Text for Coanda launch vehicle cross-sectional view

100. Indicating the donut shape of the air intake for the Coanda launch vehicle.

102. Re-enforcing of the outer envelope temperature management system acting as additional heat shielding on the leading edge of the outer envelope temperature management system. This can be constructed in a similar manner to SIAD supersonic inflatable aerodynamic decelerator, but would be profiled for a doughnut shape to take advantage of the Coanda effect, which has been tested successfully by NASA, at supersonic velocities, except where SIAD uses nitrogen, it is preferrable helium would be used instead, along with a more aerodynamic profile. See NASA websites for more information. This is just one of several possible options available. *1.

104. The outer envelope of an aerodynamic shaped gas impermeable balloon, acting as a temperature management system, and as structural support. This can be constructed using aluminium-ised BoPET (Biaxially-oriented polyethylene terephthalate) more commonly known as Mylar, Melinex and Hostaphan set to reflect heat outwards . This may have to be laminated, with other fabrics using similar techniques that are used to make space suit fabrics, for protection against rips, punctures and tears, for structural strength and safety according to the flight profile required. Other materials may also be considered, for production models. The process required has to take into consideration the thermal transfer properties of the materials used. *1.

106. The inner envelope of a gas impermeable balloon, acting as a temperature management system, and used as structural support, and also as a fuel container for the lighter than air combustible gas and/or gasses. This can be constructed in a similar manner to as that of the outer envelope(12), but with an emphasis on thermal temperature transfer without the need for as much structural strength. With the aluminium-ised BoPET set to reflect heat inwards. *1.

108. Helium gas will be used to inflate features 104 and 106 at a pressure to provide structural strength, when needed, and to safely transfer frictional heat energy, due to drag, to feature 110 . As part of the temperature management system. *1

110. Primary lighter than air gaseous fuel eg. H_2(Hydrogen) and/or CH_4(Methane). To be used to passively and actively lift the vehicle.

112. Top of the payloads module corresponding to number 144 on fig.7 This structure containing the payload and ballast/secondary fuel tanks(which can be made from H.D.P.E.), can be constructed from carbon fibre, which can be glued and/or welded to the outer envelope (104). *7

114. Fuel line for primary lighter than air gaseous fuel H_2 &/or CH_4 displaced by pressure differentials into the engine. This can be constructed from H.D.P.E. (High-density polyethylene).

116. Edge on lamina flow strut connected to the top of the payload module. This can be made of carbon fibre. *4

118. Leading edge of lamina flow strut. This can be made of carbon fibre. *4

120. Pressurised helium above H_2O ballast tank used to pump H_2O into engine. *2

122. Pressurised helium above H.T.P ballast tank used to pump H.T.P. into engine. *2

124. Human safe escape capsule with fire proof parachute. This can be made of carbon fibre.

126. Payload with fire proof parachute.

128. H.T.P. ballast tank. This can be constructed from H.D.P.E. (High-density polyethylene). *2

130. H_2O ballast tank. This can be constructed from H.D.P.E. (High-density polyethylene). *2

132. H.T.P. Pressurised pipe to feed coanda engine. This can be constructed from H.D.P.E. (High-density polyethylene) connected to alumina pipework part of a 3D printed alumina engine. *5

134. H_2O pressurised pipe to feed coanda engine. This can be constructed from H.D.P.E. (High-density polyethylene) connected to alumina pipework part of a 3D printed alumina engine. *5

136. Trailing edge of lamina flow strut. This can be made of carbon fibre.

138. Coanda engine expanded details on figs 8,9 and 10. This can be a 3D printed alumina engine.

140. Indicating the donut shape of the Coanda launch vehicle for optimal air flow utilising the Coanda effect.

*1 These features maybe optional if a suitable material can combine strength, gas impermeability and heat energy transfer in a light weight structural layer.

*2 These features maybe optional depending on the flight profile required *3.

*3 Features 128 and 130 are interchangeable features that can also be used in combination.

*4 The lamina flow struts contain the pipework of H_2 &/or CH_4, H.T.P. and H_2O that are used to feed the engine. The struts can also be configured at different angles to control airflow and vehicle orientation. The number of struts can also be increased for more control and structural strength depending on the flight profile required.

*5 The H.T.P. And H_2O pipework represented by the dotted lines refer to the pipework from ballast tanks obscured by the ballast tanks numbered 128 and 130.

*7. The inner side of Coanda module connects directly onto the lamina flow struts, which connect directly onto the Coanda engine. This feature is not nescessarily to scale with the rest of the module in this representation.