DISPLACEMENT FIELD TECHNOLOGIES INC.

Relativistic Propulsion

Simplified Description and Implementation

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Revision 1.01

The following document is a SIMPLIFIED general description of the propulsion devices that are being developed by Displacement Field Technologies Inc.

Copyright

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Preface

This document provides a ***MUCH SIMPLIER*** general description of the implementation of the next generation of propulsion devices based on the interaction of relativistic electric fields and static electric fields.

This document was created with the general assumption that a backyard tinkerer or garage inventor is going to be much more successful at implementing this technology than a PhD in science (physics) or engineering (electrical engineering) that is comfortable with the methods and concepts that are used today. As such, the information contained in this document will be geared towards the backyard inventor and garage tinker.

IN THIS DOCUMENT WE ARE GOING TO GIVE YOU THE DETAILS NEEDED TO IMPLEMENT THIS NEW TECHNOLOGY.

If you need a more in depth description oriented to the scientist or technical professional the document “New Electrodynamics” is the one to read to make your brain hurt...

1900

"I can state flatly that heavier than air flying machines are impossible."

***Source: Lord Kelvin*.**

2010

"We can state flatly that field propulsion is impossible."

***Source: Science community*.**

All the information in this document is contained in patents filed with the US patent office. The information that is presented in this document is just only the summary of the material that was contained in these patents.

Background

Here is quick summary of the history of how the mathematics for electromagnetics was created and where the world stands today. We are not going to go into the mathematics except to describe what they mean.

The premise that electromagnetics and electrical engineering has been based on is on a set of equations that were originally empirically derived from the effects of conductors. The equations were unified by James Maxwell with the set of root equations shown below:

$$\vec{E} = -\frac{\partial \vec{A}}{\partial t} - \vec{\nabla}\Phi \quad \text{Volt/meter} \tag{1}$$

$$\vec{B} = \vec{\nabla} \times \vec{A} \qquad \text{Tesla} \tag{2}$$

These equations were the key to unifying the magnetic field and electric field and proving that light was electromagnetic radiation. But there was this extra equation that no one could figure what it was saying.

$$S = \frac{1}{c^2}\frac{\partial \Phi}{\partial t} + \vec{\nabla} \cdot \vec{A} \quad \text{Tesla} \tag{3}$$

So this equation 3 got rationalized away in a mathematical construct (a lot of hand waving and smoke and mirrors) of gauge fixing (or by choosing a gauge) by Oliver Heaviside and Lorentz. This operation ended up creating the Coulomb gauge and Lorentz gauge. Oliver Heaviside and Lorentz were able to make this equation disappear under the assumption that it wasn't a factor in conduction currents.

NOT that the physical effects from equation 3 were really "0".

So we end up with two root equations that describe most of the effects that we observe from conductors. Equation 2 described a magnetic field and equation 1 the electric field. No one thought that there might something wrong with this picture.

Then a guy named Albert Einstein came along and he was able to show that the magnetic force, that was attributed to a magnetic field, was really an artifact of the interaction of the changes of the electric field of the moving electrons interacting with the properties of a conductor that produced this magnetic force. Not there was a **REAL** magnetic field. Just a relativistic change in the moving electrons electric field being modified by the conductor creating a force between the conductors. But this new view of how the magnetic force is created wasn't important to electrical engineers, since they only worked with conductors and the tools that they were use to using were still going to work.

Plus this new view of relativistic source of the magnetic force would required a new mathematical framework to be taught to electrical engineers that would encompass all the effects that one would see from electrical conductors and moving charged objects. No one though it was really nessary to teach it to electrical engineers.

But this little tick of little hand waving and smoke done by Oliver Heaviside and Lorentz to make equation 3 to go away wasn't going to work if you were a physicist and needed to know how things worked under the hood of conductors. But they didn't get it. They took the gauge fixing that was being done by electric engineers and declared that it was a physical reality and ran with it without really understanding the implications of it. They were able to do this without any experimental evidence that it really is "0". Even 100 years later they still haven't gotten down wind that there is something wrong.

Today that has given us everything from Rockets to the Large Hardon Collider….

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New Electrodynamics Derivation

To arrive at the correct mathematical framework for charge objects we came up with the correct derivation for moving charged objects using James Maxwell's derivation.

Quaternion Electrodynamic Potential for a moving charged object

$$\Phi = i\,\Phi + \vec{i}\cdot\frac{\vec{V}}{c}\,\Phi \text{ Volts}$$

$$\nabla\Phi = (\frac{i}{c}\frac{\partial}{\partial t} + \vec{i}\cdot\vec{\nabla})(i\Phi + \vec{i}\,\frac{\vec{V}}{c}\,\Phi) \text{ Volts/Meter}$$

$$\nabla\Phi = -(\frac{\partial}{\partial t}\frac{\Phi}{c} + \vec{\nabla}\cdot\frac{\vec{V}}{c}\Phi) + \vec{i}\cdot[\,\vec{\nabla}\times\frac{\vec{V}}{c}\,\Phi + i\,(\frac{\partial\vec{V}}{\partial t}\frac{\Phi}{c^2} + \nabla\Phi)] \text{ Volts/Meter}$$

Electric Field Equation

$$\vec{E} = -\frac{\partial\vec{V}}{\partial t}\frac{\Phi}{c^2} - \vec{\nabla}\times\frac{\vec{V}}{c}\Phi - \vec{\nabla}\Phi \text{ Volts/Meter} \qquad (7)$$

Scalar Electric Potential Equation

$$S = \frac{\partial}{\partial t}\frac{\Phi}{c} + \vec{\nabla}\cdot\frac{\vec{V}}{c}\,\Phi \text{ Volts/Seconds} \qquad (8)$$

So what are these equations saying?

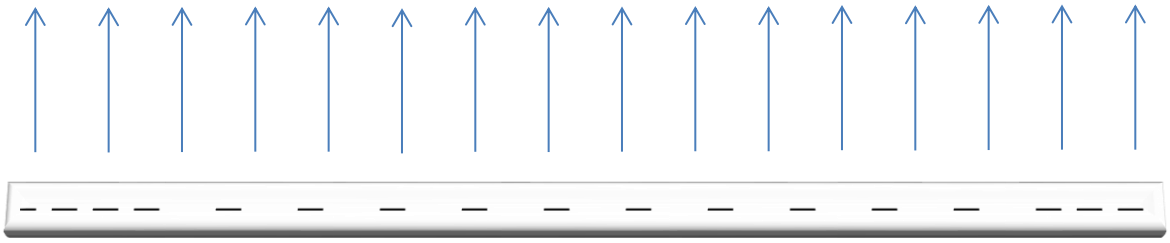
1. **When a moving charged object is viewed perpendicular to its motion its electric field will increase. This is seen as the magnetic field when this change is viewed from the outside of a conductor with an electric current.**
2. **When a moving charged object is viewed with the charged object approaching you will observe an increase in the electric field from the charged object.**
3. **When a moving charged object is viewed with the charged object receding from you will observe a decrease in the electric field from the charged object.**
4. **If a charged object is accelerated perpendicular to its motion you will see a point in space that the electric field detaches from the moving object. An electric field that decouples from the moving object.**

Using these 4 different effects one can easily create a system of charged objects in relative motion that will generate usable thrust that can one day soon take man into space.

Geometric Amplification

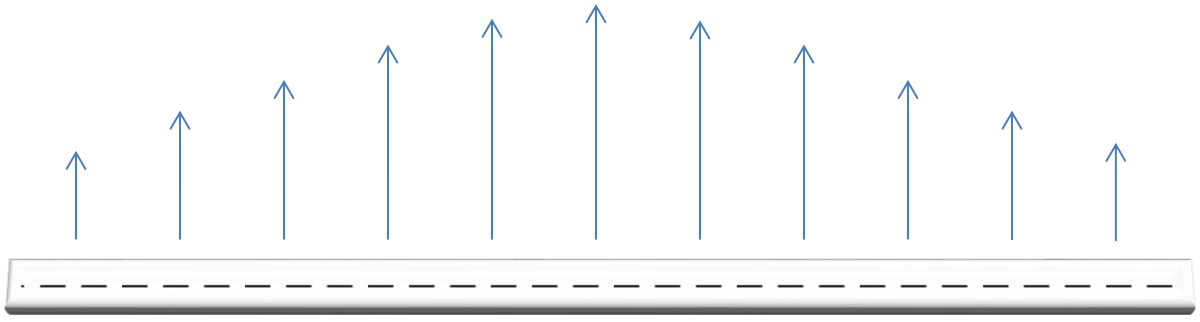
The second trick that is used to create a usable field propulsion device is to use the characteristics of the charged object to amplify the changes in the electric field from the motion of the moving charged object.

The electric field changes that are going to be seen from a moving charged sheet are going to be different than its static electric field. The static electric field that is seen from the flat conducting sheet is shown below:



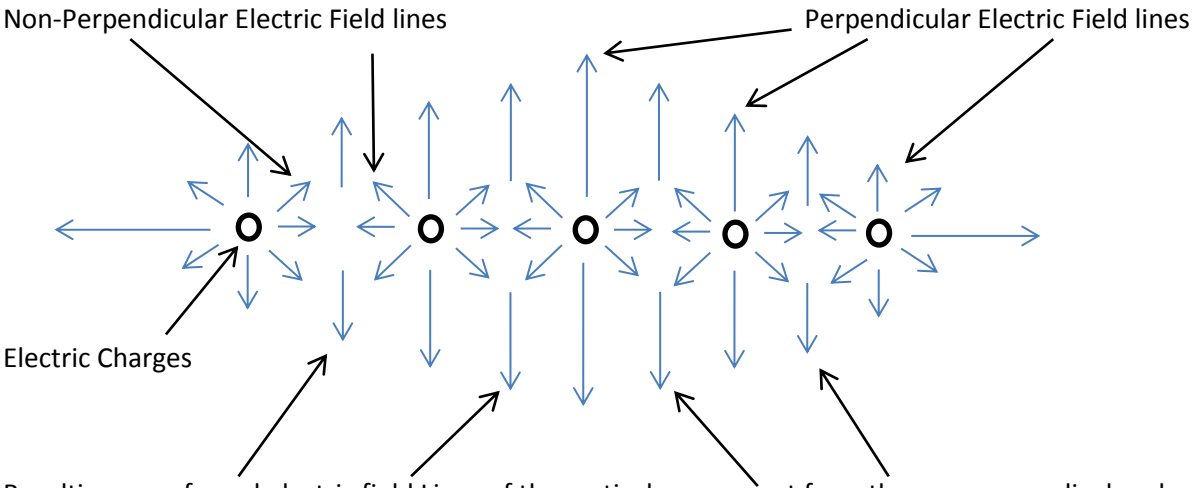
Charged conducting sheet

The relativistic electric field from the moving charged sheet is going to be similar to the static electric field from a charged non-conducting sheet. When we observe the sheet perpendicular to its motion we observe an electric field that is greatest at the center of the sheet.



The relativistic electric field from a moving charged sheet

This is the consequence of the non-perpendicular components of the relativistic electric field charges reinforcing the electric fields of the charges near the center of the sheet. In the electrical engineering world this is known as the integration of the potential across the sheet or a line integral of the potential over a line. But conceptually it's just the potential reinforcing its self over the area of a charged non-conducting charged sheet.



This geometric amplification is not observed from curve surfaces or rough surfaces. If you have a moving smooth flat surface moving close to a charged moving curved or rough surface the rough surface will see a total electric field that is different than the smooth surface sees. This will result in the smooth surface seeing a force that is different than the rough surface sees.

Implementing Geometric Amplification

This particular type of geometric amplification has been reported by lots of people. When it does and it can't be explained by the current mathematical framework it gets filed under ***"Yea, Another Whacko!"***

Below is a case study that can't be explained by the current electromagnetic theory that is a direct result of our new equations.

```
7.7 CASE STUDY - LARGE PLASTIC WEB ELECTROSTATIC PROBLEMS, RESULTS AND
   CURE, D. Swenson, 3M Company
   Tremendous static charge generation on a plastic web causes unique
   physical phenomena and special problems. Solution was simple and cost
   effective.
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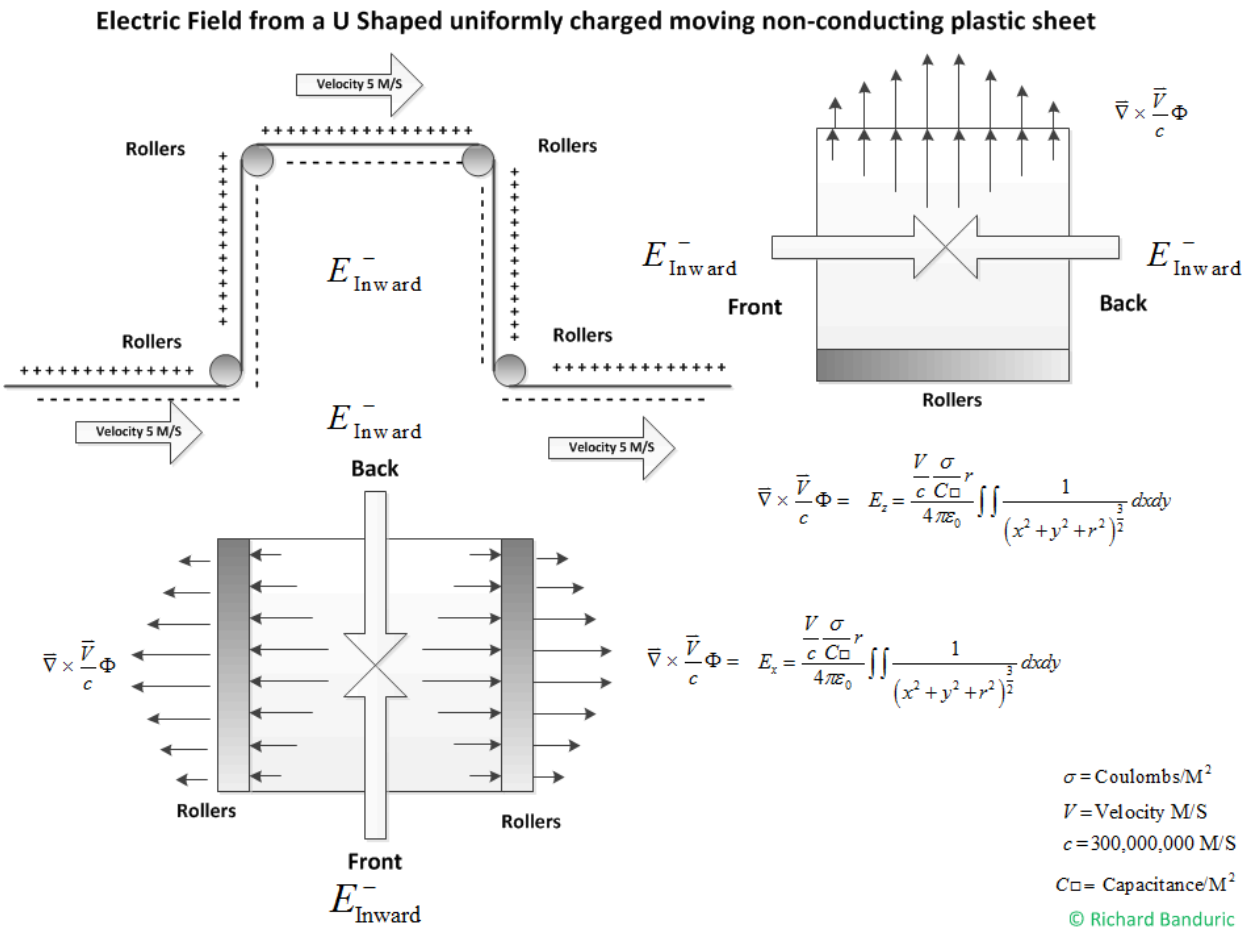
A summary of this case study is at http://amasci.com/weird/unusual/e-wall.html

This type of geometric amplification is diagrammed below:



This type of amplification was seen as the appearance of a new electric field E^{-}_{Inward} inside the tunnel of moving uniformly charged plastic sheet. This new electric field was the result of the increase in the electric field from the sheets motion at the center of the moving charged sheets from their relative motion. This resulted in a negative electric field component that is seen pointing into the tunnel that will create an outward force to any negatively charged object that tries to enter the tunnel. This force would then appear to be an "electrostatic Wall" near the center of the moving sheet.

This type of geometric amplification is seen on insulating charged surfaces like charged plastic sheets. This causes the companies that transfer plastic sheets from one roll to another to ground the rollers that they use to move the sheets from roller to roller. The same techniques that companies use to fix this problem are the ones that you DON'T want to do to observe the effects of geometric amplification.

The gotcha's of geometric amplification

1. **Conductors! A conductor has the definition of a material the has an electric field of near 0. That is even if the conductor crosses "inertial frames of references" or when the conductor segments are moving at different velocities. A conductor will "Short out" a relativistic change in an electric field if a moving charged element has some of the conductor moving at a different speed.**
    a. **The conductors in moving charged elements cannot have direct connections to other conductors moving at different speeds.**
    b. **Moving charged elements that have to be charged from a power supply that is stationary have to have an electronic tube diode to separate it from the supply. A semiconductor will not work. The tube should be in the moving charged object or physically close to it as possible.**
2. **Electrical isolation! The charge elements cannot leak charge off them. If they do, the charged elements will leak of their charge to their static values when they are in motion.**
3. **Earth Ground! DO NOT HAVE ANY CONNECTIONS TO GROUND. The earth is a conductive sphere with an infinite supply and electrons. These electrons will move thru the earth to try to neutralize any change in the electric field that might develop thru the motion of a charge object. This phenomenon is known as the neutralization of the charge space.**
4. **When you can, use charge insulators as moving elements and NOT charge conductors. This one is tough to do. But not impossible.**
5. **Use an ELECTROSTATIC High Voltage Power supply! Van de Graaff, Wimshurst, etc. Modern High Voltage Power supplies are discouraged. Batteries with isolated boost H.V. power supply will work if they do not have any connections to ground.**

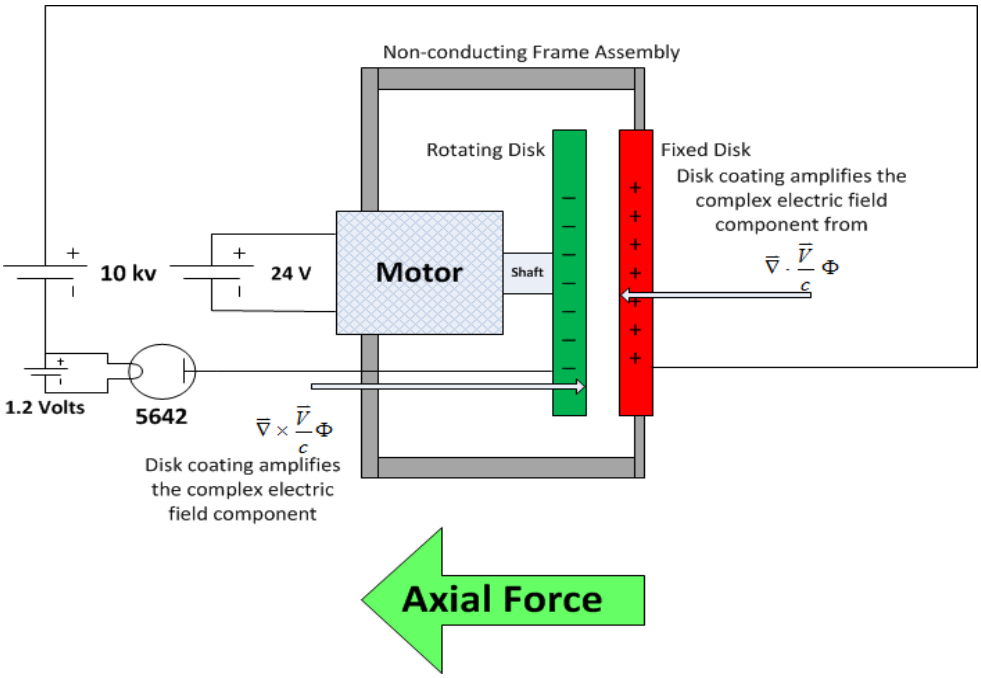
Get this, someone 23 years ago did follow the rules here and they did create working device! But because they didn't understand what was going on under the hood of conductors they never developed it.

If two ***electrically isolated*** charged disks with different surface characteristics [they can be different surface types or shapes or sizes] will see different total electric fields from each other when rotated against each other. If these two disks are rotating against each other and are mechanically connected in an assembly, the two different relativistic electric fields that the static electric fields see on the two rotating disks will create a total force on the assembly that is not completely offset by the opposing forces seen on the other rotating disk. This effect was documented in the **European Patent 0486243A2 "Machine for Acceleration in a Gravitational Field." Filed Nov. 11, 1991, granted May 20, 1992** as a result of acceleration charges in a "gravity well". The effect was real but the reason was incorrect. The effect was caused by the interaction of two different relativistic electric fields against the others static electric field. Not the result of accelerating charges in a "gravity well". In this case the difference in the sizes of the cylindrical electrodes was the source of the different relativistic electric fields that produced the forces reported.

The "strange" method that is used in this patent to charge the cylindrical electrodes is a good example of someone attempting to follow our "Gotha Rules" empirically and actually creating a working device.

This guy totally blew it. But you don't have to.

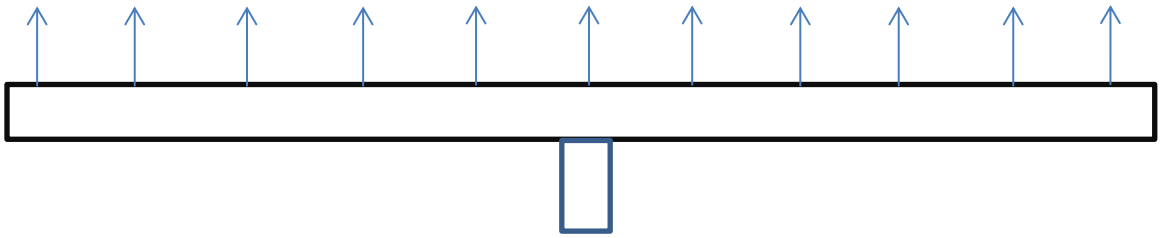
He was able to see thrust with 2 rotating cups. Rotating charged disks work just as well. The diagram of a working static displacement field drive using disks instead of cups is diagramed below using a charged smooth conductive disk as the rotating disk.



When an electrically isolated charged smooth conductive disk is rotated we get the following geometric amplification from it.

Static Electric Field from a Smooth negatively charged conducting Disk.

$$\vec{E} = \vec{\nabla}\Phi$$



Edge View of rotating Charged Disk Shaft

Relativistic Electric field from a Rotating Smooth charged Disk.

$$\vec{\nabla} \times \frac{\vec{V}}{c}\Phi \qquad V = \text{Distance to Center} \times \text{RPM} \times 2 \times \Pi$$

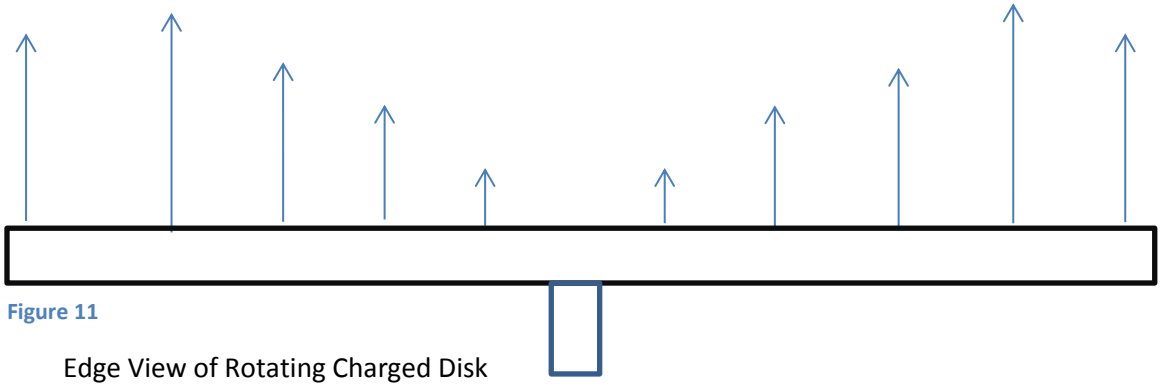


Figure 11

Edge View of Rotating Charged Disk

Geometric amplification of the relativistic electric field from the rotation of charges on the disk is greatest near the edge of the rotating disk. The peak amplitude is not at the edge of the disk but is near the edge of the disk. The static electric field and the relativistic electric field components will add to each other to give a composite complex electric field that is dependent on the rotation speed of the disk. On the next page is an output display of one of our test systems that is measuring the electrical field over an electrically isolated charged smooth conducting rotating disk.

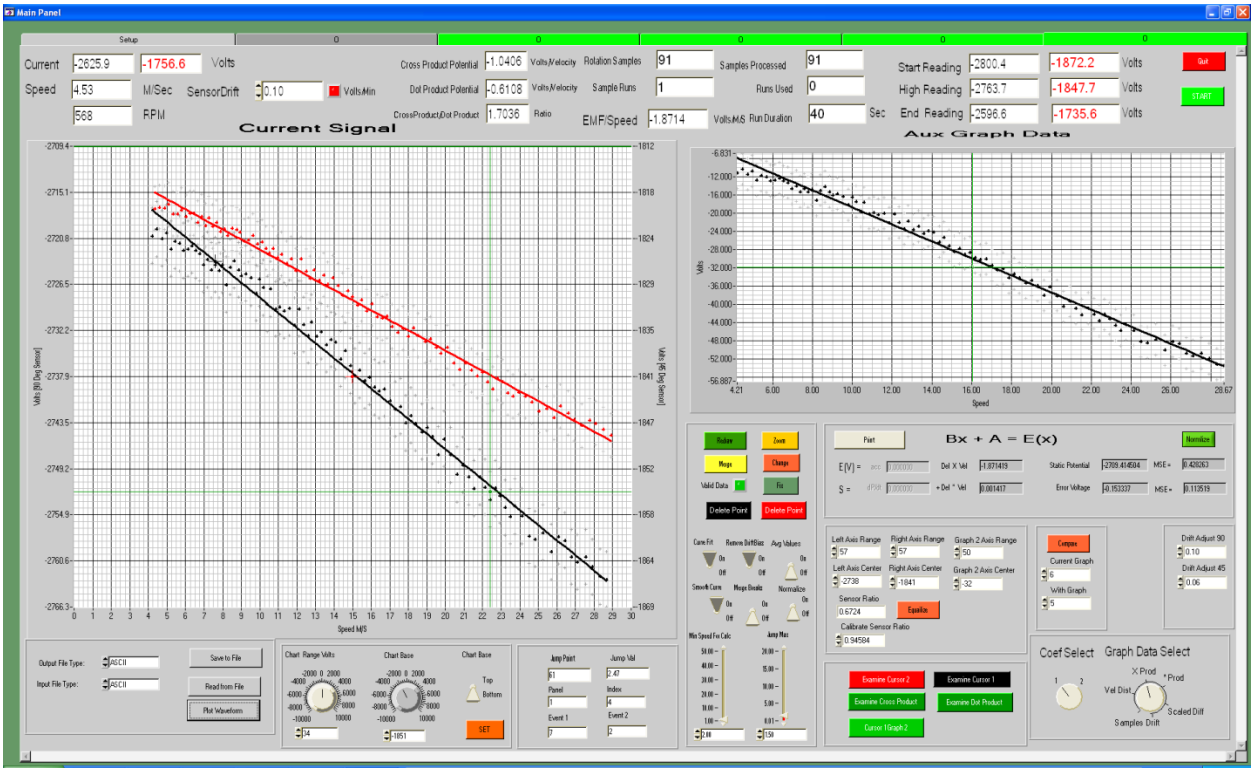


Figure 12

The left chart is the plot of the electric field intensity read as a negative potential (increasing electric field is down) above a charged rotating disk. The horizontal axis is the rotation speed of the rotating charges on the disk that is seen near the edge of a 9 inch rotating disk. The black plot is the increase in the electric field seen above the disk for different speeds as seen from the stationary frame of reference. The electric field sensor for the black plot is positioned directly above the surface of the disk. The red plot is the electric field from the same type of sensor rotated 45 degrees to the face of the disk. The black legend is on the left and the red plot's legend is on the right.

The right plot is the plot of the increase in the electric field component of this coating when it is observed perpendicular to the face of the disk. At 30 m/s this component is - 50 volts. This increase in the electric field (The potential on the disk is – 2730 Volts) is the result of the geometric amplification.

If we rotate this disk against a rough disk that doesn't have geometric amplification, the rough disk will see an electric field that is different than the electric field that is observed by our smooth disk. This will result in a difference in the forces observed by the disks.

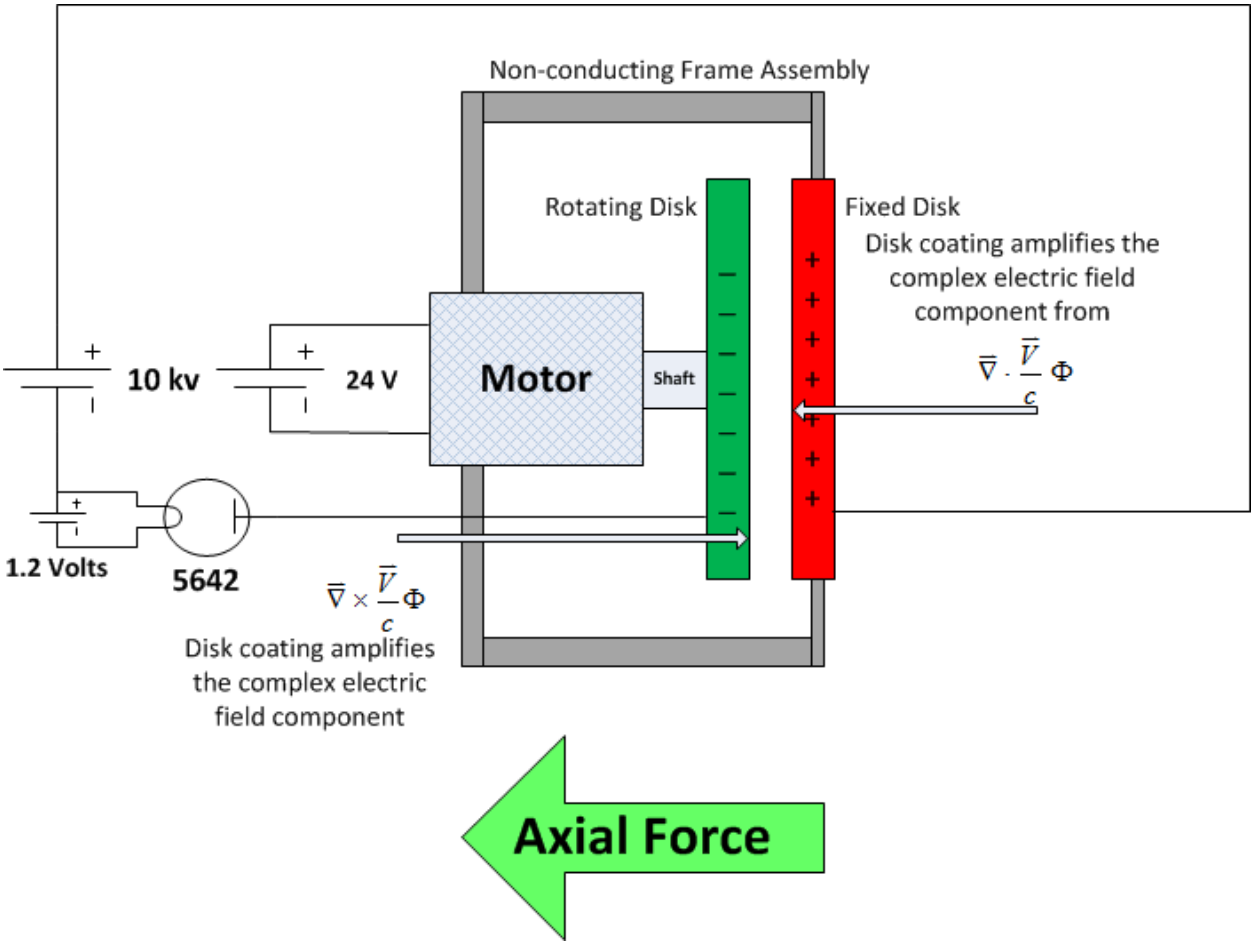
THIS WILL BE OBSERVED AS AN AXIAL THRUST THAT WE CAN USE FOR PROPULSION!

The rough disk instead will present approaching and receding charges on its roughness to the rotating smooth disk that be is seen as a rotation resistance at the motor. Or a reaction force that is perpendicular to the axial force. This is actually how a propeller generates an axial force from air where an axial force is generated from a rotation resistance of the propeller sees from its motion in air.

In practice that amplitude of this force is still very small. The trick to get large forces is to increase that surface area of the rough disk. You do that through special coatings.

Creating Thrust

Below is an example of an assembly of a rotating disk against a fixed disk that has these two different types of coatings applied to them. These two different types of disks with two different types of surfaces will produce very different complex electric fields. If these two different types of coatings are applied to the faces of a non-conducting disks and they are charged and rotated against each other in the assembly shown below an axial force is seen with the reaction force that is seen as a drag force.



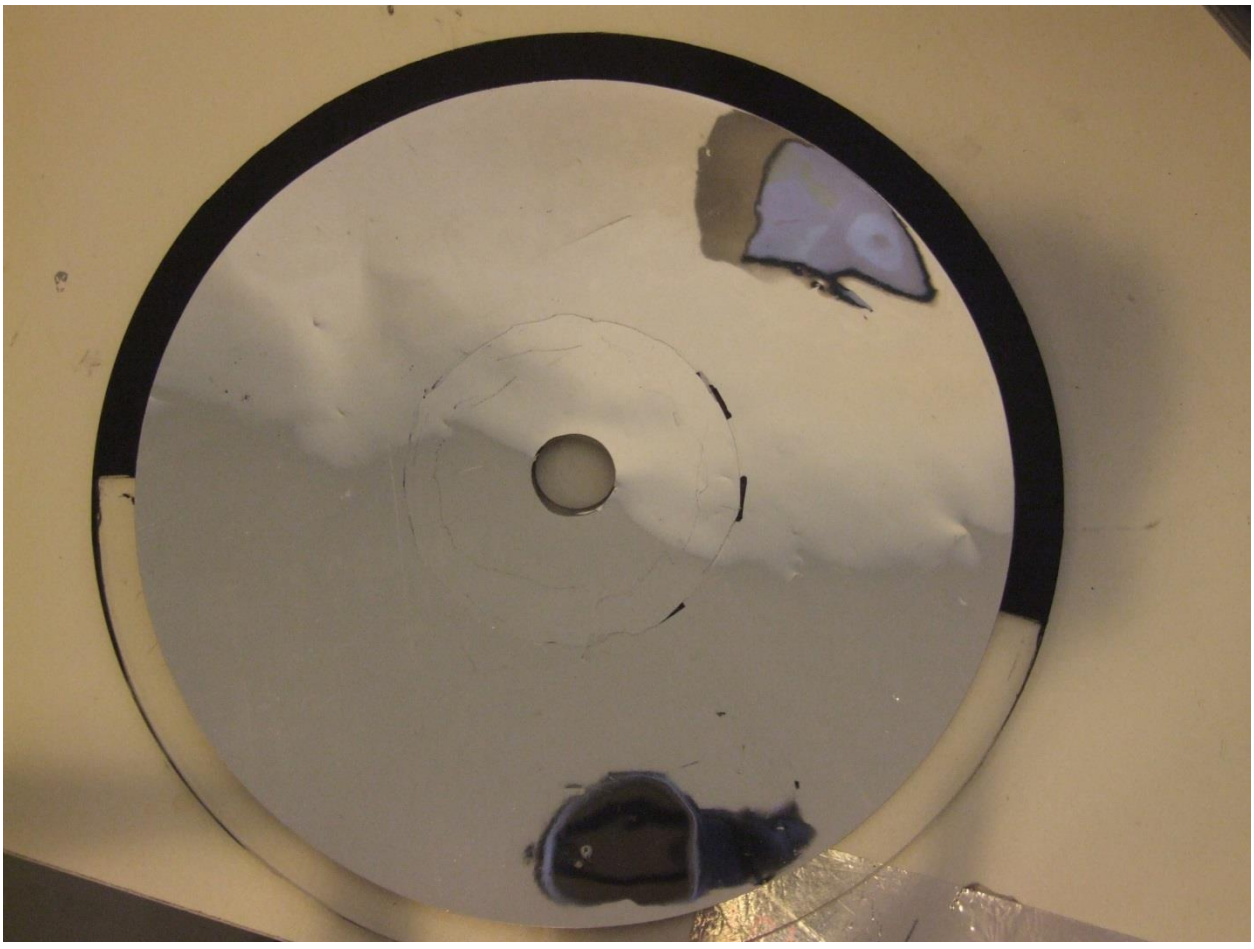
The things to pay attention to in this device:

1. The tube diode (5642). You could use 2 tubes but one will work. Make sure that the conductor from the plate to the disk is as short as possible. Make sure that the rotating disk and short conductor have "0" leakage current. Don't use a semiconductor diode.
2. The smooth conducting disk has to be mirror smooth. The charge on the disk is moving faster on the outer portions of the disk than at the center. So a conductive ring is better

than the entire face being conductive. The conductive ring having a surface resistance greater than 1K/square helps to keep the charge from moving in response to its motion.

3. The fixed disk needs to have the highest surface area and capacitance possible. The reason that this device's performance is dependence more on this coating and not on the rotating disk.
4. The power supply cannot have any connections to ground. Plus it should be an electrostatic supply. A battery with a high voltage boast circuit can work.

The coatings used in these tests were made by Displacement Field Technologies Inc. and are examples of simple coatings with dielectric constants close to 1. The coatings that are used in our disks today, that we are offering you, are 3 generations later than the examples shown in this document.



Smooth Conductive Disk Insert

Picture of the smooth conductive coating disk insert used in the example.

This is a 1st generation coating.

Black Conductive Disk

Picture of the “black” coating that generates a large dot product component of the complex electric field.

This is a 1st generation coating.

The above picture is an example of a “state of the art” Nano-composite coating material that has a high cross product with a high dielectric constant that is going into our latest devices.

This is a 4th generation coating.

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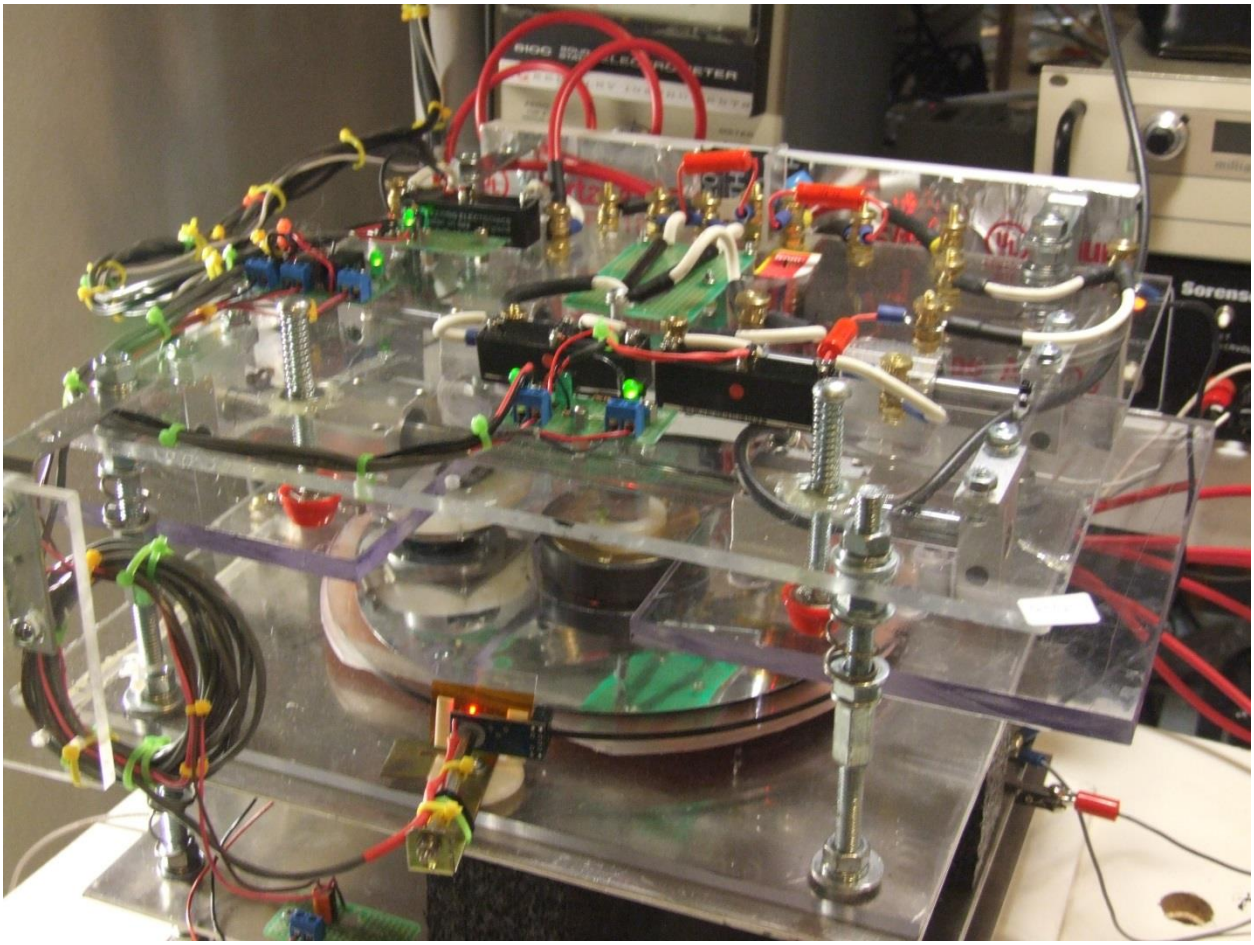
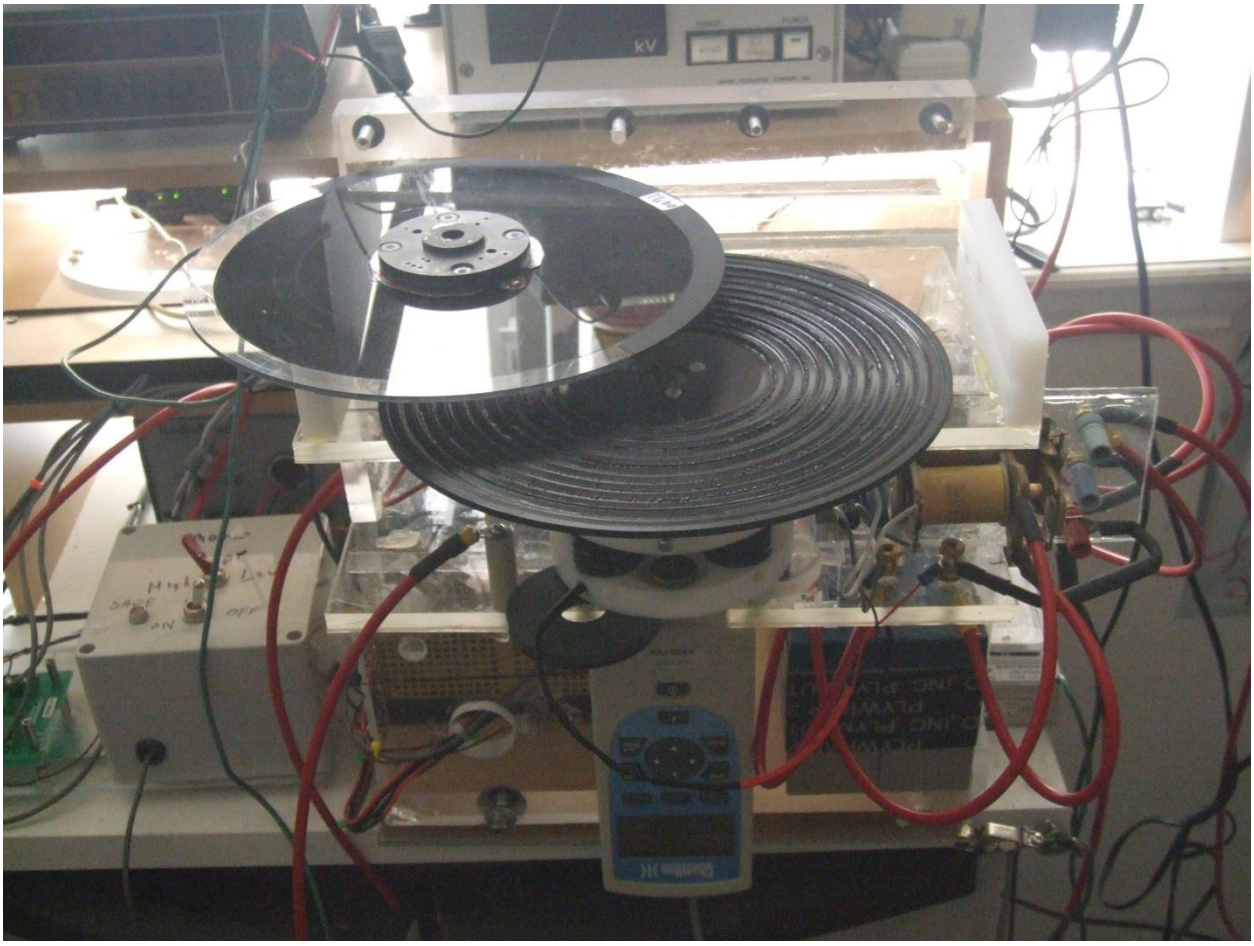


The above picture is the automated test system head that was used to characterize these examples.



This test fixture is about to be loaded with a dot product disk that generates a radial field when its rotated. The bottom disk is designed to take advantage of the radial electric field that forms from this kind of disk to generate a thrust from. This test fixture is used to test disks from the 9 inch electric field tester to characterize the axial and drag forces from different combinations of disk coatings.

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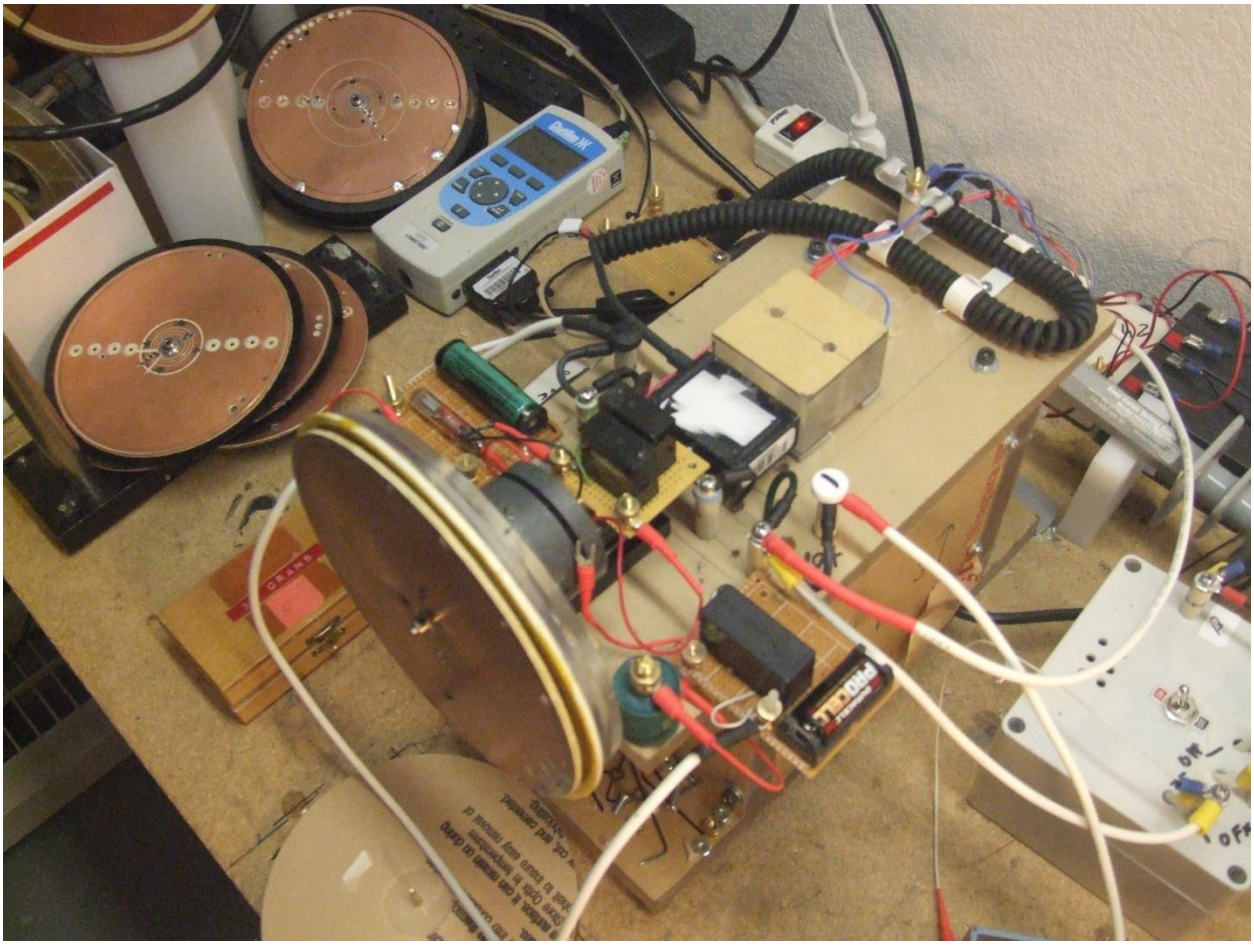

This test fixture is rotating a copper cross product disk against a charged sealed dot product composite fixed disk to determine their thrust and drag performance parameters.

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The Future

The interaction of static electric fields and relativistic Electric fields to create thrust are just the beginning of this new technology. The examples and the screen shots are of real results from real coatings that are being produced **TODAY** and not some theoretical prediction. Displacement Field Technologies Inc. are looking for partners to advance this technology and create the infinite number of different types of devices that can be made from propulsion devices to devices that will nullify the centrifugal forces on rotating devices.

The prototype that is soon the be marketed is just a demo device that is going to be a precursor to devices with greater lifting forces and lower power consumption figures. The ultimate goal is to produce propulsion devices that can lift a 1000 Kg [10 Kilo Newton] at a power consumption of 1 Kilowatt or less. These devices are going to be able to be used at sea level or in the vacuum of space. These devices will have no need for propellant and would be powered from any electric power source from batteries to solar cells.

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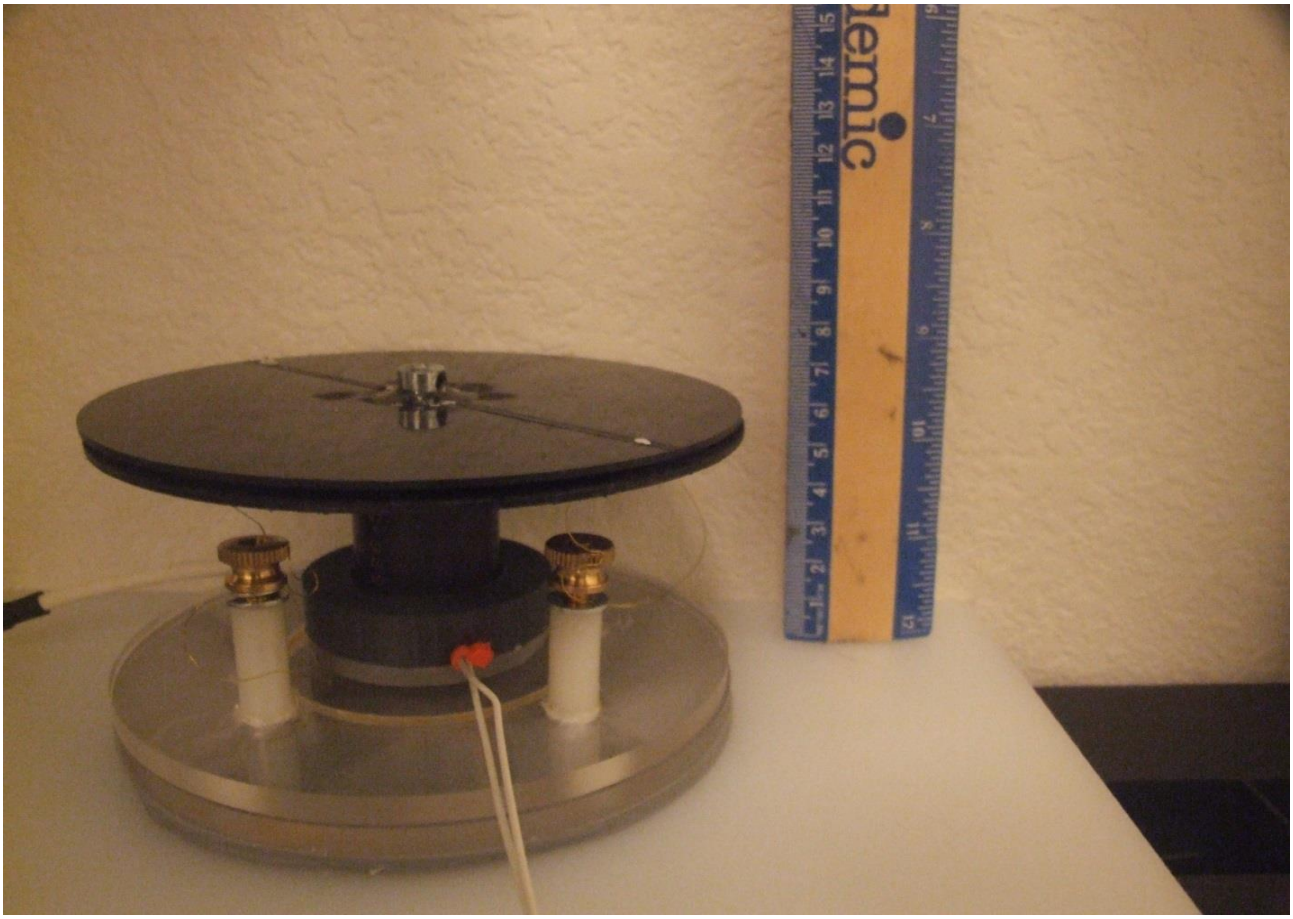

Small 3 inch Static Displacement Drive Prototype

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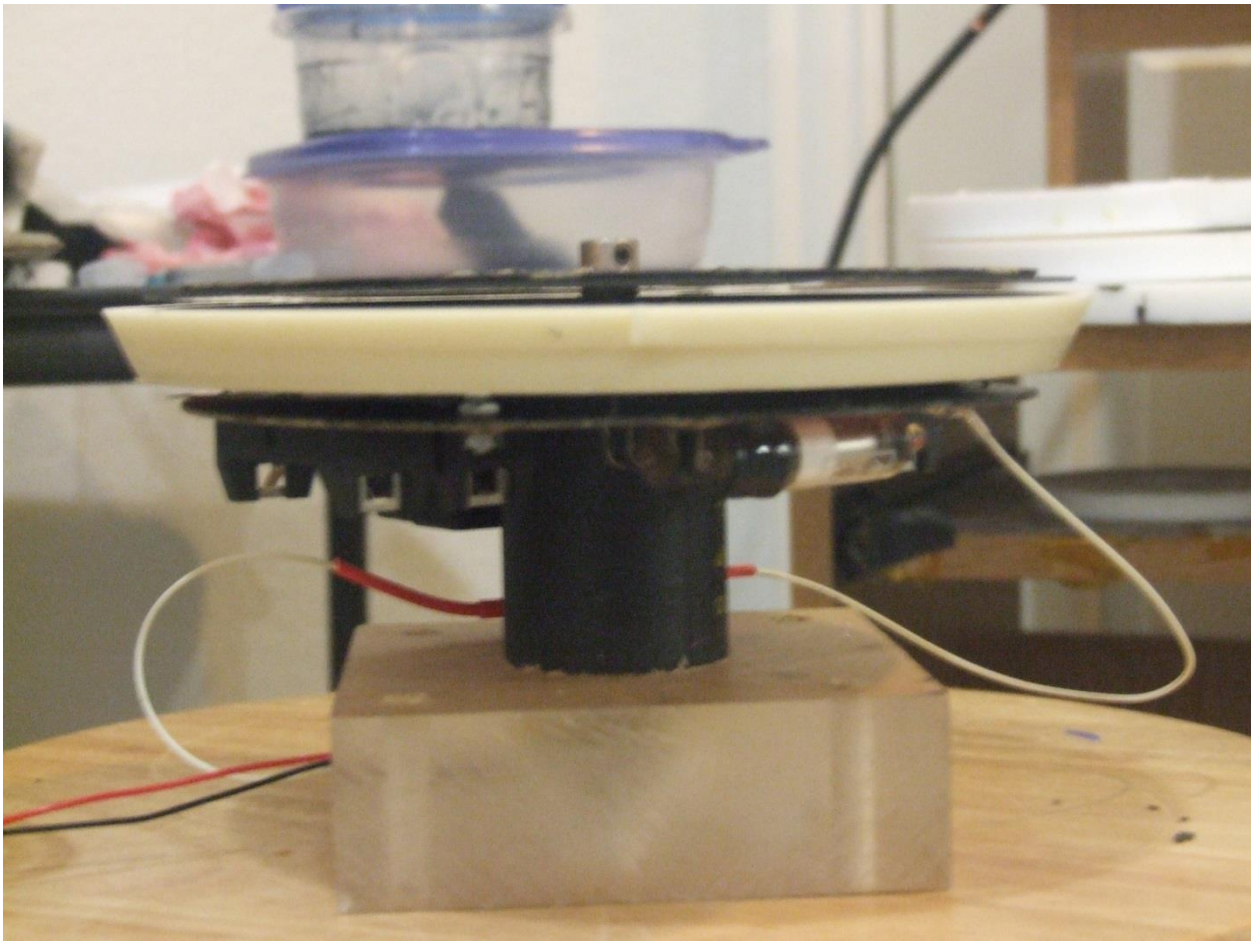
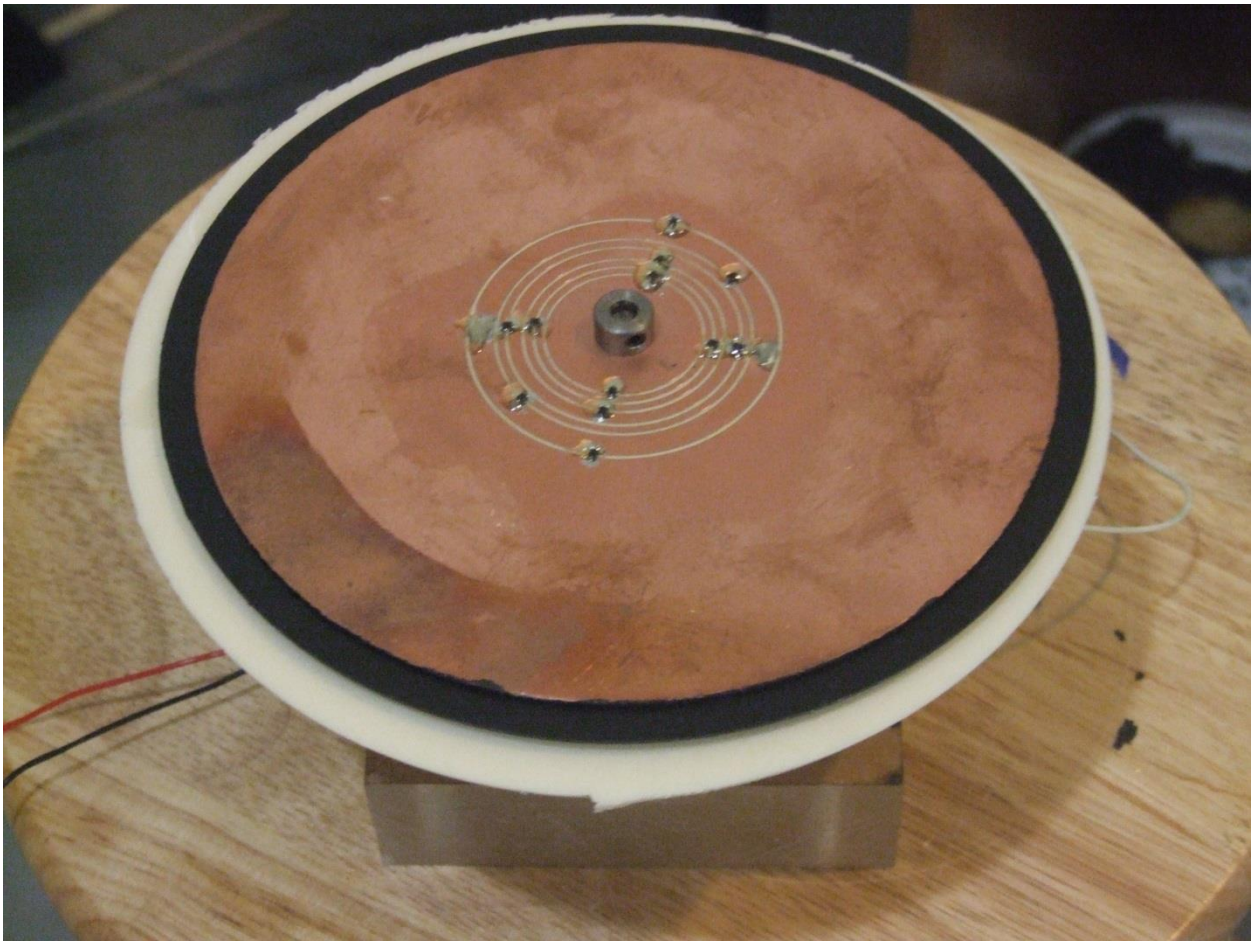
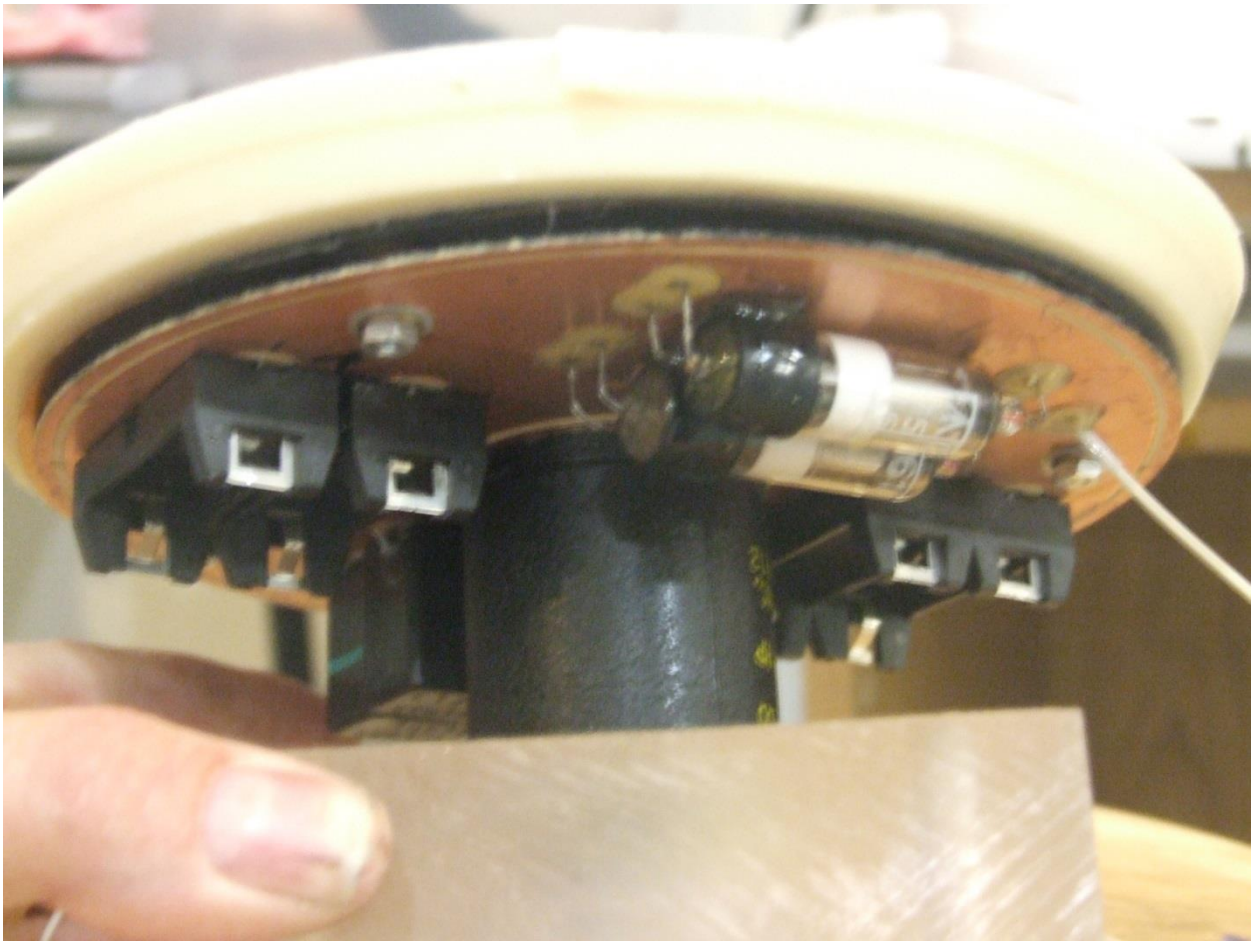


Static Displacement Field Drive Prototype to be used for future a 3rd party NASA thrust test.



Top view of the Static Displacement Field Drive Prototype showing the cross product disk with ultra-low leakage diodes.



Bottom view of the Static Displacement Field Drive Prototype showing the HV board assembly with electronic tube diodes.

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Symbol Definitions:

mN	milliNewton
nC	Nano Coulomb
Kg	Kilogram
m/s	Meter/Seconds

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