PERFORMANCE OF THE "SUNBURST" N MACHINE by Bruce E. DePalma

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Beginning in the spring of 1979, the author and his assistants in conjunction with the personnel and facilities of the ***Sunburst*** spiritual and agricultural community constructed a prototype N generator for test and evaluation. After a one year period of mechanical evolution and refinement, serious testing commenced in August 1980. The important parameter to be considered is the mechanical drag associated with the production of an increment of electrical power which is extracted from space by the machine.

THE EXPERIMENT

The experimental setup consisted of the N generator machine, as diagrammed in Figure 1, driven by a drive motor. Specifically, the N generator is provided (as shown in the illustration) with twelve brushes on the axle which contract the edge of the disc.

The disc brushes are arranged in three groups of four on the two sides and top of the disc. The axle brushes are in two groups of six, placed symmetrically on the two sides of the front bearing mount plate. The brushes are 1'' x 1'' rectangular graphite carbon.

The bearings are fitted with an oil lubrication system and the machine is balanced and wound with fiber glass to run without vibration at 6000 r.p.m. The bearing supports and the surroundings of the machine are wood and brass to avoid the proximity of iron or other magnetic material which would induce drag into the machine with the withdrawal of current.

The drive motor is a standard 40 H.P., 400 v.a.c., 60 c.p.s., three phase unit. Motor speed is rated 3485 r.p.m., maximum draw is rated 50.5 amperes at full output. The motor is connected to the N machine by a double drive belt. The motor pully diameter is 9 7/8'' and the generator pully diameter is 5 3/4''. This gives a step-up ratio of 1.72 x the motor speed to rotate the generator at the design speed of 6000 r.p.m.

INPUT AND OUTPUT CALCULATIONS

With initial startup of the machine, the inertial load on the drive motor results in a 200 ampere surge per phase of the drive motor current. After attaining operating speed the drive motor current is 15 amperes at 440 v.a.c. as measured with a Triplett model 30 ammeter clamped around one of the input phase wires of the motor.

Calculation of the motor power input required to overcome windage and brush friction losses at 6000 r.p.m.:

15 x 440 x .7(p.f.) x 1.73 (pwr. corr 30) =
7900 watts = 10.07 H.P.

In a number of trial runs the N generator is run up to speed @ 6000 r.p.m. and the brushes are heated by contact with the disc and friction. With the brushes hot, their internal voltage drop and their series resistance are much reduced over the ''cold'' condition.

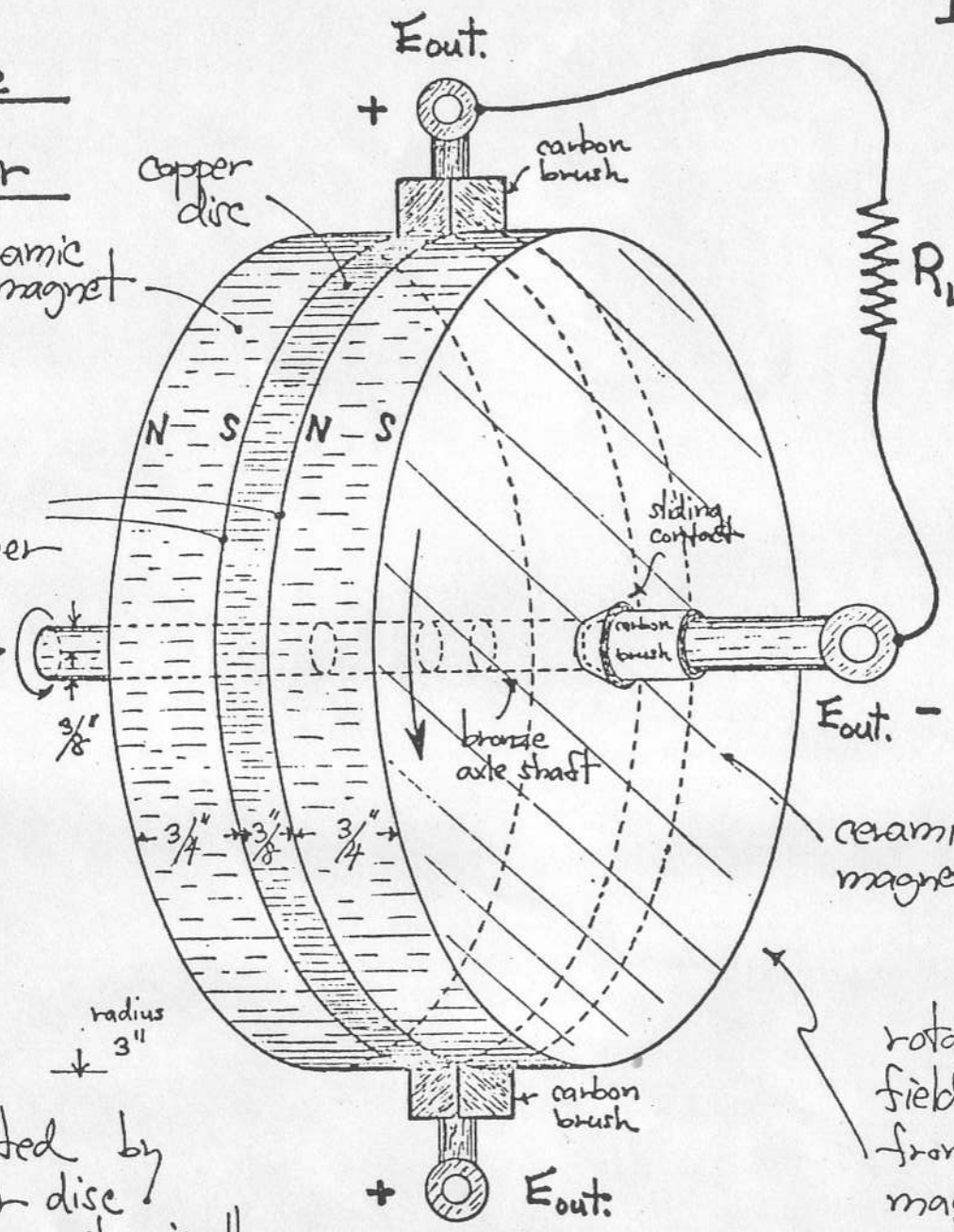
The output of the N generator is regulated by control of the electromagnet. Maximum magnet current is 20 amperes at 200 v.d.c. as provided by a separate power supply and rectifier bridge controlled with a variac operating from the 200 v.a.c. line.

The electrical output of the N machine is measured by passing the current through two 800 ampere rated shunts in parallel. The shunts are Hickok Instruments, style 920-221, rated 50 m.v. for 800 amperes passing through them. Two shunts in parallel, mounted on the front bearing support plate absorb the output of the machine. The current is controlled by a large

"N" Machine

D.C. Generator

$$E_{out.} = \frac{BWr^2}{2}$$



$$I_L = \frac{BWr^2}{2(r_{int_N} + R_L)}$$

power output limited by internal resistance of copper disc & brushes.

Application of Principle of Constraint (Force-Energy) to the generation of electricity by a rotating polarized magnetic field.

Since this is a free energy machine the drive motor must simply ensure the driveshaft turn at constant speed (ω).

A.C. can be generated by combining the generator disc as an element in a mechanically resonant system.

rotating magnetic field must be isolated from conductive & or magnetically permeable materials.

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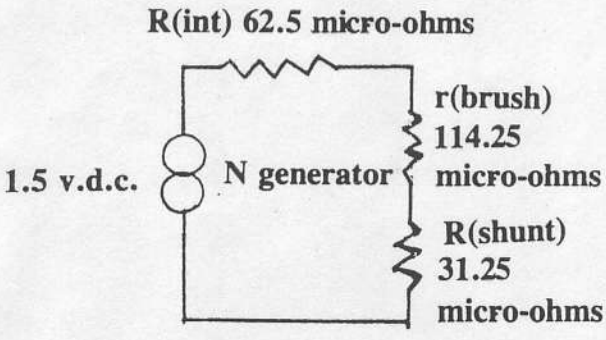
copper knife switch located immediately behind the shunts which control the current picked up by the 12 brushes riding on the outer edge of the N generator disc.

RESULTS OF SIX TRIAL RUNS

After the apparatus is started and the N generator attains the 6000 r.p.m. speed, the magnet is energized and the generator output switch is closed to direct the output current into the load consisting of the parallel combination of the two 800 ampere shunts. The output of the machine is indicated by 50 millivolts appearing across the shunts for every 1600 amperes of current generated by the machine. Voltage is measured by a separate voltage pickup brush located under the front bearing support. The results of six runs of the experiment:

machine speed	6000 r.p.m.
drive motor current no load	15 amperes
drive motor current increase when N machine is loaded	½ ampere max.
voltage output no load	1.5 volts d.c.
voltage output loaded	1.05 v.d.c.
current output of N generator (225 m.v. across shunt @ 50 m.v./1600 amp.)	7200 amperes
Power output of N machine	7560 watts = 10.03 H.P.
Incremental power ratio = (7560 watts out)/(268 watts in) =	**28.2**
Generator internal resistance	62.5 micro-ohms

Reduction of the above data gives as the equivalent circuit for the machine:



The measurement instruments for the voltage and current were:

voltage: Universal AVOMETER model 8, 1% accuracy

current: Triplett model 630-NS, 1% accuracy.

DISCUSSION

The figures clearly speak for themselves. During testing when the current output of the N machine was alternatively switched off and on: there was no discernable mechanical change in the condition of the apparatus, i.e., the machinery did not appear to slow in any way and the attitude of the belt and pully system did not alter, showing evidence of any additional mechanical torque being transmitted to the loaded N generator.

The increase in drive motor current was consistant and consisted of a very small discernable movement of the ammeter needle which was exactly at half scale on the 30m ampere range.

The next improvement in the system would be to substitute a centrifugal mercury current collector system of conventional design. If we consider such a system the friction losses and heating associated with sliding contacts is eliminated. The electrical resistance can be made very low with such arrangements. Assuming the electrical resistance of the external circuit is made zero through such means then we can expect:

N generator output with zero load resistance = 23,000 amperes
equivalent H.P. = 46.25

It is clear **the power output is limited by the internal resistance of the N generator axle and disc.** Earlier experiments with the same machine gave as an internal resistance 19.2 micro-ohms. Due to the heat liberated in the operation of the experimental machine probably some oxide has formed on the shaft and disc thereby raising the internal resistance on the machine. **Liquid metal sliding contacts can be hermetically sealed to eliminate this problem.**

Further evidence of the low drag of the N generator was evidenced when the drive motor was turned off and the machine allowed to coast

down from the normal 6000 r.p.m. operating speed. Under these conditions opening and closing the current control knife switch to interrupt the flow of the 7200 ampere output current caused **no visible effect** in the slowing down of the apparatus whether the current was flowing or not. Of course, for a generator constructed along conventional lines such a test would result in an immediate arresting of the rotation of the machine as 10 H.P. of electrical load was thrown on the machine.

From the viewpoint of physics, the interesting point is: **what is the mechanism of the drag of an N machine?** I have thought about the problem. The drag only appears when the current is drawn from the N generator disc. No drag is associated simply with the presence or absence of the magnetic field of the electromagnet.

What occurs with the withdrawal of current from the machine is that the magnetic field lines which are normally parallel to the axis of rotation of the machine are distorted into a spiral by the circular magnetic field created in the disc by withdrawal of current. I feel it is the torque interaction of this spiral field with a free space with a non-zero intrinsic magnetic permeability which is resulting in the slight drag which is measured. More precise measurements will clarify this interpretation.

Finally, no change in the current supplied to the electromagnet occurs whether current is being withdrawn from the machine or not. This is consistant with the operation of conventional electrical generators wherein the field excitation current is not altered by withdrawal of current from these machines.

CONCLUSION

Regardless of the later mechanical and electrical improvements which can be made to the construction of the N generator, the point has been proved that **the energy which is extracted directly from space by such a machine can be obtained without the drag penalty of the machine constructed along the conventional lines.** ###

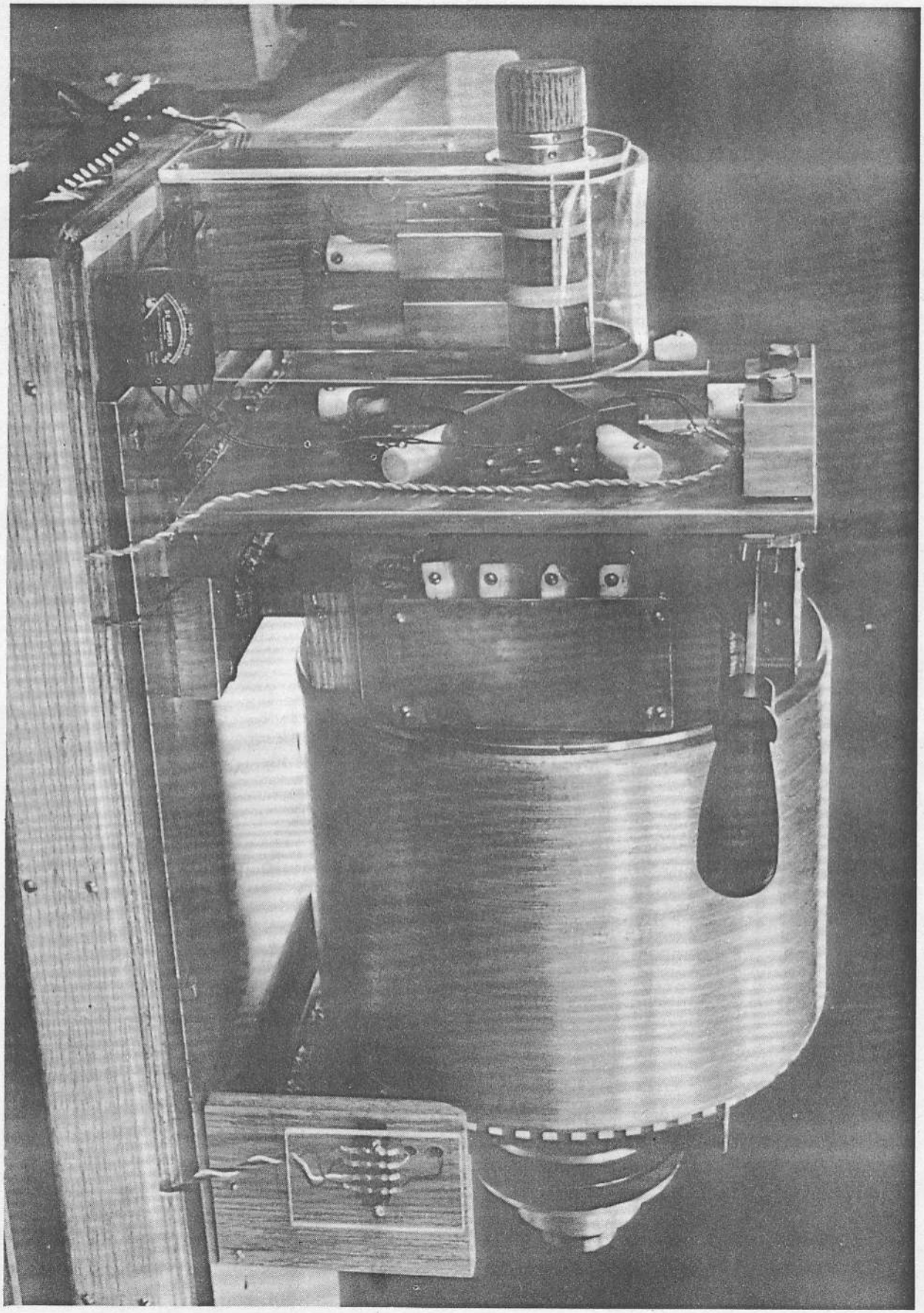
BATTERY BREAKTHROUGHS

A "regenerative braking system" has been invented by a Swedish engineer, Bjorn Ortenheim. His system allows an electric vehicle to put 70% of the energy used for deceleration back into the storage battery. In conventional vehicles the braking energy is wasted as friction heat. The regenerative braking system has already been installed on the 'Silentia' electric rail autos. These are used in the iron mines in Swedish Lapland. The Silentia can get 55 miles on one charge on its 'roller-coaster-like' track in the mine tunnels. The Silentia uses ordinary lead-acid batteries that comprise 25% of the vehicle's total weight. The energy density of these batteries is only 25-30 watt-hours per kilogram.

International Nickle Co. (Inco) of Canada has developed a new version of the iron-nickle storage battery originally invented by Thomas Edison. Its research labs in Birmingham, England, came up with a rugged, highly reliable powerpack with an almost unlimited lifetime. It has been tested for 5,000 deep discharge cycles. The energy density of this new battery has been increased to 80 wh/kg (from a low 20-25 wh/kg) and the battery's efficiency has been raised from 65-70% to more than 90%. The battery contains plastic sheets less than 0.002 inch thick which are coated with electrochemical deposits of iron or nickle which are about 0.005 inches thick. The company will start producing the battery commercially in late 1981 in England. The AGA company of Sweden and the ESB (Edison Storage Batteries) Co. of Philadelphia, both of which are now controlled by the English parent company, will also produce the battery.

"Cassettes" weighing 1/4 of a ton are planned for one-ton vehicles, which should be able to go 250 miles on one charge. It will take less than four minutes to replace a spent powerpack. It is expected that the very high energy density (greater than 200 wh/kg) of the new battery will make performance of vehicles equipped with it equal to that of equivalent internal combustion powered vehicles.

Source: ***Spotlight,*** Jan. 19, 1981. ###



The DePalma N Machine