



## « TRANSRAD » Lightning Rod

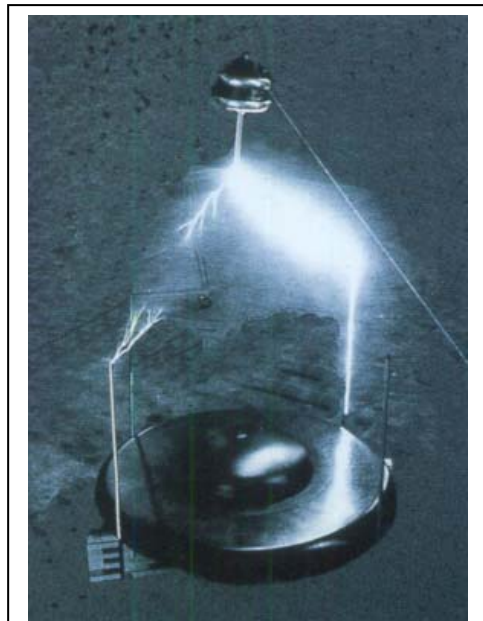
Near an antenna (radar or radio frequencies ...), set-up of a lightning protection system may create troubles due to its metallic frame which may disturb the field emitted or received by the antenna.

In most of the cases, this disturbance is negligible if the lightning protection systems is far enough from the antenna. It is not always the case for some radar antennas with narrow angle detection for which the sole presence of the down-conductor (which becomes even more obvious if the conductor is supported by a mast or a pole) brings enough disturbance to prevent the user to install lightning protection means.

To solve this problem a new lightning protection system has been developed which is "transparent" to electromagnetic waves called "TRANSRAD". It is made of a fiber glass rod on which is deposited a "sparkover" band (also called lightning protection band) which is a semiconductor substrate with some metallic elements.

This new lightning protection system has been tested thoroughly especially in the high voltage laboratory of CEAT (Centre d'Études Aéronautiques de Toulouse, testing lab depending from Government, making especially test for the aircraft industry namely in our case, high voltage impulse and the high energy lightning strike used by the aircraft industry), which led to a product which is now installed on all the "TACAN" antennas for the French air force.

(see picture)



CEAT qualification test

Area protected by this system is the same than the one given by a metallic lightning rod and all the standard rules have to be observed (NFC 17-100 ; IEC 61024-1).

Experience has shown that many impacts have been collected on these systems (a system of 4 rods is installed per antenna). In 7 years a single strike has been recorded on the antenna itself in spite of the rods, which has been attributed to a low magnitude current, in accordance with the electro-geometric model after thorough studies made by the French Army.

Regarding civil applications of these lightning rods, simulations have been carried out in cooperation with ONERA in order to protect STNA (French civil aviation technical group) radar. This application is currently studied in order to install such systems on direct lightning sensitive radars.