Taking a closer Look at the Demonstration Equipment
October 24, 2006

This is the classic photo of E.V. Gray's "Popping Coil" Demonstration apparatus. This can be found on Peter Lindemann's web site. This photo was taken by Tom Valentine in 1973. Mr. Gray is the man in the center and Fritz Lens (his new father-in-law) is on the right. The man on the left is unidentified (most likely Richard Hackenburger VP of Engineering).

For years, about all one could say about this photo was that there was a fair amount of equipment involved in these demonstrations. The energy source appears to be a common large automotive 12 volt battery. Identifiable components are the custom made air transformer and the Triplett 630-A multimeter, all the rest of the technical detail is hidden by the black Plexiglas instrument boxes. By itself this photo does not yield much information.

In 2004 a former E.V. Gray investor came forth and presented Peter Lindemann and John Bedini with a period collection of historical snapshots. Five of these photos were of the same apparatus that was shown to Mr. Valentine in the above photo. The location was different, but the equipment and layout appears to be the same. It is assumed that these new investor photos were taken at Mr. Grays shop in Van Nuys, CA. These photos were developed in January and June of 1974 so they could have been taken within a few months of the Valentine 1973 photo. By observing these photos some additional technical information about this novel technology can be extracted.

The Investor Photos:

Investor Photo #013C
Overall View

This is a nice shot of the whole demonstration apparatus from one end of the table showing the supply battery, two popping coils and an end view of the air transformer. Despite the limited focus, this photo shows that the popping coils are connected in parallel since the white leads on the left are both terminated on the negative terminal of the battery. Also connected to the battery is a component that appears to be an analog metering current shunt - a low value high current resistor device. However, there is no meter connected to this component as there would be in a normal application. This suggests that it is being used simply as a low value current limiting resistor. It is doubtful that this component was ever intended to be used in a metering capacity. Its output would have been a very short voltage pulse that could not be recorded or observed on any of the test instrumentation shown in any of these photos.

It is believed that the two black leads on the right of the air transformer are disconnected and hanging straight down to the floor. Compare this situation to the Tom Valentine photo where these heavy black leads are connected to two of the black boxes.

There appears to be four black wires connected to the right side of the electromagnets. The two larger black wires are thought to connect to the wiper of the DPST knife switch. It is not known for sure where the small remaining black wires connect, but most likely to an additional set of electromagnets parked under the air transformer as shown in photo #013B. If so, then there probably was an accompanying demonstration that showed what would happen if additional load was added to the circuit.

Investor Photo #012D
Popping a coil with the second demonstration setup on the "Right"

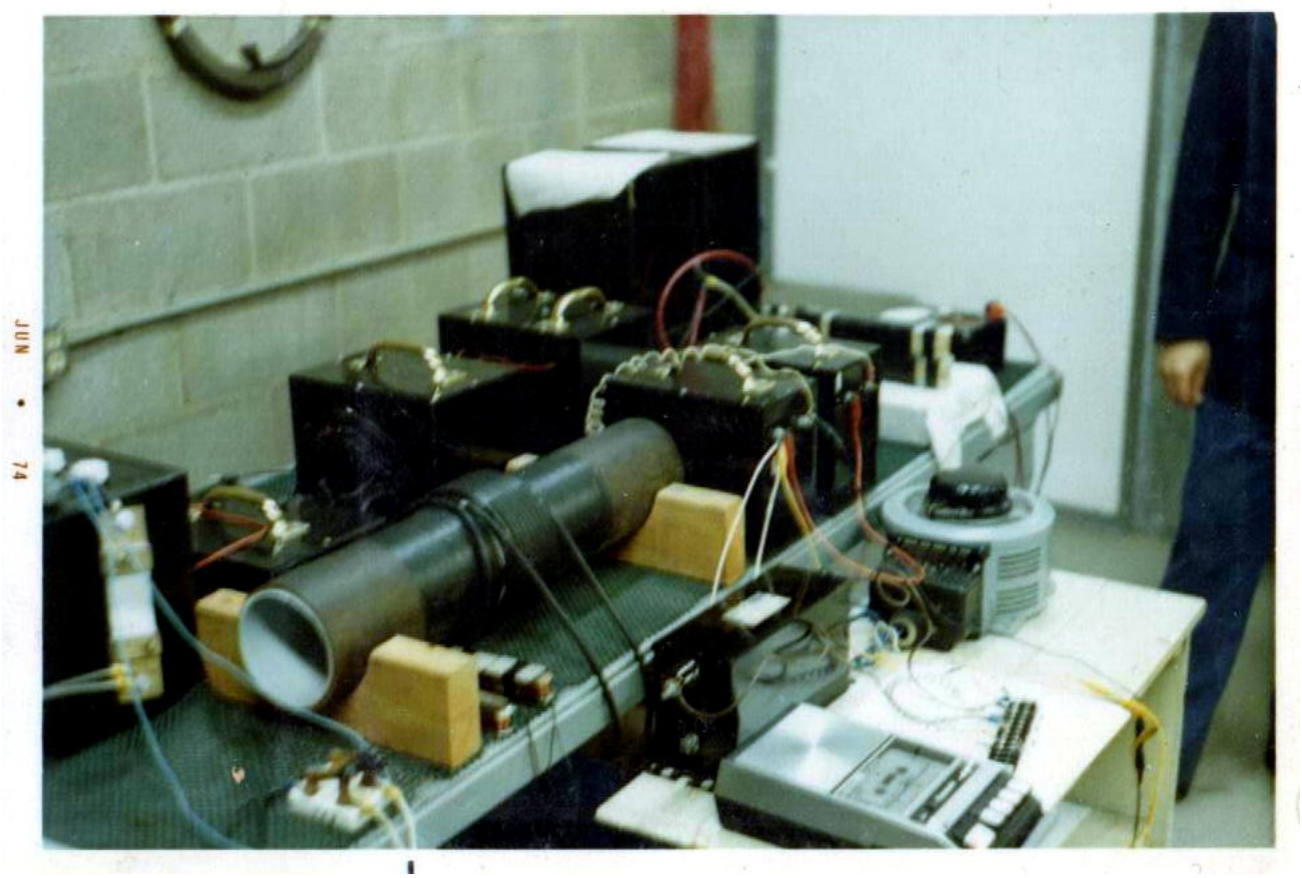
This photo is taken at the same location some time earlier where the circumstances were slightly different. The small white table and its attending equipment that is shown in the future June 74 photos are not preset. This photo (Jan 74) was developed 6 months before Photo #013C. The equipment on the large table seems to be in the same relative positions. What this photo reveals is that there is a second "Popping Coil" demonstration taking place at the other end (right side) of the table.

It is proposed that this total assembly of "Black Boxes" (a dozen or more subsystems) actually supports two different and independent demonstrations, a "Popping Coil" demo on the left and another similar "Popping Coil" demo on the right. The photos available allow for a better technical analysis of the demonstration equipment on the left side of the table. It is unknown as to what the actual differences between these two demonstrations were, however it is apparent that the coils being popped have obvious size differences. In photo #012D the coil in mid air is about twice the size of the electromagnets shown at the other end of the table in photo #013C. The Tom Valentine photo shows a set of electromagnets (at rest in the lower right hand corner) that are at least four times the size of the coils used for the demonstration that was set up on the left side of the

table. However, the launched coil shown above is not the same (being 50% smaller) as the coil shown in the Tom Valentine photograph, even though it is being powered by the same equipment.

It is thought that the demo on the right had something to do with a higher power level or a more advanced method of energy recovery. Most likely, the demo on the left was intended to make the initial technical introduction to the basic idea of a repulsion motor concept, while the demo on the right had some important engineering advancement to display.

Photo #012D is dark but it helps shows that the two white wires from the DPST knife switch for the left demo connect to the two equal size boxes in the middle of the table, one wire per box.



Investor Photo #013B
120VAC Power Source being explored

This June 1974 photo is a nice over view of the “left” demonstration equipment. The major issue here is the additional equipment on the small white table. Here we see some identifiable items, a neon transformer, a 2KW Variac autotransformer, a cassette tape recorder and a barrier type terminal strip. The question is: What is this extra stuff for?

It appears that this setup is a variation from the normal equipment demonstration as seen in the Tom Valentine photo. It seems that the Air Transformer is disconnected from the system and has been replaced by the power provided by the equipment on the white table. Most likely this was an attempt to demonstrate that AC line power could be converted to “Cold Electricity”. It is important to note the variations in this particular circuit layout as it provides some clues as to the function of the various Black Boxes.

First, notice that the two white wires that go to the DPST knife switch have now been connected to one terminal of the black box, while a red jumper connects to the white wires' previous connection point. Compare this to how these white wires are connected in the Tom Valentine photo.

It is not all together clear how the Neon transformer and Autotransformer are connected but a standard approach would be to have the Variac control the input line voltage to the Neon transformer. This Variac has the ability to increase its output voltage by 25% above its input. If this Neon transformer were a common 15KV 30 mA unit then the RMS output voltage could have been adjusted to a maximum of 18 KV. This is comparable to the output of an auto ignition coil. The peak DC voltage potential would have been about 25KV. However it is unlikely they were operating at this high of voltage for very long because of the size, layout and construction of the temporary conductors.

Since a single pair of conductors (yellow and black jumpers) drop below the top of the white table it is proposed that there is a high voltage diode stack underneath the table on a shelf that is operating in half-wave mode. Had full-wave mode been used then four wires would be seen leaving the top of the table (which is still a possibility).

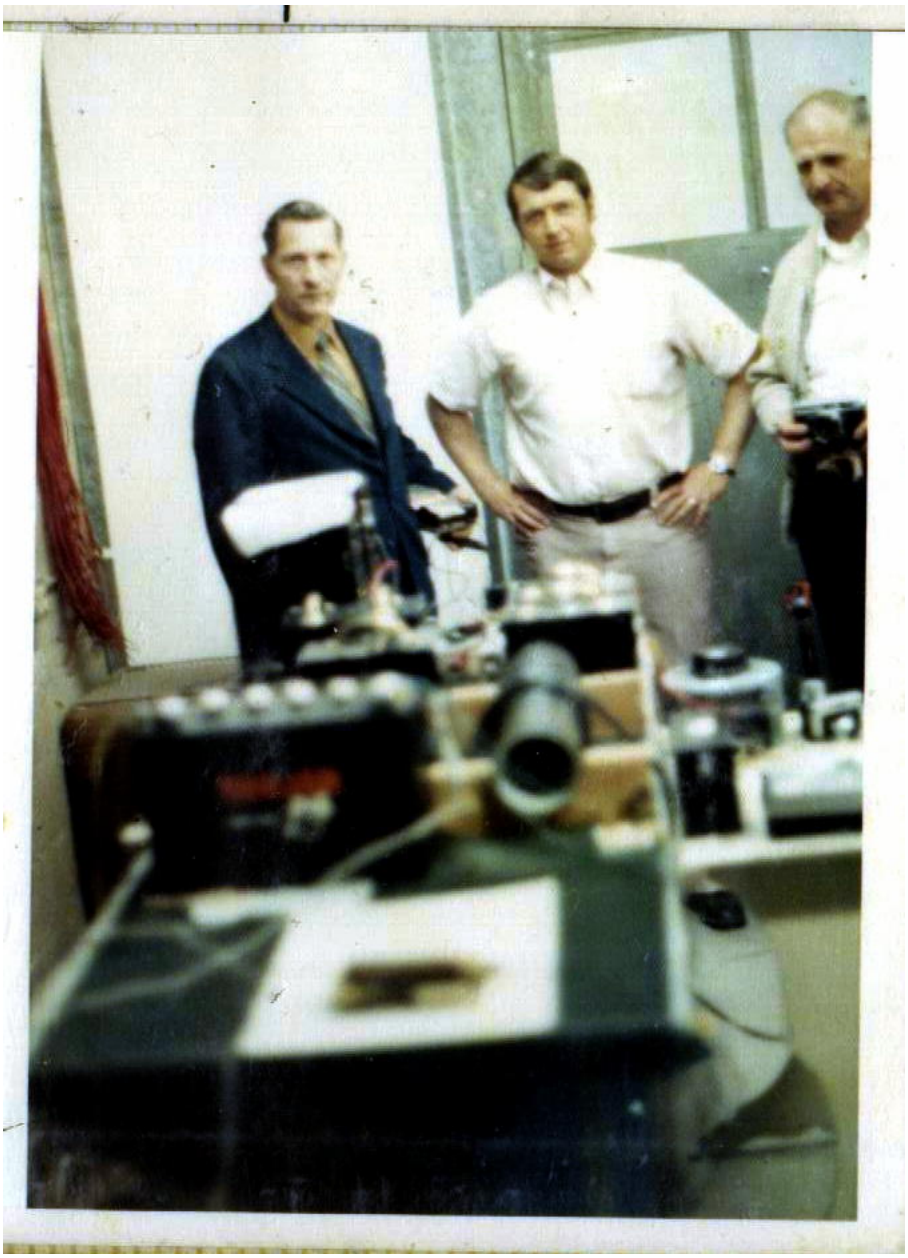
The utilization of DC pulses is very clear in the Gray motor patent. It has often been wondered why Mr. Gray didn't use full-wave rectification in his power supply to take advantage of the increased efficiency. Apparently this equipment does not have a taste for straight DC voltage. This concept is reinforced by the use of the half-wave rectification power supply shown in photo #013B. This situation supports the idea that Mr. Gray may have had capacitors connected in series, without equalization resistors, thus pulsating DC would have been needed to charge them.

Photo #013B shows the best view of the demonstration equipment for the "Right" demonstration. It seems to be composed of five Black boxes, two small ones, two large ones, and one small flat one. If a knife switch was used to launch the popping coil it is not visible in these photos. An air transformer seems to be missing from this equipment collection. However, consider the cylindrical object seen under the large table in photos #012D and #013D. This is about the size of a gallon paint can and has yellow tape on top. Three black wires (and possibly a fourth) can be seen leading to this device. It is proposed that this is the air transformer used for this equipment. It has a larger diameter (8") than the air transformer that is used for the "Left" demonstration (4"). It is believed that the automotive battery seen at the left end of the large table is the prime source of power for both demonstrations. A Triplett 630-A multimeter can be seen laying down on the far right of the table.

Examine the air transformer in its disconnected configuration. Notice how the two black conductors roll off the coil to the floor. This can only be achieved with two separate layers. The nearest conductor is part of the first layer. From this observation the relative polarity of the air transformer can be determined.

The core of the air transformer appears to be about 4" in diameter, when compared to the 2"x4" support blocks. It appears to be of a dual layer construction like one kind of pipe was slipped over another. The inner pipe resembles gray electrical PVC, but thinner (could be schedule 20 pipe). The outer pipe is a dark brown material that is not a common modern construction material. It is closer to an older fiber-composite material that was used for sewer pipe in the 50's. Why the need for two nested cores? Is the dielectric breakdown of the core that big of an issue for such a small air transformer? The insulation strength of the (assumed) spark plug wire is near 50KV and should be plenty for the operating voltages expected. In addition there appears to be a hefty layer of electrical black tape between the core and the heavy windings.

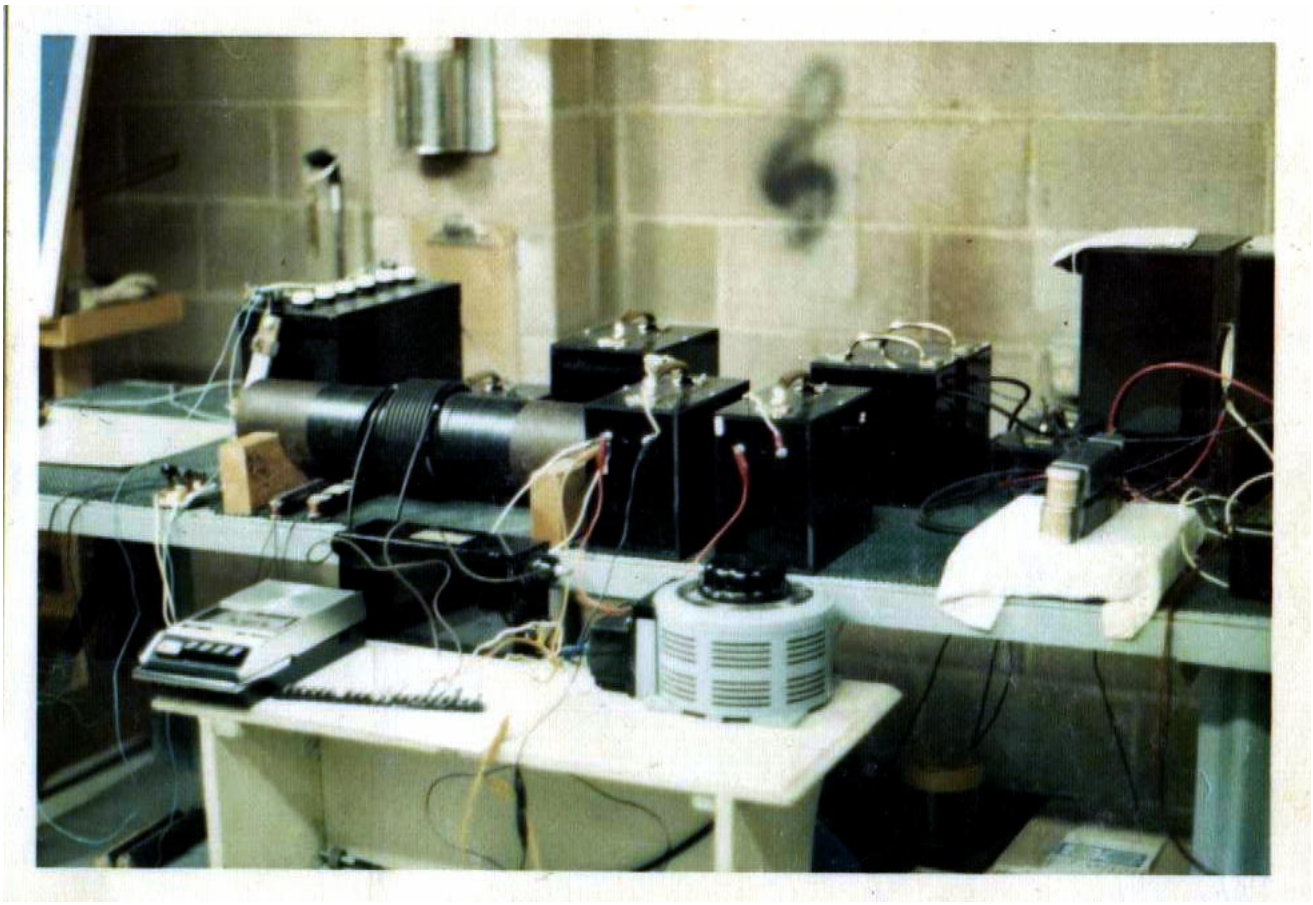
It has been proposed that the black tape covers a single layer of #16 AWG magnet wire that forms a winding 3-4 times longer than the observed spark plug wire "primaries". This feature (if it exists) is considered to be an additional energy recovery subsystem.



Investor Photo #013C
Group Photo Session

This photo is too fuzzy to extract much additional detail, (as compared to photo #013C) however the 35mm camera that is being held by the gentleman on the right is clear enough. Also, note the Flash Cube snapshot camera sitting beside the autotransformer. Cameras are in abundance in this portrait. This suggests that this particular collection of photos (June 74) were the result of a planned event where selected investors were allowed take all the snapshots they wanted. It is believed that this was a rare event. Therefore we can be assured that the equipment displayed at this time had been personally sanitized by Mr. Gray to insure that none of the essentials of his “Secret” would be disclosed.

The well dressed gentleman, on the left, appears to be holding another cassette tape recorder with a black plastic microphone being held in his fingers.



Investor Photo #013D
Count the Turns on the Air Transformer

This is about the best photo available showing the overall layout of both coil popping demonstrations. A lot of the essential details are hidden in this presentation but some of the subsystem interconnections can be determined.

The lower shelf of the white table displays what appears to be a HV “door knob” capacitor that is connected to Yellow and Black jumpers. It is more likely that this is a HV diode.

Note: This document is one in a series produced by Mr. McKay as part of his investigation of the work of Edwin Gray senior and he invites readers to contact him if they have any constructive comments or queries concerning the work of Mr. Gray. Mr McKay’s e-mail address is mmckay@tycoint.com