IN PROGRESS

Electronic Voice Phenomena Project Phase 2

David M. Rountree B.S.E.E.
Audio Engineering Society
Skylands Paranormal Investigations
I.G.H.S.
N.J.G.H.S.
Rhine Research Center
International Paranormal Research Association
Center for Paranormal Research
International Paranormal Investigators
National Paranormal Research Association
International Alliance of Paranormal Encounters
The Paranormal Research Society

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Introduction

This paper addresses the continuing research into the composition of Electronic Voice Phenomena, commonly referred to as EVP. As outlined in the previous work, “Electronic Voice Phenomena Project, Phase 1” I have made the discovery that EVP emissions are really unknown transitory magnetic disturbances. This phase will explore the correlation between audio electronic signals in free air resonance in relation to the magnetic disturbances currently being documented during an EVP event. The following data has been compiled in an effort to link the magnetic disturbances to an electromagnetic source. A series of experiments were set up, using custom designed apparatus we developed, in order to attain this data. We encourage others to duplicate our work and provide peer review.

Research Techniques

Free Air Conductance Experiment

In an attempt to measure changes in free air conductance, we will be using a capacitance meter that will measure the capacitance of two aluminum plates spaced very close together, establishing a capacitive reactance. I have not previously gone into great detail as to the purpose of the experiment, so this is the procedure we will follow, and I hope others will try to duplicate our work, and hopefully we will reach the same findings.

Our initial experiments duplicated the Princeton study in which they measured the Zero Point Energy Field. We actually had an induced magnetic field form around the plates, with no charge applied to them (no meter connected either, so it wasn't battery induced, and it had frequency, it was not DC in nature). The resulting electromagnetic field was spontaneous, measurable energy from an unknown source. This was done in my basement lab, which is isolated underground from stray RF radiation, and is a relatively clean room noise-wise. We have set it up as a control environment for our other experiments.

What we are trying to prove is this:

Noise is all around us. We are not focusing on actual audio noise, but on noise of a much higher frequency range. Specifically, noise in the microwave to light bands. We extended it into the light spectrum because light is associated with many paranormal events. (By the way we are also working on a way to portably measure plasma energy. This is an effort to answer the orb question, but that is the subject of another study.)

There is high frequency electrical noise all around us, as I said. There are also true magnetic waves all around us, at varying frequencies. Normally, these two sources of noise do not interfere with each other. I believe, in a paranormal event, they do indeed interfere with each other. And for them to do that, the medium between them must alter. In other words, the air that doesn't conduct electricity so well normally, increases in its ability to do so, much like what occurs when lightning strikes by traveling through the air. Ion counts increase, as we and others have previously noted in independent research, conductivity increases, and the frequencies beat together. What we want to confirm is the increase in air conductance, which is indicated by ion count increases. To do this, we need a big air capacitor, which is what we have designed. We also need to know the frequency of the fluctuations of the air conductance, because that is also a key piece of the puzzle.

If the conductance fluctuations are simplistic in nature, then the noise frequencies MUST be complex in nature, and this would indicate that Frequency Modulation is the medium of transport for the noise frequencies. However, should (as I suspect) the conductance is complex in nature, then the noise will be simplistic or Amplitude Modulated. I suspect it will be Amplitude Modulated, because many of the EVPs recorded over the years show evidence of mild amplitude modulation on them. This allows them to move through the air, much like radio waves are transmitted.

By using an RF spectrum analyzer and a multi-array antenna cluster, we should be able to identify any High Frequency sources, and by using a converted Low Noise amp from a satellite dish and a dual cone antenna, I will be able to identify Microwave frequencies. I have a parabolic dish for tracing down the source as well. So we are looking for a lot of information to correlate.

Beat frequency is a phenomenon that occurs when you have two frequencies interfering with each other. The result is the difference between the two frequencies. If both frequencies are fluctuating, then the result will be fluctuating, and the result may be an electromagnetic fluctuation in the audio frequency range. You wouldn't hear it, but the coil in your microphone will react to it, possibly generating the recording of an EVP.

A working example of this would be such;

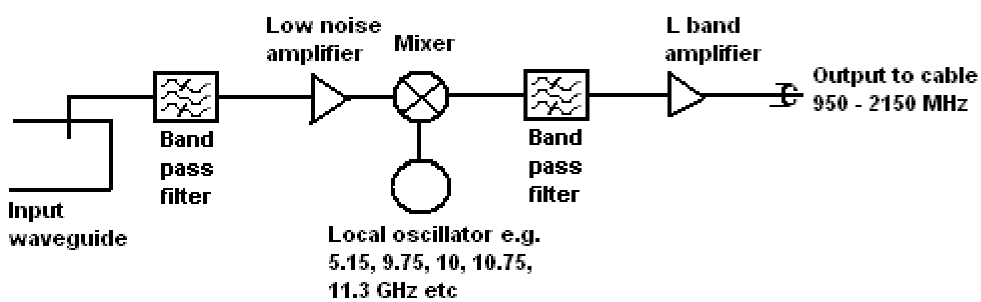
if you have a 1 GHz signal, and a 1.01 GHz magnetic field, the resulting frequency would be 1 kHz, clearly an audio spectrum signal. The next question would be what causes the noise fluctuations to occur with such precision as to generate an intelligible voice, responding to a seemingly just asked question? That is for another days work.

Microwave Detection, Measurement and Source Identification Experiment

Measuring the frequency of microwave radiation present will be vital in establishing the link and identity of background noise that is contributing to the generation of EVPs. Since there are many different types and frequencies involved, the detection gear will have to be varied, and able to read and measure a broad spectrum of RF waveforms.

Low noise block down converter (LNB)

The abbreviation LNB stands for Low Noise Block. It is the device on the front of a satellite dish that receives the very low level microwave signal from the satellite, amplifies it, changes the signals to a lower frequency band and sends them down the cable to the indoor receiver.
The expression low noise refers the quality of the first stage input amplifier transistor. The quality is measured in units called Noise Temperature, Noise Figure or Noise Factor. Both Noise Figure and Noise Factor may be converted into Noise Temperature. The lower the Noise Temperature the better. So an LNB with Noise Temperature = 100K is twice as good as one with 200K.
The expression Block refers to the conversion of a block of microwave frequencies as received from the satellite being down-converted to a lower (block) range of frequencies in the cable to the receiver. Satellites broadcast mainly in the range 4 to 12 to 21 GHz.



Low noise block down converter (LNB) diagram

The diagram shows the input waveguide on the left which is connected to the collecting feed or horn. As shown there is a vertical pin through the broad side of the waveguide that extracts the vertical polarization signals as an electrical current. The satellite signals first go through a band pass filter which only allows the intended band of microwave frequencies to pass through. The signals are then amplified by a Low Noise Amplifier and thence to the Mixer. At the Mixer all that has come through the band pass filter and amplifier stage is severely scrambled up by a powerful local oscillator signal to generate a wide range of distorted output signals. These include additions, subtractions and multiples of the wanted input signals and the local oscillator frequency.   Amongst the mixer output products are the difference frequencies between the wanted input signal and the local oscillator frequencies. These are the ones of interest.   The second band pass filter selects these and feeds them to the output L band amplifier and into the cable. Typically the output frequency = input frequency - local oscillator frequency. In some cases it is the other way round so that the output frequency = local oscillator frequency - input frequency. In this case the output spectrum is inverted.

Examples of input frequency band, LNB local oscillator frequency and output frequency band are shown below.

Input frequency band from satellite waveguide	Input band GHz	Local Oscillator (LO) frequency	Output L band into cable.	Comments
C band	**3.4-4.2**	**5.15**	**950-1750**	**inverted output spectrum**
	3.625-4.2	**5.15**	**950-1525**	**"**
	4.5-4.8	**5.76**	**950-1260**	**"**
	4.5-4.8	**5.95**	**1150-1450**	**"**
Ku band	**10.7-11.7**	**9.75**	**950-1950**	
	10.95-11.7	**10**	**950-1700**	
	11.45-11.95	**10.5**	**950-1450**	
	11.2-11.7	**10.25**	**950-1450**	
	11.7-12.2	**10.75**	**950-2000**	
	12.25-12.75	**11.3**	**950-1450**	
	11.7-12.75	**10.6**	**1100-2150**	
Ka band	**19.2-19.7**	**18.25**	**950-1450**	
	19.7-20.2	**18.75**	**950-1450**	
	20.2-20.7	**19.25**	**950-1450**	
	20.7-21.2	**19.75**	**950-1450**	

All the above illustrate a simple LNB, with one LNA and one LO frequency. More complex LNBs exist, particularly for satellite TV reception where people wish to receive signals from multiple bands, alternative polarizations, and possibly simultaneously.

Dual-band LNBs

These will typically have two alternative local oscillator frequencies, for example 9.75 GHz and 10.6 GHz with the higher frequency option selected using a 22 kHz tone injected into the cable. Such an LNB may be used to receive 10.7 - 11.7 GHz using the lower 9.75 GHz LO frequency or the higher band 11.7 - 12.75 GHz using the higher 10.6 GHz LO frequency.

Dual polarization LNBs

The LNB shown above has one wire going into the waveguide to pick up vertical polarization. If the input waveguide is circular is can support two polarizations and it can be arranged for there to be two input probes at right angles, thus allowing two alternative polarizations to be selected (vertical or horizontal), either one or the other. Dual polarization LNBs may commonly be switched remotely using two alternative DC supply voltages. e.g. 13 volts makes it receive vertical polarization and 19 volts make it receive horizontal polarization.

Multi-LNBs

If both input probes have their own LNB amplifiers etc you have effectively two LNBs in the same module, which will have two output cables, one for each polarization. Many variants on this theme exist, with options also for multiple bands. Such a "Quad LNB" might thus have 4 outputs, for each polarization and each of two bands. Such an arrangement is attractive for a block of flats, head end antenna, which need to feed multiple indoor satellite TV receivers with the viewers all wanting all permutations of the two polarizations and two frequency bands.

LNB Frequency stability

All LNBs used for satellite TV reception use dielectric resonator stabilized local oscillators. The DRO is just a pellet of material which resonates at the required frequency. Compared with quartz crystal a DRO is relatively unstable with temperature and frequency accuracies may be +/- 250 kHz to as much as +/- 2 MHz at Ku band. This variation includes both the initial value plus variations of temperature over the full extremes of the operating range. Fortunately most TV carriers are quite wide bandwidth (like 27 MHz) so even with 2 MHz error the indoor receiver will successfully tune the carrier and capture it within the automatic frequency control capture range.
If you want the LNB for the reception of narrow carriers, say 50 kHz wide, you have a problem since the indoor receiver may not find the carrier at all or may even find the wrong one. In which case you need a rather clever receiver that will sweep slowly over a range like +/- 2 MHz searching for the carrier and trying to recognise it before locking on to it. Alternatively it is possible to buy Phase Lock Loop LNBs which have far better frequency accuracy. Such PLL LNBs have in internal crystal oscillator or rely on an external 10 MHz reference signal sent up the cable by the indoor receiver. PLL LNBs are more expensive. The benefit of using an external reference PLL LNB is that the indoor reference oscillator is easier to maintain at a stable constant temperature.

LNB Phase noise

All modern DRO LNBs are sold as 'digi-ready'. What this means is that some attention has been paid in the design to keeping the phase noise down so as to facilitate the reception of digital TV carriers. The phase noise of DRO LNBs is still far worse than for PLL LNBs. What good phase noise performance is really needed for is for the reception of low bit rate digital carriers and for digital carriers using high spectral efficiency modulation methods like 8-PSK, 8-QAM or 16-QAM modulation, which reduce the bandwidth required but need more power from the satellite, a bigger receive dish and better quality PLL type oscillators in both the transmit and receive chains.

LNB supply voltages

The DC voltage power supply is fed up the cable to the LNB. Often by altering this voltage it is possible to change the polarization or, less commonly, the frequency band. Voltages are normally 13 volts or 19 volts.
Perfect weatherproofing of the outdoor connector is essential, otherwise corrosion is rapid. Note that both the inner and outer conductors must make really good electrical contact. High resistance can cause the LNB to switch permanently into the low voltage state. Very peculiar effects can occur if there poor connections amongst multiple cables to say an LNB and to a transmit BUC module as the go and return DC supplies may become mixed up and the wrong voltage applied across the various items. The electrical connections at the antennas between the LNB and the BUC chassis are often indeterminate and depend of screws in waveguide flanges etc. Earth loop currents may also be a problem - it is possible to find 50 Hz or 60 Hz mains currents on the outer conductors - so be careful. Such stray currents and induced RF fields from nearby transmitters and cell phones may interfere with the wanted signals inside the cables. The quality and smoothing of the DC supplies used for the LNBs is important.

LNB Transmit reject filter

Some LNBs, such as those from Invacom, incorporate a receive band pass, transmit band reject filter at the front end. This provides both good image reject response for the receive function but also protects the LNB from spurious energy from the transmitter, which may destroy the LNB. See Invacom pdf data sheet for an example.

How to test an LNB:

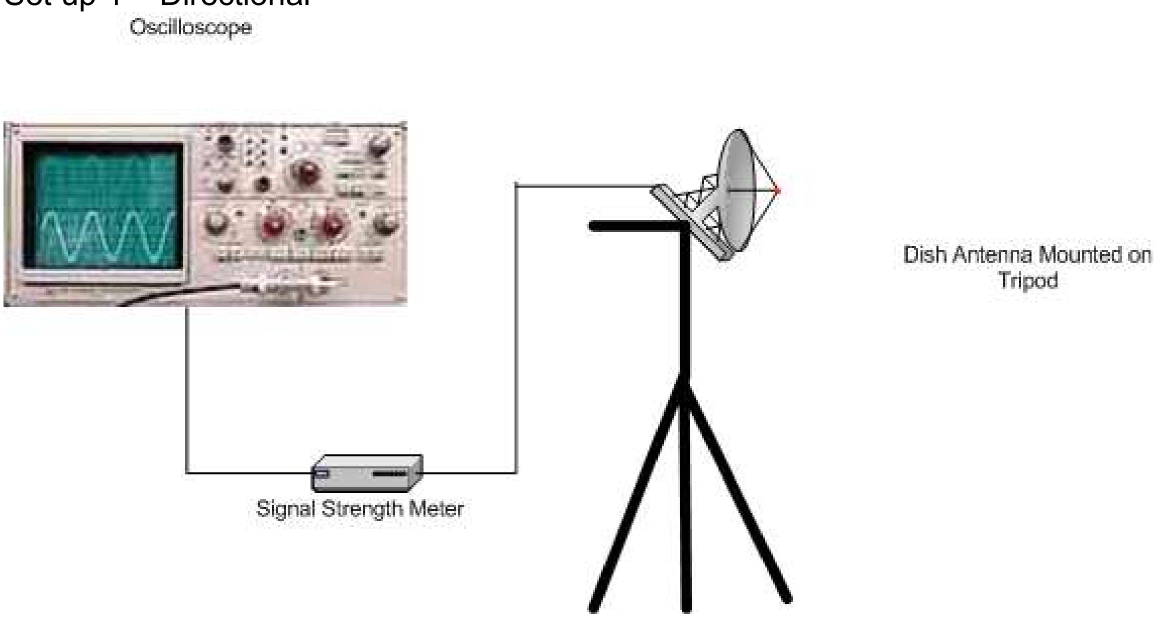
Check with a current meter that it is drawing DC current from the power supply. The approx number of milliamps will be given by the manufacturer. Badly made or corroded F type connections are the most probable cause of faults. Remember that the centre pin of the F connector plug should stick out about 2mm, proud of the surrounding threaded ring.
Use a satellite finder power meter. If you point the LNB up at clear sky (outer space) then the noise temperature contribution from the surroundings will be negligible, so the meter reading will correspond to the noise temperature of the LNB, say 100K (K means degrees Kelvin, above the 0 K absolute zero

temperature). If you then point the LNB at your hand or towards the ground, which is at a temperature of approx 300K then the noise power reading on the meter should go up, corresponding to approx 400K (100K +300K).
Note that LNBs may fail on one polarization or on one frequency band and that the failure mode may only occur at certain temperatures.
If you choose to try a replacement LNB in a VSAT system check the transmit reject filter and supply voltage - you don't want to be one of those people who keeps blowing up LNBs trying to find a good one !

Methodology

The idea is that two devices be built, one employing a parabolic dish antenna in order to trace the signal source, and one that is designed to receive omni directionally, to measure the frequency using a cone or bi-cone antenna. The set up would be as follows:

Set up 1 – Directional



Set up 2 – Omni-Directional

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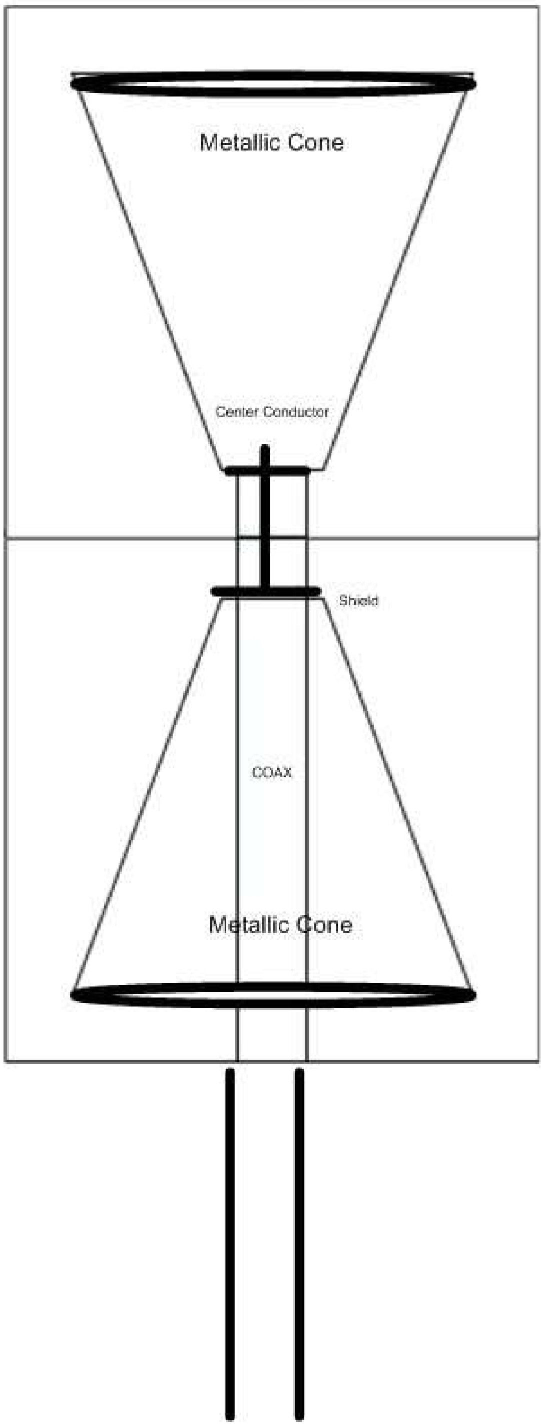
Bi-Cone Omni-Directional Microwave Antenna



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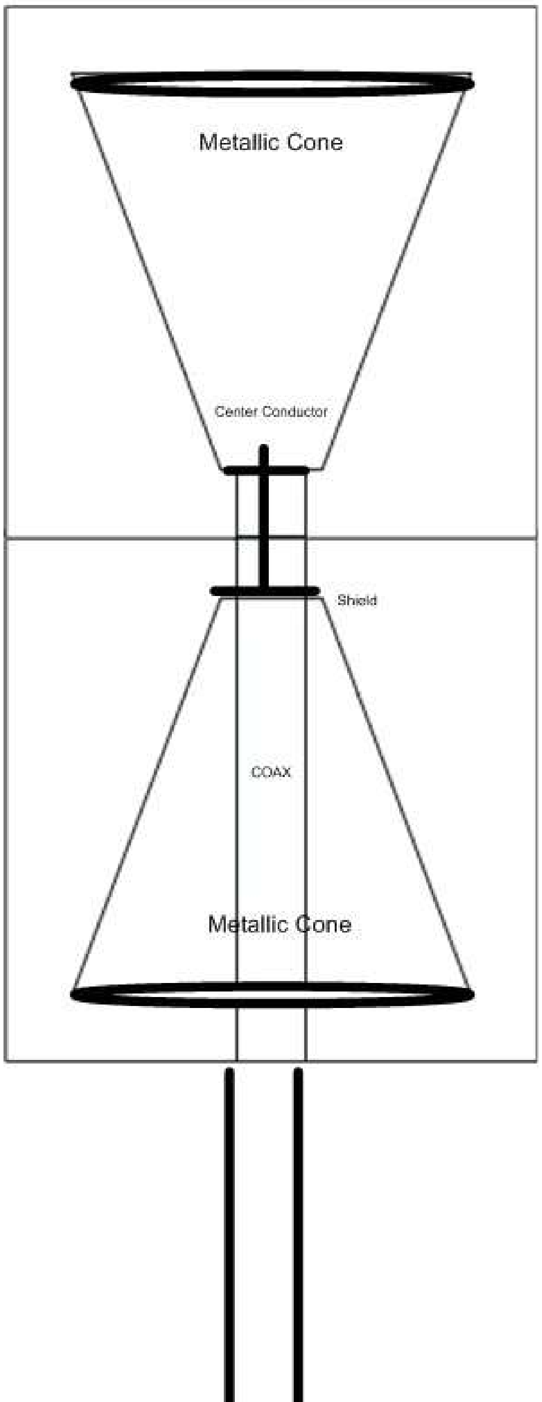
Bi-Cone Omni-Directional Microwave Antenna



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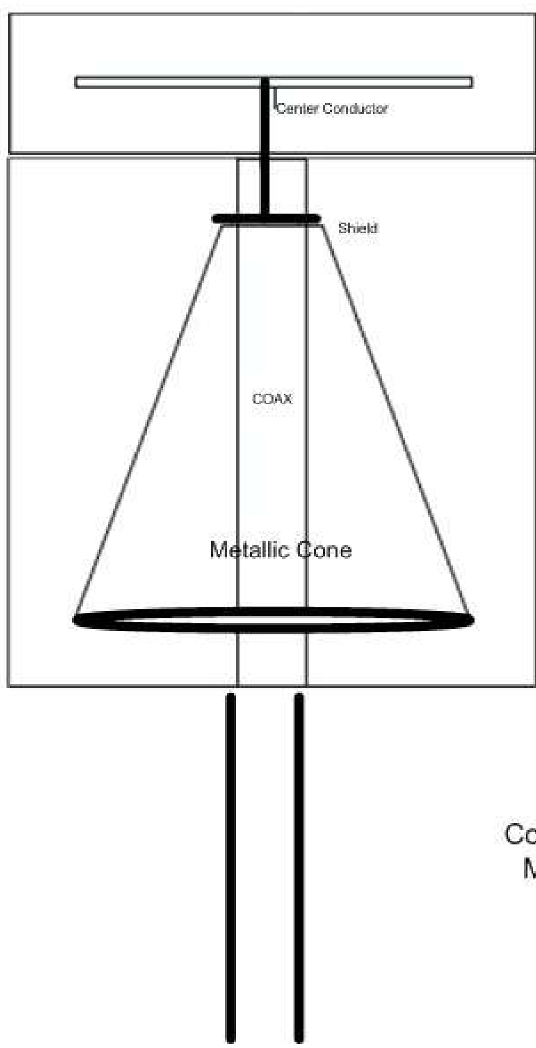
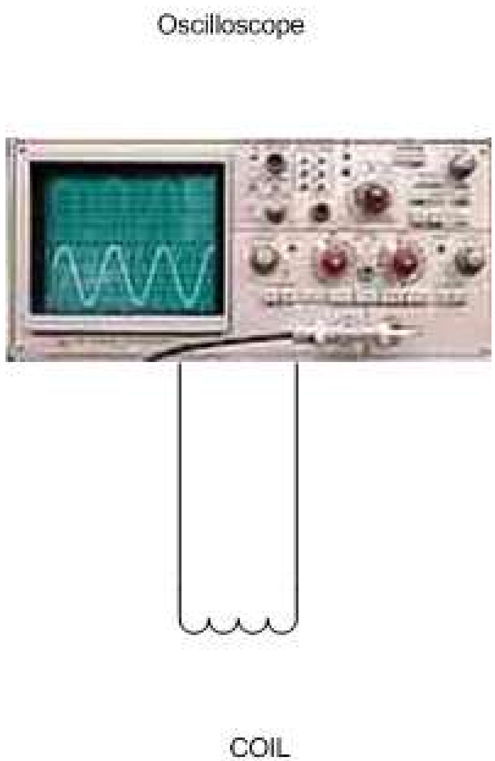
Metallic Cone



Cone Omni-Directional
Microwave Antenna

This experiment is designed to detect, identify and measure the strength of Microwave radiation in an effort to identify probably sources of EVP. This would be repeated with an RF array to also measure VHF and UHF Frequencies.

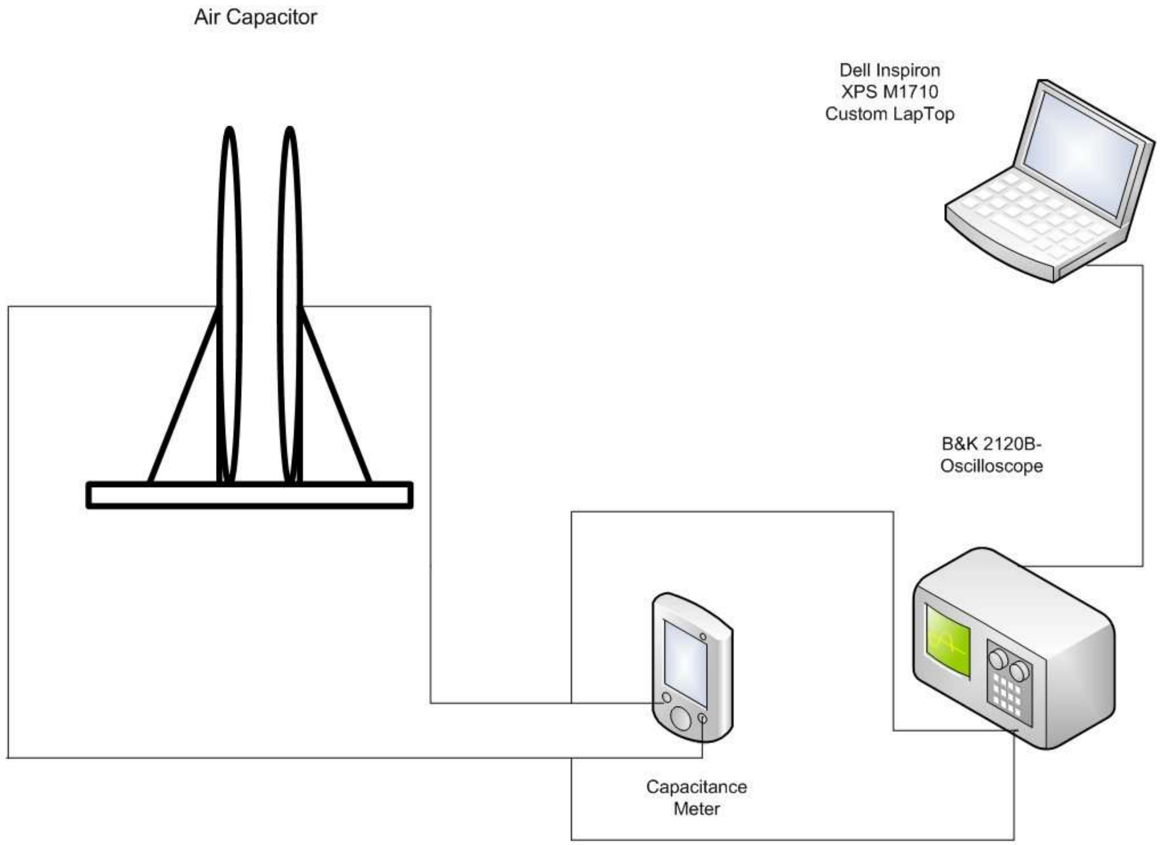
Magnetic Wave Detection and Frequency Measurement Experiment



This set up would be used to monitor magnetic frequencies presence.

The Experiments

The first experiment is designed to test the functionality of the Free Air Conductance Device, hereafter termed the FACD. The device was set up in a controlled environment and tests were run to measure ambient conductance. Since we are using a capacitance meter to measure the changes in the air's ability to conduct electricity, the values will be listed in divisions of FARADS. By adjusting the air gap, we were able to reach a stable ambient reading of 51.7 pf.



I was able to increase the air conductance capability artificially in order to test the unit. I placed 16 drops of Infant Iron supplement in an atomizer full of distilled water, and misted the air over the sensor plates. The capacitance increased to 276.1 pf, indicating an increase in free air conductivity.

Initial static test readings of 51.7 pf

Enhanced reading after applying iron rich water vapor