be similar in format to a rocket plume. The distribution of the electrical properties (e.g. the electron density) are inhomogeneous both radially and axially.(U)

13. The modelling results [3] can only be an approximation, since the actual structure of the plasma UAP has never been measured. In the absence of any other information, it is assumed that a UAP (of the plasma type) comprises a plasma which obeys Maxwell's Equations. The important factors of a tubular-shaped plasma appear to be:

(a) In similarity to other radar targets the target response will vary with plasma 'cylinder' orientation and radar polarisation.

(b) The RCS varies with the incident radar's Radio Frequency.

(c) The RCS per unit length increases with the aspect angle, with the maximum RCS being reached near the cylinder centre.

(d) Unlike 'solid' targets, for the electron density selected, the reflectivity is low. XXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX S.26

14. For the purpose of the model, since total RCS is obtained by integrating lengthwise (in this case the length of the UAP); a radar range resolution of 100m is assumed. The numerical results were extracted (for the purpose of this DIS report) over a plasma cylinder radius of 0.4m and length of just over 1m up to a radius of 0.88 and length 122m.(U)

15. The set of results, shown at Figure 1-4, indicates a very small RCS per unit length, much less than $1m^2$, depending on aspect and polarisation. It is assumed that very similar effects may be present from elongated rotating vortex rings if they were illuminated by radar energy (U)

Aircraft as a Charged Body

16. The lower atmosphere is not a plasma under normal conditions. (3×10^{25} electrically neutral molecules per cubic meter and only about 5×10^{8} ions). Ionising radiation accounts for ion pairs to be created all the time, balanced by the like number neutralised by re-combination. In fair weather, at sea level, there is an average downwards electric field force of about 130 $volt.m^{-1}$. The earth's layer at about 60km altitude is the lowest level in the atmosphere of uniform electrical potential (known as the 'electrosphere'). The potential of the electrosphere is ~300,000 volts positive with respect to the earth's surface (i.e. the earth's surface is the balancing negative charge). A current flows because the air is not a perfect insulator. The charge balance (since the charge would otherwise leak away) is maintained by several hundred thousand lightning flashes per hour around the world. It is important to note that aircraft flying at velocity (V) create their own electrostatic charge; as they represent a conductor travelling in earth's magnetic field (β) (and in fact generate a voltage between the extremities (e.g. for a Length L, Velocity V ($E=\beta LV$). If the 'charged' aircraft encounters another charged body in the atmosphere it is assumed that the laws of electrostatics will apply and either an attraction or repression will occur. However,the aircraft will

[3] Shi Jiamming et al "Computation of the RCS of the Turbulent Plasma Cylinder" Inst. of Plasma Physics 43rd Inst. of State Ministry of Electronics PR China CIE Radar Conference 1996However, the aircraft will