CLAIMS:

1. A system for providing a controlled temperature in a control volume, the system comprising:

a main chamber defining the control volume, the main chamber having at least one main chamber inlet and at least one main chamber outlet;

a mixing chamber having a mixing chamber outlet in selective fluid communication with said at least one main chamber inlet, at least one mixing chamber inlet, and a ram air inlet different from said at least one mixing chamber inlet;

a main ram intake, in operation thereof being open to atmospheric air, and a ram conduit connecting said main ram intake to said ram air inlet, wherein said main ram intake is configured for selectively channeling said ram airflow at a first temperature into said mixing chamber;

a gasflow source in selective fluid communication with said at least one mixing chamber inlet and configured for selectively providing a source gasflow at a second temperature to said mixing chamber, said second temperature being greater than said first temperature;

wherein said mixing chamber is configured for:

- in the presence of said source gasflow in said mixing chamber, selectively allowing said ram airflow and said source gasflow in said mixing chamber to mix therein to provide a mixing chamber outflow to the main chamber; or
- in the absence of said source gasflow, selectively allowing said ram airflow in said mixing chamber to flow to the main chamber to thereby provide a mixing chamber outflow;

wherein said mixing chamber outflow being at a third temperature at least at said at least one main chamber inlet; and

a control system operative to control at least one of said ram airflow, said source gasflow and said mixing chamber outflow to provide a desired said third temperature at least at said at least one main chamber inlet;

wherein said main chamber includes an auxiliary outlet, and said gasflow source includes a recirculation conduit connecting said auxiliary outlet to said at least one mixing chamber inlet and configured for providing a recirculating airflow from said main chamber into the mixing chamber to thereby provide said source gasflow.

2. The system according to claim 1, wherein said control system is operative to provide said third temperature such as to maintain a temperature in said control volume within a preset operating temperature range between a preset minimum temperature and a preset maximum temperature.

3. The system according to claim 2, wherein said preset minimum temperature is -35°C and wherein said preset maximum temperature is +55°C.

4. The system according to claim 1, further comprising a first temperature sensor in said main chamber at said at least one main chamber inlet, the first temperature sensor being in operative communication with said control system.

5. The system according to claim 1, further comprising a second temperature sensor in said main chamber at said main chamber outlet, the second temperature sensor being in operative communication with said control system.

6. The system according to claim 5, wherein at least one of the following features:

- the control system operates to increase at least one of the source gasflow, the second temperature, and the mixing chamber outflow, responsive to one of a sensed inlet temperature as sensed by said first temperature sensor or a sensed outlet temperature as sensed by said second temperature sensor reaching said preset minimum temperature; or
- the control system operates to increase at least one of the source gasflow, the second temperature, and the mixing chamber outflow, responsive to one of a sensed inlet temperature as sensed by said first temperature sensor or a sensed outlet temperature as sensed by said second temperature sensor reaching said preset minimum temperature, and, wherein the control system operates to cease said increase of at least one of the source gasflow, the second temperature, and the mixing chamber outflow, responsive to one of said sensed inlet temperature or said sensed outlet temperature being above said preset minimum temperature.

7. The system according to claim 4, wherein at least one of the following features:
   - the control system operates to decrease at least one of the source gasflow and the second temperature, or to increase the mixing chamber outflow, responsive to one of said sensed inlet temperature or said sensed outlet temperature reaching said preset maximum temperature;
   - the control system operates to decrease at least one of the source gasflow and the second temperature, and to increase the mixing chamber outflow, responsive to one of said sensed inlet temperature or said sensed outlet temperature reaching said preset maximum temperature
   - the control system operates to decrease at least one of the source gasflow and the second temperature, and/or to increase the mixing chamber outflow, responsive to one of said sensed inlet temperature or said sensed outlet temperature reaching said preset maximum temperature, and, wherein the control system operates to cease said decrease of at least one of the source gasflow and the second temperature, or to cease said increase of the mixing chamber outflow, responsive to one of said sensed inlet temperature or said sensed outlet temperature being below said preset maximum temperature;
   - the control system operates to decrease at least one of the source gasflow and the second temperature, and to increase the mixing chamber outflow, responsive to one of said sensed inlet temperature or said sensed outlet temperature reaching said preset maximum temperature, and, wherein the control system operates to cease said decrease of at least one of the source gasflow and the second temperature, and to cease said increase of the mixing chamber outflow, responsive to one of said sensed inlet temperature or said sensed outlet temperature being below said preset maximum temperature.

8. The system according to claim 1, further comprising at least one of:
   - a first controllable variable pump operatively connected to the control system and configured for controllably varying the magnitude of said source gasflow into said mixing chamber; or

- a second controllable variable pump operatively connected to the control system and configured for controllably varying the magnitude of said mixing chamber outflow into said main chamber.

9. The system according to claim 1, wherein said recirculation airflow is a first proportion of said mixing chamber outflow.

10. The system according to claim 9, wherein said first proportion is between 30% and 70% of said mixing chamber outflow.

11. The system according to claim 1, further comprising a first heating system coupled to said recirculation conduit to selectively heat said recirculation airflow to provide a desired said second temperature to said source gasflow.

12. The system according to claim 1, wherein at least one of:

- said gasflow source comprises an auxiliary ram intake, in operation thereof being open to atmospheric air, and an auxiliary conduit connecting said auxiliary ram intake to said mixing chamber inlet, wherein said auxiliary ram intake is configured for selectively channeling an atmospheric auxiliary airflow into the mixing chamber to thereby provide said source gasflow;

- said gasflow source comprises an auxiliary ram intake, in operation thereof being open to atmospheric air, and an auxiliary conduit connecting said auxiliary ram intake to said mixing chamber inlet, wherein said auxiliary ram intake is configured for selectively channeling an atmospheric auxiliary airflow into the mixing chamber to thereby provide said source gasflow, and, comprising a second heating system coupled to said auxiliary conduit to selectively heat said atmospheric auxiliary airflow to provide a desired said second temperature to said source gasflow.

13. The system according to claim 1, wherein said gasflow source includes a pressurized gas container, and a container conduit connecting said pressurized gas container to said mixing

chamber inlet and configured for providing a pressurized gasflow into the mixing chamber to thereby provide said source gasflow.

14. The system according to claim 1, further comprising a main ram intake, in operation thereof being open to atmospheric air, and a ram conduit connecting said main ram intake to said ram air inlet, wherein said main ram intake is configured for selectively channeling said ram airflow into said mixing chamber.

15. An air vehicle comprising the system as defined in claim 1.

16. A method for providing a controlled temperature in a control volume, the control volume being defined by a main chamber having at least one main chamber inlet and one main chamber outlet, and an auxiliary outlet, the method comprising:

(A) providing a main ram intake coupled to a mixing chamber, the main ram intake being open to atmospheric air, the mixing chamber having a ram air inlet, a mixing chamber outlet in selective fluid communication with the main chamber inlet, at least one mixing chamber inlet, and wherein the ram air inlet is different from the at least one mixing chamber inlet, and, selectively channeling an atmospheric ram airflow at a first temperature into the mixing chamber, to thereby provide said source gasflow; (B) selectively providing a source gasflow at a second temperature into said mixing chamber, said second temperature being greater than said first temperature; and wherein:

- in the presence of said source gasflow in said mixing chamber, selectively allowing said ram airflow and said source gasflow in said mixing chamber to mix therein to provide a mixing chamber outflow to the control volume; or
- in the absence of said source gasflow, selectively allowing said ram airflow in said mixing chamber to flow to the control volume to thereby provide a mixing chamber outflow;

said mixing chamber outflow being at a third temperature at least at entry to the control volume;

(C) controlling at least one of said ram airflow, said source gasflow and said mixing chamber outflow to provide a desired said third temperature at least at entry to the control volume; and

(D) providing a recirculating airflow from the control volume into the mixing chamber via a recirculation conduit to thereby provide said source gasflow, wherein said recirculation conduit connects said auxiliary outlet to said mixing chamber inlet.

17. The method according to claim 16, wherein said third temperature such as to maintain a temperature in said control volume within a preset operating temperature range between a preset minimum temperature and a preset maximum temperature.

18. The method according to claim 17, wherein said preset minimum temperature is -35°C and wherein said preset maximum temperature is +55°C.

19. The method according to claim 16, wherein at least one of the following features:

- providing a heating source and, using the heating source, controllably heating said source gasflow to a desired said second temperature;
- providing a desired said third temperature based at least partially on a sensed inlet temperature as sensed at an inlet of the control volume;
- providing a desired said third temperature based at least partially on a sensed outlet temperature as sensed at an outlet of the control volume;
- providing a desired said third temperature based at least partially on a sensed outlet temperature as sensed at an outlet of the control volume, and, increasing at least one of the source gasflow, the second temperature, and the mixing chamber outflow, responsive to one of said sensed inlet temperature and said sensed outlet temperature reaching said preset minimum temperature;
- providing a desired said third temperature based at least partially on a sensed outlet temperature as sensed at an outlet of the control volume, and, increasing at least one of the source gasflow, the second temperature, and the mixing chamber outflow, responsive to one of said sensed inlet temperature and said sensed outlet temperature reaching said preset minimum temperature, and,

ceasing said increase of at least one of the source gasflow, the second temperature, and the mixing chamber outflow, responsive to one of said sensed inlet temperature and said sensed outlet temperature being above said preset minimum temperature;

- providing a desired said third temperature based at least partially on a sensed outlet temperature as sensed at an outlet of the control volume, and, decreasing at least one of the source gasflow and the second temperature, and to increase the mixing chamber outflow, responsive to one of said sensed inlet temperature and said sensed outlet temperature reaching said preset maximum temperature;
- providing a desired said third temperature based at least partially on a sensed outlet temperature as sensed at an outlet of the control volume, and, decreasing at least one of the source gasflow and the second temperature, and to increase the mixing chamber outflow, responsive to one of said sensed inlet temperature and said sensed outlet temperature reaching said preset maximum temperature, and, ceasing said decrease of at least one of the source gasflow and the second temperature, and to cease said increase of the mixing chamber outflow, responsive to one of said sensed inlet temperature or said sensed outlet temperature being below said preset maximum temperature.

20. The method according to claim 16, wherein at least one of the following features:

- controllably varying the magnitude of said source gasflow into said mixing chamber;
- controllably varying the magnitude of said mixing chamber outflow into the control volume;
- controllably varying the magnitude of said mixing chamber outflow into the control volume, and, controllably varying the magnitude of said mixing chamber outflow into the control volume.

21. The method according to claim 16, wherein said recirculation airflow is a first proportion of said mixing chamber outflow, and wherein said first proportion is between 30% and 70% of said mixing chamber outflow.

22. The method according to claim 16, further comprising at least one of the following features:

- selectively channeling an atmospheric auxiliary airflow into the mixing chamber, different from said ram, airflow, to thereby provide said source gasflow;
- providing a pressurized gasflow into the mixing chamber to thereby provide said source gasflow; or
- wherein the control volume accommodates electronic components.

23. The system according to claim 1, wherein the mixing chamber comprises a stagnation plate longitudinally spaced from the ram air inlet.