PATENT CLAIMS

1. A device for performing thermal compensation of a weapon barrel (11) of a gun (10) having at least one weapon barrel (11) which is mounted in a barrel cradle (3), and in a barrel support (4) as a prolongation of the barrel cradle (3), **characterized** in that a plurality of temperature sensors (p1-p16) are integrated into the barrel cradle (3) and the barrel support (4) and are connected via data lines (6) to a data box (7), and the data box (7) is connected to a data processing device (9), wherein the data processing device (9) calculates a barrel inclination by means of temperature differences, and in order to perform thermal compensation the data processing device (9) can act on actuators in order to change the orientation of the weapon barrel (11).

2. The device as claimed in claim 1, **characterized** in that preferably 16 temperature sensors (p1-p16) are integrated, wherein variations in the number are possible.

3. The device as claimed in claim 1 or 2, **characterized** in that preferably four planes (E1-E4) are defined substantially perpendicularly with respect to the barrel axis, wherein one plane (E4) is preferably located in the barrel cradle (3), and three planes (E1-E3) are preferably located in the barrel support (4).

4. The device as claimed in claim 3, **characterized** in that the temperature sensors (p1-p16) are preferably arranged in the region of the corners of the planes (E1-E4).

5. The device as claimed in one of claims 1 to 4, **characterized** in that the barrel support (4) is frame-like.

6. The device as claimed in one of claims 1 to 5, **characterized** in that the actuators are servo-motors of the gun itself, with which servo-motors the weapon barrel (1) can be oriented in its azimuth and/or elevation.

7. A method for performing thermal compensation of a weapon barrel (11) of a gun (10) having at least one weapon barrel (11) which is mounted in a barrel cradle (3), and in a barrel support (4) as a prolongation of the barrel cradle (3), having the steps:

- measuring the temperature by means of temperature sensors (p1-p16) on the barrel cradle (3) and the barrel support (4),
- determining the temperature difference between the upper and lower sides and between the right-hand and left-hand sides of the barrel cradle (3) as well as the barrel support (4),
- calculating the barrel inclination by means of the determined temperature differences, and
- compensating the barrel inclination by changing the orientation of the weapon barrel (11).

8. The method as claimed in claim 7, **characterized** in that temperature differences of each sensor plane (E1 to E4) of the barrel support (4) and of the barrel cradle (3) are determined in elevation and/or azimuth.

9. The method as claimed in claim 7 or 8, **characterized** in that the temperature-induced barrel deflection is compensated directly by actuators, such as servo-motors of the actual gun of the weapon.

10. The method as claimed in one of claims 7 to 9, **characterized** in that failure of individual temperature sensors (p1-p16) is compensated by means of a mathematical model.

11. The method as claimed in claim 10, **characterized** in that the evaluation algorithm contains various fallback levels for the event of a plurality of temperature sensors (p1-p16) failing.

12. The method as claimed in one of claims 7 to 11, **characterized** in that the inherent inertia of the system is also taken into account.

13. The method as claimed in one of claims 7 to 12, **characterized** in that time profiles of the temperature correlation function are recorded.

14. The method as claimed in claim 13, **characterized** in that the time profile/profiles is/are also stored for later maintenance work in such a way that they can be read out in the gun computer.

CLAIMS

1. A device for performing thermal compensation of a weapon barrel (11) of a gun (10) having at least one weapon barrel (11) which is mounted in a barrel cradle (3), and in a barrel support (4) as a prolongation of the barrel cradle (3), with a plurality of temperature sensors (p1-p16) integrated into the barrel cradle (3) and the barrel support (4) and connected via data lines (6) to a data box (7), and the data box (7) is connected to a data processing device (9), wherein the data processing device (9) calculates a barrel inclination by means of temperature differences, and in order to perform thermal compensation the data processing device (9) can act on actuators in order to change the orientation of the weapon barrel (11) **wherein** the actuators are servo-motors of the gun itself, with which servo-motors the weapon barrel (1) can be oriented in its azimuth and/or elevation.

2. The device as claimed in claim 1, **characterized** in that 16 temperature sensors (p1-p16) are integrated, wherein variations in the number are possible.

3. The device as claimed in claim 1 or claim 2, **characterized** in that four planes (E1-E4) are defined substantially perpendicularly with respect to the barrel axis, wherein one plane (E4) is located in the barrel cradle (3), and three planes (E1-E3) are located in the barrel support (4).

4. The device as claimed in claim 3, **characterized** in that the temperature sensors (p1-p16) are arranged in the region of the corners of the planes (E1-E4).

5. The device as claimed in any one of claims 1 to 4, **characterized** in that the barrel support (4) is frame-like.

6. A method for performing thermal compensation of a weapon barrel (11) of a gun (10) having at least one weapon barrel (11) which is mounted in a barrel cradle (3), and in a barrel support (4) as a prolongation of the barrel cradle (3), having the steps:
   - measuring the temperature by means of temperature sensors (p1-p16) on the barrel cradle (3) and the barrel support (4),
   - determining the temperature difference between the upper and lower sides and between the right-hand and left-hand sides of the barrel cradle (3) as well as the barrel support (4),
   - calculating the barrel inclination by means of the determined temperature differences, and
   - compensating the barrel inclination by changing the orientation of the weapon barrel (11)

   wherein failure of individual temperature sensors (p1-p16) is compensated by means of a mathematical model.

7. The method as claimed in claim 6, **characterized** in that temperature differences of each sensor plane (E1 to E4) of the barrel support (4) and of the barrel cradle (3) are determined in elevation and/or azimuth.

8. The method as claimed in claim 6 or claim 7, **characterized** in that the temperature-induced barrel deflection is compensated directly by actuators, such as servo-motors of the actual gun of the weapon.

9. The method as claimed in claim 6, **characterized** in that the evaluation algorithm contains various

fallback levels for the event of a plurality of temperature sensors (p1-p16) failing.

10. The method as claimed in any one of claims 6 to 9, **characterized** in that the inherent inertia of the system is also taken into account.

11. The method as claimed in any one of claims 6 to 10, **characterized** in that time profiles of the temperature correlation function are recorded.

12. The method as claimed in claim 11, **characterized** in that the time profile/profiles is/are also stored for later maintenance work in such a way that they can be read out in the gun computer.