Supplementary Technical Overview of the
***StarDrive Dynamo's* Method of Operation** (rev.61003)

The only part of the "StarDrive" technology developed by Archer Enterprises which is fairly complex is how to produce an external DC Field voltage across the housing that is much greater than that produced by the EDF Generator's internal field coils and magnetic rings. In short, this has to do with demonstrable aspects of 'classical' vacuum tube design and operating principles. Without going into greater detail than is absolutely necessary, the following list of key points will hopefully illuminate the methodology adequately for now:

1) The axial positive collector housing sections must be stripped of electrons much faster than they can be replaced by corona discharge from the peripheral negative emitter housing section. This creates a cumulative voltage imbalance across the housing, by an electronic principle called *instantaneous charge differential*, that can be up to thousands of times larger than the Primary Array voltage used to charge the housing's positive collectors.

2) Accomplishing this objective first requires that the collectors be connected to hot tungsten cathodes whose electron emission characteristics are greatly enhanced by impregnating them with a special barium compound, as compared to the cooler rotor-mounted field emitters which are used to charge the negative housing section.

3) To sustain a corresponding housing-to-rotor voltage differential at a desired equilibrium value, the electrons stripped from the collectors must then fall into a potential well created by a pair of rotor-mounted "field ballast capacitors", the storage value of which is figured according to a classically-derived electrostatic formula that relates the desired Field voltage to the equal areas of the negative and positive housing sections and to the given field coil voltage.

4) Finally, the physical characteristics of the ballast capacitors must be such that the electric field intensity within them is equal to or greater than the desired Field intensity across the Dynamo's housing, thereby providing an "equal and opposite force" which supports the *primary voltage expansion ratio* defined by the primary-cathode-to-field-emitter electron emissivity ratio.

For safety reasons, the field voltage utilized in all *air-cooled* StarDrive *Generators* will be limited by design to 850 VDC, and to 1,400 VDC in the larger *liquid-cooled* StarDrive *Dynamos*. With regard to the 24 kW Generator air-cooled prototype model, such units will operate with a total field coil potential difference of 638 volts applied to the rotor induction rings. Because of the odd dual capacitive geometry of the Primary Power System, the peak theoretical induced rotor voltage should be ± 213 VDC, and that portion of this "ideal" induced rotor voltage which will be impressed on the primary anode rings is projected from experimentation to be +21.3 volts (or 1/30 of the field coil voltage). With the primary cathodes at ground potential, or zero volts, this is also the 'driving' Primary Array voltage.

Since the potential on the housing collectors must be equal to 1/2 the field voltage, the voltage drop across the prototype's power resistors will be 425 VDC - which is equal to the input voltage of the solid-state inverters that will provide the device's usable AC power output. The output inverter will therefore be connected between the collector end of the power resistors (in parallel) and the primary cathodes. It can also be seen that the *primary voltage expansion ratio* in this case is 40-to-1, this being the ratio of Field voltage to Primary Array voltage, and the level of primary cathode chemical treatment required to achieve this ratio can be readily figured according to the famous Richardson-Dushman equation.