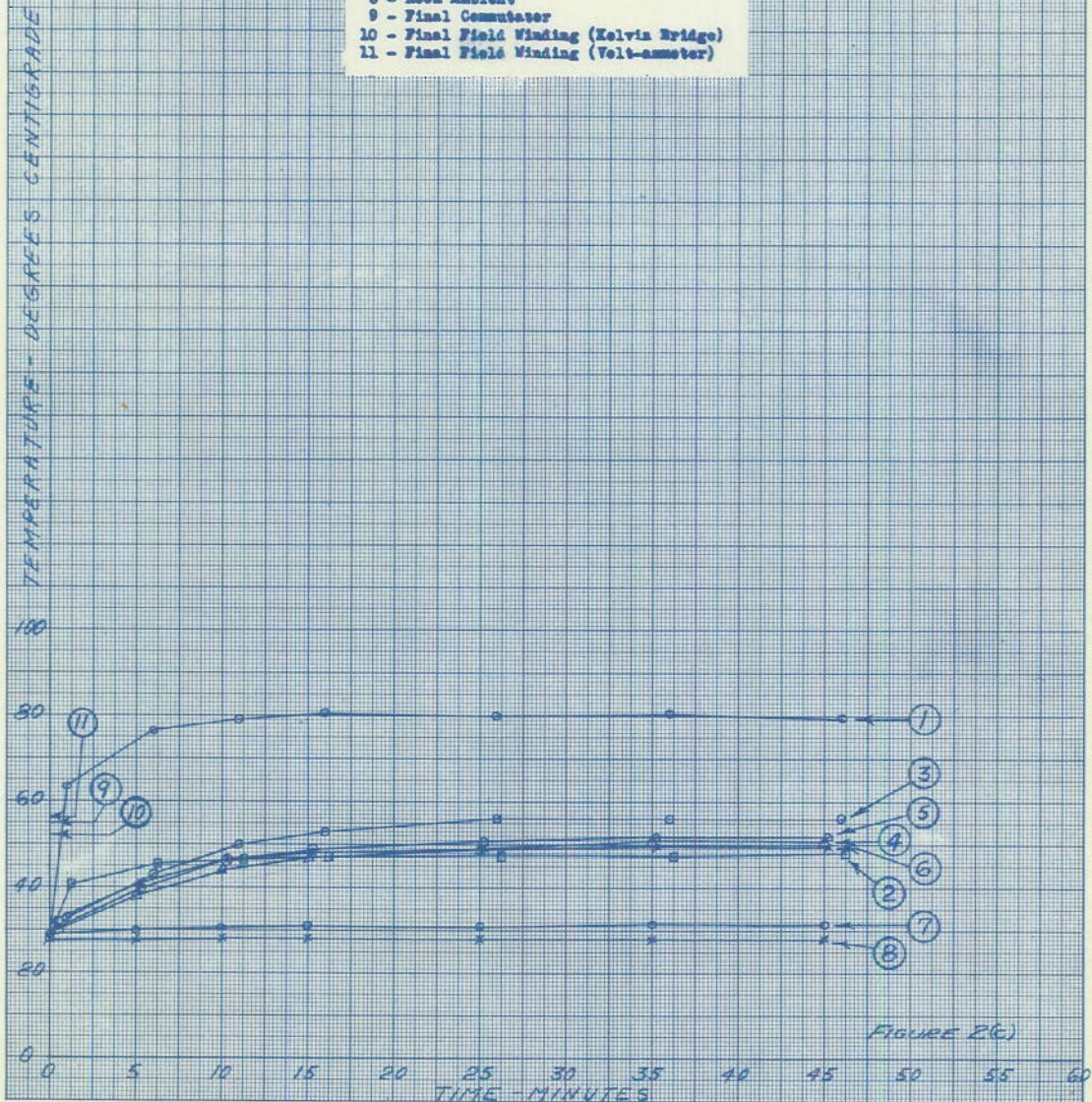


FIGURE 2 (b)

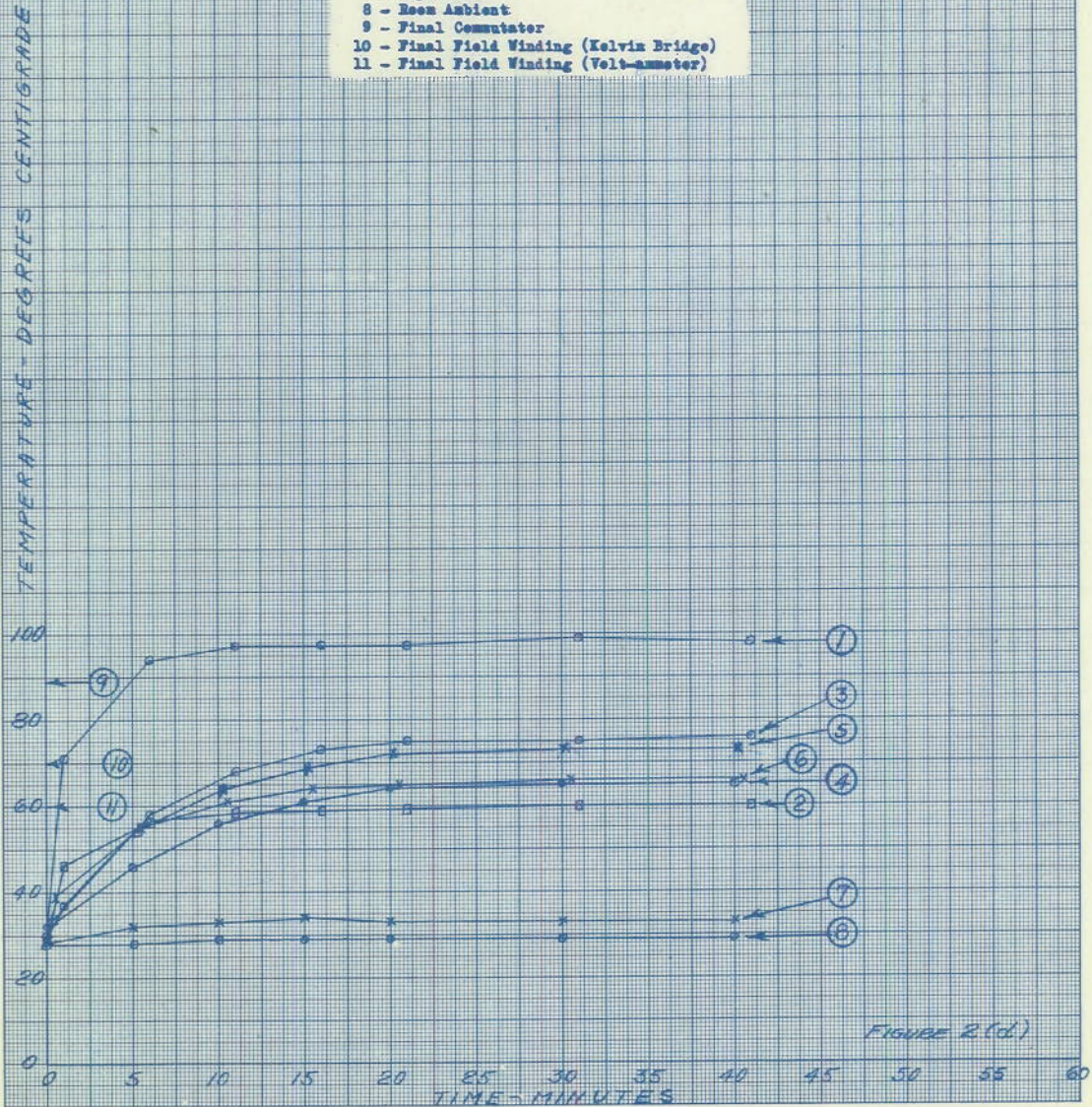
D.C. GENERATOR
 ELECTRIC AUTO-LITE COMPANY
 TYPE 20M70B9 SERIAL NO. 4Y041
 TEMPERATURE AS A FUNCTION OF TIME
 FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE
 CONSTANT GENERATOR SPEED - 3400 R.P.M.
 AVERAGE TERMINAL VOLTAGE - 27.7 VOLTS
 50% RATED LOAD CURRENT - 90 AMPERES

- 1 - Brushes-Average
- 2 - Pigtails-Average
- 3 - Field Pole
- 4 - Bearing
- 5 - Frame
- 6 - Output Air
- 7 - Input Air
- 8 - Room Ambient
- 9 - Final Commutator
- 10 - Final Field Winding (Kelvin Bridge)
- 11 - Final Field Winding (Volt-ammeter)



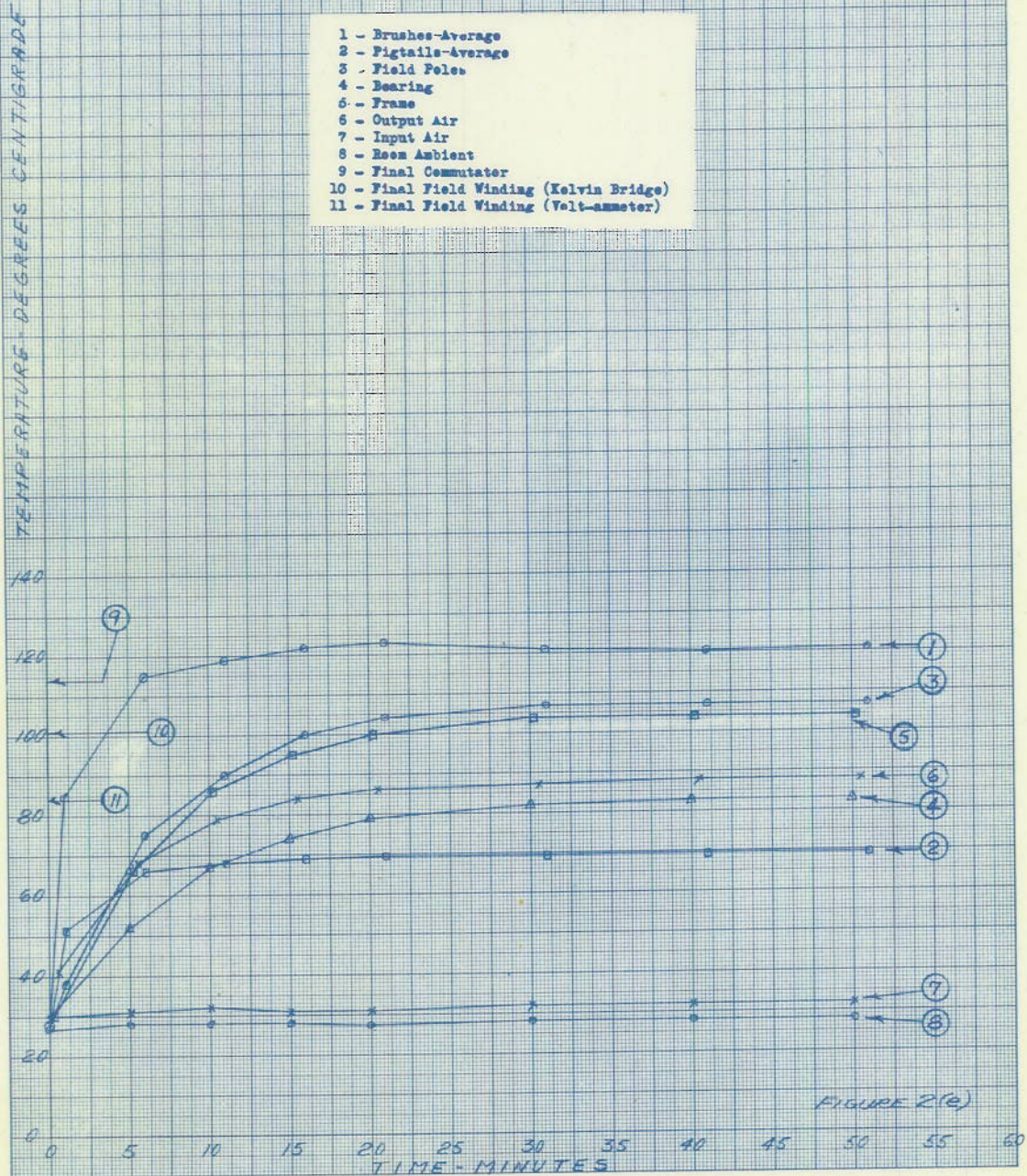
D.C. GENERATOR
 ELECTRIC AUTO-LITE COMPANY
 TYPE 20M70B9 SERIAL NO. 4Y041
 TEMPERATURE AS A FUNCTION OF TIME
 FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE
 CONSTANT GENERATOR SPEED - 3400 I.P.M.
 AVERAGE TERMINAL VOLTAGE - 27.7 VOLTS
 75% RATED LOAD CURRENT - 125 AMPERES

- 1 - Brushes-Average
- 2 - Pigtaile-Average
- 3 - Field Poles
- 4 - Bearing
- 5 - Frame
- 6 - Output Air
- 7 - Input Air
- 8 - Room Ambient
- 9 - Final Commutator
- 10 - Final Field Winding (Kelvin Bridge)
- 11 - Final Field Winding (Volt-ammeter)



D.C. GENERATOR
 ELECTRIC AUTO-LITE COMPANY
 TYPE 20M70B9 SERIAL NO. 4Y041
 TEMPERATURE AS A FUNCTION OF TIME
 FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE
 CONSTANT GENERATOR SPEED - 3400 R.P.M.
 AVERAGE TERMINAL VOLTAGE - 27.7 VOLTS
 100% RATED LOAD CURRENT - 180 AMPERES

- 1 - Brushes-Average
- 2 - Pigtaills-Average
- 3 - Field Poles
- 4 - Bearing
- 5 - Frame
- 6 - Output Air
- 7 - Input Air
- 8 - Room Ambient
- 9 - Final Commutator
- 10 - Final Field Winding (Kelvin Bridge)
- 11 - Final Field Winding (Volt-ammeter)



D.C. GENERATOR
 ELECTRIC AUTO-LITE COMPANY
 TYPE 20M70B9 SERIAL NO. 4Y041
 TEMPERATURE AS A FUNCTION OF TIME
 FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE
 CONSTANT GENERATOR SPEED - 3400 R.P.M.
 AVERAGE TERMINAL VOLTAGE - 27.7 VOLTS
 125% RATED LOAD CURRENT - 225 AMPERES

- 1 - Brushes-Average
- 2 - Pigtaills-Average
- 3 - Field Poles
- 4 - Bearing
- 5 - Frame
- 6 - Output Air
- 7 - Input Air
- 8 - Room Ambient
- 9 - Final Commutator
- 10 - Final Field Winding(Kelvin Bridge)
- 11 - Final Field Winding(Volt-ammeter)

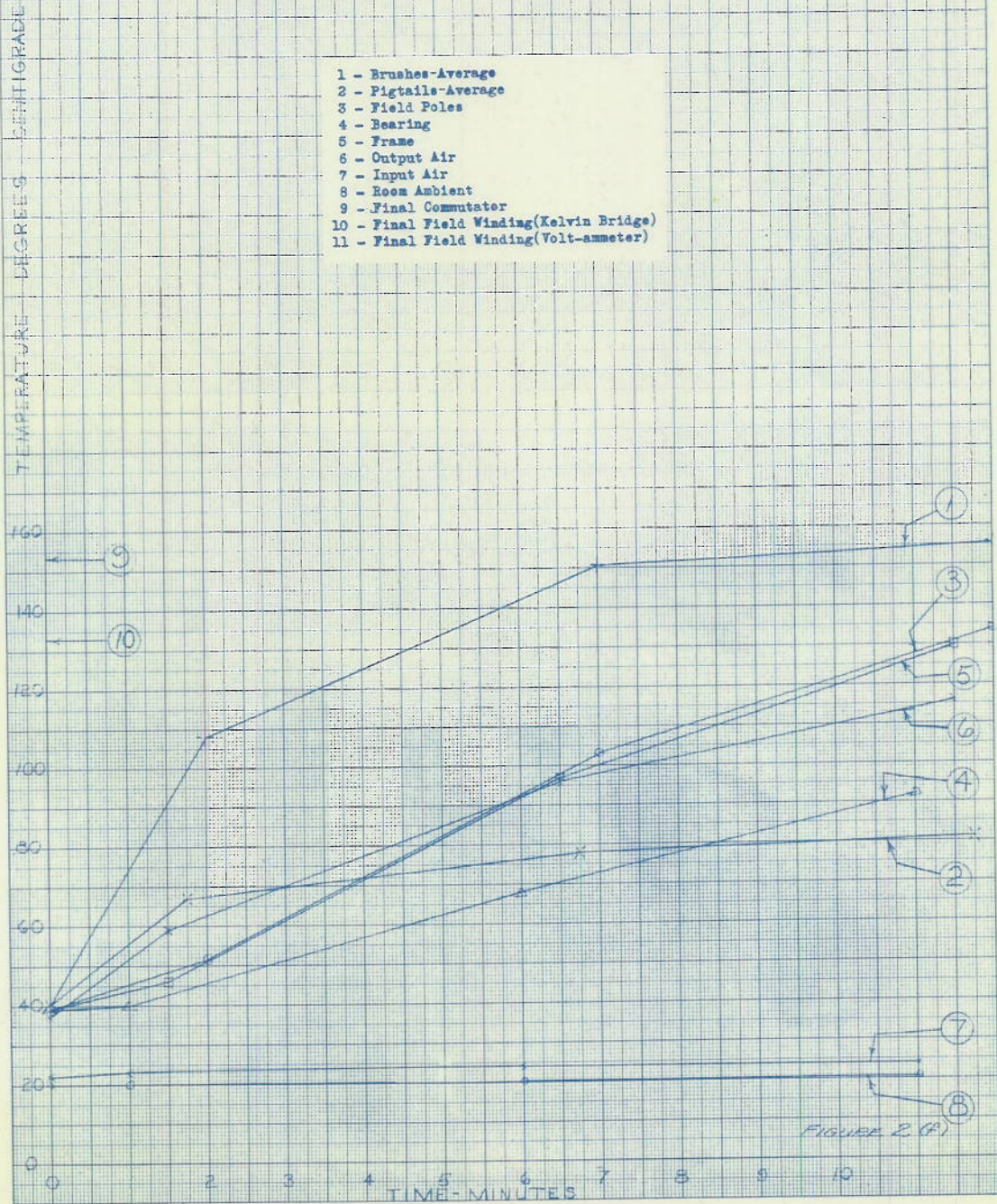


FIGURE 2 (F)

D.C. GENERATOR
 ELECTRIC AUTO-LITE COMPANY
 TYPE 2CM70B9 SERIAL NO. 4Y041
 TEMPERATURE AS A FUNCTION OF TIME
 FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE
 CONSTANT GENERATOR SPEED - 3400 R.P.M.
 AVERAGE TERMINAL VOLTAGE - 27.7 VOLTS
 150% RATED LOAD CURRENT - 270 AMPERES

- 1 - Brushes-Average
- 2 - Pigtaile-Average
- 3 - Field Poles
- 4 - Bearing
- 5 - Frame
- 6 - Output Air
- 7 - Input Air
- 8 - Room Ambient
- 9 - Final Commutator
- 10 - Final Field Winding(Kelvin Bridge)

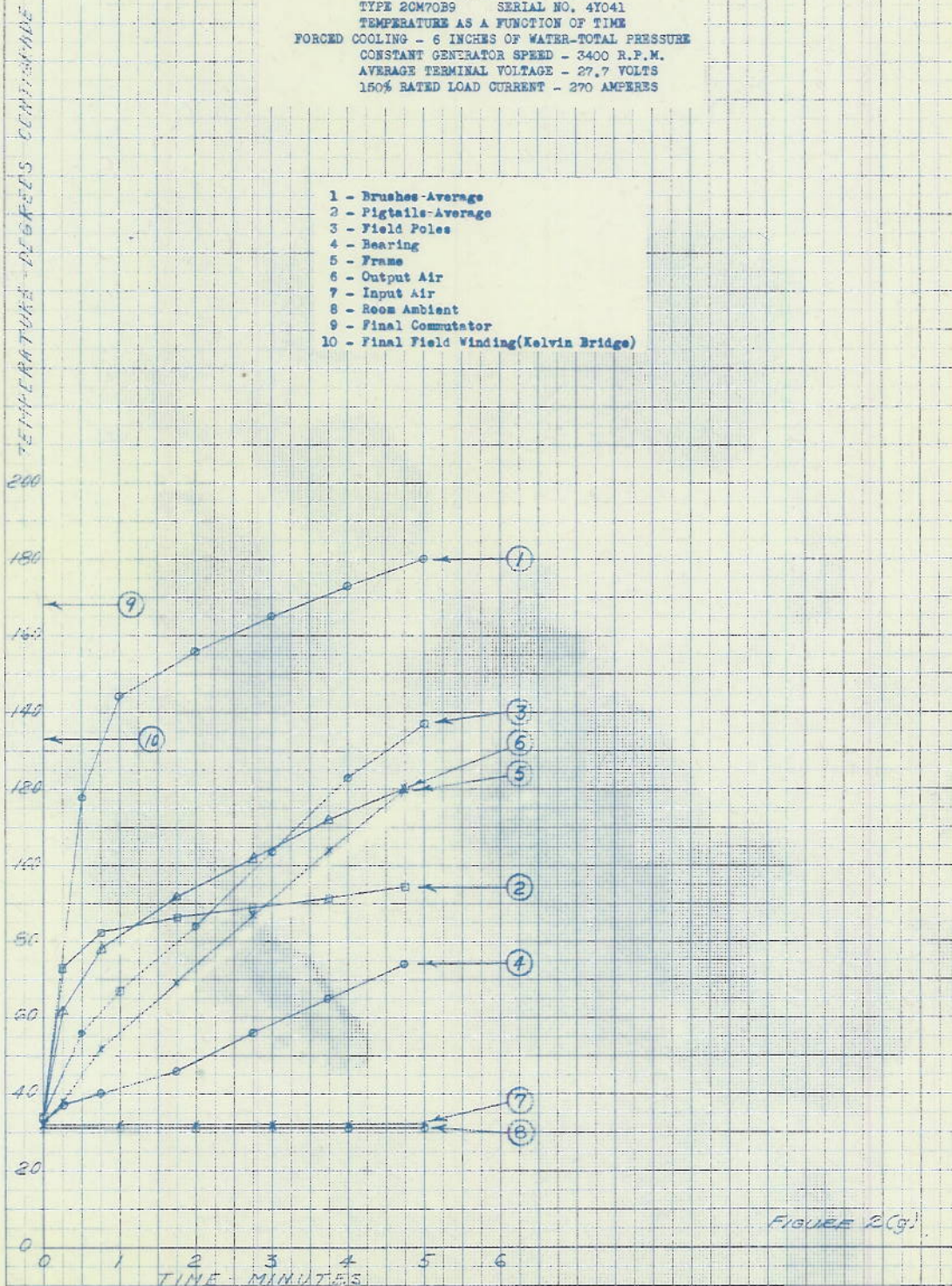


FIGURE 2(G)

D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 TYPE 20M6324 SERIAL NO. 2201065
 TEMPERATURE AS A FUNCTION OF TIME
 FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT TERMINAL VOLTAGE - 27.7 VOLTS
 0% RATED LOAD CURRENT - OPEN CIRCUIT

- 1 - Brushes-Average
- 2 - Pigtaills-Average
- 3 - Field Poles
- 4 - Bearing
- 5 - Frame
- 6 - Output Air
- 7 - Input Air
- 8 - Room ambient
- 9 - Final Commutator
- 10 - Final Field Winding (Kelvin Bridge)
- 11 - Final Field Winding (Volt-ammeter)

TEMPERATURE - DEGREES CENTIGRADE

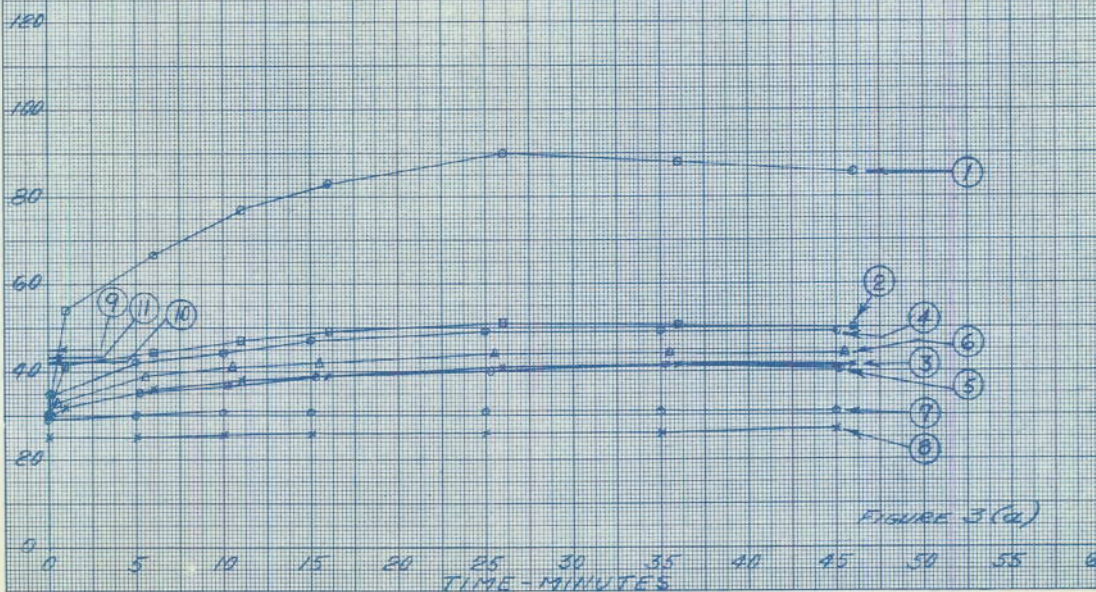


FIGURE 3(a)

D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 TYPE 20M6SB4 SERIAL NO. 2201065
 TEMPERATURE AS A FUNCTION OF TIME
 FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT TERMINAL VOLTAGE - 27.7 VOLTS
 25% RATED LOAD CURRENT - 50 AMPERES

- 1 - Brushes - Average
- 2 - Pigtaills - Average
- 3 - Field Poles
- 4 - Bearing
- 5 - Frame
- 6 - Output Air
- 7 - Input Air
- 8 - Room Ambient
- 9 - Final Commutator
- 10 - Final Field Winding (Kelvin Bridge)
- 11 - Final Field Winding (Volt-ammeter)

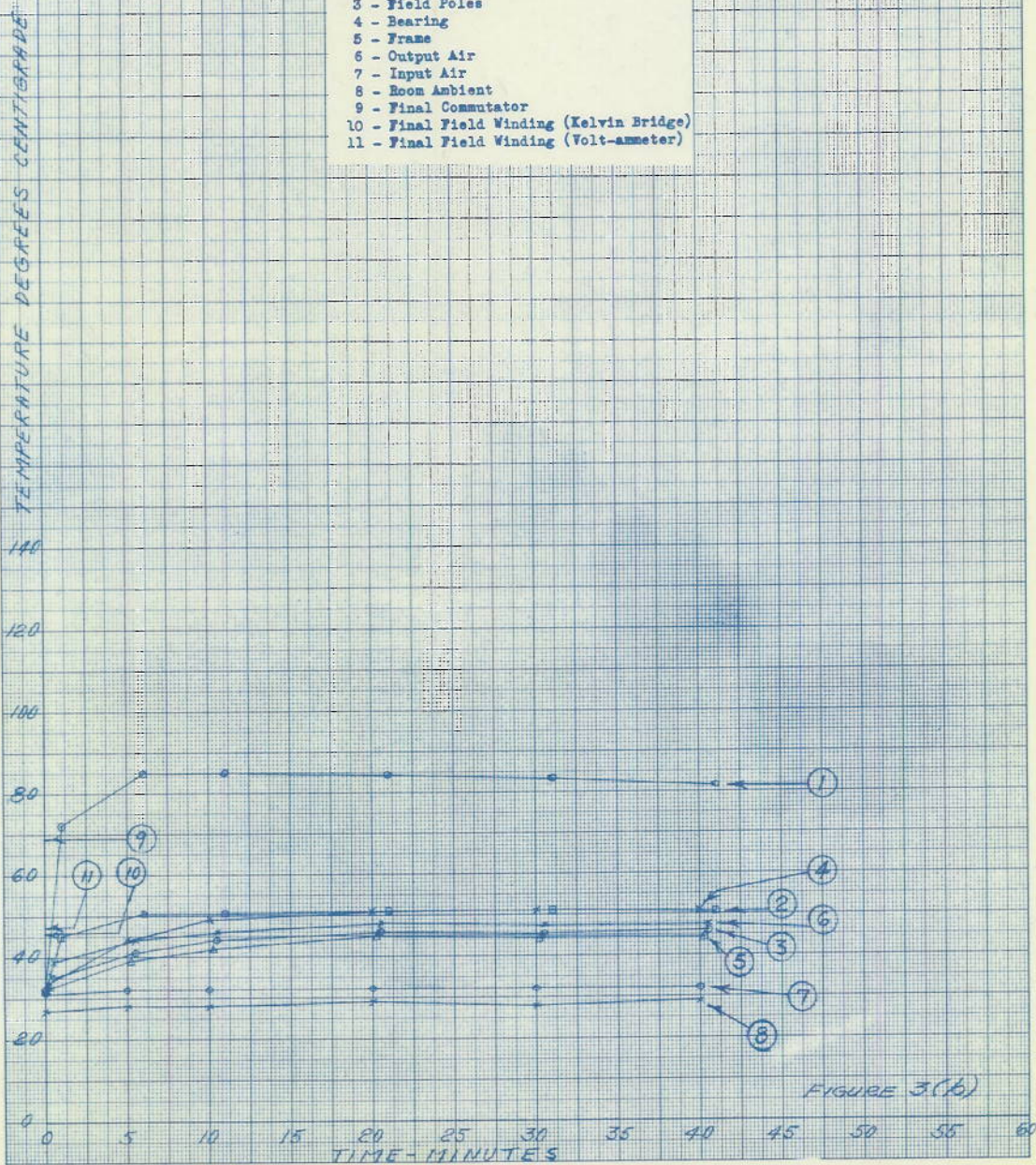


FIGURE 3(b)

D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 TYPE 20M63B4 SERIAL NO. 2201065
 TEMPERATURE AS A FUNCTION OF TIME
 FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT TERMINAL VOLTAGE - 27.7 VOLTS
 50% RATED LOAD CURRENT - 100 AMPERES

- 1 - Brushes-Average
- 2 - Pigtails-Average
- 3 - Field Poles
- 4 - Bearing
- 5 - Frame
- 6 - Output Air
- 7 - Input Air
- 8 - Room Ambient
- 9 - Final Commutator
- 10 - Final Field Winding (Kelvin Bridge)
- 11 - Final Field Winding (Volt-ammeter)

TEMPERATURE - DEGREES CENTIGRADE

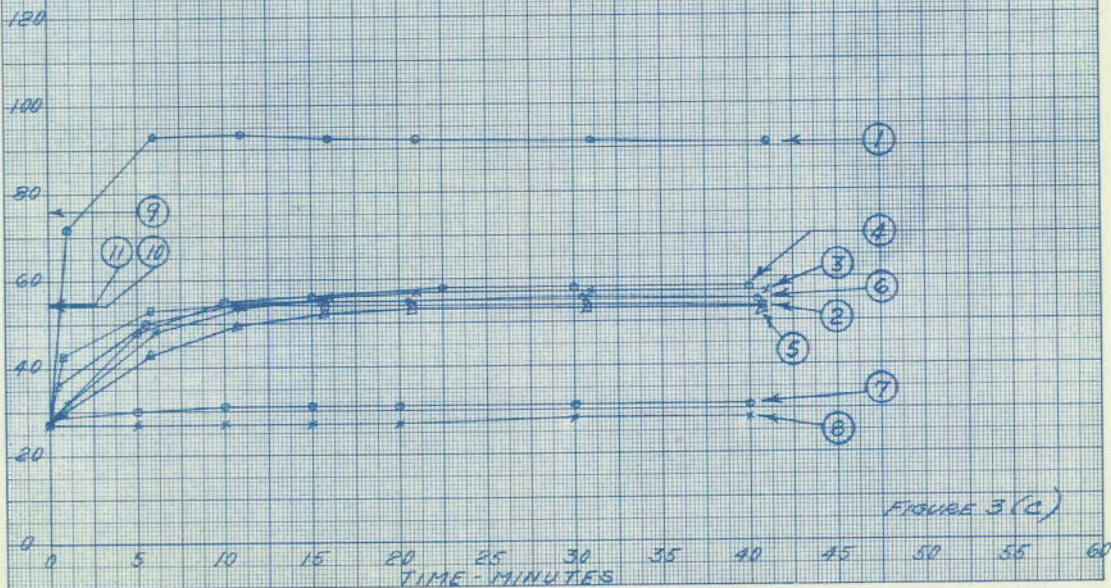
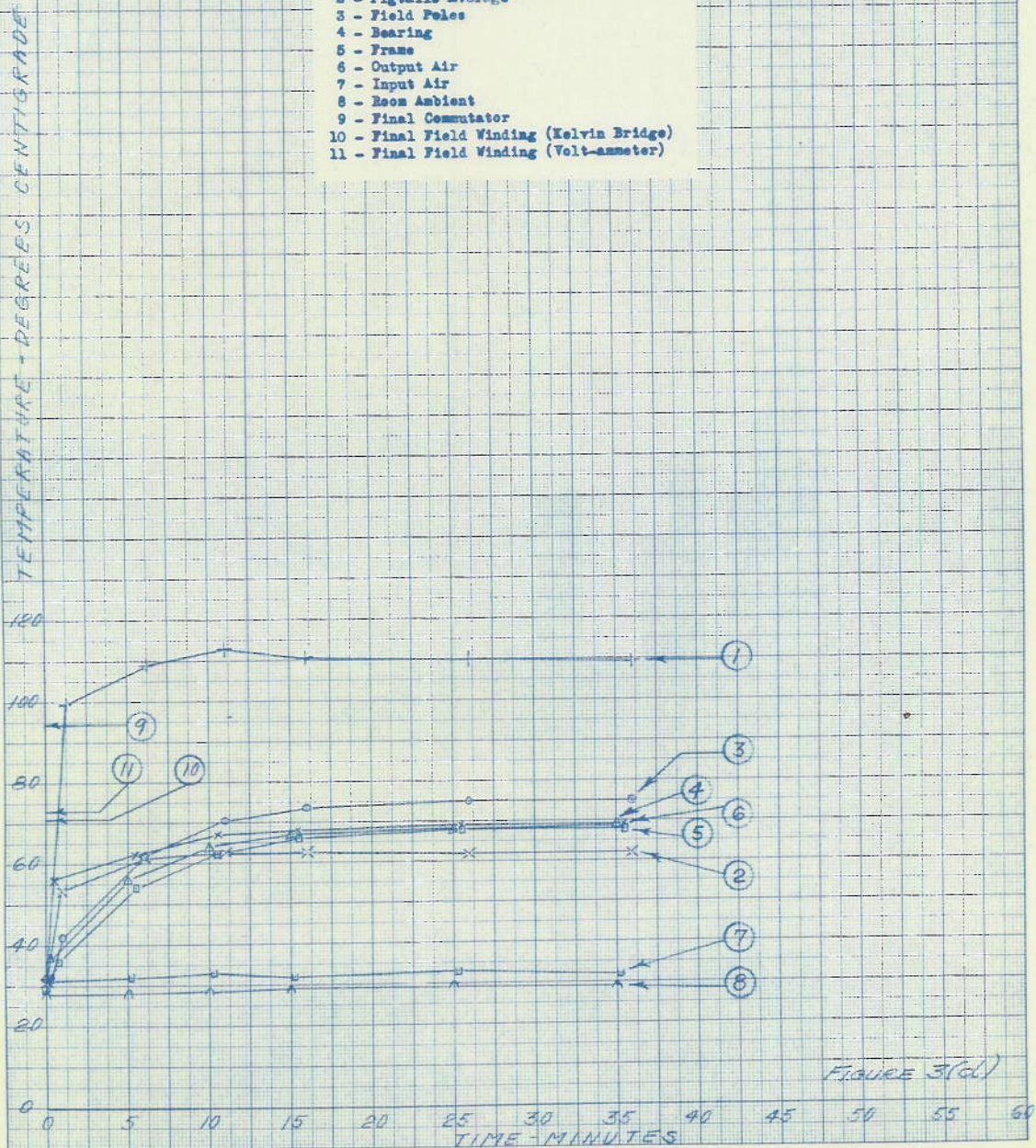


FIGURE 3(C)

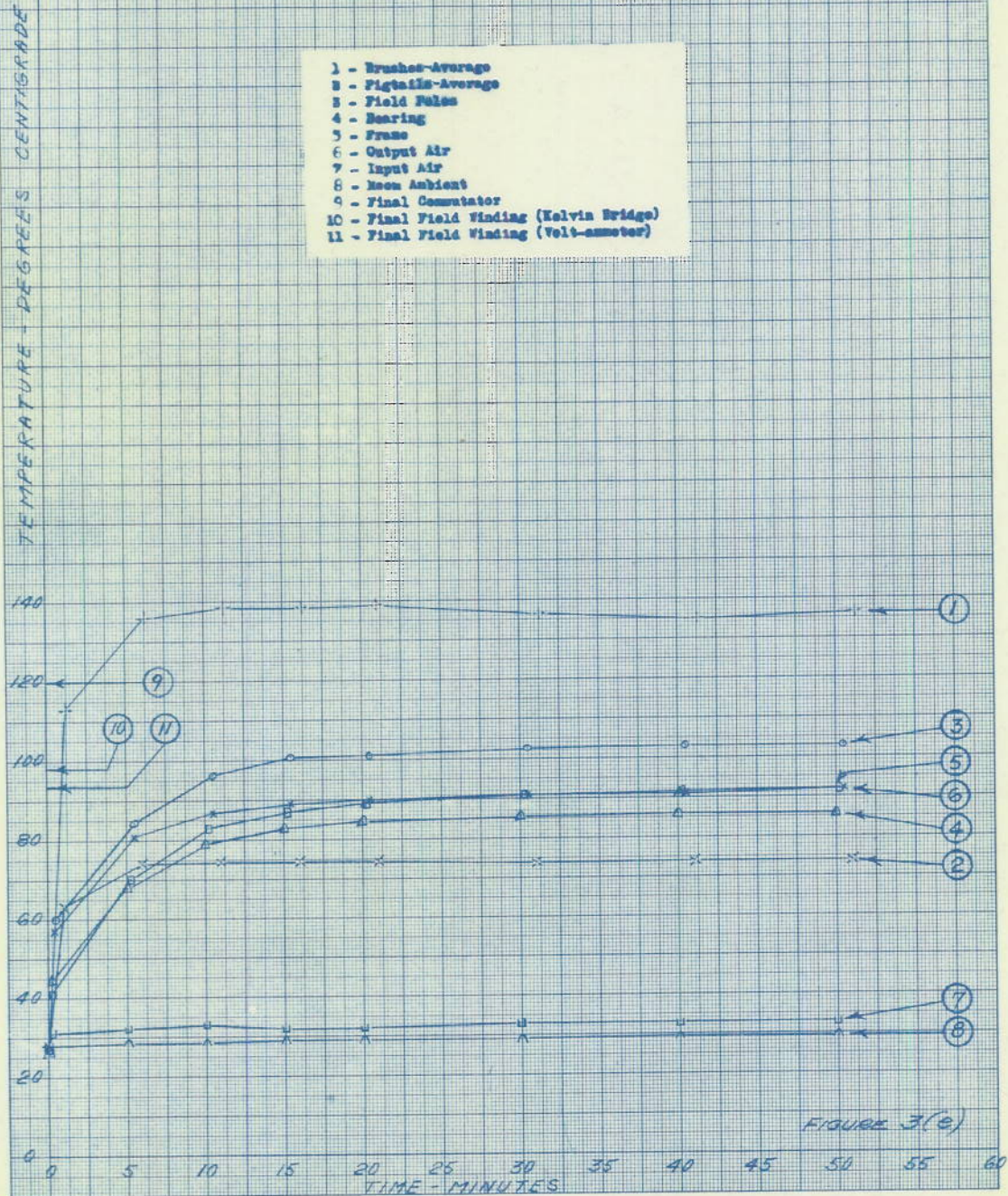
D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 TYPE 2CM63B4 SERIAL NO. 2201065
 TEMPERATURE AS A FUNCTION OF TIME
 FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT TERMINAL VOLTAGE - 27.7VOLTS
 75% RATED LOAD CURRENT - 150 AMPERES

- 1 - Brushes-Average
- 2 - Pigtaills-Average
- 3 - Field Poles
- 4 - Bearing
- 5 - Frame
- 6 - Output Air
- 7 - Input Air
- 8 - Room Ambient
- 9 - Final Commutator
- 10 - Final Field Winding (Kelvin Bridge)
- 11 - Final Field Winding (Volt-ammeter)



D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 TYPE 20M63B4 SERIAL NO. 2201065
 TEMPERATURE AS A FUNCTION OF TIME
 FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE
 CONSTANT GENERATOR SPEED - 5000 R.P.M.
 CONSTANT TERMINAL VOLTAGE - 27.7 VOLTS
 100% RATED LOAD CURRENT - 200 AMPERES

- 1 - Brush-Average
- 2 - Pigtails-Average
- 3 - Field Poles
- 4 - Bearing
- 5 - Frame
- 6 - Output Air
- 7 - Input Air
- 8 - Room Ambient
- 9 - Final Commutator
- 10 - Final Field Winding (Kelvin Bridge)
- 11 - Final Field Winding (Volt-ammeter)



D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 TYPE 2CM6334 SERIAL NO. 2201065
 TEMPERATURE AS A FUNCTION OF TIME
 FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE
 CONSTANT GENERATOR SPEED - 6600 R.P.M.
 CONSTANT TERMINAL VOLTAGE - 27.7 VOLTS
 125% RATED LOAD CURRENT - 250 AMPERES

- 1 - Brushes-Average
- 2 - Pigtaills-Average
- 3 - Field Poles
- 4 - Bearing
- 5 - Frame
- 6 - Output Air
- 7 - Input Air
- 8 - Room Ambient
- 9 - Final Commutator
- 10 - Final Field Winding (Kelvin Bridge)
- 11 - Final Field Winding (Volt-ammeter)

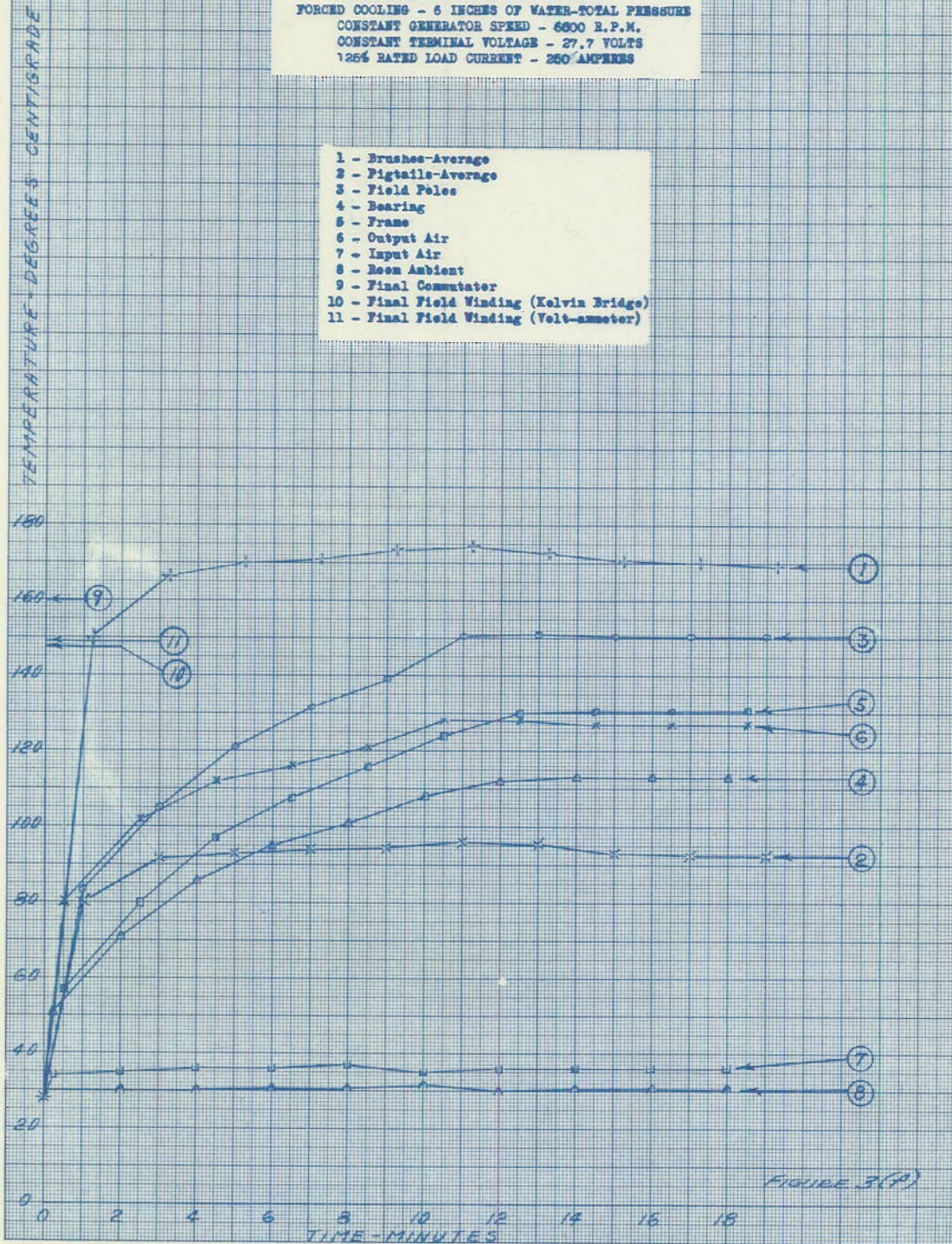


FIGURE 3(P)

D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 TYPE 2CM63B4 SERIAL NO. 2201065
 TEMPERATURE AS A FUNCTION OF TIME
 FORCED COOLING - 6 INCHES OF WATER-TOTAL PRESSURE
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT TERMINAL VOLTAGE - 27.7 VOLTS
 150% RATED LOAD CURRENT - 300 AMPERES

- 1 - Brushes Average
- 2 - Pigtaile Average
- 3 - Field Poles
- 4 - Bearing
- 5 - Frame
- 6 - Output Air
- 7 - Input Air
- 8 - Room Ambient
- 9 - Final Commutator
- 10 - Final Field Winding (Kelvin Bridge)
- 11 - Final Field Winding (Volt-ammeter)

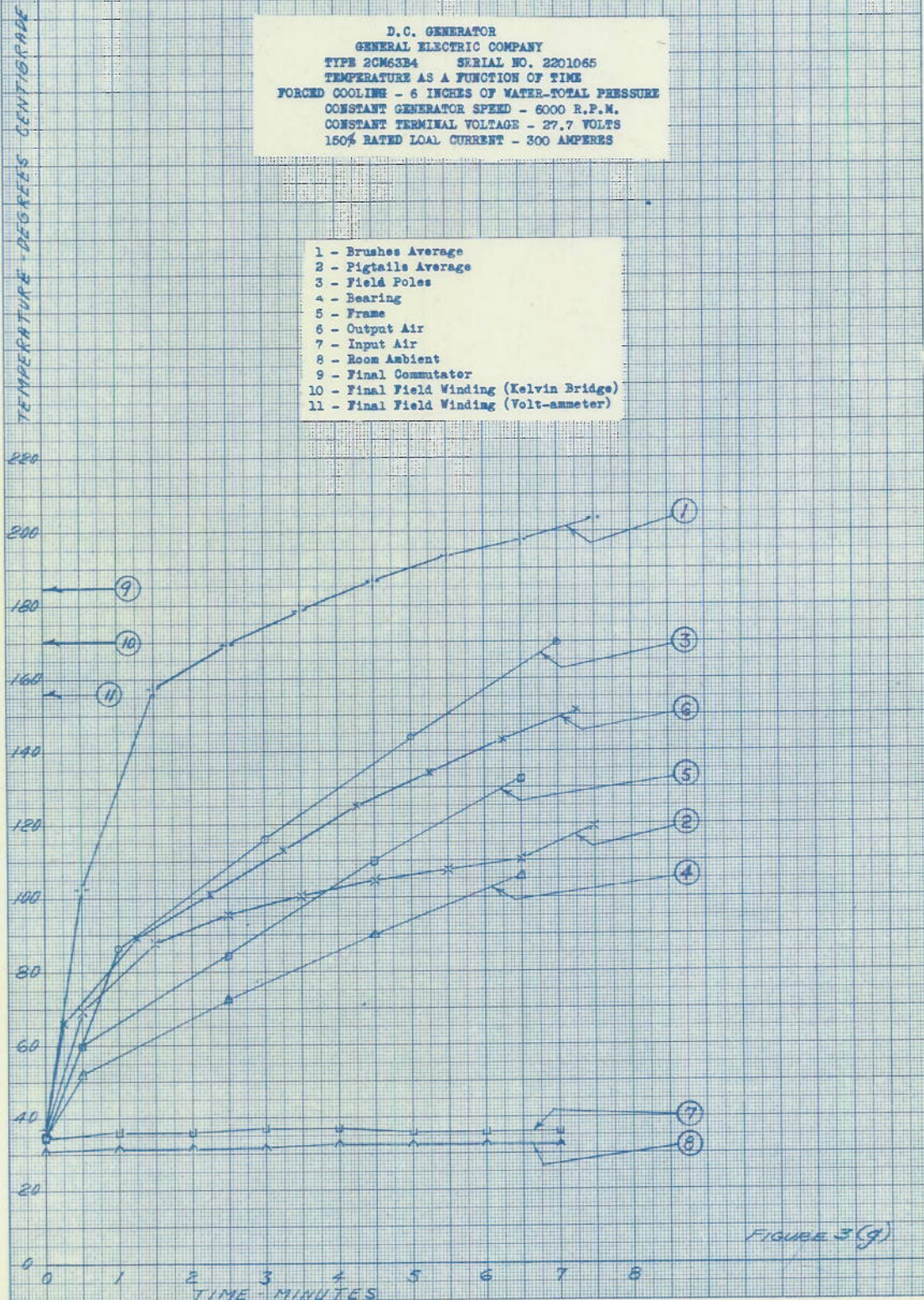
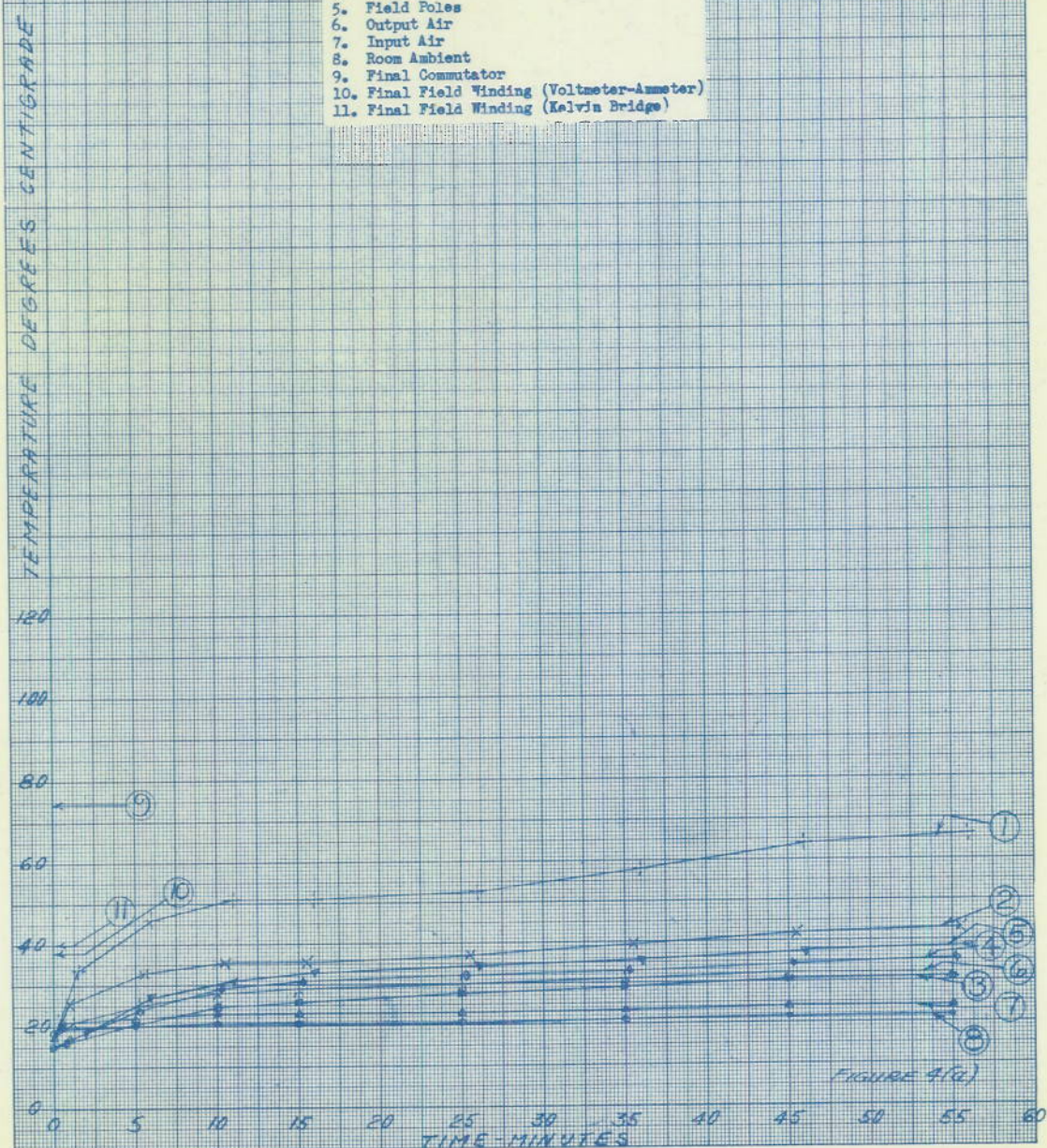


FIGURE 3(g)

D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 TYPE 914-15-1 SERIAL NO. A-3644
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 0% RATED LOAD CURRENT - OPEN CIRCUIT

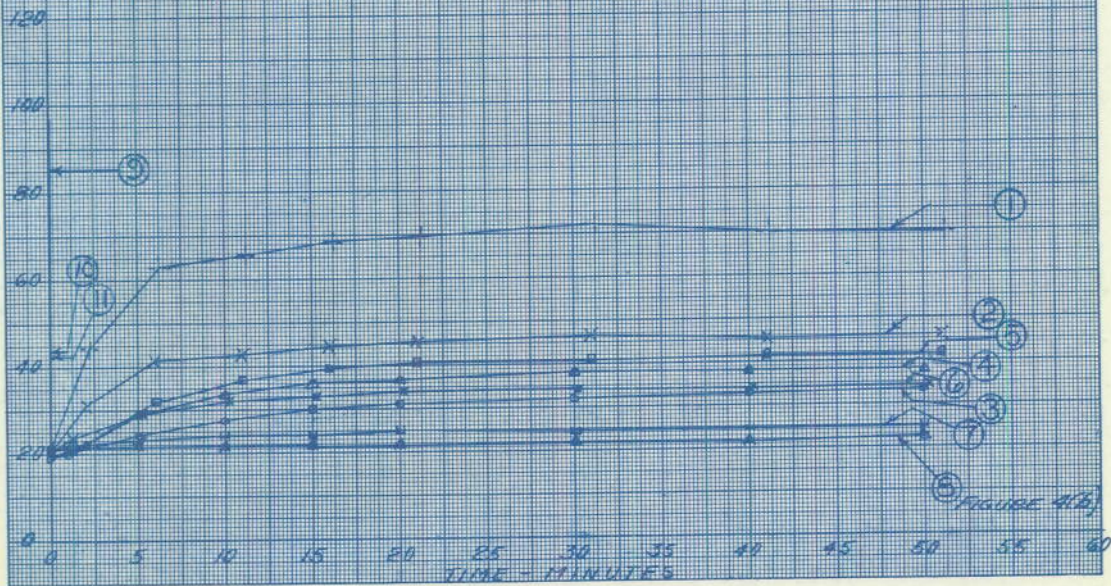
1. Brushes - Average
2. Pigtaills - Average
3. Bearing
4. Frame
5. Field Poles
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Voltmeter-Ammeter)
11. Final Field Winding (Kelvin Bridge)



D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 TYPE 914-15-1 SERIAL NO. A-3644
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 25% RATED LOAD CURRENT - 50 AMPERES

1. Brushes - Average
2. Pigtaills - Average
3. Bearing
4. Frame
5. Field Poles
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Voltmeter-Ammeter)
11. Final Field Winding (Kelvin Bridge)

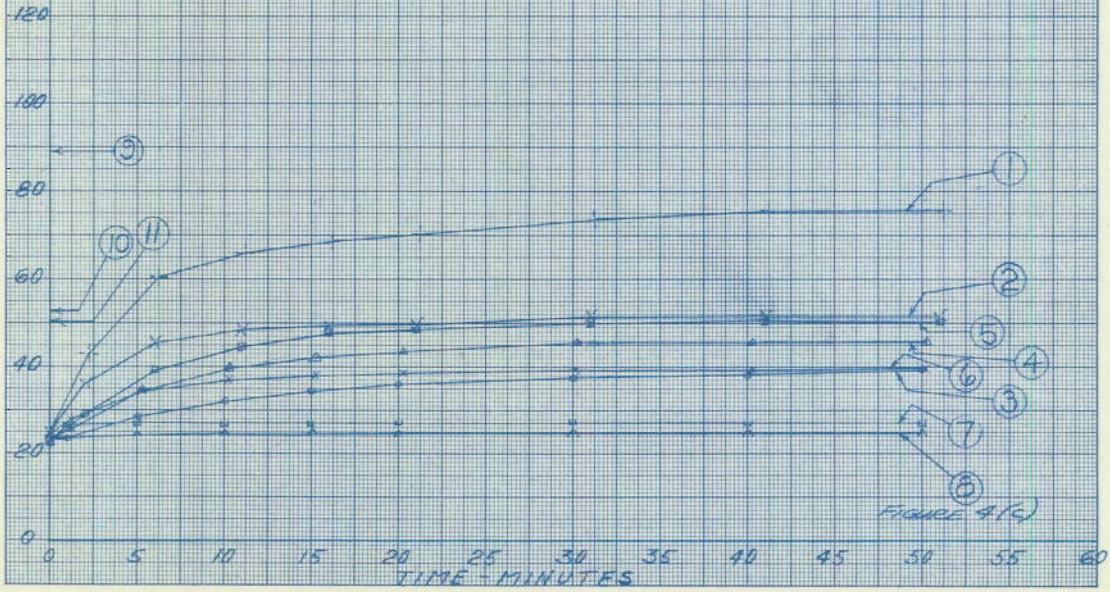
TEMPERATURE - DEGREES CENTIGRADE



D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 TYPE 914-15-A SERIAL NO. A-3644
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 50% RATED LOAD CURRENT - 100 AMPRES

1. Brushes - Average
2. Pigtaills - Average
3. Bearing
4. Frame
5. Field Poles
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Voltmeter-Ammeter)
11. Final Field Winding (Kelvin Bridge)

TEMPERATURE - DEGREES CENTIGRADE



D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 TYPE 914-15-A SERIAL NO. A-3644
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 75% RATED LOAD CURRENT - 150 AMPERES

1. Brushes - Average
2. Pigtaills - Average
3. Bearing
4. Frame
5. Field Poles
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Voltmeter-Ammeter)
11. Final Field Winding (Kelvin Bridge)

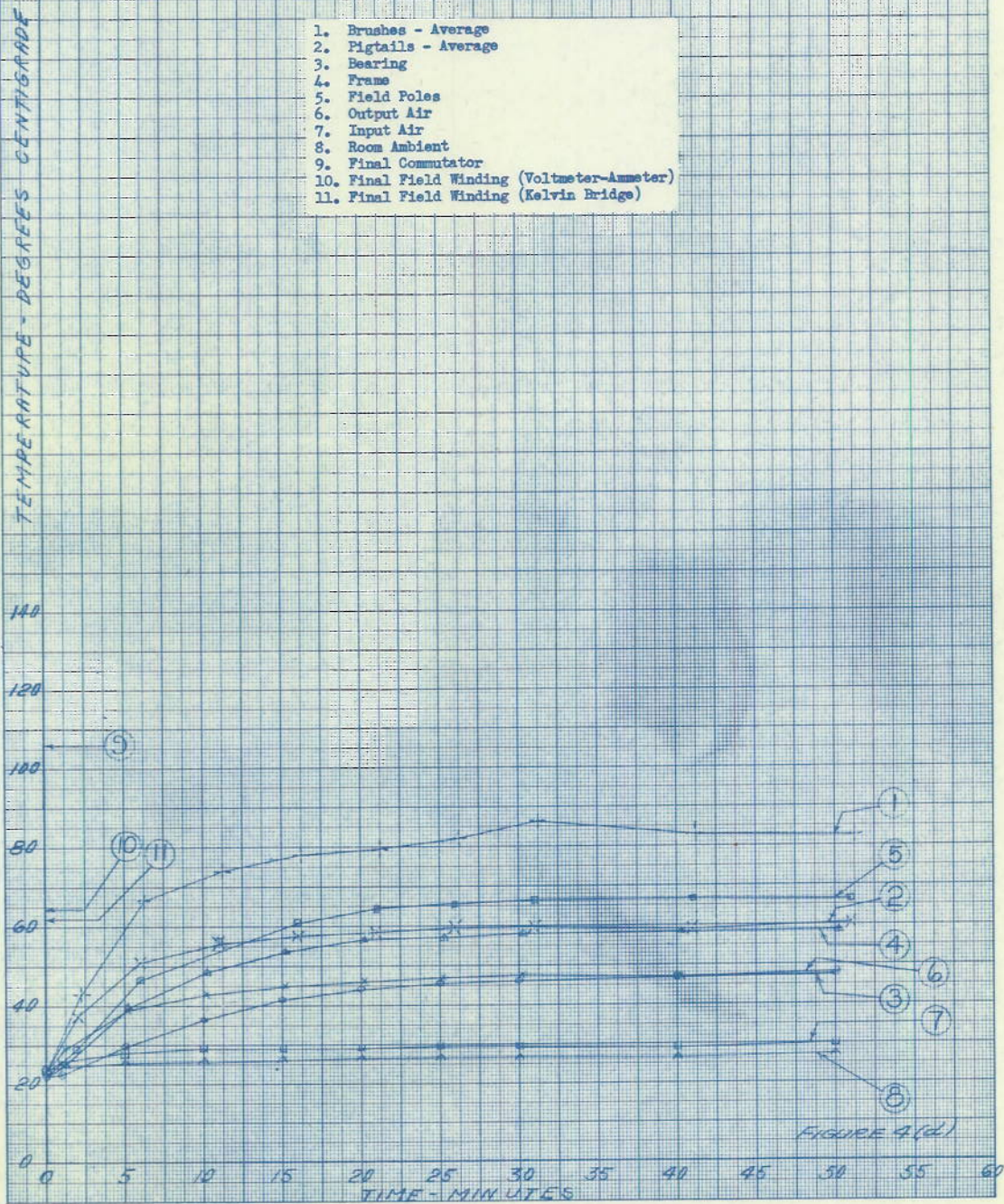
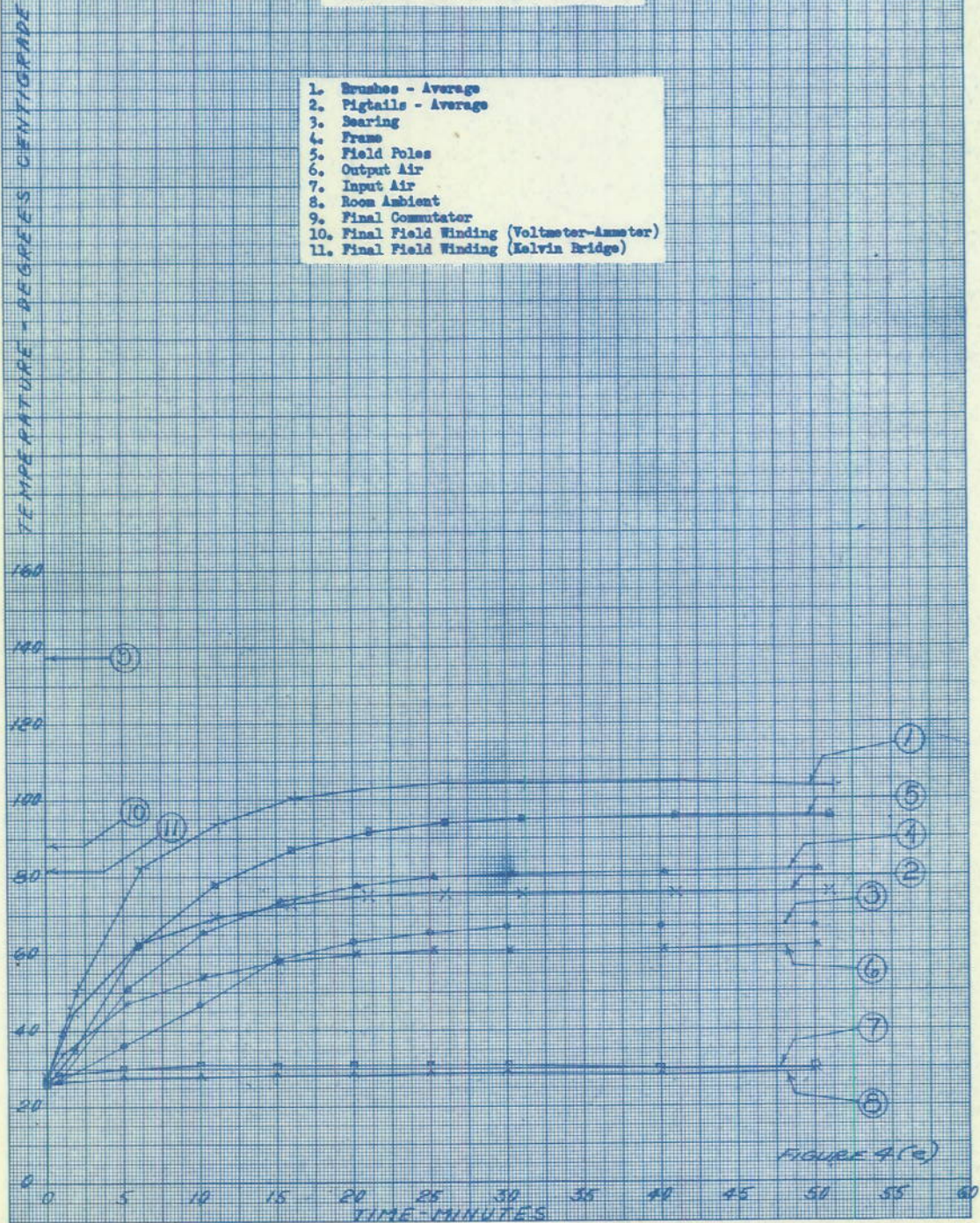


FIGURE 4(d)

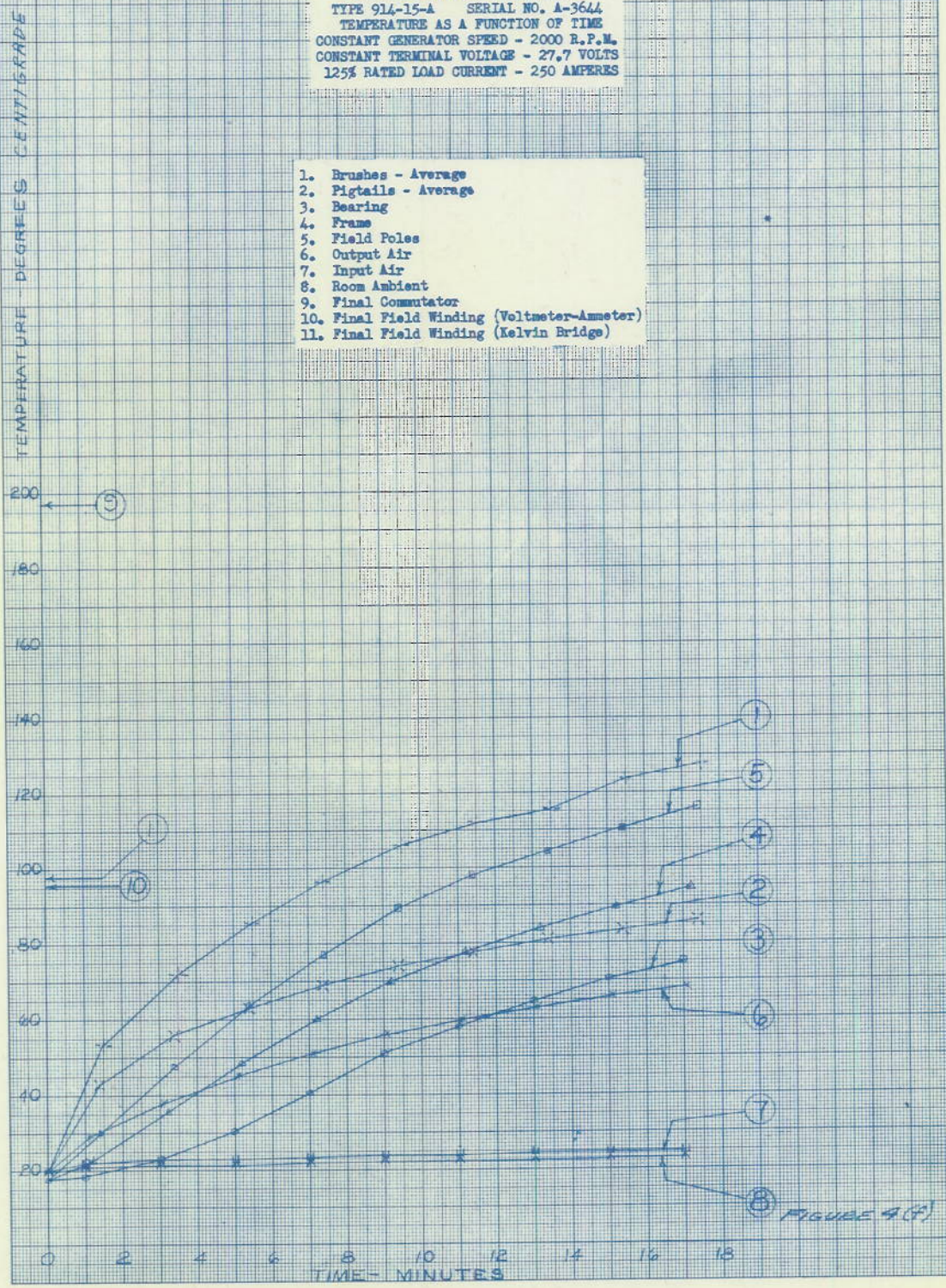
D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 TYPE 91A-15-A SERIAL NO. A-3644
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR SPEED - 2000 R.P.M.
 CONSTANT TERMINAL VOLTAGE - 27.7 VOLTS
 100% RATED LOAD CURRENT - 200 AMPERES

1. Brushes - Average
2. Pigtaills - Average
3. Bearing
4. Frame
5. Field Poles
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Voltmeter-Ammeter)
11. Final Field Winding (Kelvin Bridge)



D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 TYPE 914-15-A SERIAL NO. A-3644
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR SPEED - 2000 R.P.M.
 CONSTANT TERMINAL VOLTAGE - 27.7 VOLTS
 125% RATED LOAD CURRENT - 250 AMPERES

- 1. Brushes - Average
- 2. Pigtaills - Average
- 3. Bearing
- 4. Frame
- 5. Field Poles
- 6. Output Air
- 7. Input Air
- 8. Room Ambient
- 9. Final Commutator
- 10. Final Field Winding (Voltmeter-Ammeter)
- 11. Final Field Winding (Kelvin Bridge)



D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 TYPE 914-15-A SERIAL NO. A-3644
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR SPEED - 2000 R.P.M.
 CONSTANT TERMINAL VOLTAGE - 27.7 VOLTS
 150% RATED LOAD CURRENT - 300 AMPERES

1. Brushes - Average
2. Pigtaills - Average
3. Bearing
4. Frame
5. Field Poles
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Voltmeter-Ammeter)
11. Final Field Winding (Kelvin Bridge)

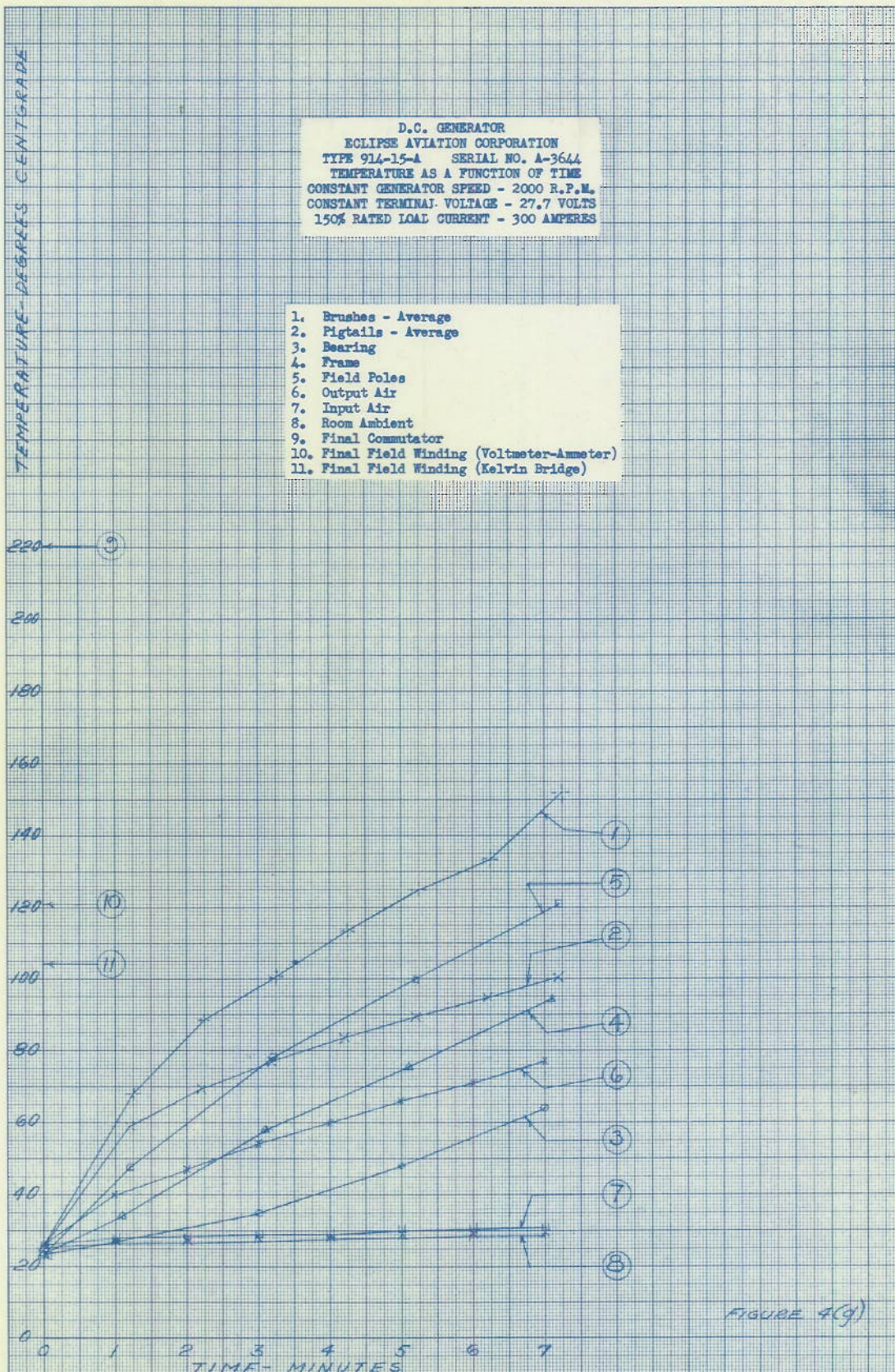
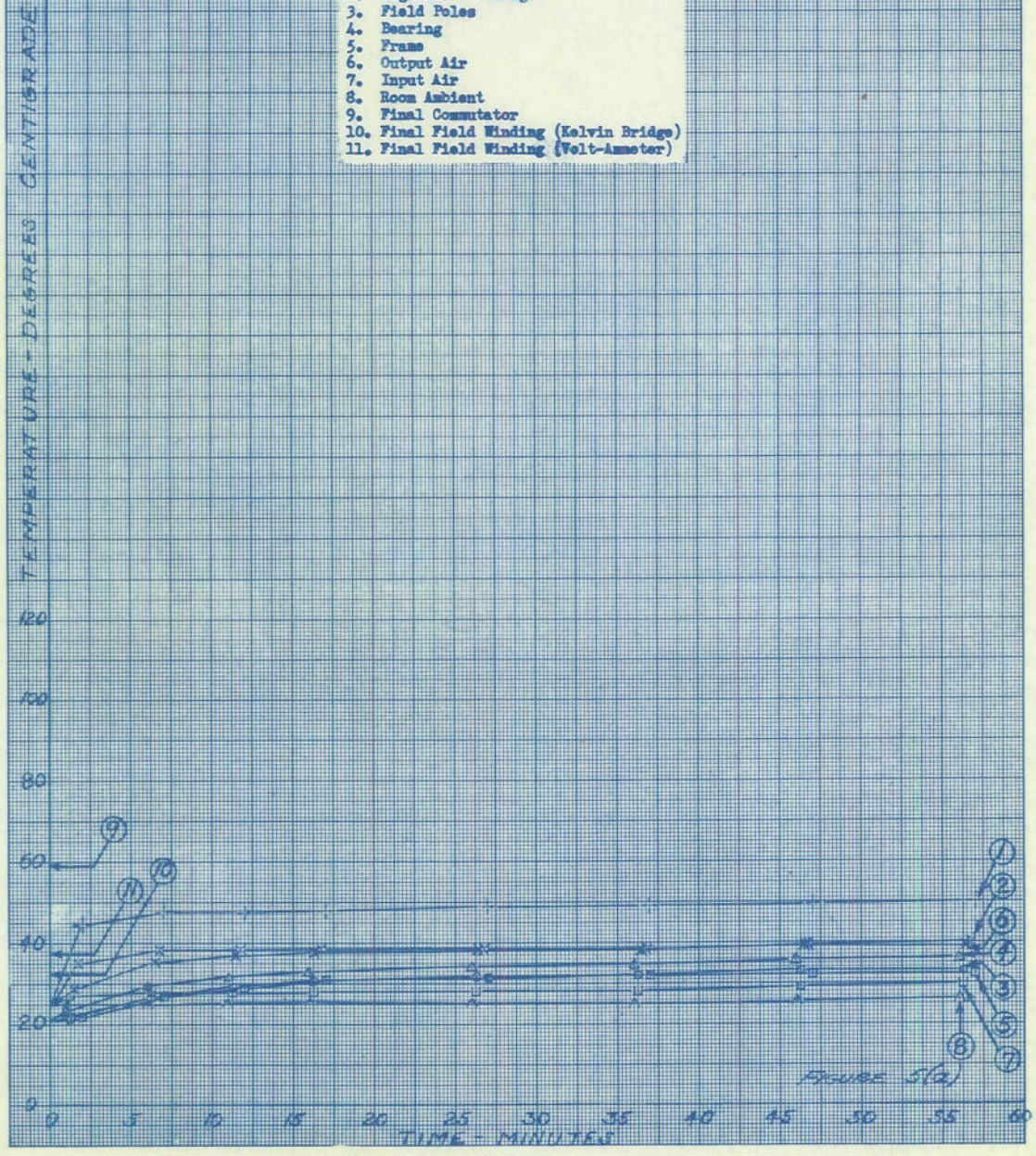


FIGURE 4(g)

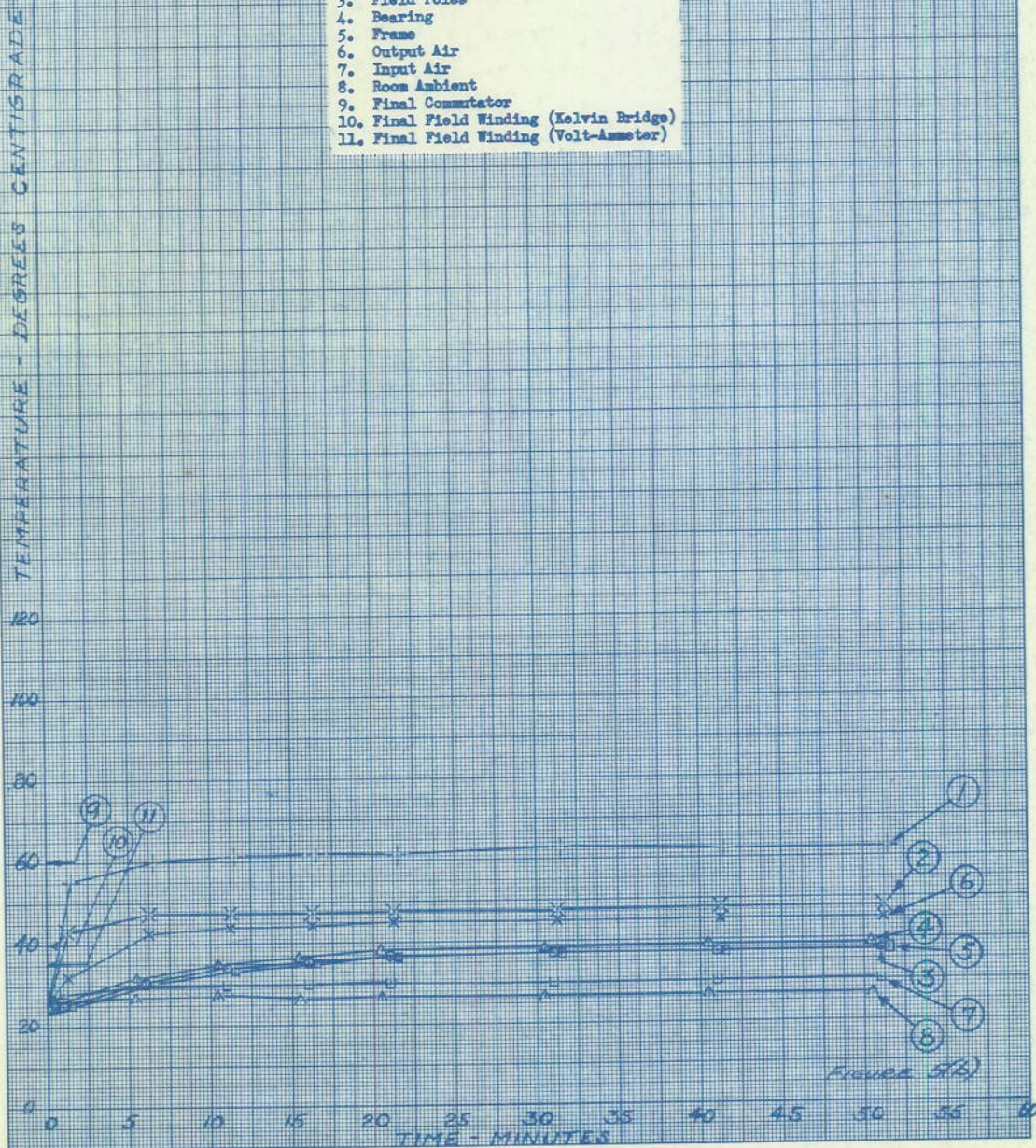
D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 TYPE 20M70R11 SERIAL NO. 2189156
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 0% RATED LOAD CURRENT - OPEN CIRCUIT

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Kelvin Bridge)
11. Final Field Winding (Volt-Ammeter)



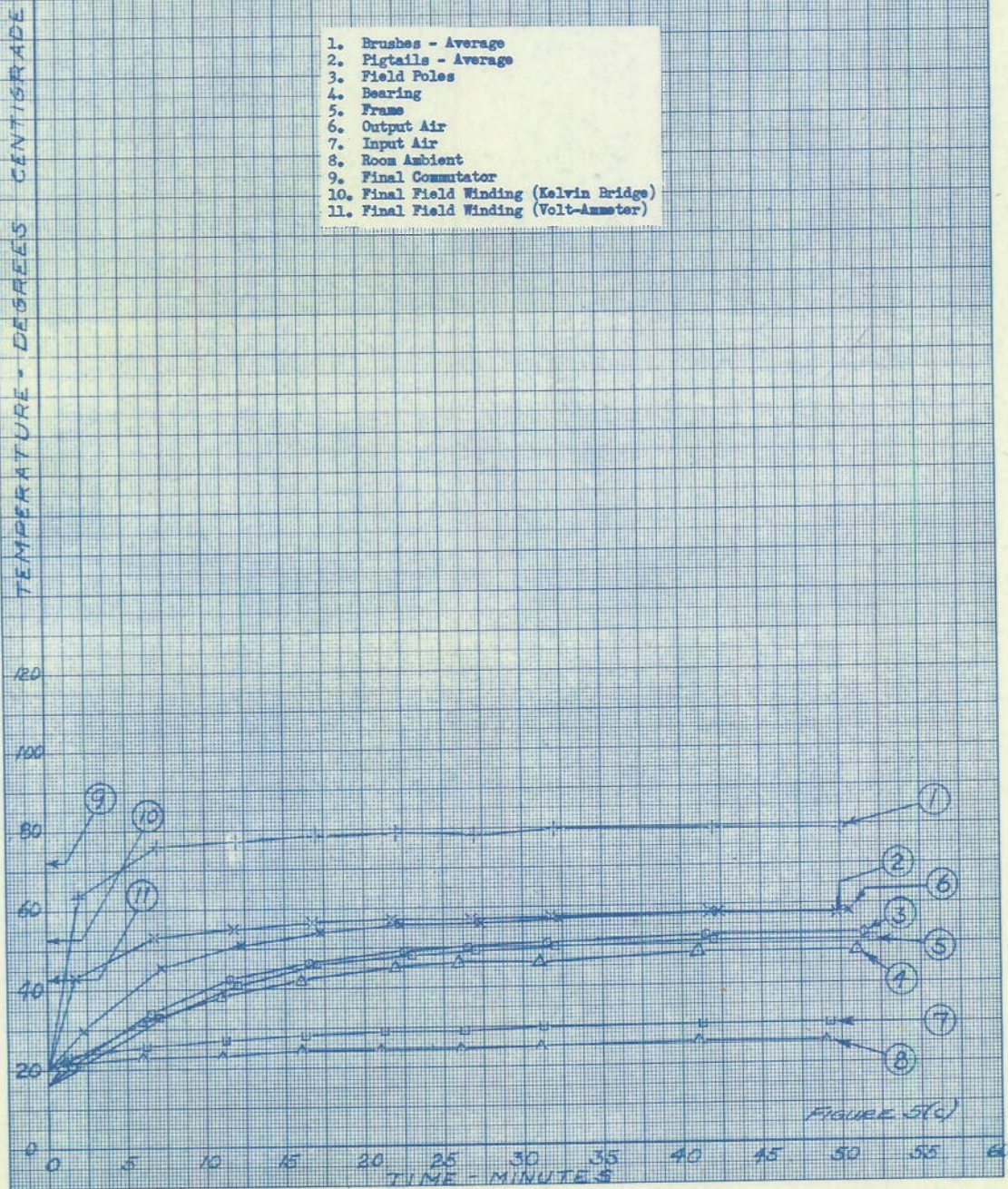
D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 TYPE 2CM70B11 SERIAL NO. 2189156
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 25% RATED LOAD CURRENT - 50 AMPERES

1. Brushes - Average
2. Pigtailes - Average
3. Field Poles
4. Bearing
5. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Kelvin Bridge)
11. Final Field Winding (Volt-Ammeter)



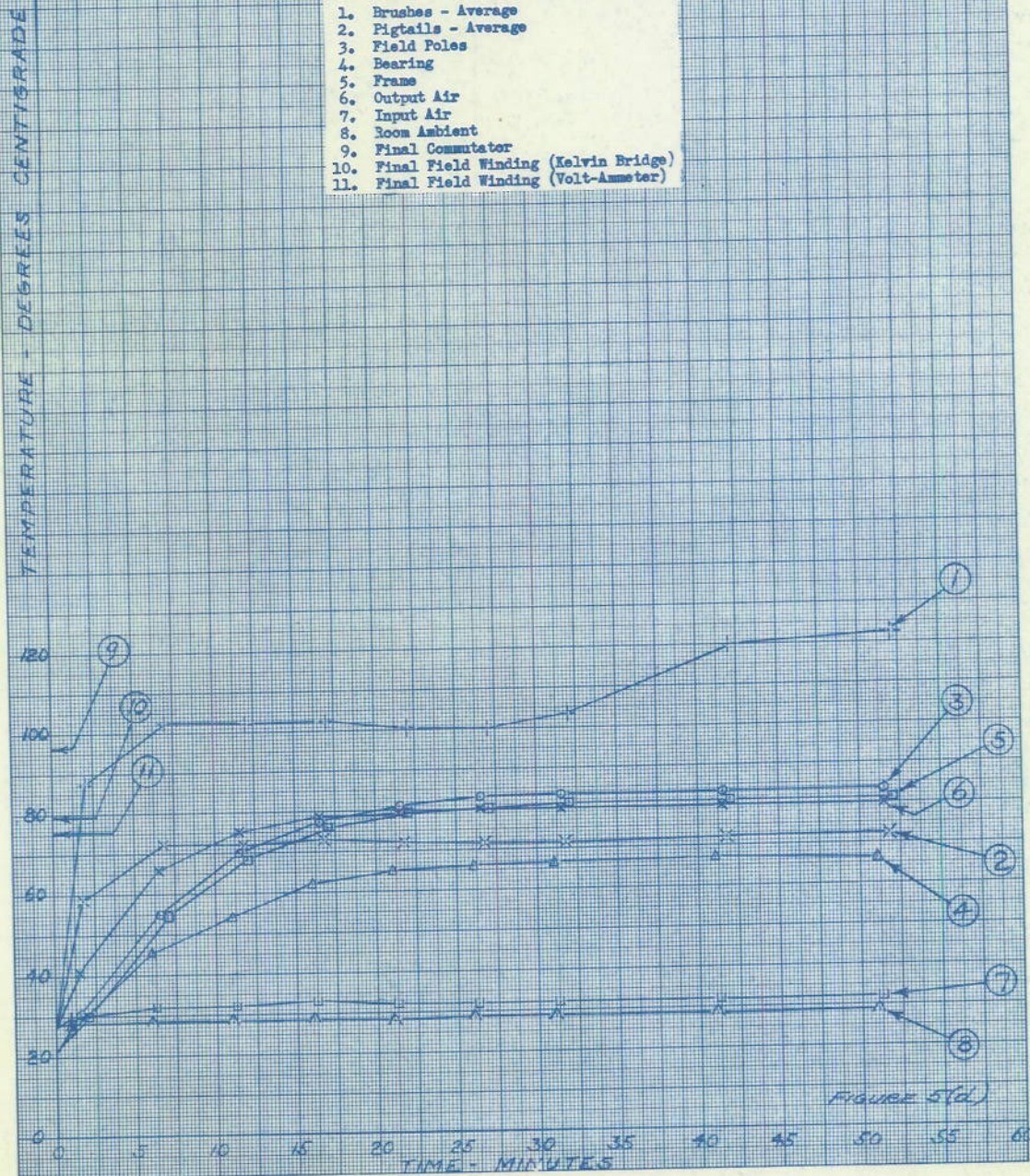
D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 TYPE 2CM70B11 SERIAL NO. 2189156
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 50% RATED LOAD CURRENT - 100 AMPERES

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Kelvin Bridge)
11. Final Field Winding (Volt-Ammeter)



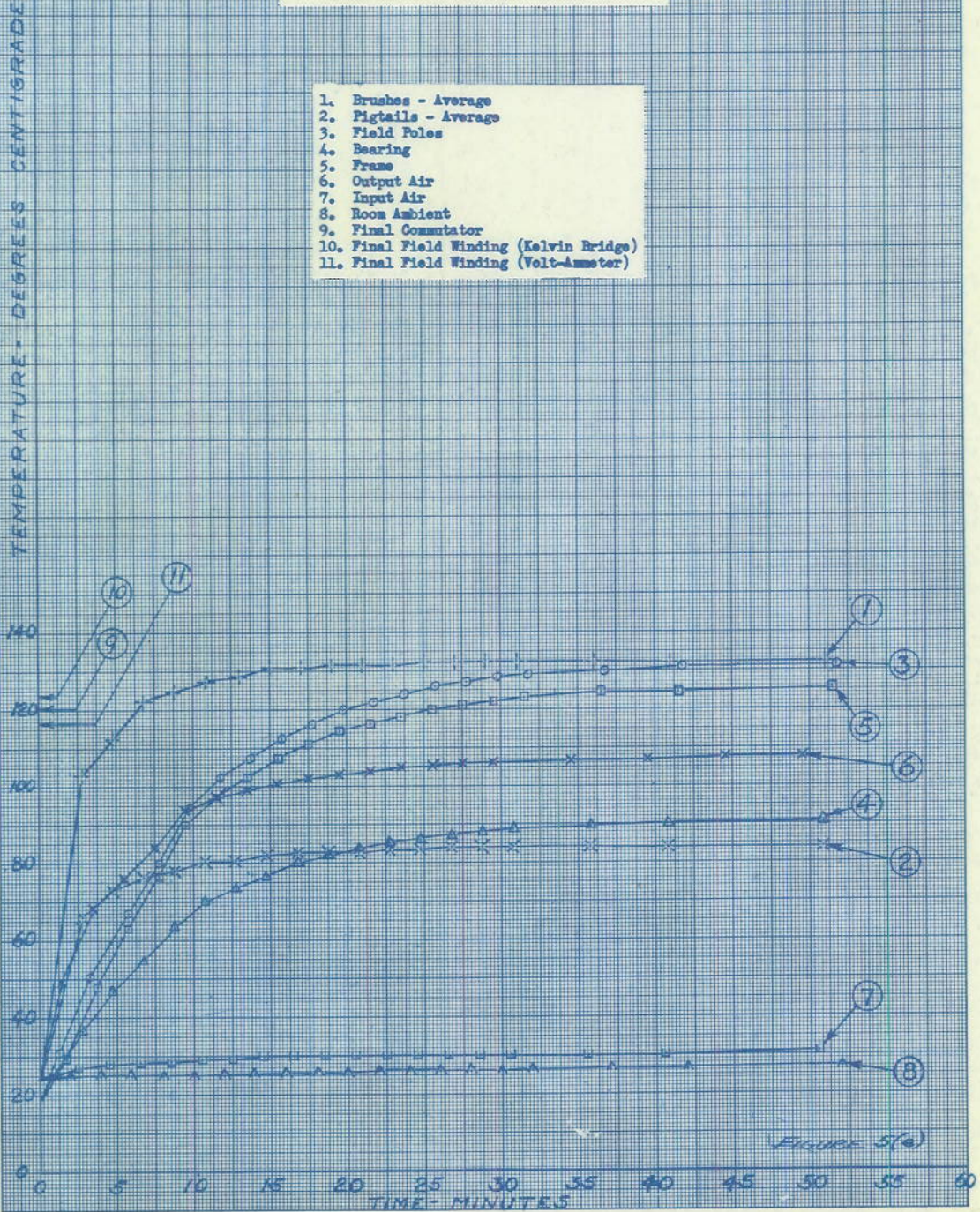
D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 TYPE 2CW70B11 SERIAL NO. 2189156
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 75% RATED LOAD CURRENT - 150 AMPERES

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Kelvin Bridge)
11. Final Field Winding (Volt-Ammeter)



D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 TYPE 2CW70B11 SERIAL NO. 2189156
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 100% RATED LOAD CURRENT - 200 AMPERES

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Kelvin Bridge)
11. Final Field Winding (Volt-Ammeter)



D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 TYPE 2CM70B11 SERIAL NO. 2189156
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 125% RATED LOAD CURRENT - 250 AMPERES

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Kelvin Bridge)
11. Final Field Winding (Volt-Ammeter)

TEMPERATURE - DEGREES CENTIGRADE

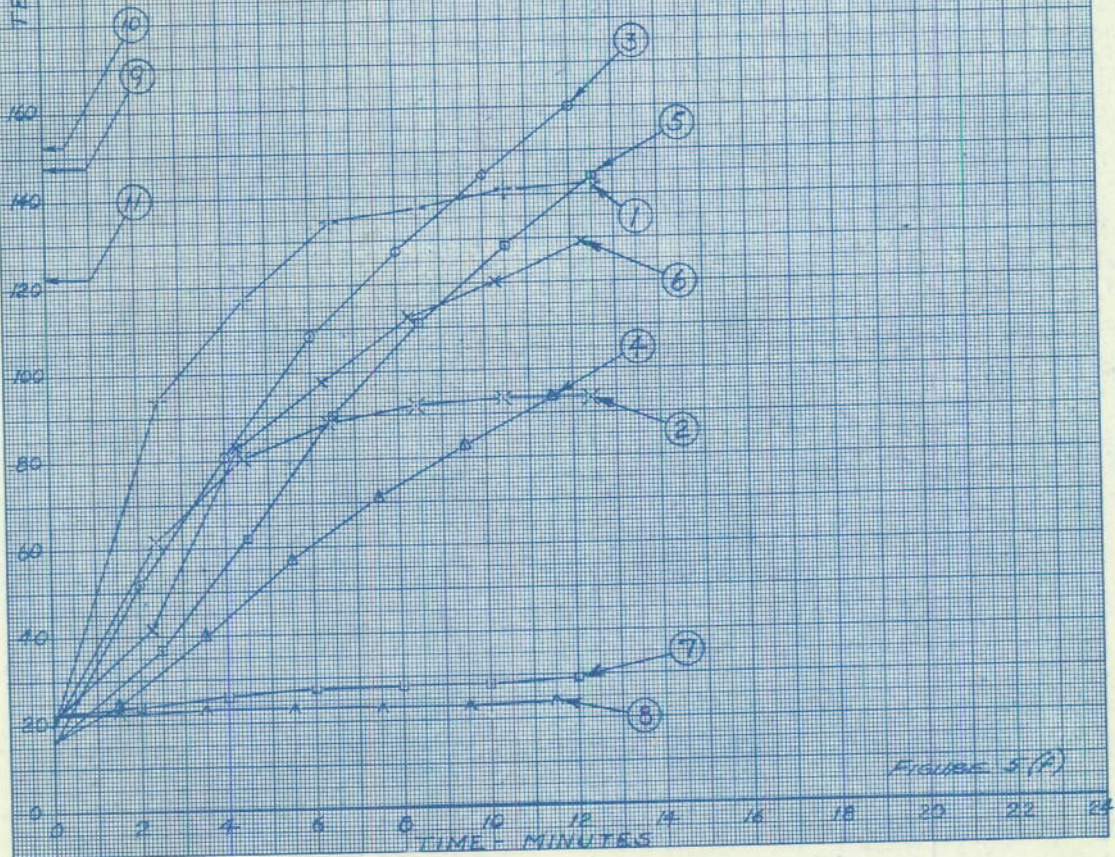


FIGURE 5 (F)

D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 TYPE 2GM73B7 SERIAL NO. 12198744
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 FORCED COOLED - 6 INCHES WATER-TOTAL PRESSURE
 % RATED LOAD CURRENT - OPEN CIRCUIT

1. Brushes - Average
2. Pigtails - Average
3. Bearing
4. Frame
5. Field Poles
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Voltmeter-Ammeter)
11. Final Field Winding (Kelvin Bridge)

TEMPERATURE DEGREES CENTIGRADE

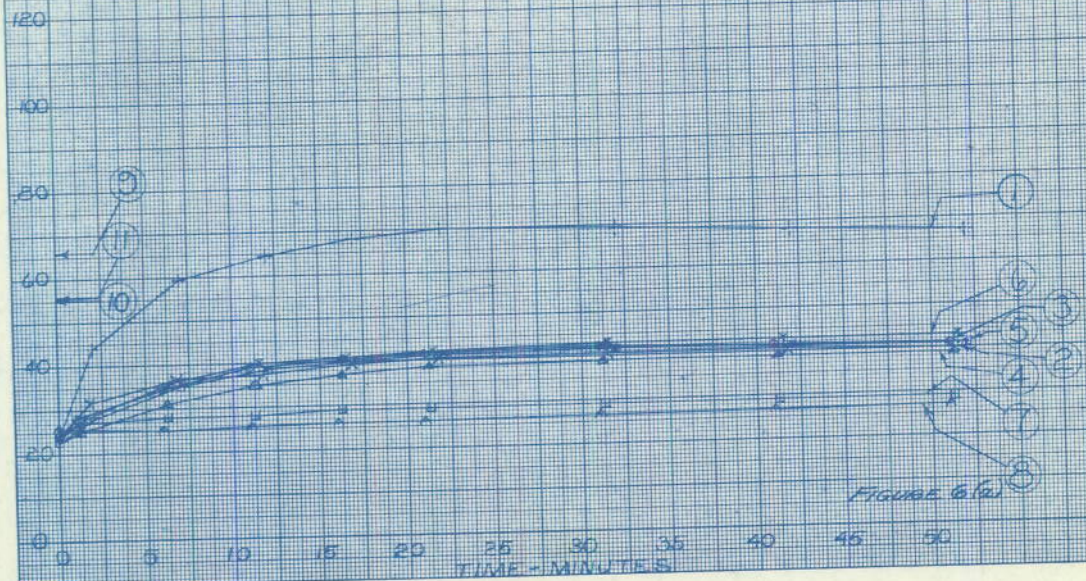


FIGURE 6(a)

D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 TYPE 2GM73B7 SERIAL NO. 12198744
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 25% RATED LOAD CURRENT - 75 AMPERES

1. Brushes - Average
2. Pigtaills - Average
3. Bearing
4. Frame
5. Field poles
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Voltmeter-Ammeter)
11. Final Field Winding (Kelvin Bridge)

TEMPERATURE DEGREES CENTIGRADE

TEMPERATURE DEGREES

TEMPERATURE DEGREES

20

40

60

80

100

0

0 5 10 15 20 25 30 35 40 45 60
 TIME - MINUTES

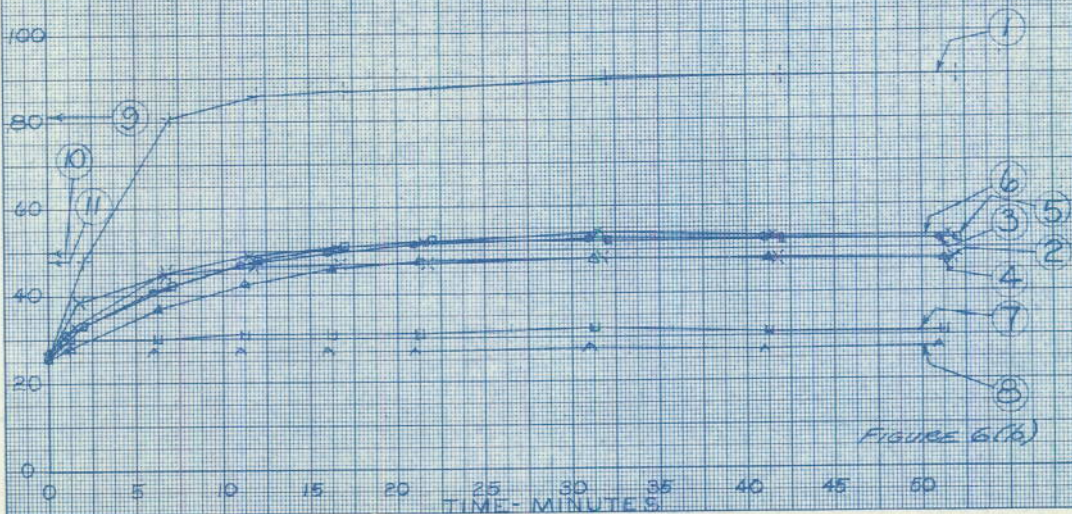


FIGURE 6(a)

D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 TYPE 2CM73E7 SERIAL NO. 12198744
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 50% RATED LOAD CURRENT - 150 AMPERES

- 1. Brushes - Average
- 2. Pigtails - Average
- 3. Bearing
- 4. Frame
- 5. Field Poles
- 6. Output Air
- 7. Input Air
- 8. Room Ambient
- 9. Final Commutator
- 10. Final Field Winding (Voltmeter-Ammeter)
- 11. Final Field Winding (Kelvin Bridge)

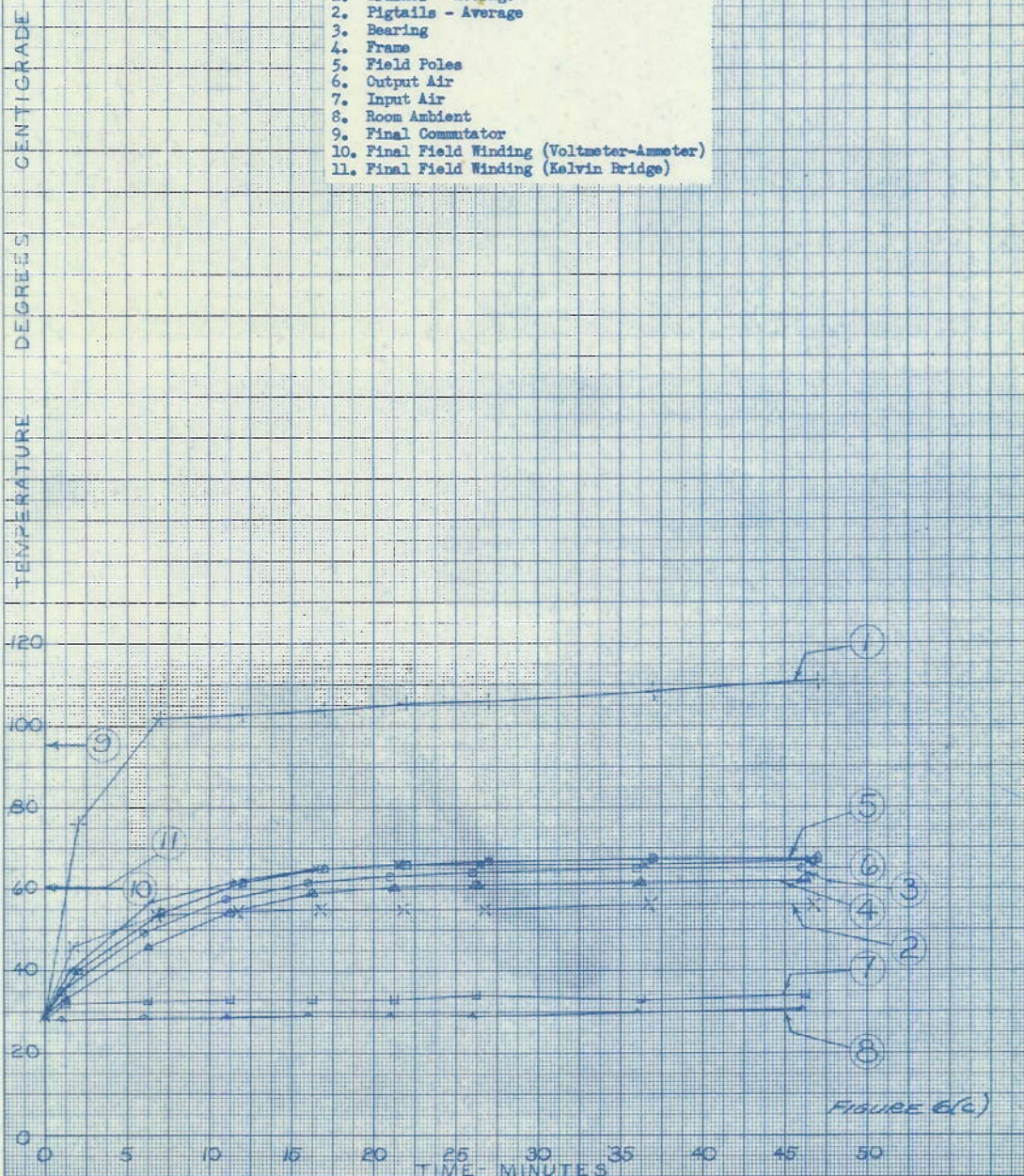
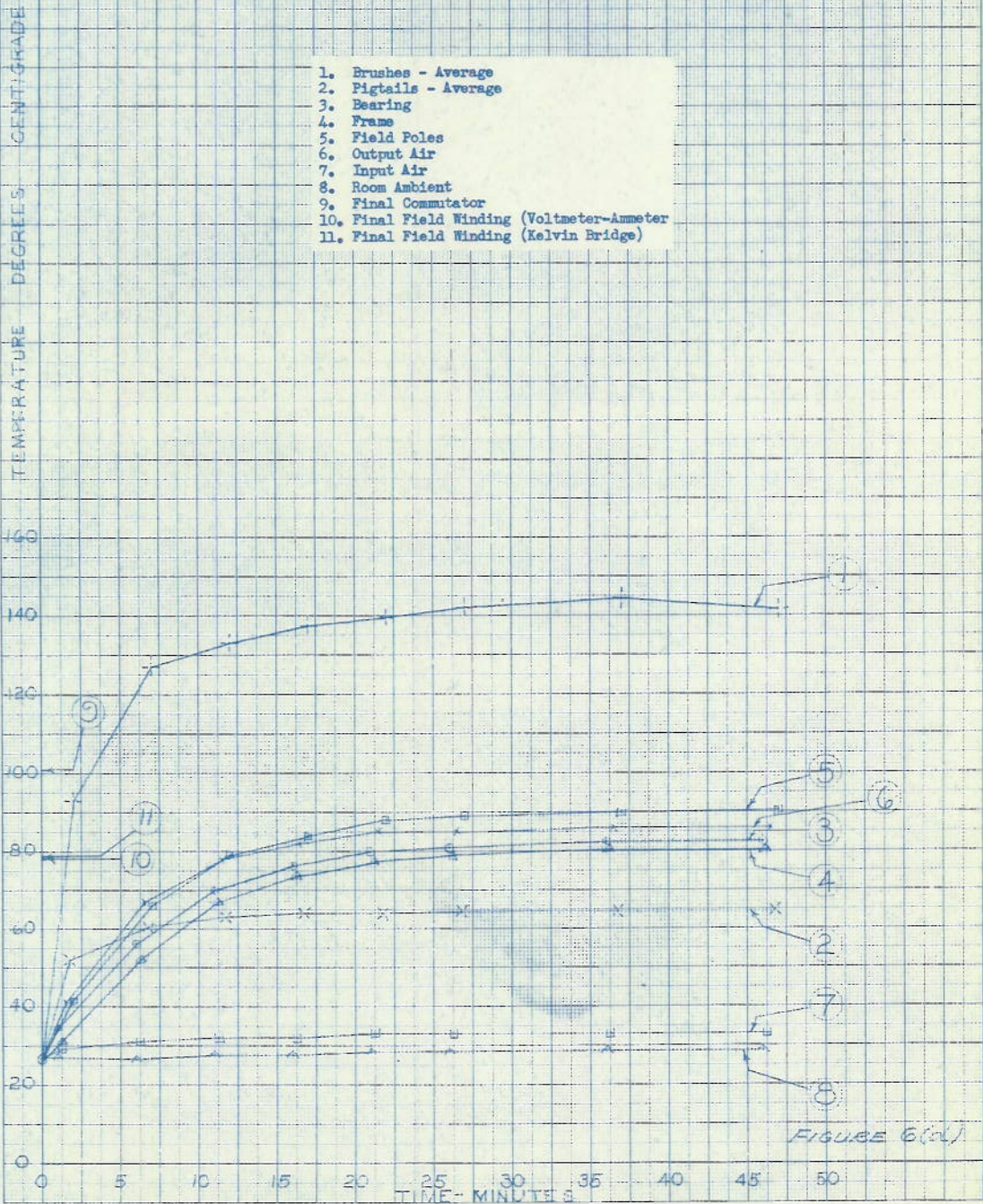


FIGURE 6(c)

D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 TYPE 2CM73E7 SERIAL NO. 12198744
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 75% RATED LOAD CURRENT - 225 AMPERES



D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 TYPE 2CM73E7 SERIAL NO. 12198744
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 100% RATED LOAD CURRENT - 300 AMPERES

- 1. Brushes - Average
- 2. Pigtails - Average
- 3. Bearing
- 4. Frame
- 5. Field Poles
- 6. Output Air
- 7. Input Air
- 8. Room Ambient
- 9. Final Commutator
- 10. Final Field Winding (Voltmeter-Ammeter)
- 11. Final Field Winding (Kelvin Bridge)

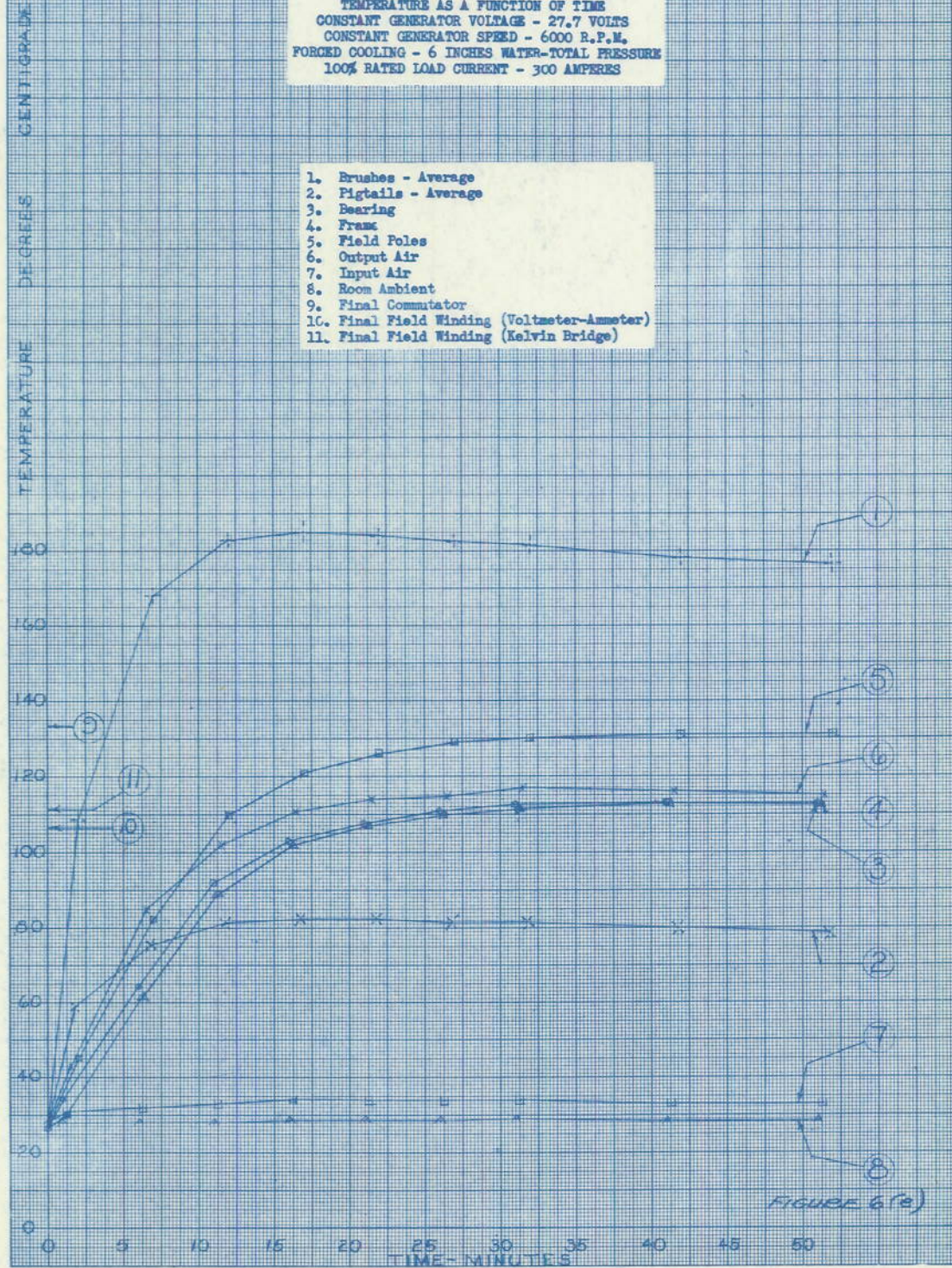


FIGURE 6 (a)

D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 TYPE 2CM73B7 SERIAL NO. 12198744
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 125% RATED LOAD CURRENT - 375 AMPERES

1. Brushes - Average
2. Pigtaills - Average
3. Bearing
4. Frame
5. Field Poles
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Voltmeter-Ammeter)
11. Final Field Winding (Kelvin Bridge)

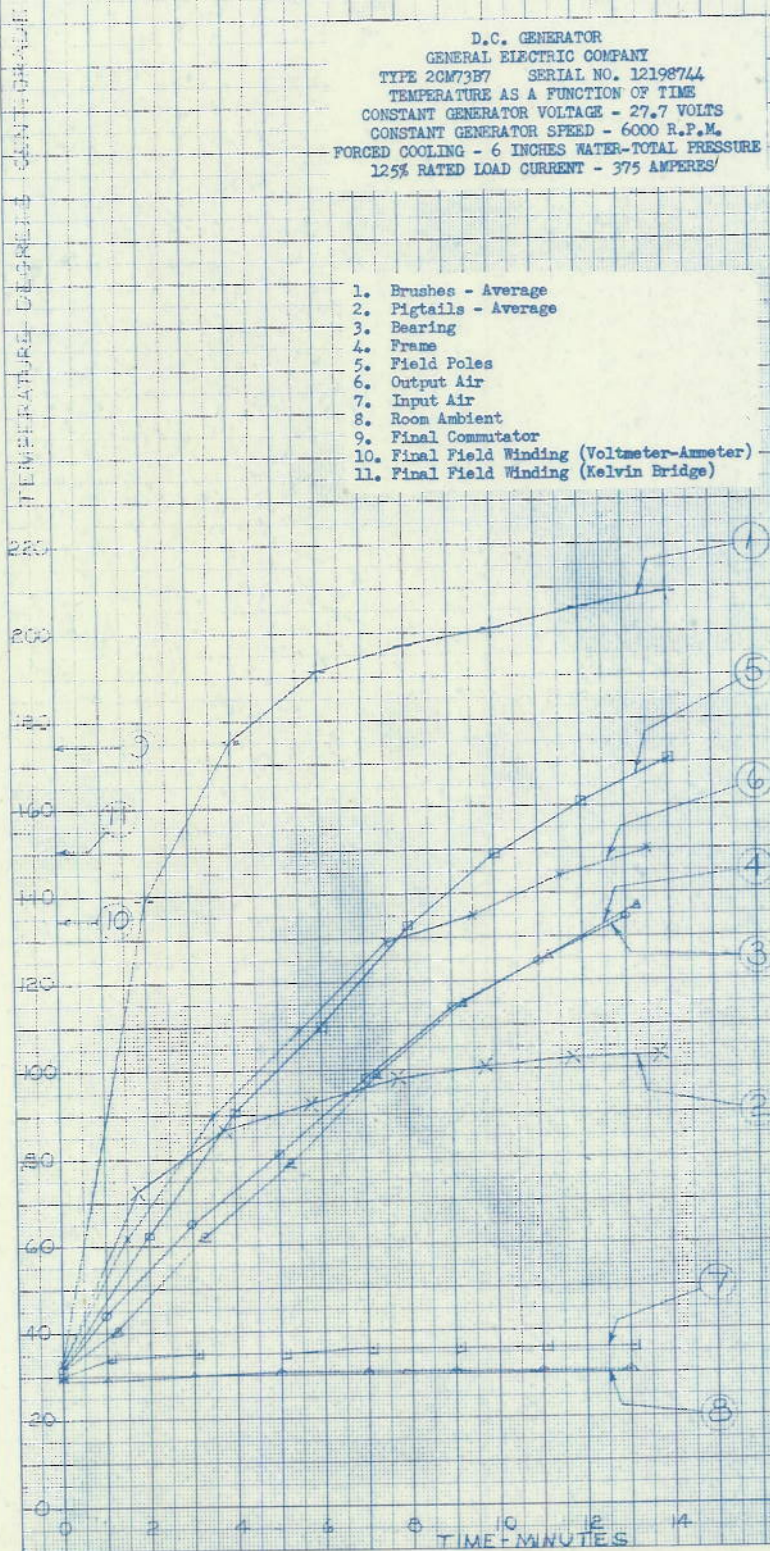


FIGURE 6 (F)

D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 TYPE 2CM73B7 SERIAL NO. 12198744
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 150% RATED LOAD CURRENT - 450 AMPERES

1. Brushes - Average
2. Pigtaills - Average
3. Bearing
4. Frame
5. Field Poles
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Voltmeter-Ammeter)
11. Final Field Winding (Kelvin Bridge)

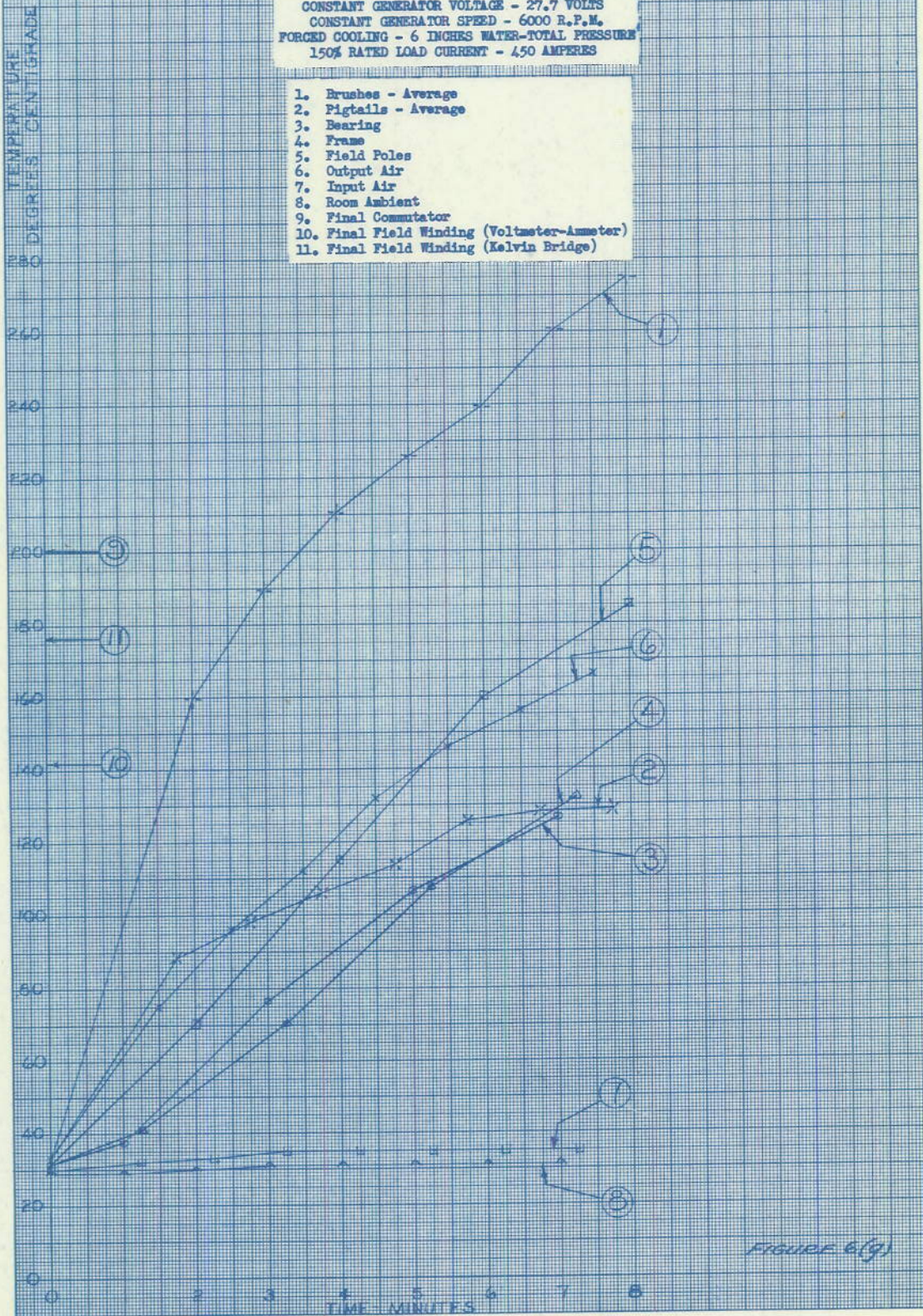
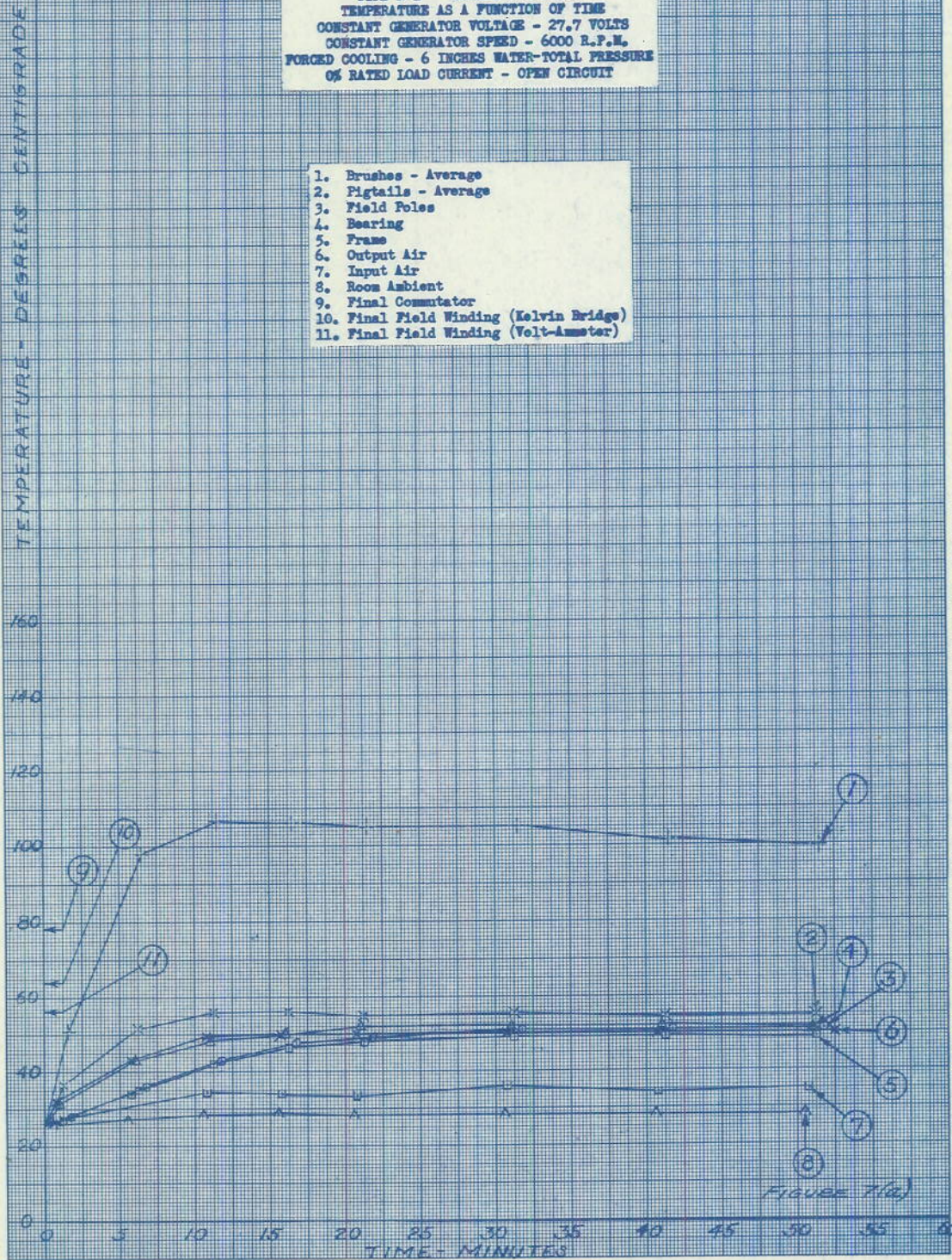


FIGURE 6(g)

D.C. GENERATOR
JACK AND HEINTZ COMPANY
TYPE R-1 SERIAL NO. 18171
TEMPERATURE AS A FUNCTION OF TIME
CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
CONSTANT GENERATOR SPEED - 6000 R.P.M.
FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
0% RATED LOAD CURRENT - OPEN CIRCUIT

1. Brushes - Average
2. Pigtails - Average
3. Field Poles
4. Bearing
5. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Kelvin Bridge)
11. Final Field Winding (Volt-ammeter)



D.C. GENERATOR
 JACK AND HEINTZ COMPANY
 TYPE R-1 SERIAL NO. 18171
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 25% RATED LOAD CURRENT - 75 AMPERES

1. Brushes - Average
2. Pigtails - Average
3. Field Poles
4. Bearing
5. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Kelvin Bridge)
11. Final Field Winding (Volt-Ammeter)

TEMPERATURE - DEGREES CENTIGRADE

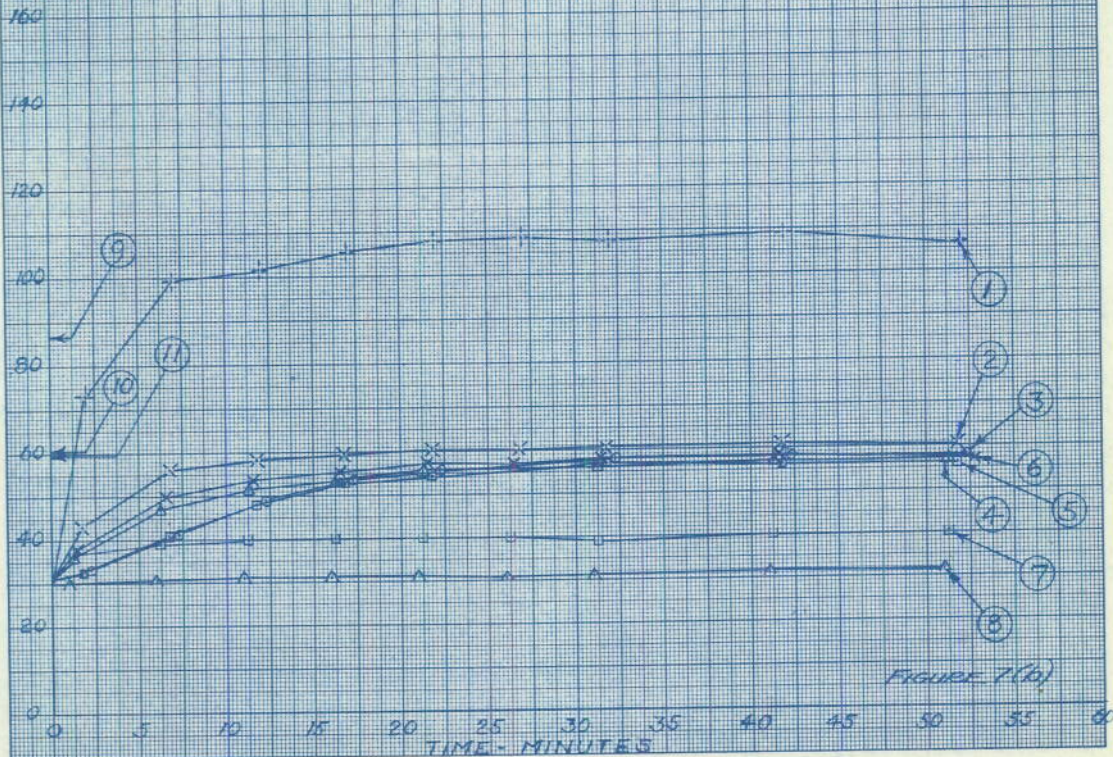


FIGURE 7(a)

D.C. GENERATOR
 JACK AND HEINTZ COMPANY
 TYPE R-1 SERIAL NO. 18171
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 50% RATED LOAD CURRENT - 150 AMPERES

- 1. Brushes - Average
- 2. Pigtaills - Average
- 3. Field Poles
- 4. Bearing
- 5. Frame
- 6. Output Air
- 7. Input Air
- 8. Room Ambient
- 9. Final Commutator
- 10. Final Field Winding (Kelvin Bridge)
- 11. Final Field Winding (Volt-Ammeter)

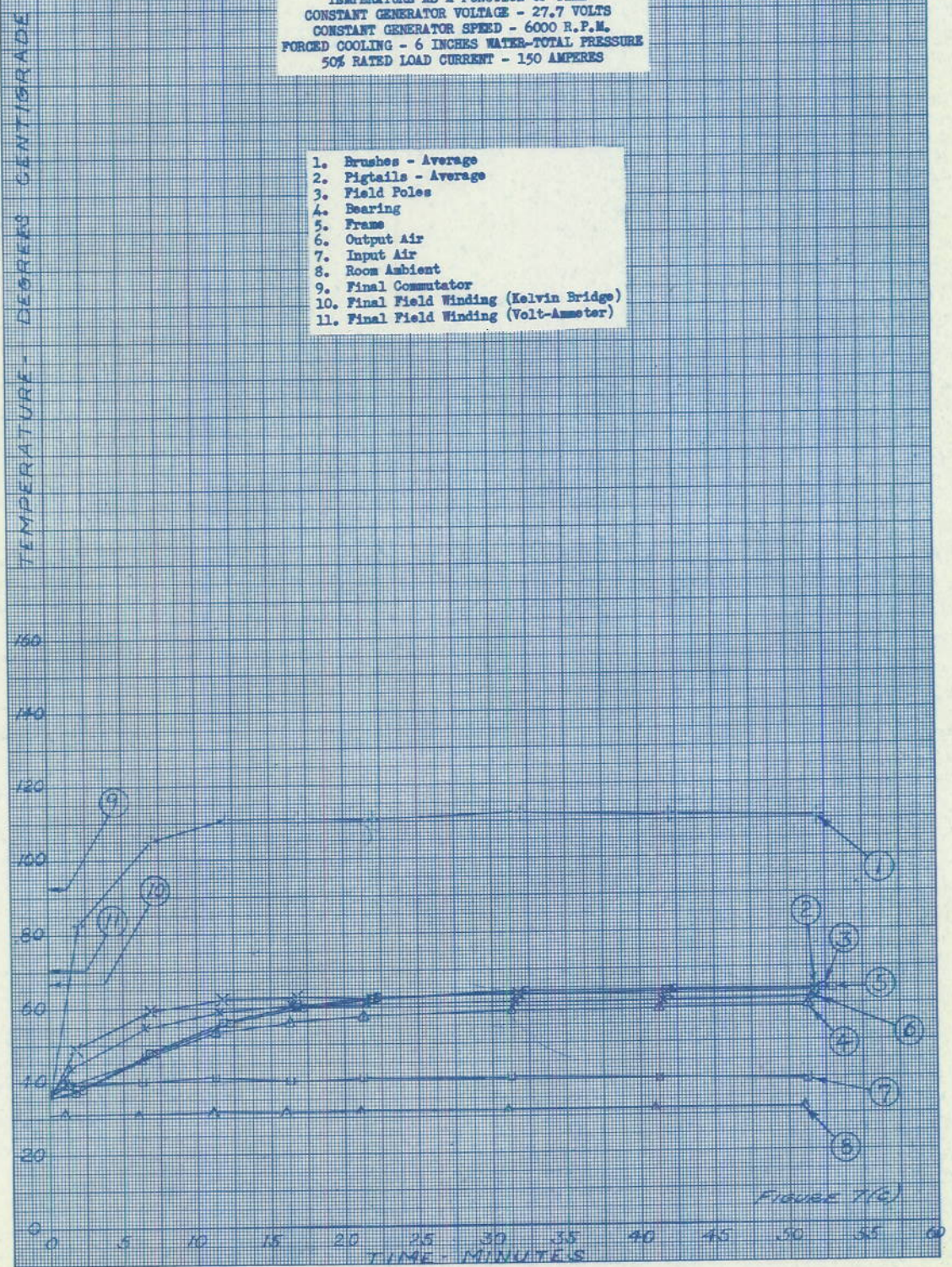
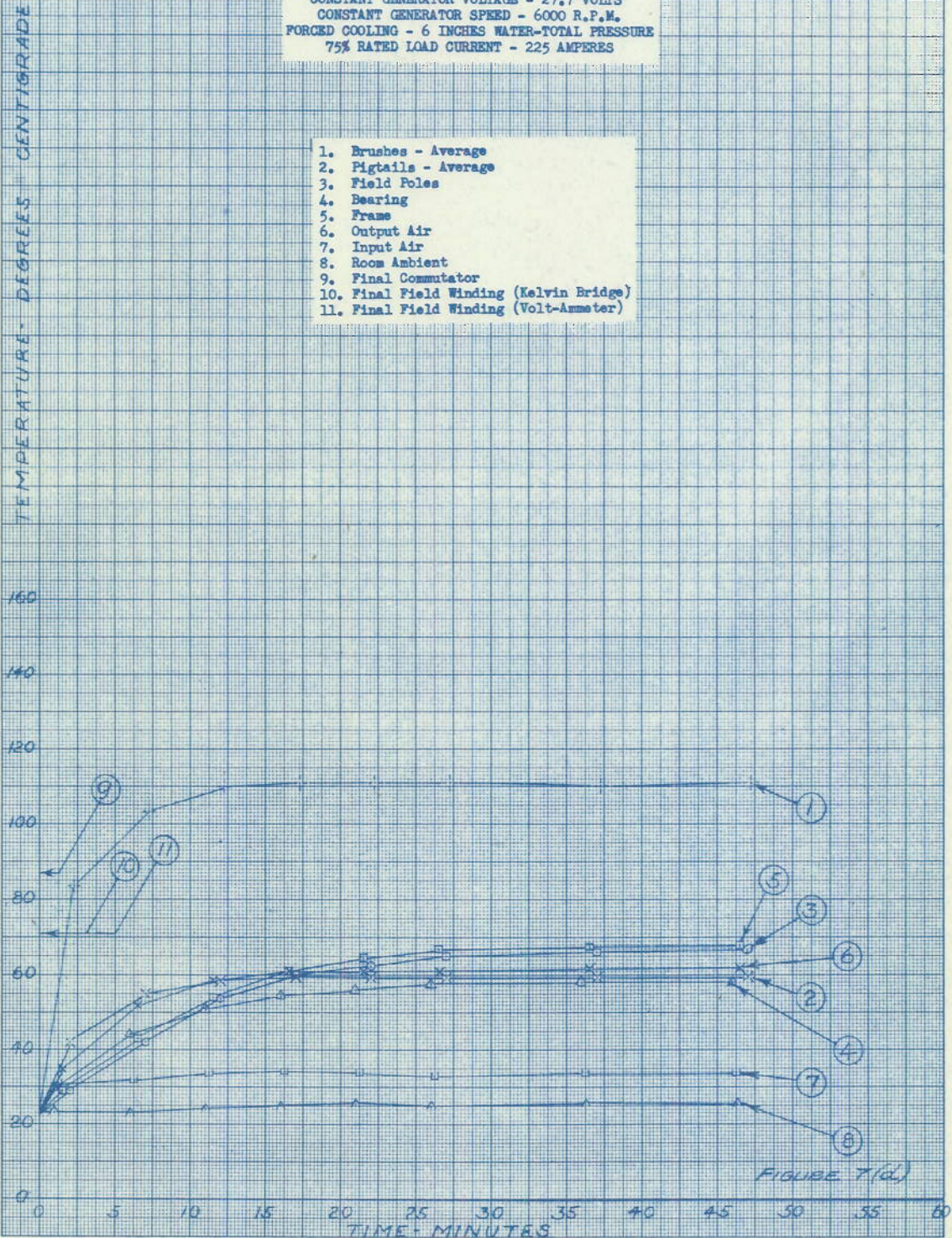


FIGURE 1(c)

D.C. GENERATOR
 JACK AND HEINTZ COMPANY
 TYPE R-1 SERIAL NO. 18171
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 75% RATED LOAD CURRENT - 225 AMPERES

1. Brushes - Average
2. Pigtailes - Average
3. Field Poles
4. Bearing
5. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Kelvin Bridge)
11. Final Field Winding (Volt-Ammeter)



D.C. GENERATOR
 JACK AND HEINTZ COMPANY
 TYPE R-1 SERIAL NO. 18171
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 100% RATED LOAD CURRENT - 300 AMPERES

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator (Kelvin Bridge)
10. Final Field Winding (Kelvin Bridge)
11. Final Field Winding (Volt-Ammeter)

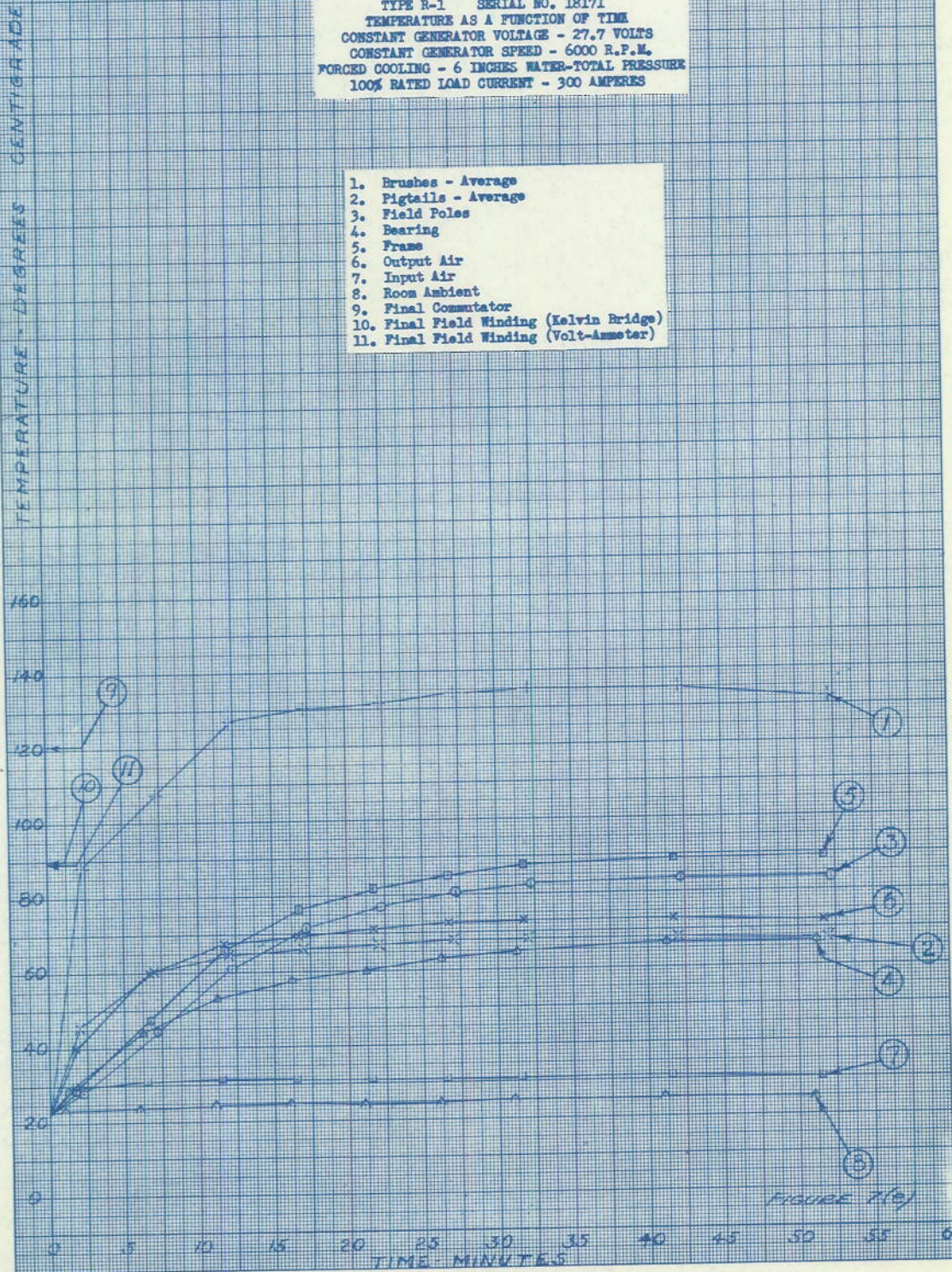
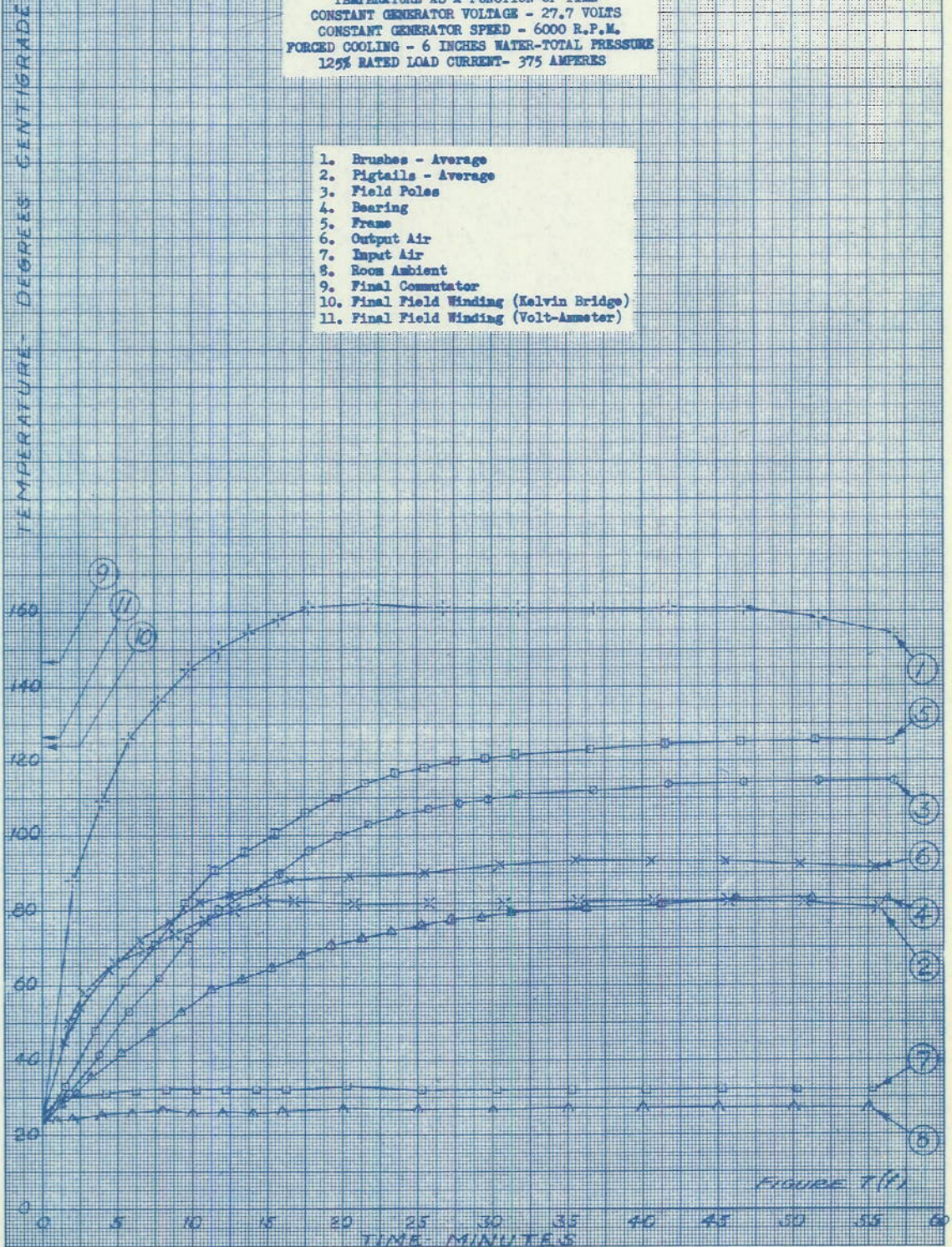


FIGURE 1(a)

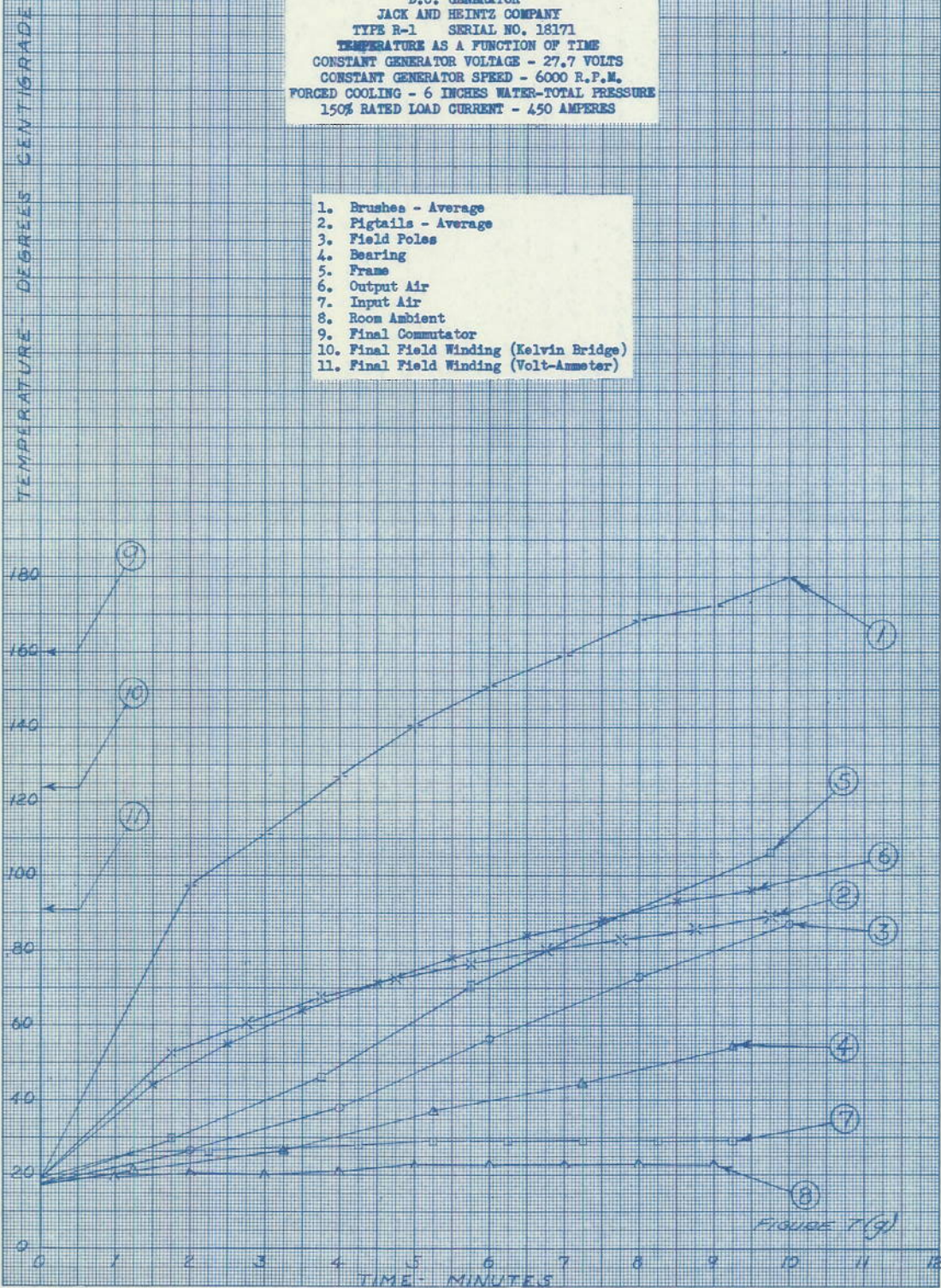
D.C. GENERATOR
 JACK AND HEINTZ COMPANY
 TYPE R-1 SERIAL NO. 18171
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 125% RATED LOAD CURRENT- 375 AMPERES

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Kelvin Bridge)
11. Final Field Winding (Volt-Ammeter)



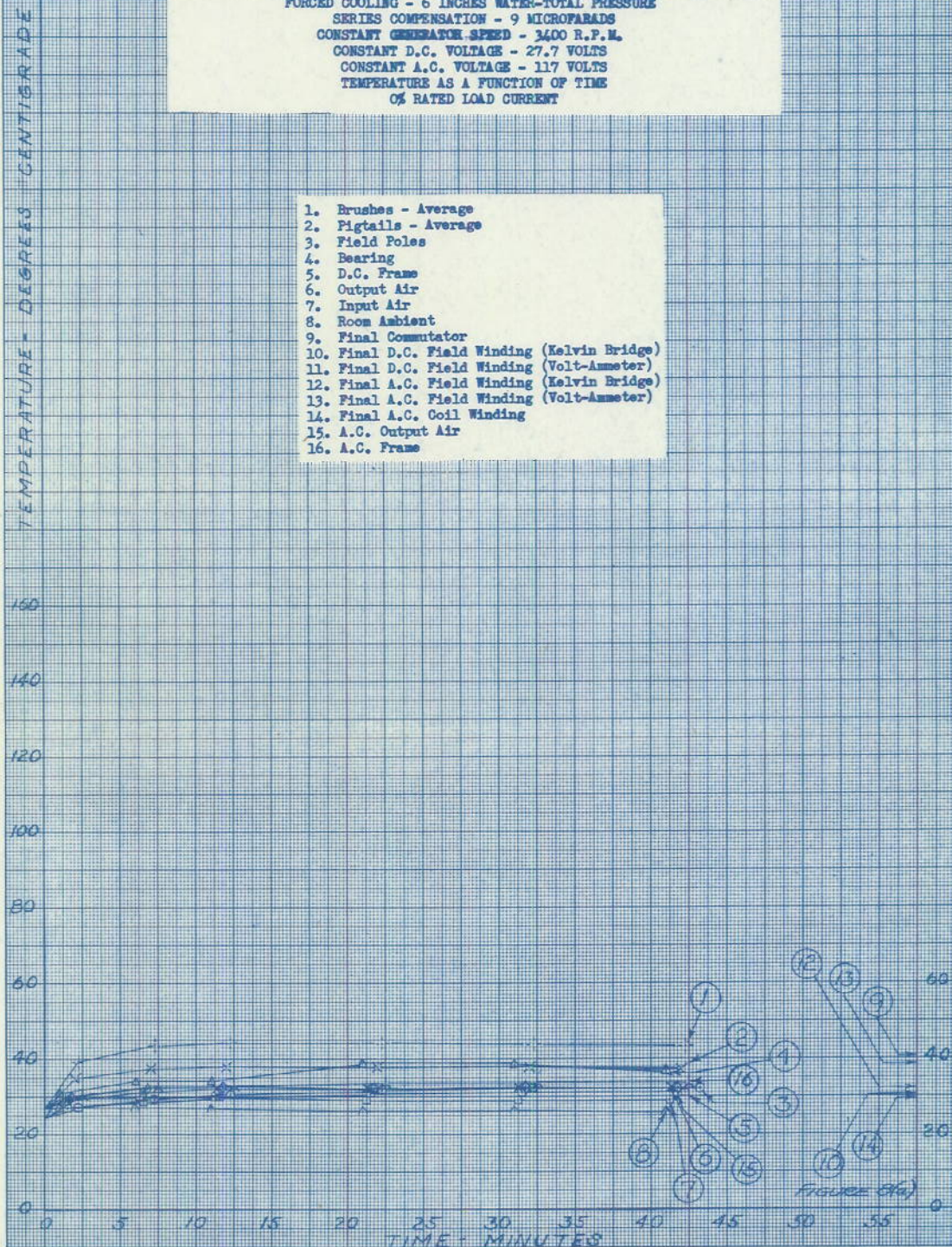
D.C. GENERATOR
 JACK AND HEINTZ COMPANY
 TYPE R-1 SERIAL NO. 18171
 TEMPERATURE AS A FUNCTION OF TIME
 CONSTANT GENERATOR VOLTAGE - 27.7 VOLTS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 150% RATED LOAD CURRENT - 450 AMPERES

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final Field Winding (Kelvin Bridge)
11. Final Field Winding (Volt-Ammeter)



A.C.-D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 MODEL 716-3-A NAVY TYPE NEA-3
 SERIAL NO. 7412 60 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 9 MICROFARADS
 CONSTANT GENERATOR SPEED - 3600 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 % RATED LOAD CURRENT

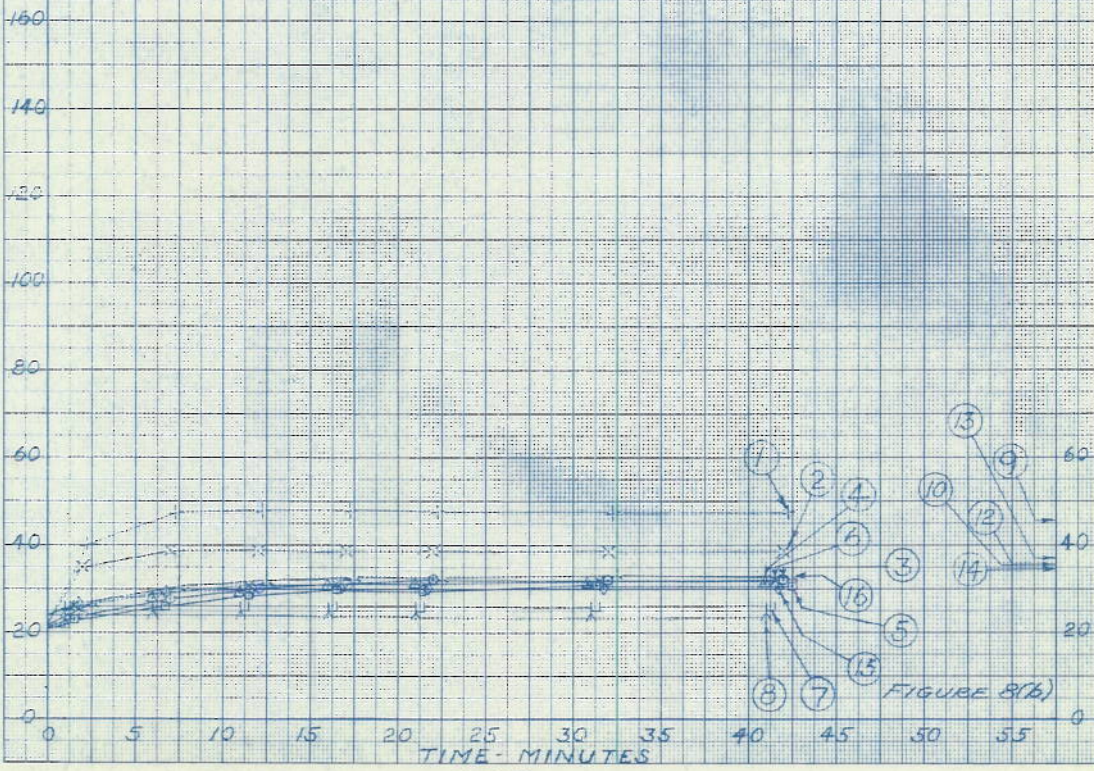
1. Brushes - Average
2. Pigtails - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
15. A.C. Output Air
16. A.C. Frame



A.C.-D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 MODEL 716-3-A NAVY TYPE NEA-3
 SERIAL NO. 7412 60 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 9 MICROPARADS
 CONSTANT GENERATOR SPEED - 3400 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 25% RATED LOAD CURRENT

TEMPERATURE - DEGREES CENTIGRADE

1. Brushes - Average
2. Pigtails - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
15. A.C. Output Air
16. A.C. Frame



A.C.-D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 MODEL 716-3-A NAVY TYPE NEA-3
 SERIAL NO. 7412 60 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 9 MICROFARADS
 CONSTANT GENERATOR SPEED - 3400 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 50% RATED LOAD CURRENT

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
15. A.C. Output Air
16. A.C. Frame

TEMPERATURE - DEGREES CENTIGRADE

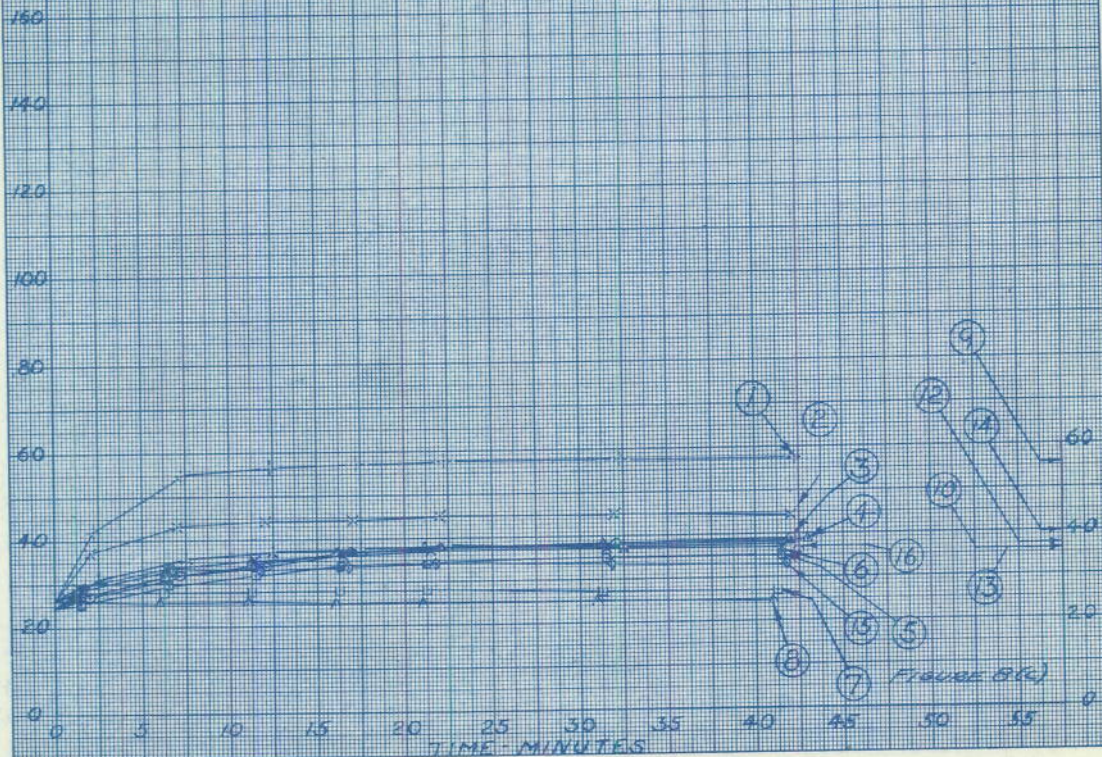
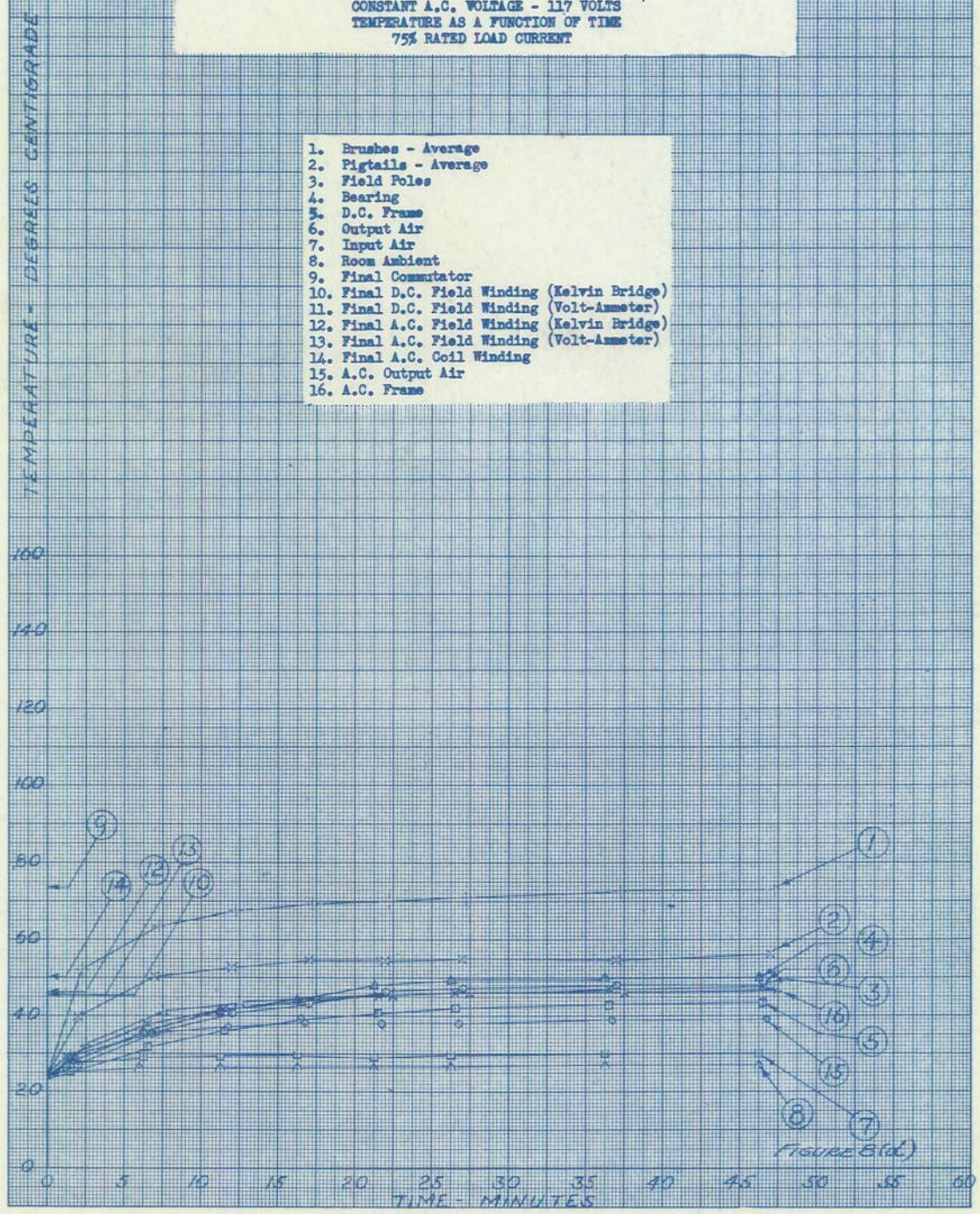


FIGURE 8(c)

A.C.-D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 MODEL 716-3-A NAVY TYPE NEA-3
 SERIAL NO. 7412 60 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 9 MICROFARADS
 CONSTANT GENERATOR SPEED - 3400 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 75% RATED LOAD CURRENT

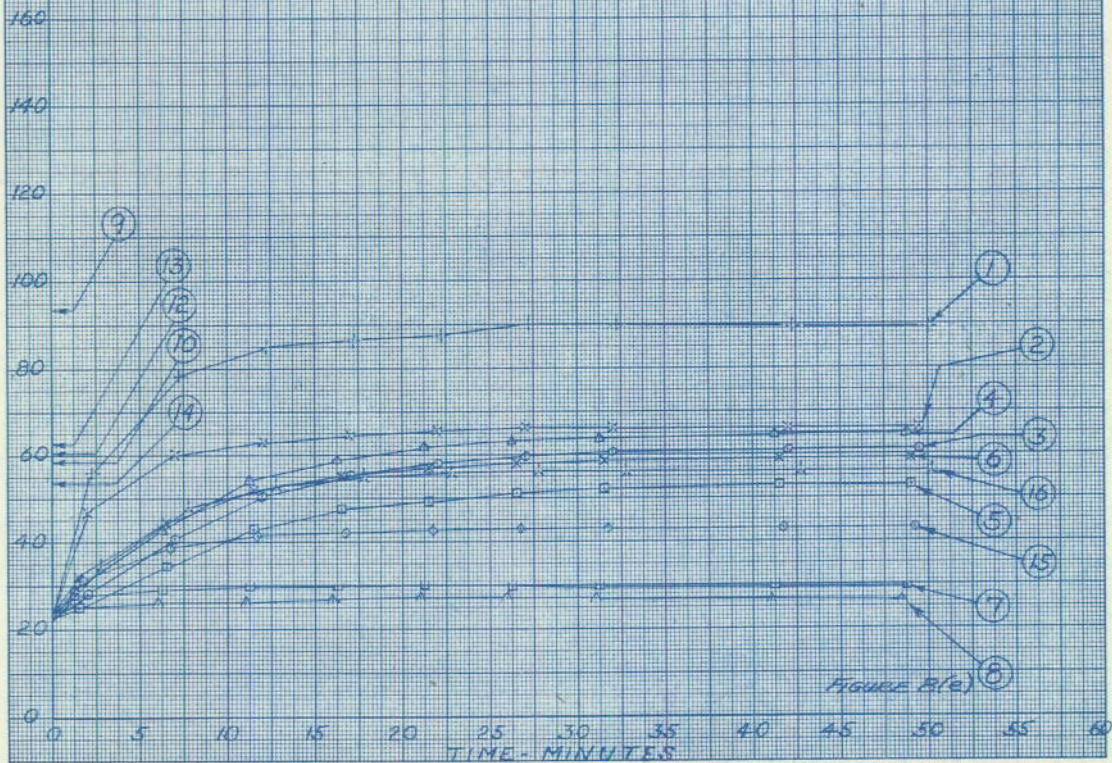
1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
15. A.C. Output Air
16. A.C. Frame



A.C.-D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 MODEL 716-3-A NAVY TYPE NEA-3
 SERIAL NO. 7412 60 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER TOTAL PESSURE
 SERIES COMPENSATION - 9 MICROFARADS
 CONSTANT GENERATOR SPEED - 3400 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 100% RATED LOAD CURRENT

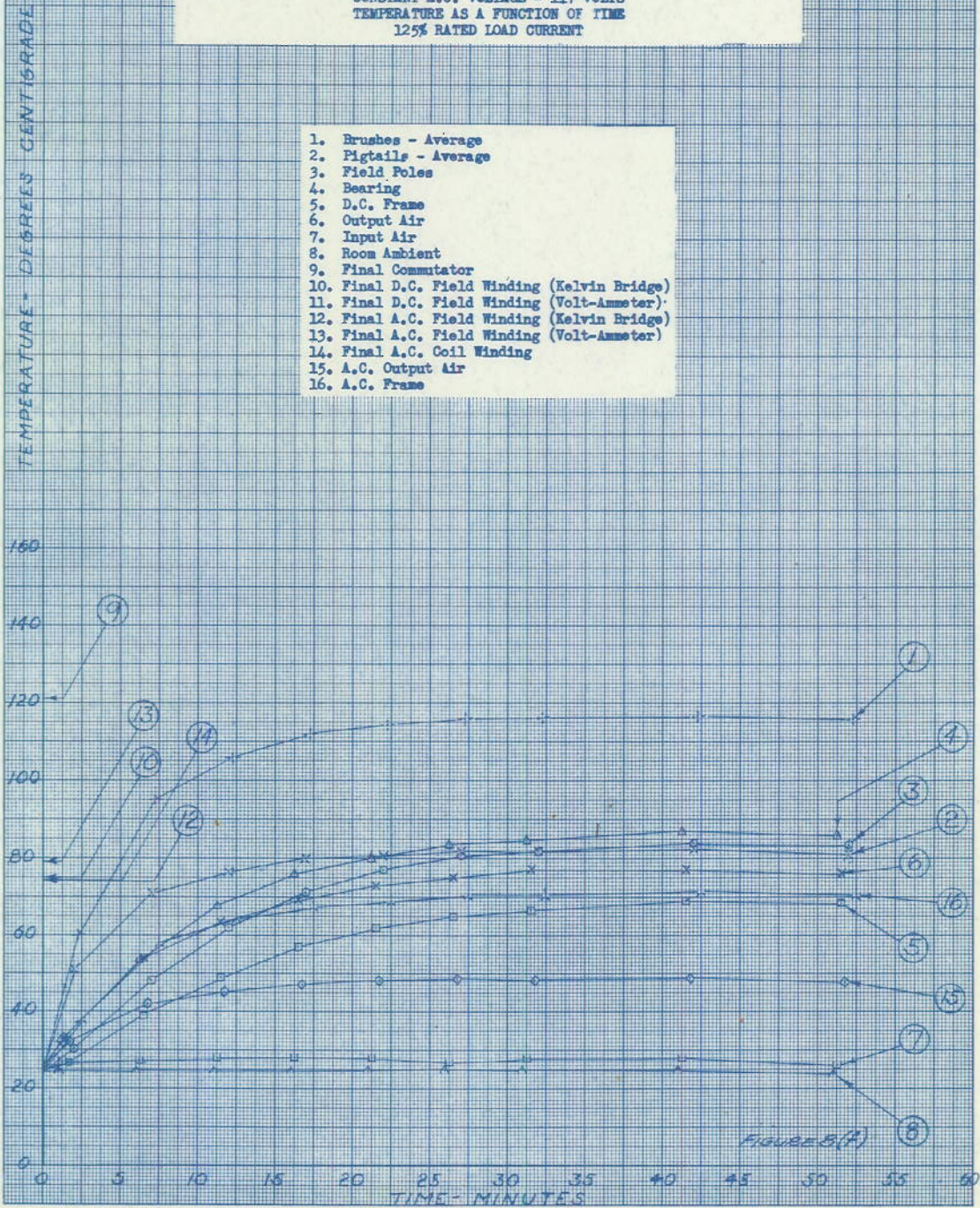
1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
15. A.C. Output Air
16. A.C. Frame

TEMPERATURE - DEGREES CENTIGRADE



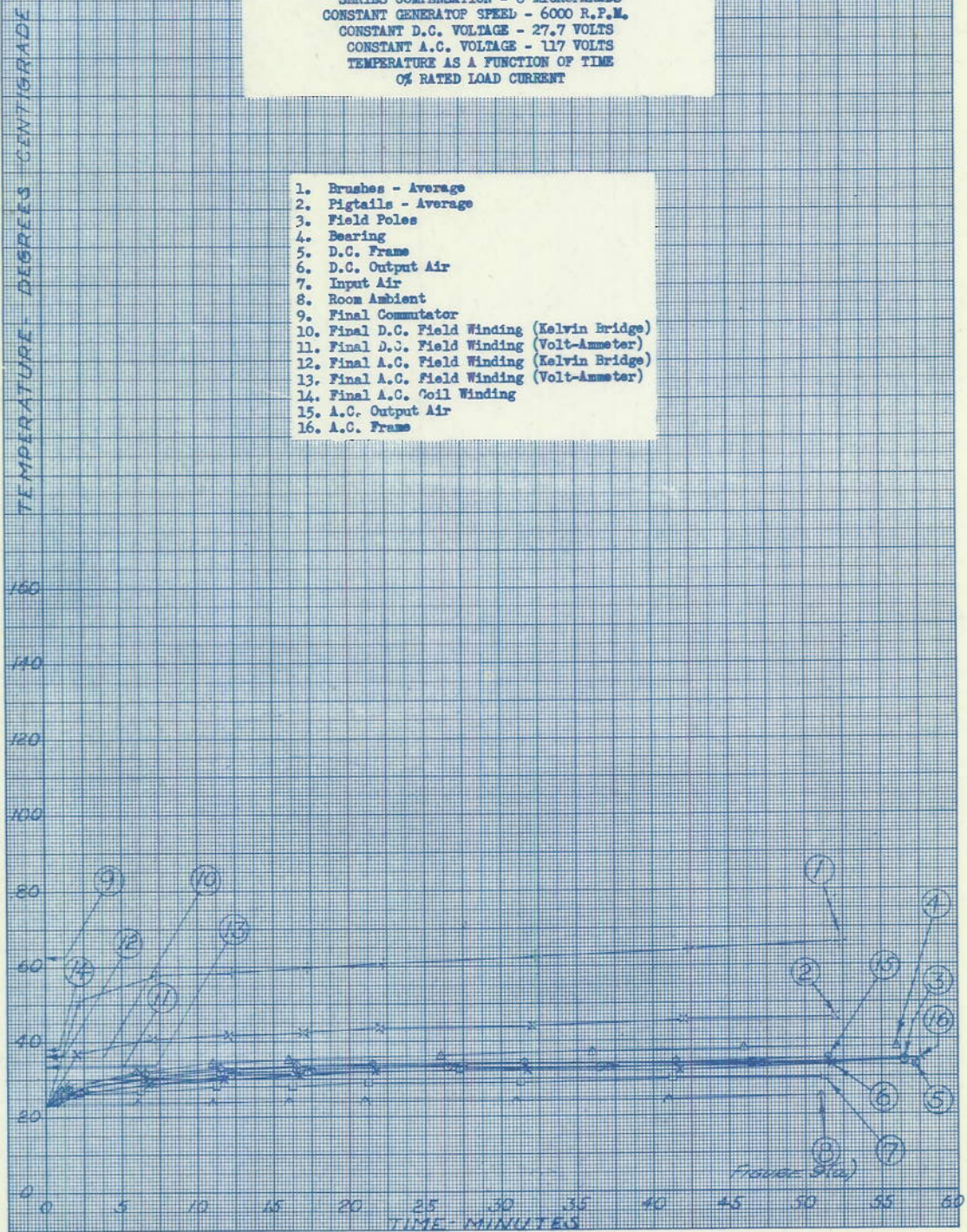
A.C.-D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 MODEL 716-3-A NAVY TYPE NEA-3
 SERIAL NO. 7412 60 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 9 MICROFARADS
 CONSTANT GENERATOR SPEED - 3400 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 125% RATED LOAD CURRENT

1. Brushes - Average
2. Pigtails - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
15. A.C. Output Air
16. A.C. Frame



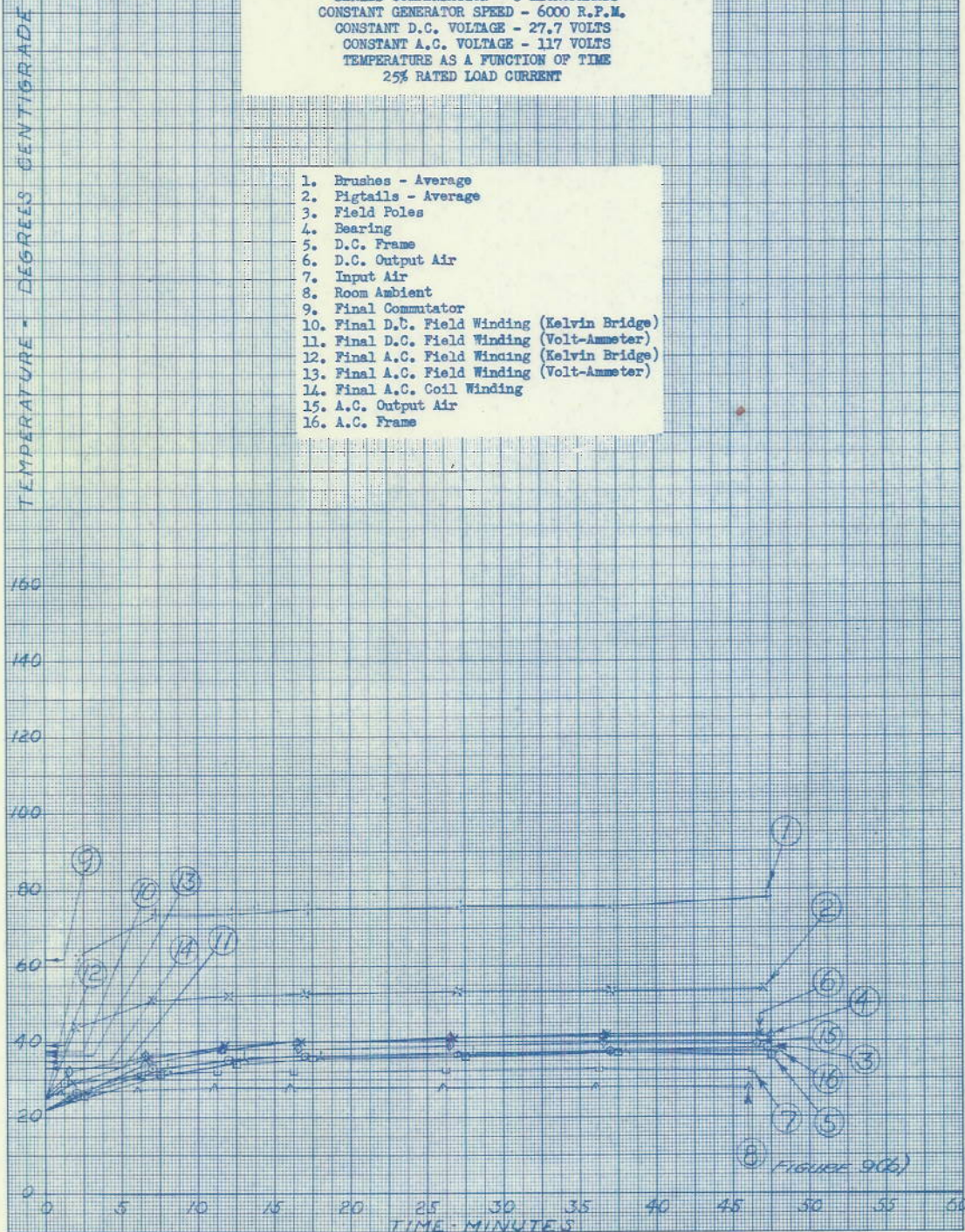
A.C.-D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 MODEL 1310-1-B NAVY TYPE NEA-4 SERIAL NO. 820
 100 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 8 MICROFARADS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 % RATED LOAD CURRENT

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. D.C. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
15. A.C. Output Air
16. A.C. Frame



A.C.-D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 MODEL 1310-1-B NAVY TYPE NEA-4 SERIAL NO. 820
 100 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 8 MICROFARADS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 25% RATED LOAD CURRENT

1. Brushes - Average
2. Pigtails - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. D.C. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
15. A.C. Output Air
16. A.C. Frame



A.C.-D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 MODEL 1310-1-B NAVY TYPE NEA-4 SERIAL NO. 820
 100 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER TOTAL PRESSURE
 SERIES COMPENSATION - 8 MICROFARADS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 50% RATED LOAD CURRENT

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. D.C. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
15. A.C. Output Air
16. A.C. Frame

TEMPERATURE - DEGREES CENTIGRADE

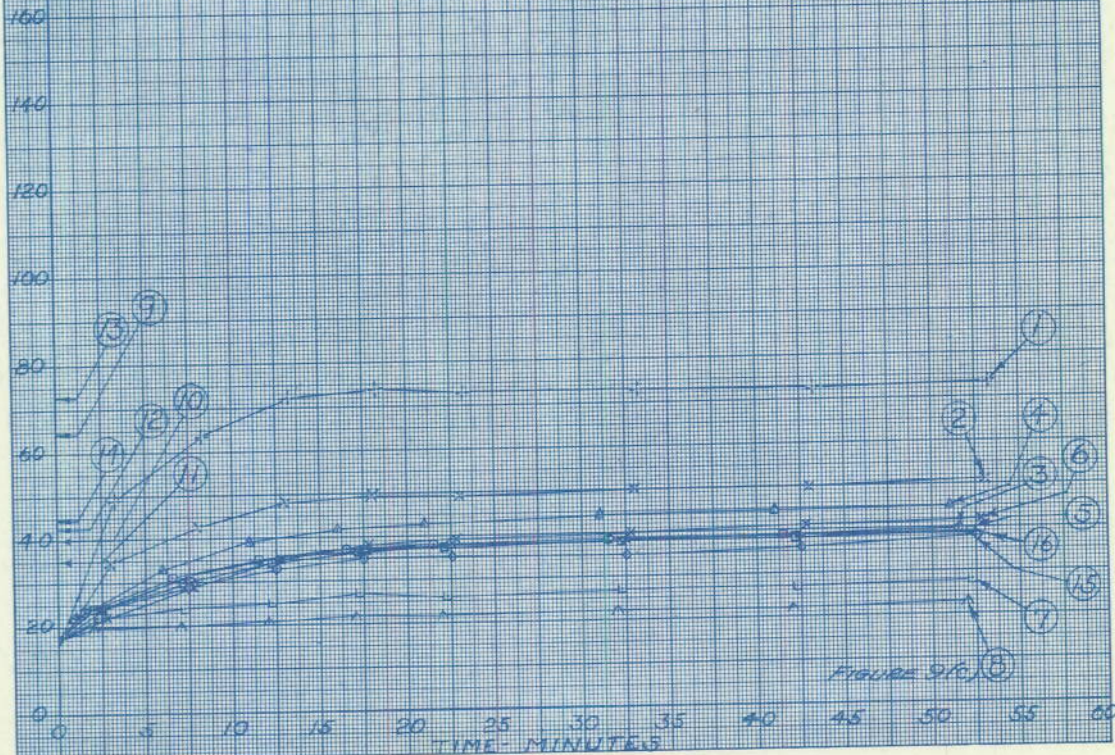
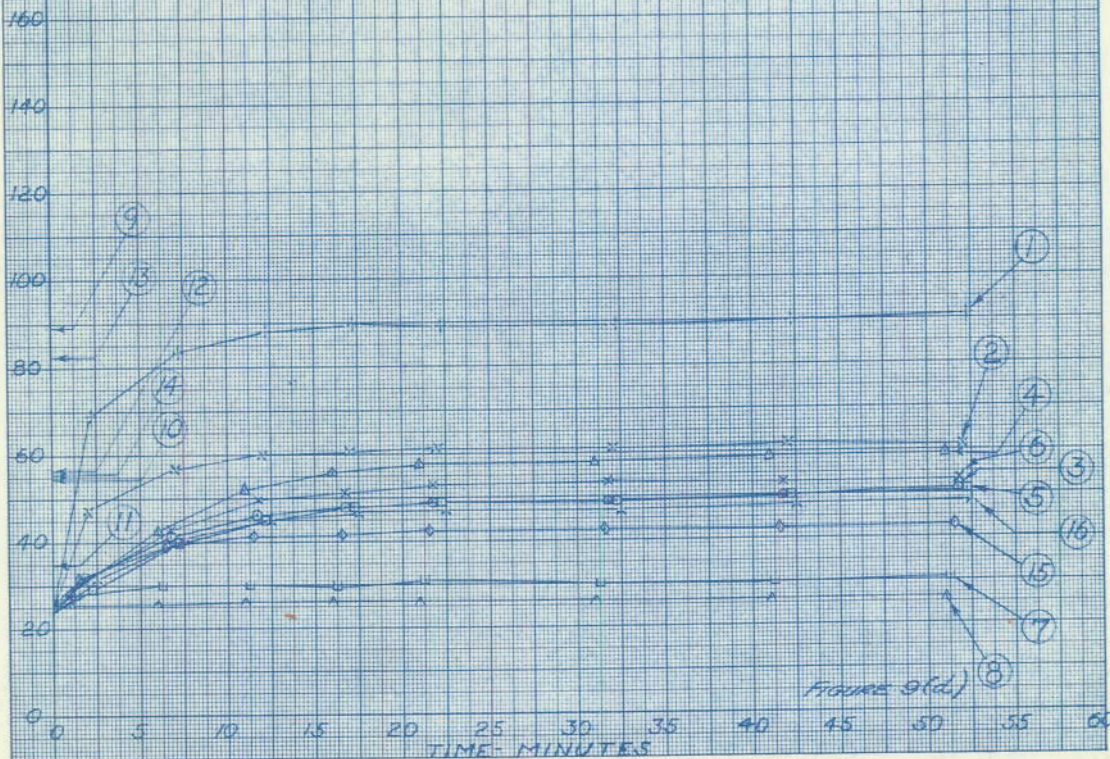


FIGURE 9 (C)

A.C.-D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 MODEL 1310-1-B NAVY TYPE NEA-4 SERIAL NO. 820
 100 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 8 MICROFARADS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 75% RATED LOAD CURRENT

TEMPERATURE - DEGREES CENTIGRADE

1. Brushes - Average
2. Pigtails - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. D.C. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
15. A.C. Output Air
16. A.C. Frame



A.C.-D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 MODEL 1310-1-B NAVY TYPE NEA-4 SERIAL NO. 820
 100 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 8 MICROPARADS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 100% RATED LOAD CURRENT

TEMPERATURE - DEGREES CENTIGRADE

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. D.C. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
15. A.C. Output Air
16. A.C. Frame

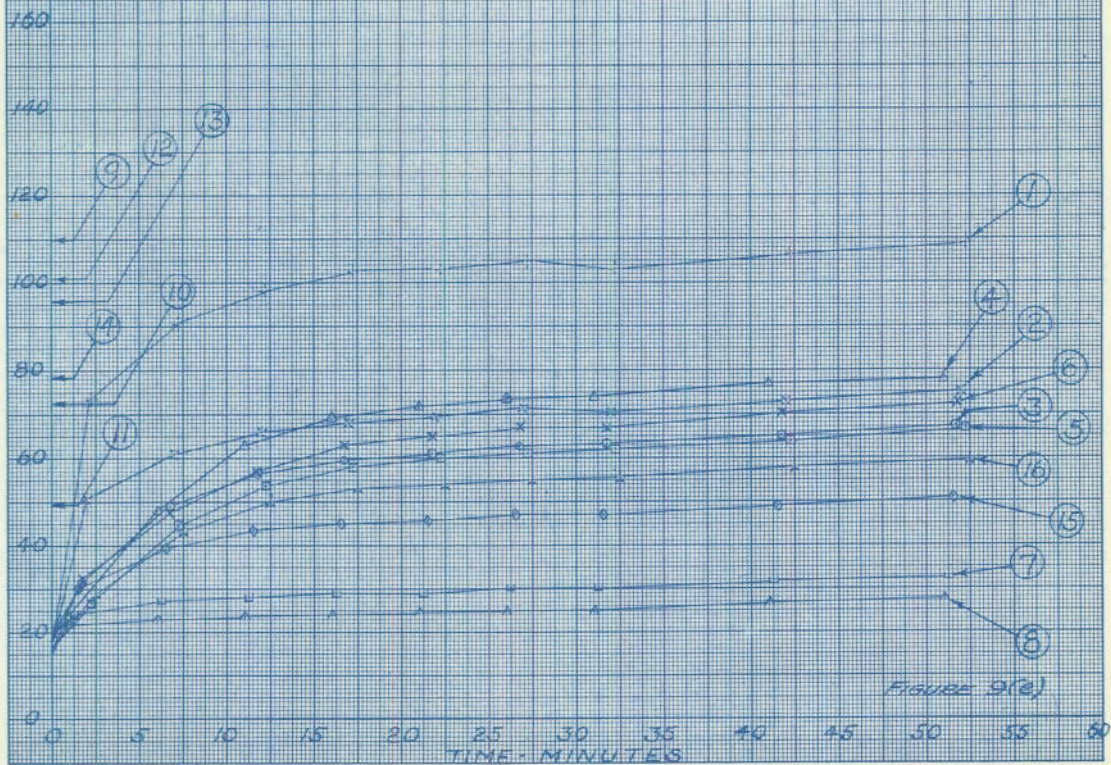
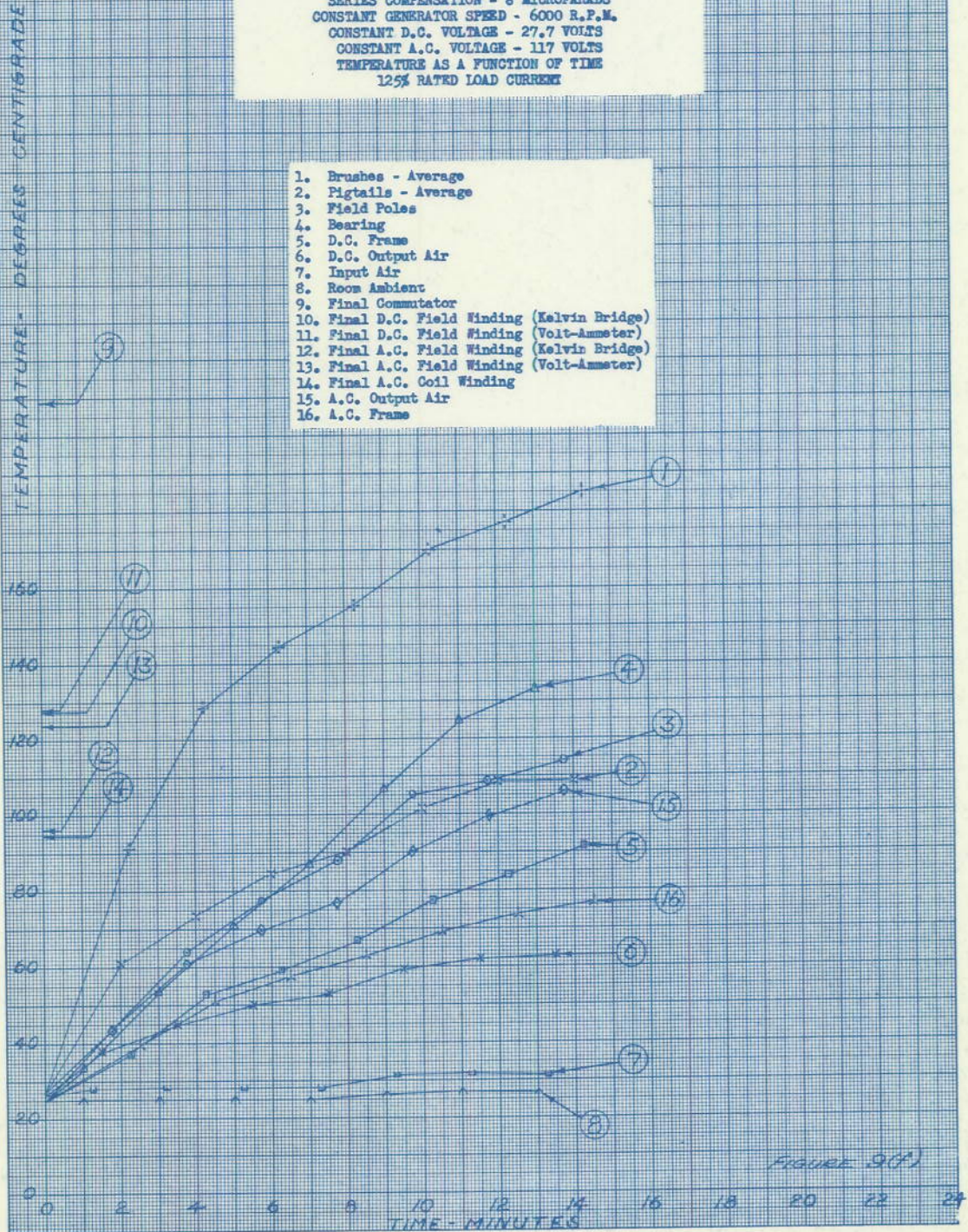


FIGURE 9(a)

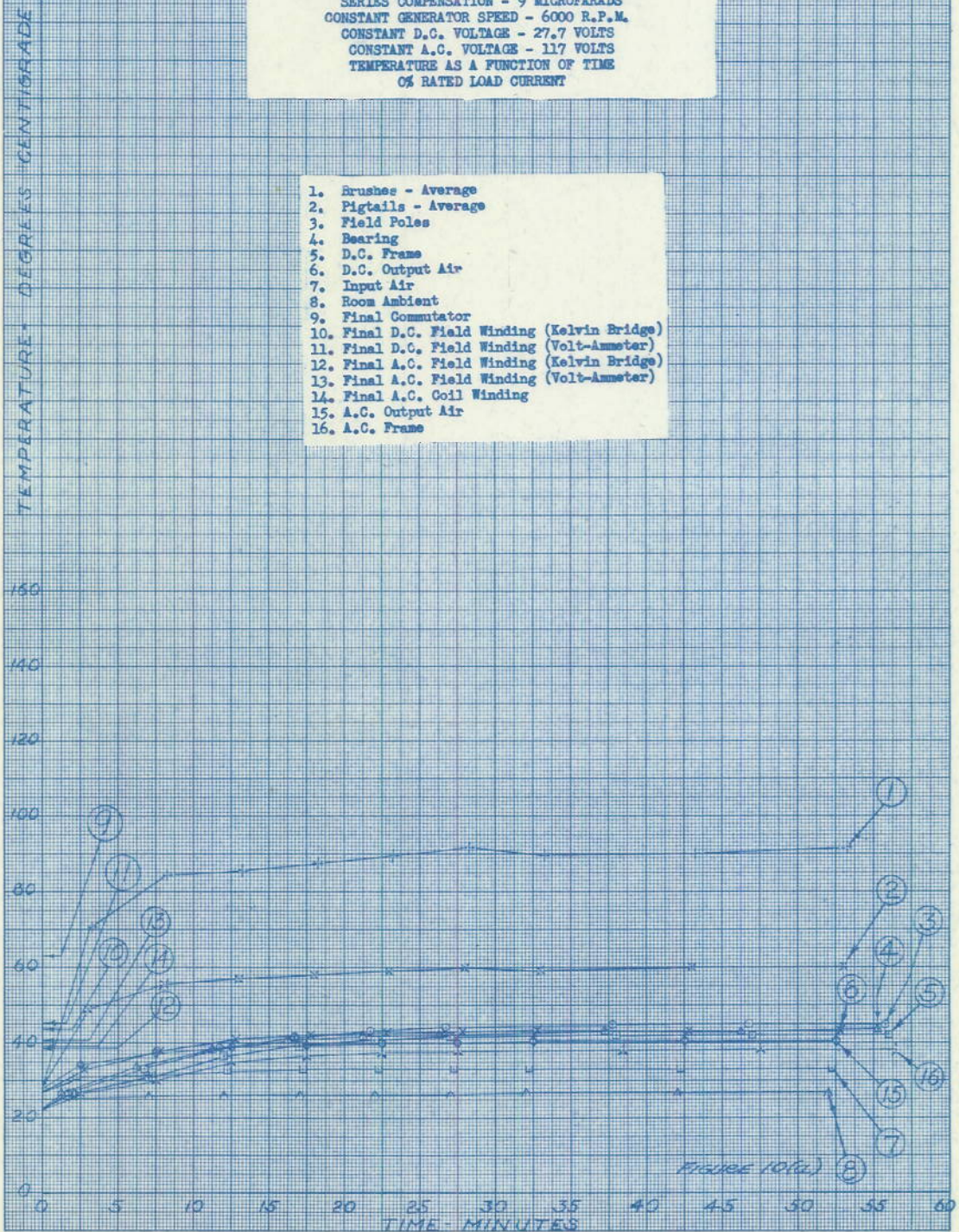
A.C.-D.C. GENERATOR
ECLIPSE AVIATION CORPORATION
 MODEL 1310-1-B NAVY TYPE NEA-4 SERIAL NO. 820
 100 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 8 MICROFARADS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 125% RATED LOAD CURRENT

1. Brushes - Average
2. Pigtails - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. D.C. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
15. A.C. Output Air
16. A.C. Frame



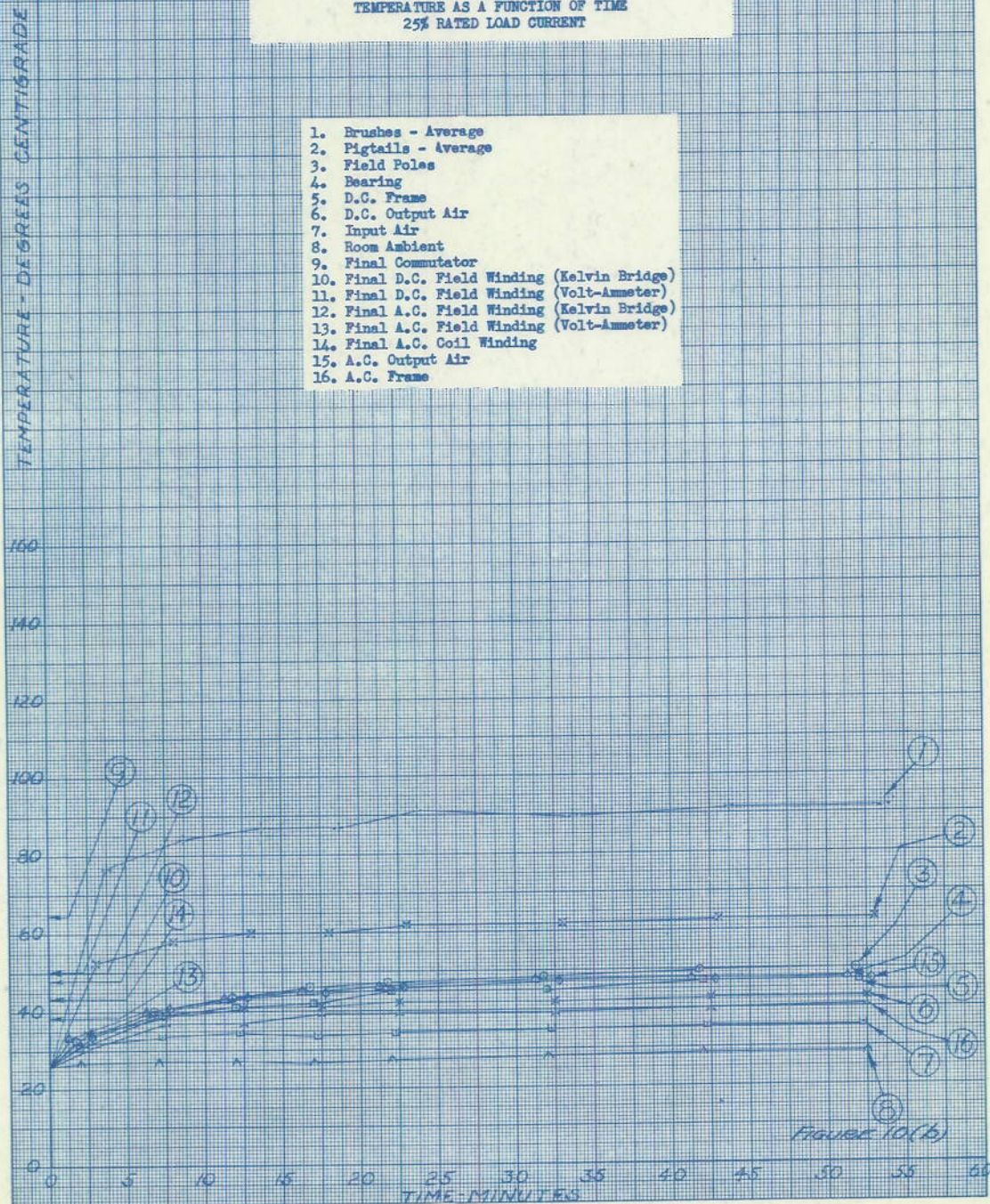
A.C.-D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 MODEL 1097-3-C NAVY TYPE NEA-5 SERIAL NO. 2000
 200 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 9 MICROFARADS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 11.7 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 % RATED LOAD CURRENT

1. Brushes - Average
2. Pigtails - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. D.C. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
15. A.C. Output Air
16. A.C. Frame



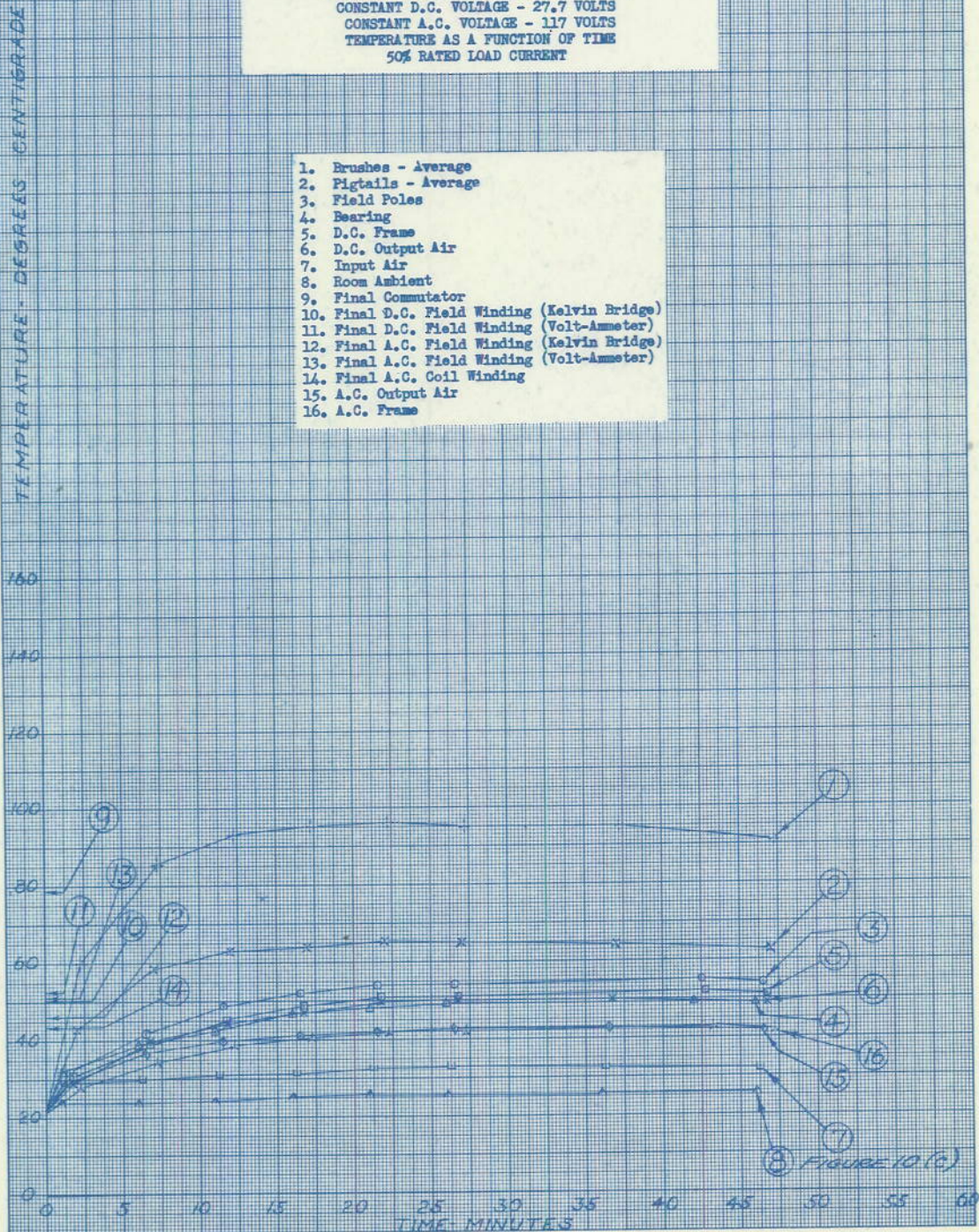
A.C.-D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 MODEL 1097-3-C NAVY TYPE NEA-5 SERIAL NO. 2000
 200 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER TOTAL PRESSURE
 SERIES COMPENSATION - 9 MICROFARADS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 25% RATED LOAD CURRENT

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. D.C. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
15. A.C. Output Air
16. A.C. Frame



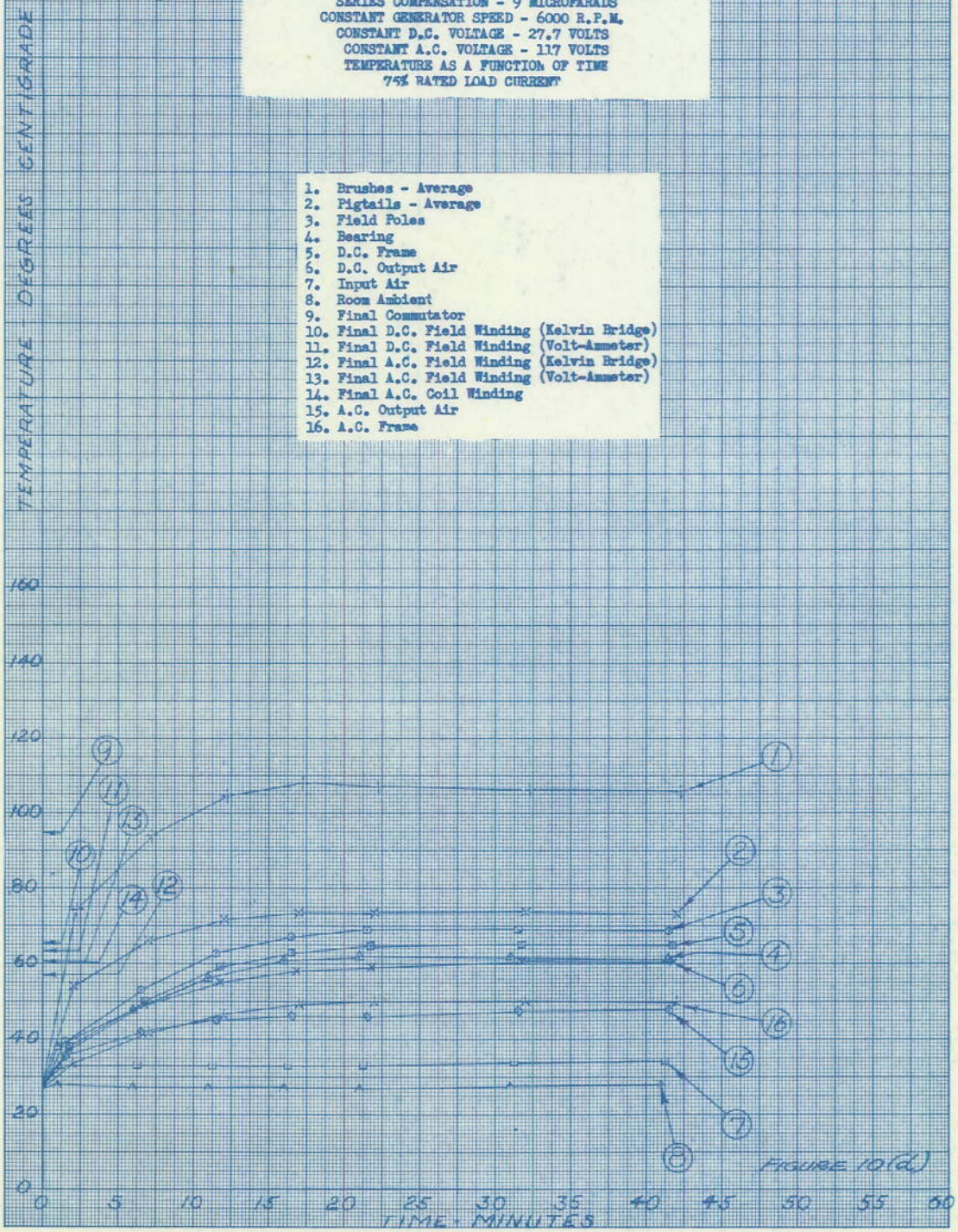
A.C.-D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 MODEL 1097-3-C NAVY TYPE NEA-5 SERIAL NO. 2000
 200 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 9 MICROFARADS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 50% RATED LOAD CURRENT

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. D.C. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
15. A.C. Output Air
16. A.C. Frame



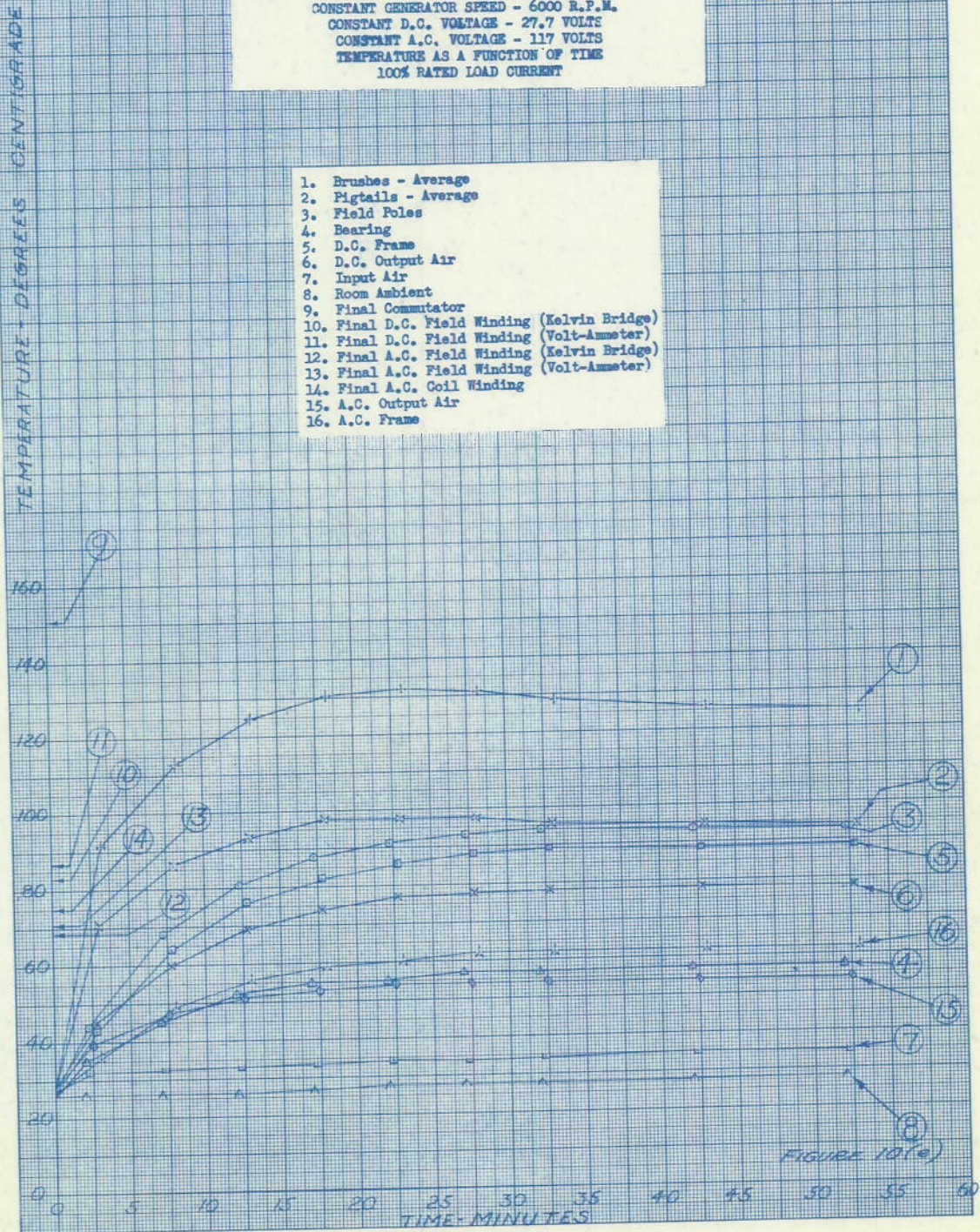
A.C.-D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 MODEL 1097-3-C NAVY TYPE NEA-5 SERIAL NO. 2000
 200 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER TOTAL PRESSURE
 SERIES COMPENSATION - 9 MICROFARADS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 75% RATED LOAD CURRENT

1. Brushes - Average
2. Pigtails - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. D.C. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
15. A.C. Output Air
16. A.C. Frame



A.C.-D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 MODEL 1097-3-C NAVY TYPE NEA-5 SERIAL NO. 2000
 200 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 9 MICROPARADS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 100% RATED LOAD CURRENT

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. D.C. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
15. A.C. Output Air
16. A.C. Frame



A.C.-D.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 MODEL 1097-3-C NAVY TYPE NEA-5 SERIAL NO. 2000
 200 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 9 MICROFARADS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 125% RATED LOAD CURRENT

TEMPERATURE - DEGREES CENTIGRADE

1. Brushes - Average
2. Pigtails - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. D.C. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
15. A.C. Output Air
16. A.C. Frame

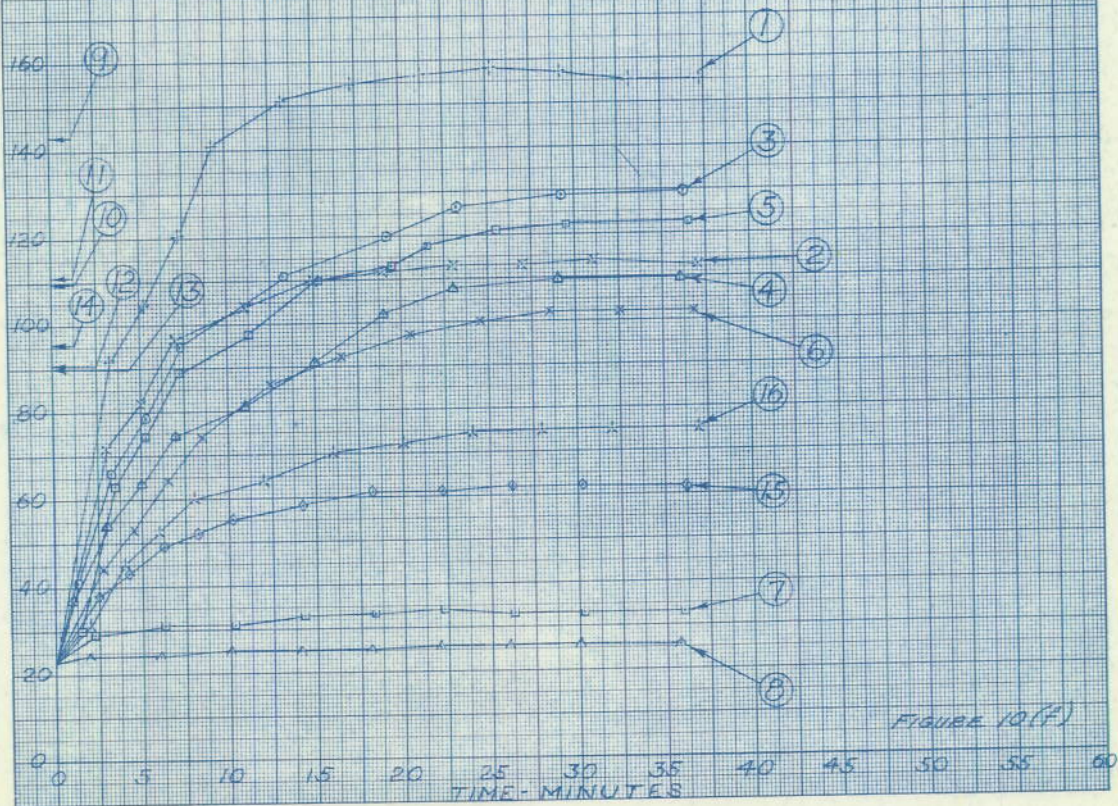
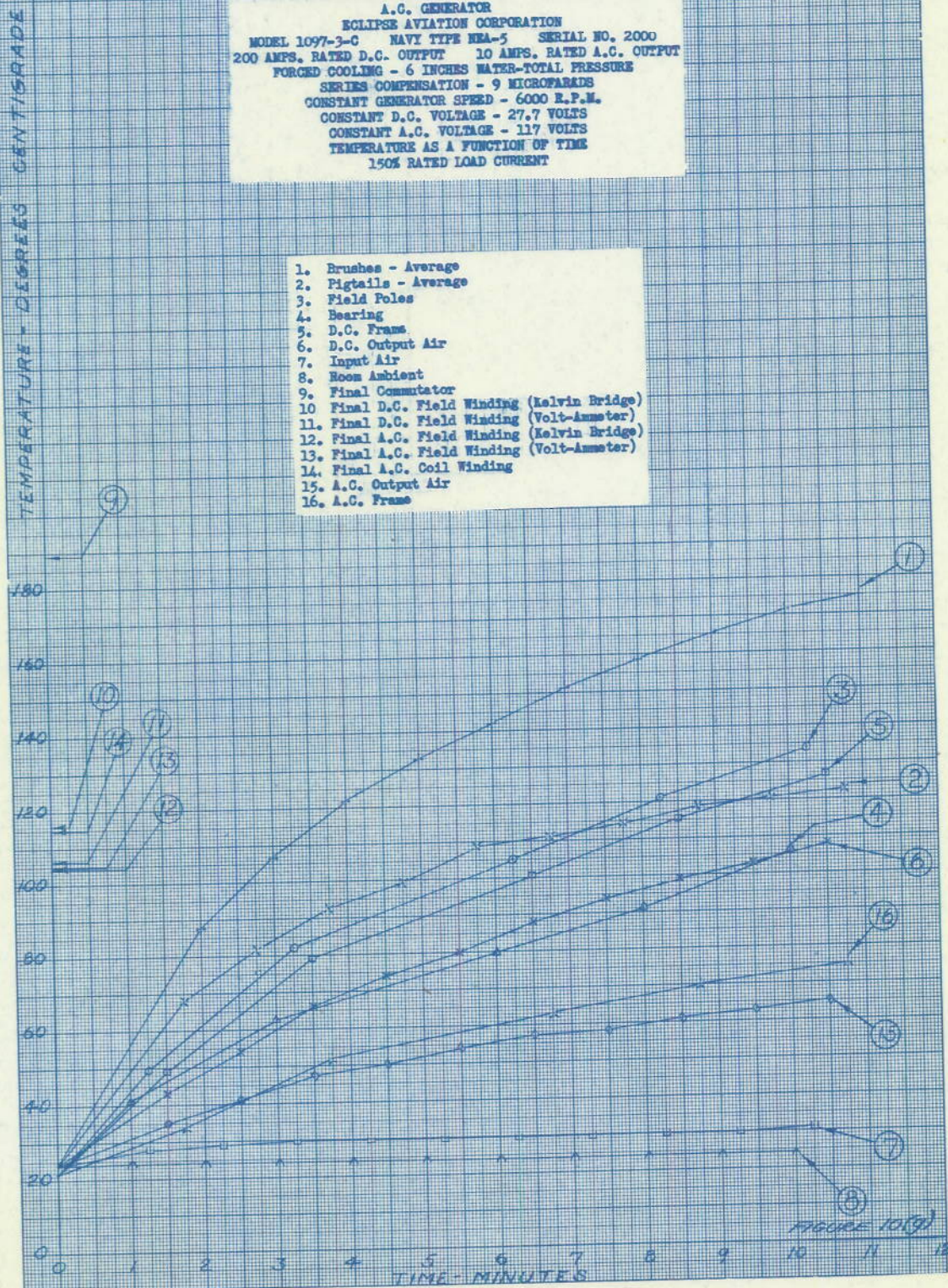


FIGURE 10(F)

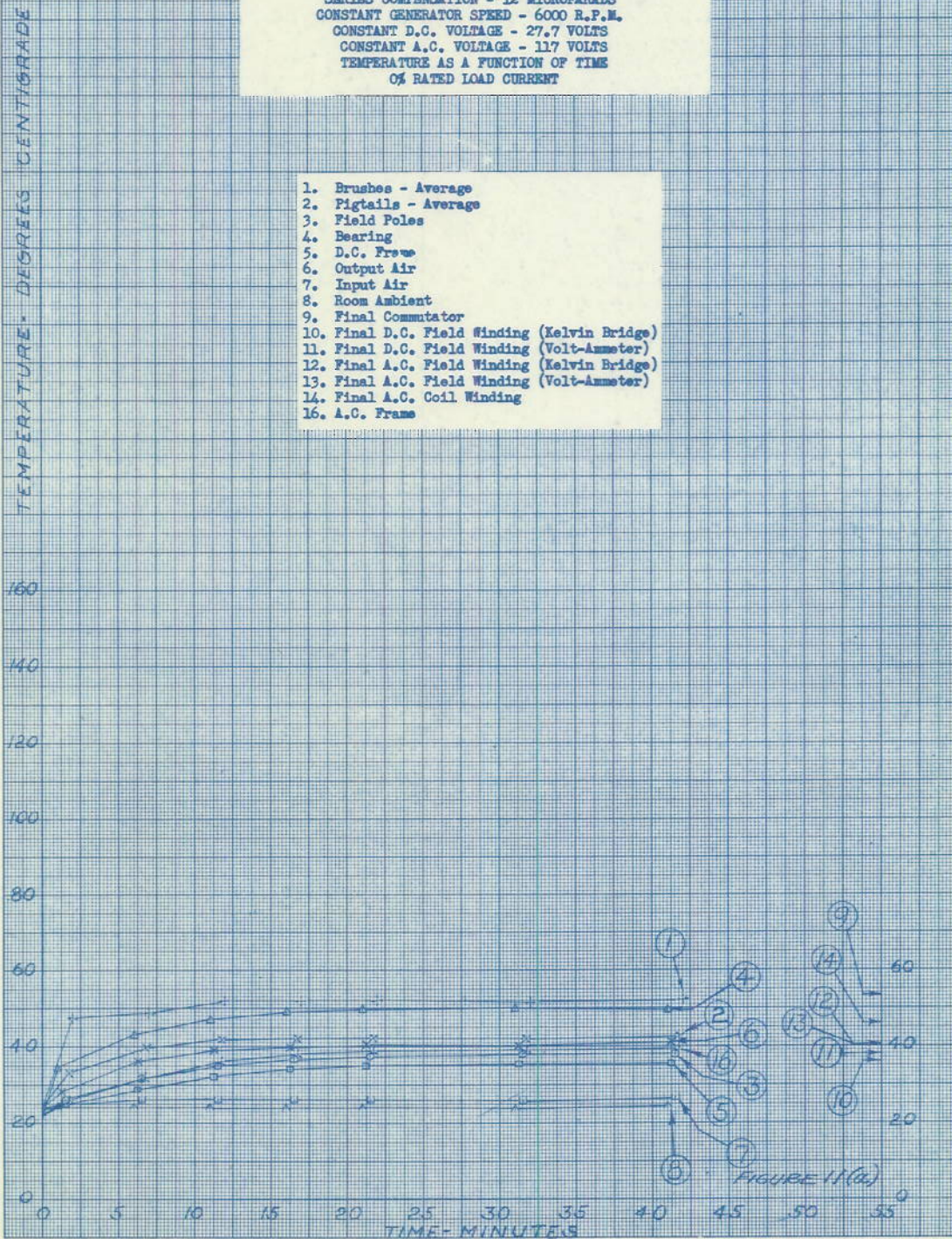
A.C. GENERATOR
 ECLIPSE AVIATION CORPORATION
 MODEL 1097-3-C NAVY TYPE NEM-5 SERIAL NO. 2000
 200 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 9 MICROFARADS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 150% RATED LOAD CURRENT

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. D.C. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
15. A.C. Output Air
16. A.C. Frame



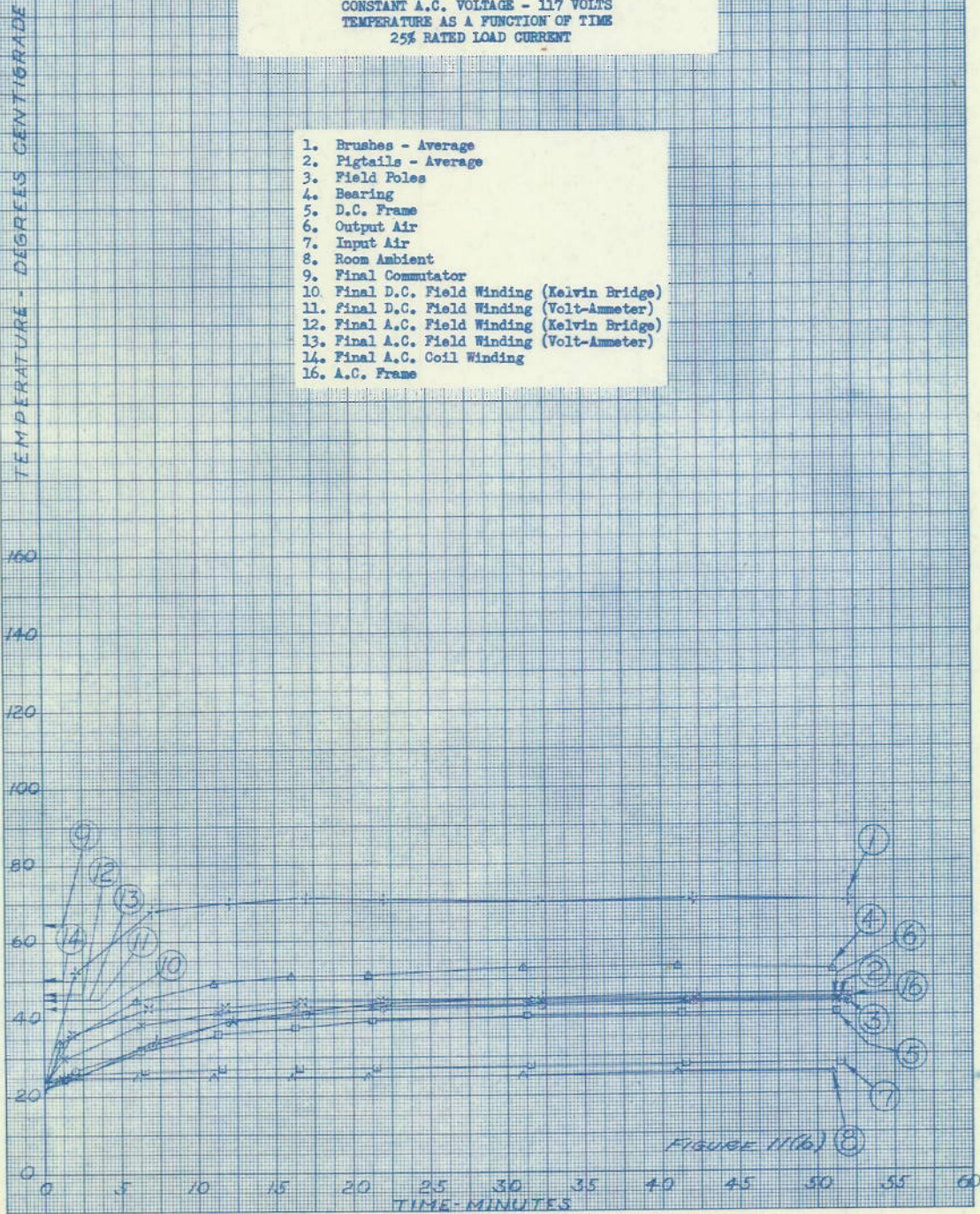
A.C.-D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 MODEL 20ME1B3 NAVY TYPE NEA-5 SERIAL NO. 2197906
 200 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 12 MICROFARADS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 % RATED LOAD CURRENT

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
16. A.C. Frame



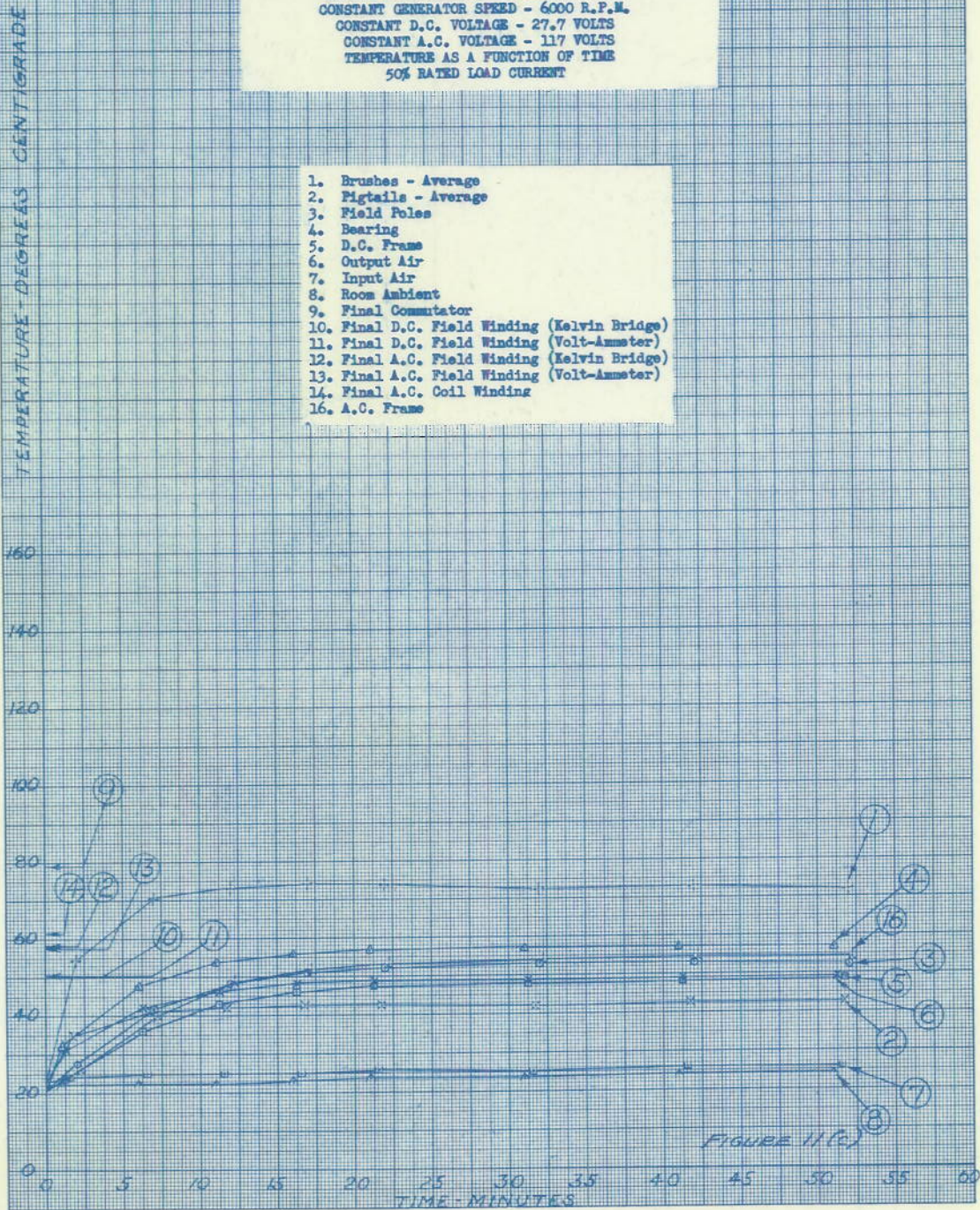
A.C.-D.C. GENERATOR
GENERAL ELECTRIC COMPANY
 MODEL 2CME1B3 NAVY TYPE NEA-5 SERIAL NO. 2197906
 200 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 12 MICROFARADS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 25% RATED LOAD CURRENT

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
16. A.C. Frame



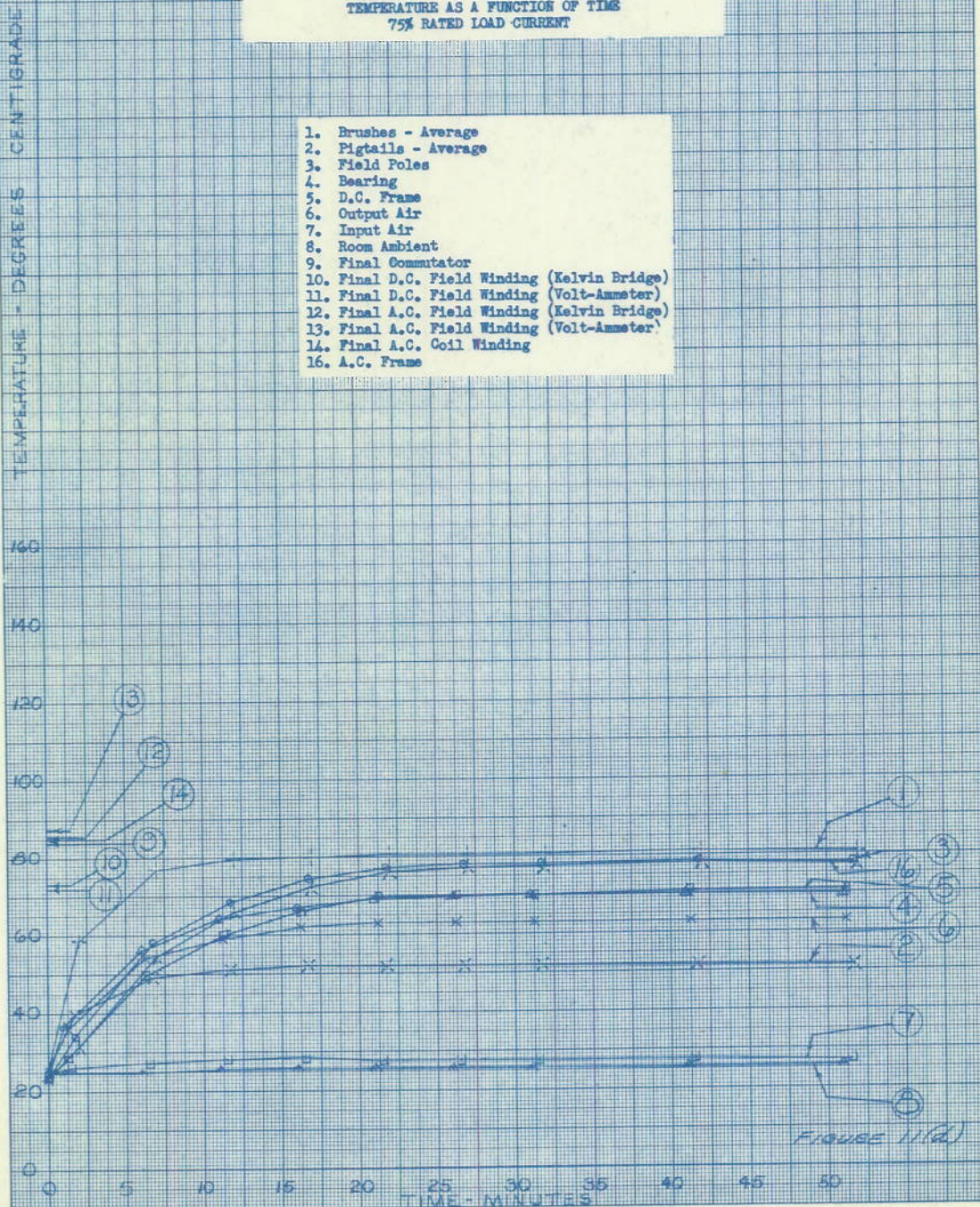
A.C.-D.C. GENERATOR
GENERAL ELECTRIC COMPANY
 MODEL 20ME1B3 NAVY TYPE NFA-5 SERIAL NO. 2197906
 200 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 12 MICROFARADS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 50% RATED LOAD CURRENT

1. Brushes - Average
2. Pigtails - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
16. A.C. Frame



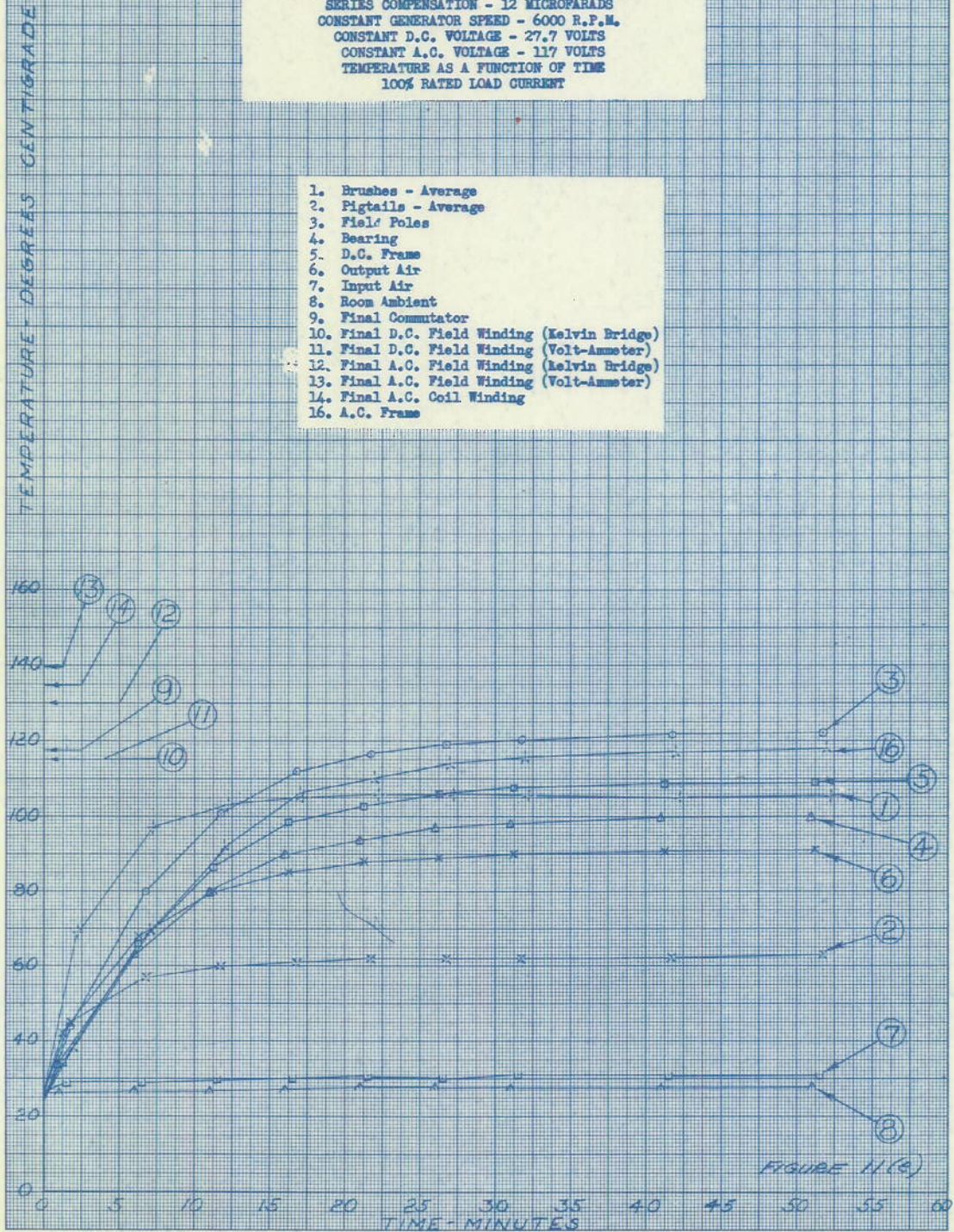
A.C.-D.C. GENERATOR
GENERAL ELECTRIC COMPANY
 MODEL 20ME1B5 NAVY TYPE NRA-5 SERIAL NO. 2197906
 200 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 12 MICROPARADS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 75% RATED LOAD CURRENT

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
16. A.C. Frame



A.C.-D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 MODEL 20ME1B3 NAVY TYPE WEA-5 SERIAL NO. 2197906
 200 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 12 MICROFARADS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 100% RATED LOAD CURRENT

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
16. A.C. Frame



A.C.-D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 MODEL 2CME1B3 NAVY TYPE NEA-5 SERIAL NO. 2197906
 200 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 12 MICROFARADS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 125% RATED LOAD CURRENT

1. Brushes - Average
2. Pigtaills - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
16. A.C. Frame

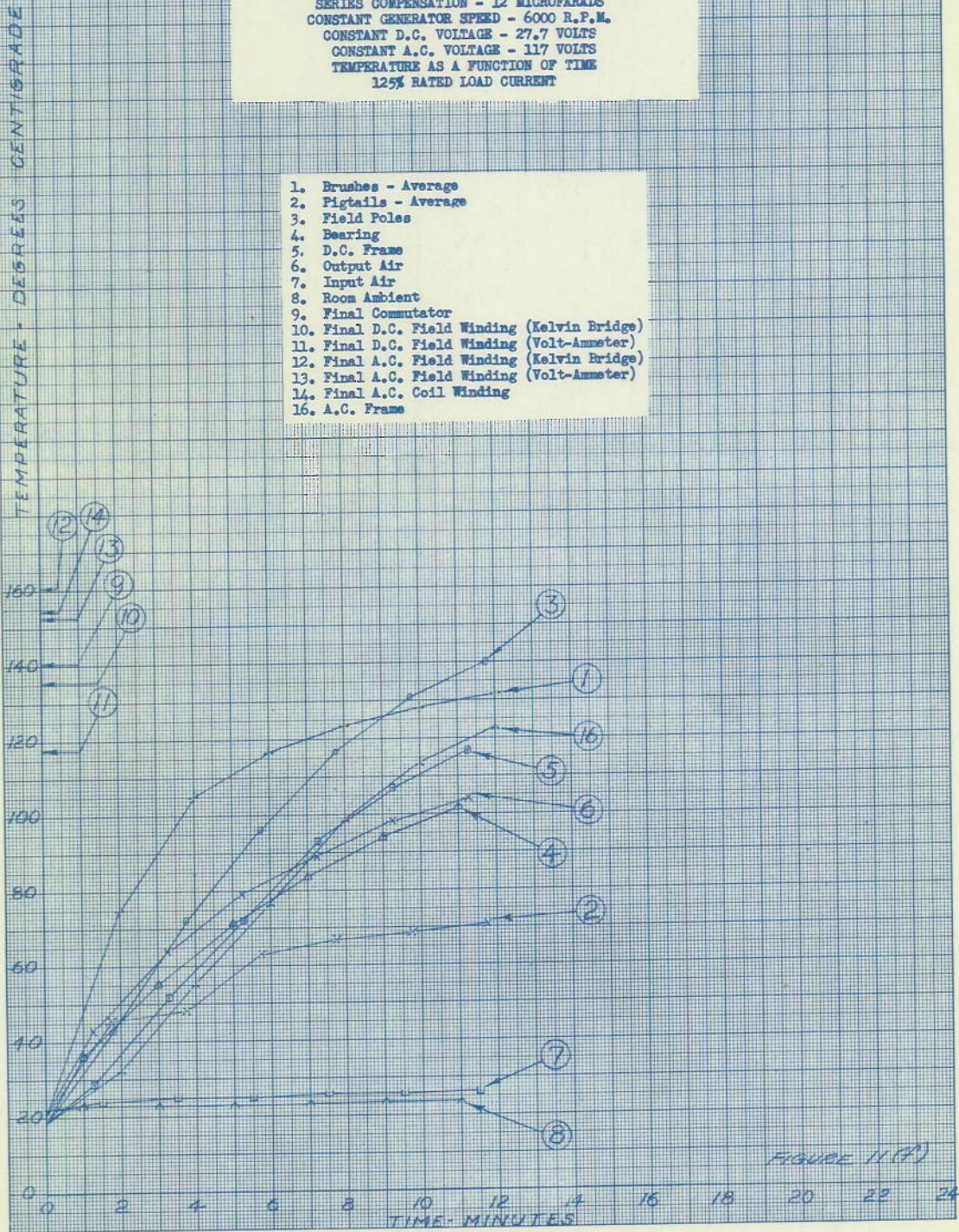


FIGURE 11(F)

A.C.-D.C. GENERATOR
 GENERAL ELECTRIC COMPANY
 MODEL 20ME1B3 NAVY TYPE NEA-5 SERIAL NO. 2197906
 200 AMPS. RATED D.C. OUTPUT 10 AMPS. RATED A.C. OUTPUT
 FORCED COOLING - 6 INCHES WATER-TOTAL PRESSURE
 SERIES COMPENSATION - 12 MICROFARADS
 CONSTANT GENERATOR SPEED - 6000 R.P.M.
 CONSTANT D.C. VOLTAGE - 27.7 VOLTS
 CONSTANT A.C. VOLTAGE - 117 VOLTS
 TEMPERATURE AS A FUNCTION OF TIME
 150% RATED LOAD CURRENT

1. Brushes - Average
2. Pigtailes - Average
3. Field Poles
4. Bearing
5. D.C. Frame
6. Output Air
7. Input Air
8. Room Ambient
9. Final Commutator
10. Final D.C. Field Winding (Kelvin Bridge)
11. Final D.C. Field Winding (Volt-Ammeter)
12. Final A.C. Field Winding (Kelvin Bridge)
13. Final A.C. Field Winding (Volt-Ammeter)
14. Final A.C. Coil Winding
16. A.C. Frame

