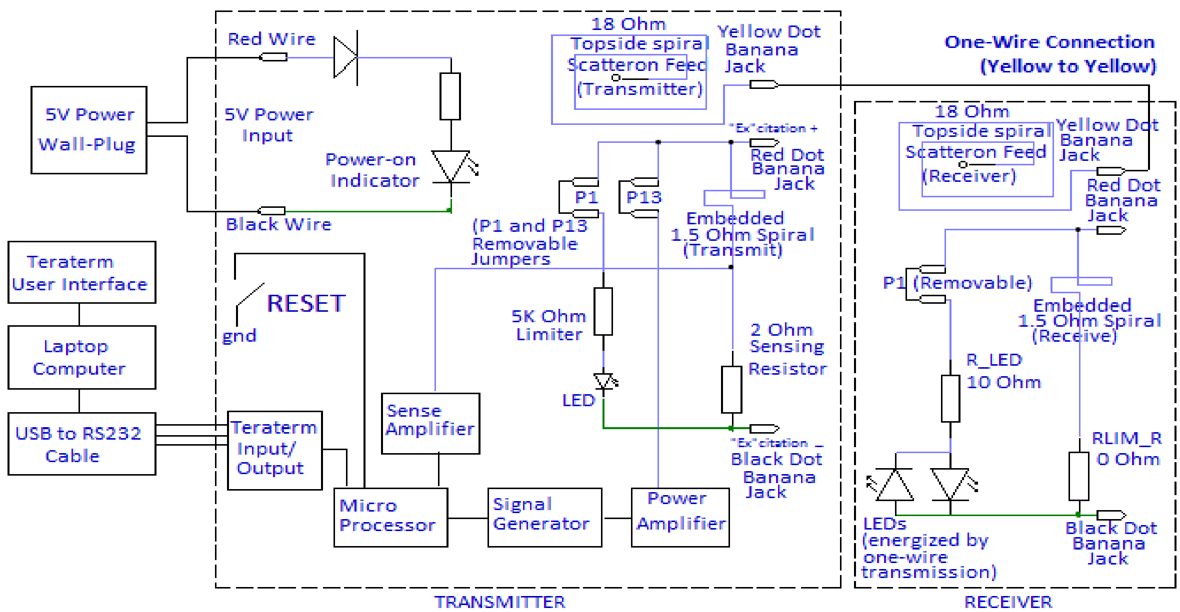
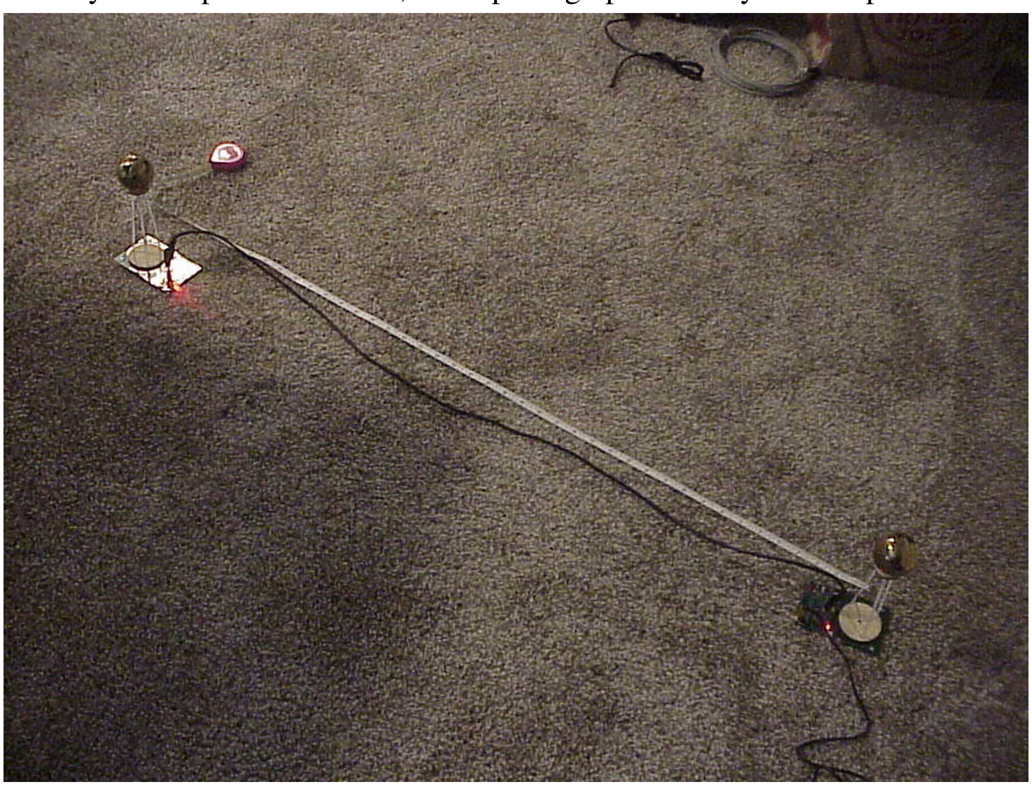
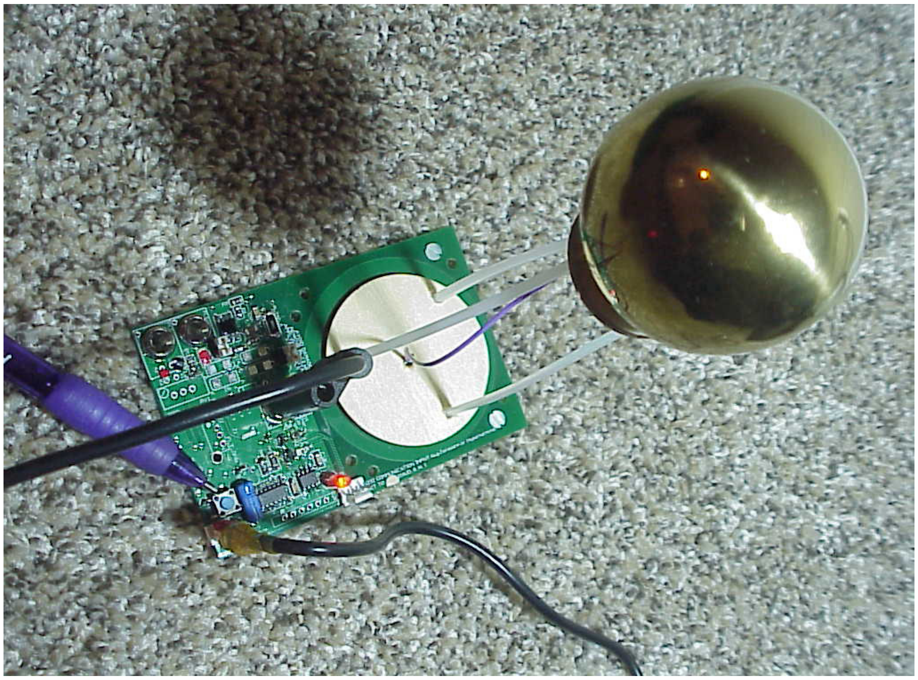
Please Read this Application Note First. The Scalar Wave Starter Kit is configured in its factory-delivered state and demonstrated herein.



A schematic of the system is provided above, and a photograph of the system sis provided below.

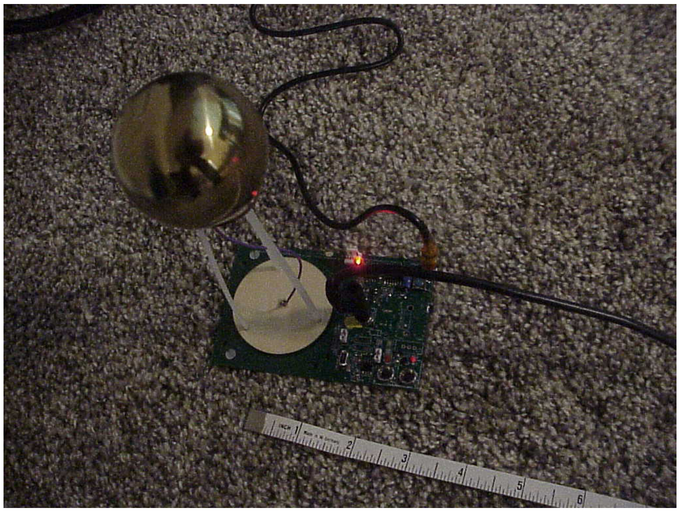


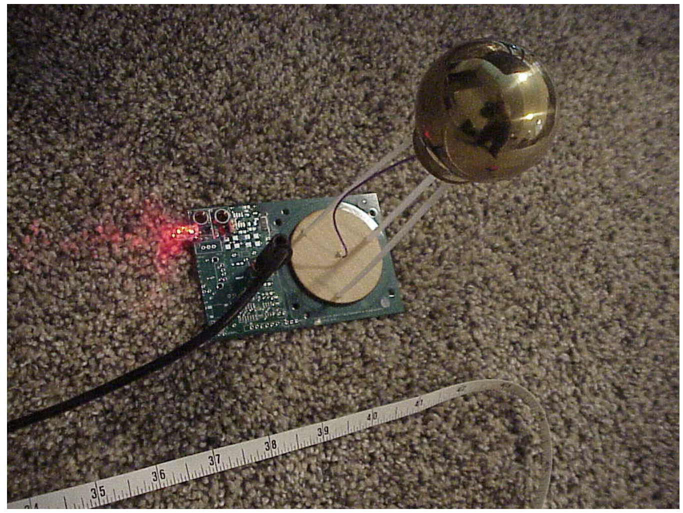
In this tuned system shown above, the receiver is top left, with illuminated LED. There is one 44-inch wire connecting transmitter and receiver. The current return path is through the two spherical scatterons. The transmitter (bottom Right) by connecting the appropriate cable, echoes its measurements to the laptop via RS232-USB connection. Using its built-in microprocessor, the Transmitter detects the presence of the passive receiver, and in this case assigns the correct frequency, hence setting the receiver LED to its brightly illuminated state. The microprocessor found and lit the LED all by itself using its tiny on-board instruments, and picked the highest measurement reading as the likely frequency to light the receiver's LED. This is a special case where the Kit's transmitter finds the optimal frequency, with this line-of-sight, 40-inch length one-wire.



The 40-inch long one-wire is shown above at the Receiver. It connects from “Yellow” transmitter jack to “Yellow” receiver jack (it is plugged-in near the base of the Receiver's scatteron above).

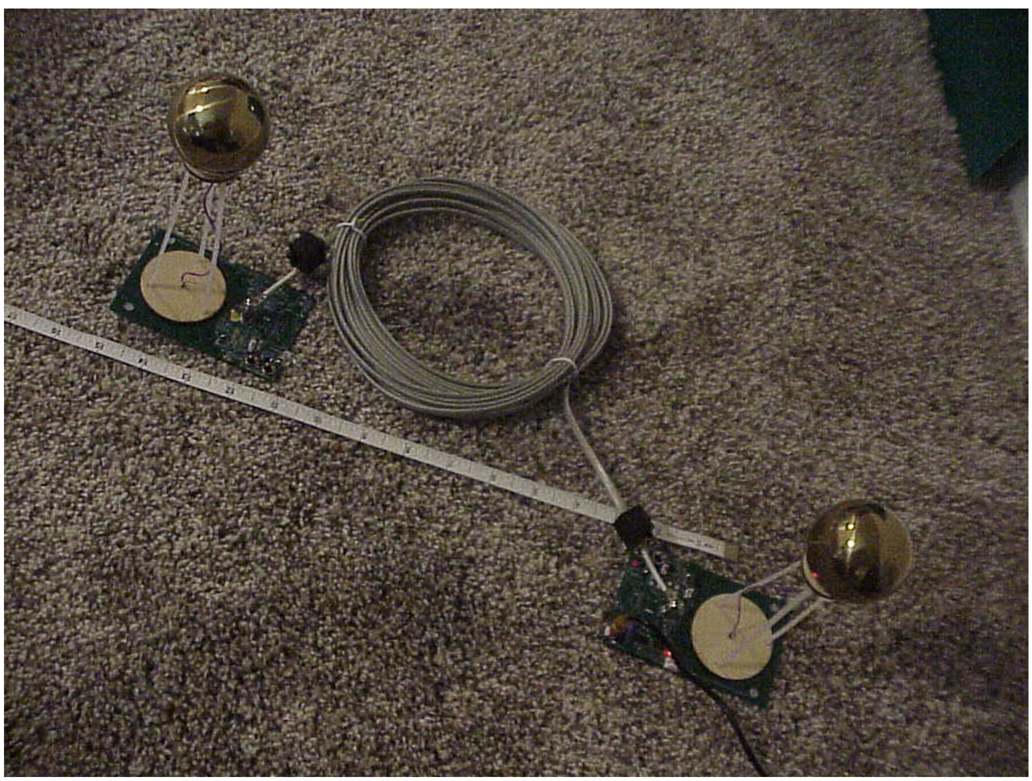
Please note there is a writing pen (next to the 5V power input jack in the above photo) pointing towards the small circular RESET button. Pressing this button causes the transmitter to immediately stop what it is doing, sweep through a set of 32 different tuning frequencies while reporting its findings to the user interface display – after which it waits for commands from the user. In this special case demonstrated above, it did pick the correct reading to illuminate the receiver LED. Picking the correct reading like this automatically, has also been observed at the end of a 100-foot one-wire, but not on every attempt with its existing software version rev1.0.





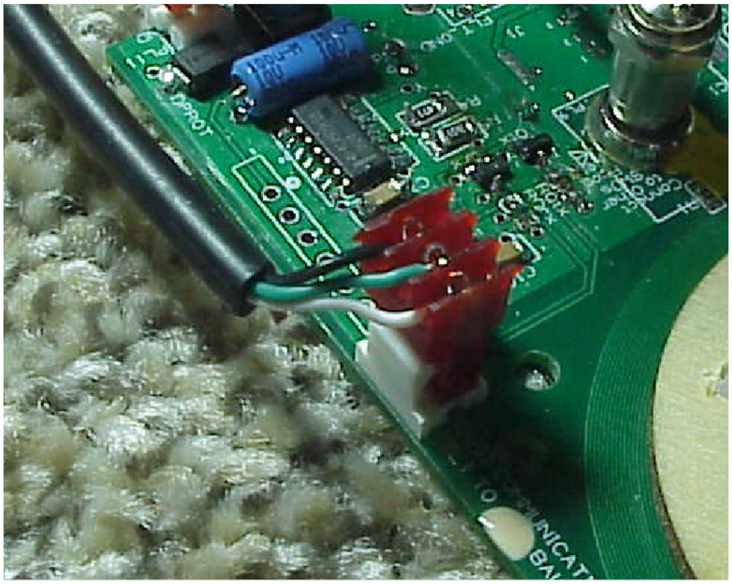
Transmitter   Receiver

Transmitter and Receiver connected by a straight One-wire, only 44-inches long. The receiver's LED (above Right) is illuminated by the transmitter, and only when its frequency index has been set to the appropriate index (index number '0000' to '0032' representing 4.5MHz – 8.5MHz).

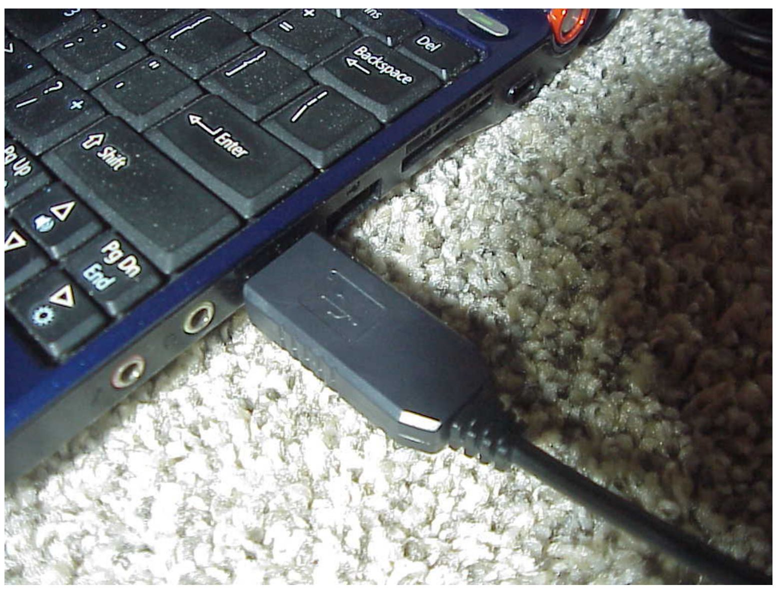


Next, install the 25-foot wire that was shipped with the starter kit, and its two RJ-11 to BNC adapters. This time the transmitter did not select the correct frequency index to permanently illuminate the receiver LED. The transmitter is thus tuned manually as shown below, the receiver LED at maximum brightness. This manual method over-rides the selected frequency-setting attempted by the Transmitter.

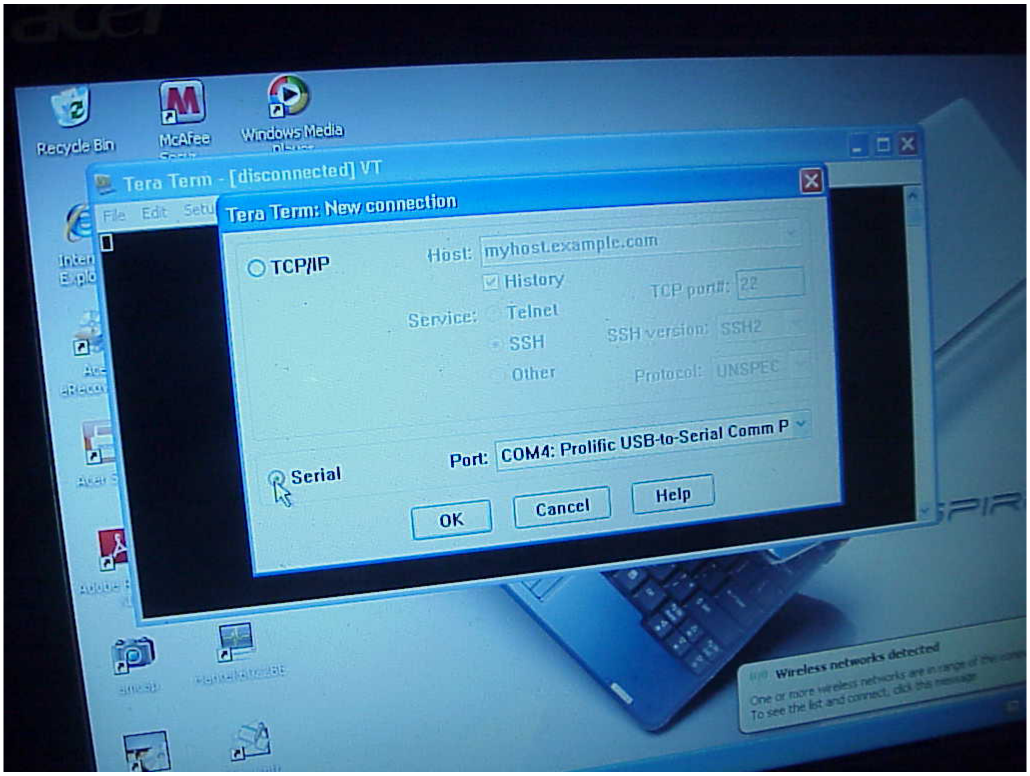
To Perform Manual Tuning, Do as Follows - Start and run Teraterm:



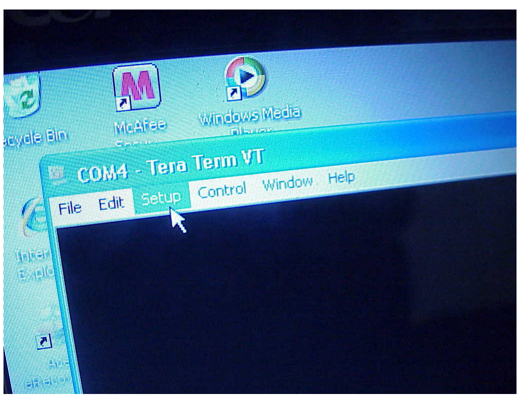
Attach USB-to-Serial Converter onto the transmitter's 3-pin connector, at the edge of the circuit card. Avoid plugging it in backwards even though the connector has a lock on its outer edge.

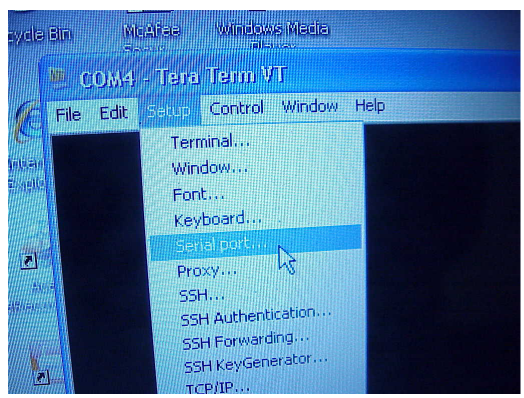


Plug the other end of the USB-to-RS232 adapter into the computer loaded with Teraterm software and Prolific USB driver. In addition to a number of Help files located on the Starter Kit Memory Stick, a recent version of Teraterm software is provided. A guide to Prolific drivers is included on the memroy stick as well. Below, the driver can be seen to have selected Device Manager on COM4.

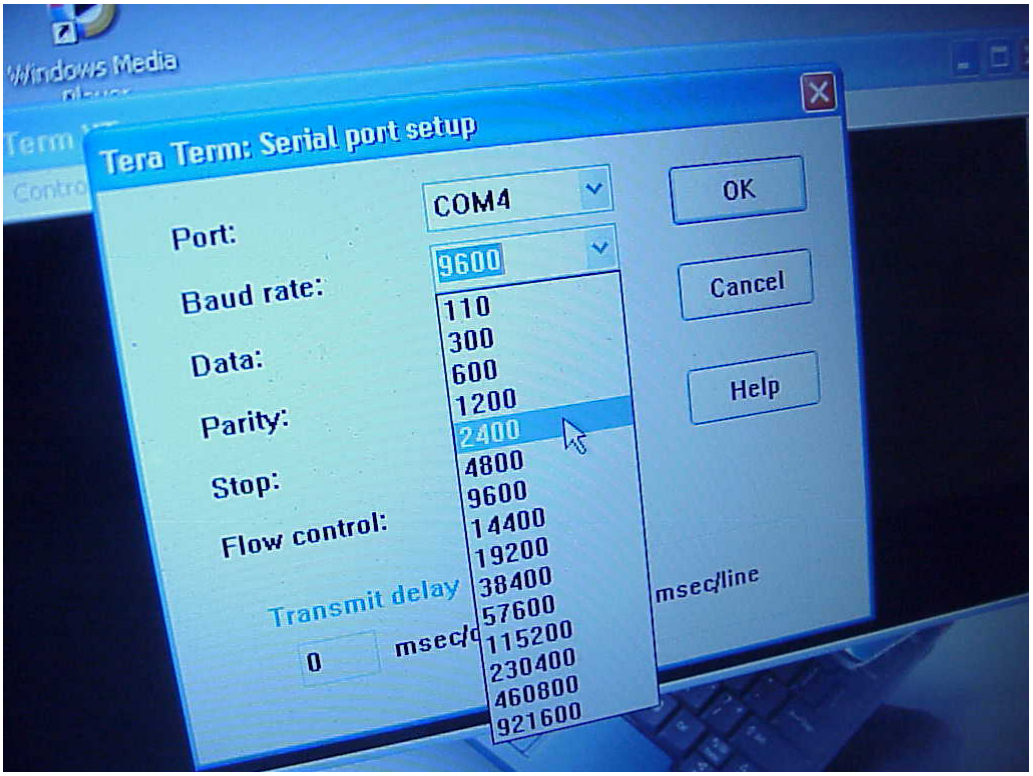


Start Teraterm, it prompts for TCP or Serial. Click the "Serial" radio button.

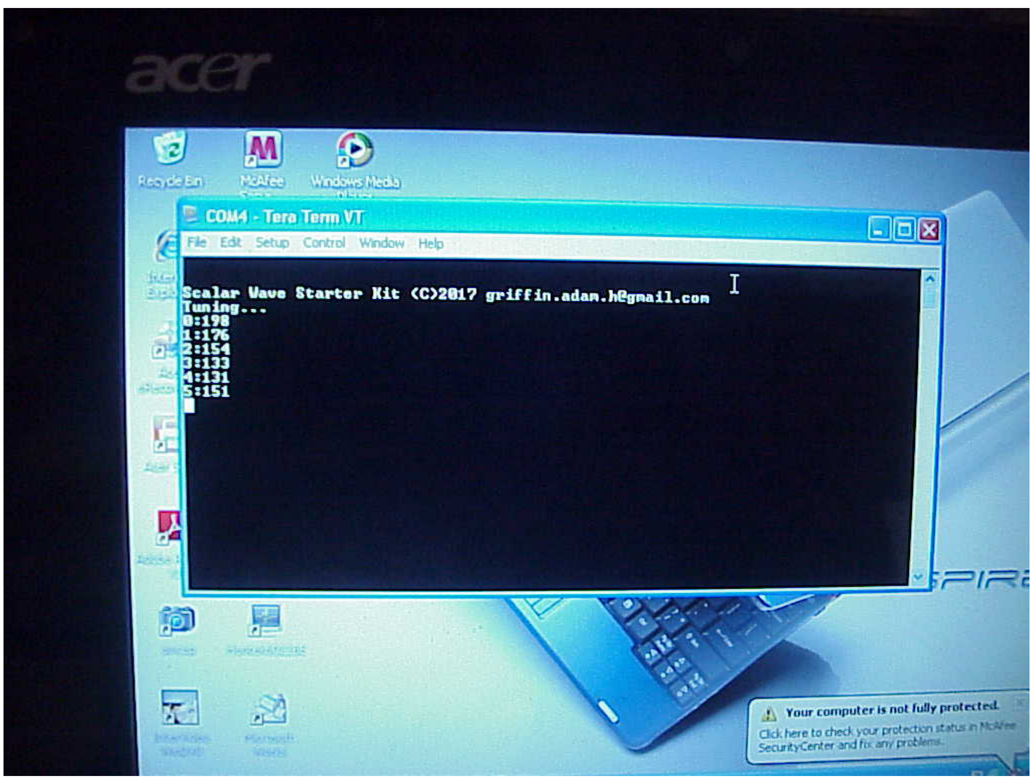




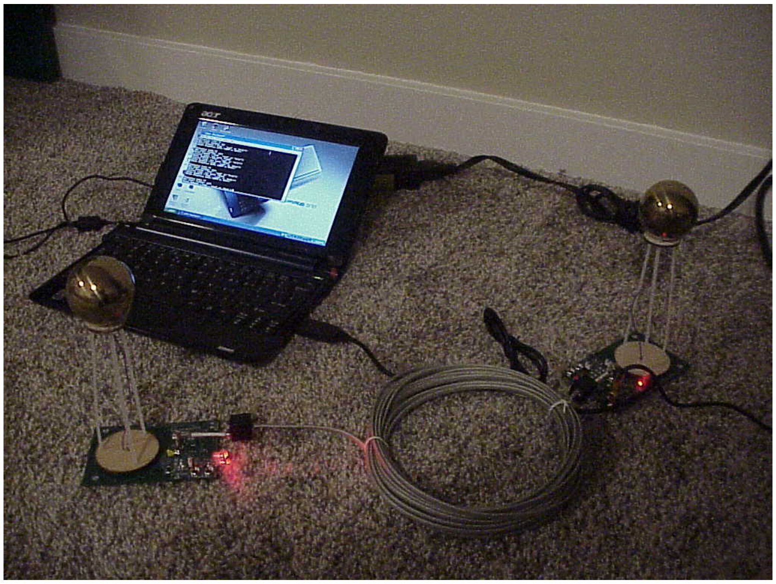
Click on "Setup". Drag pointer to "Serial port".



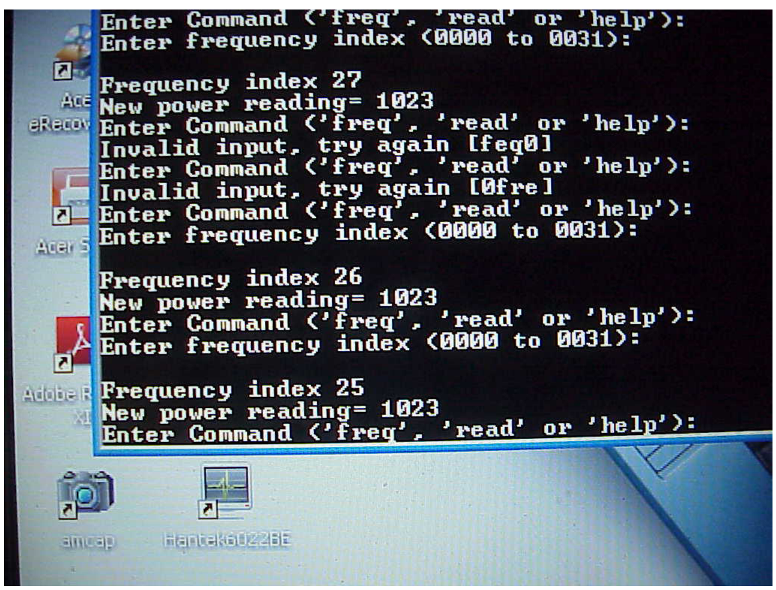
Scroll down and select “2400” baud. Click OK.



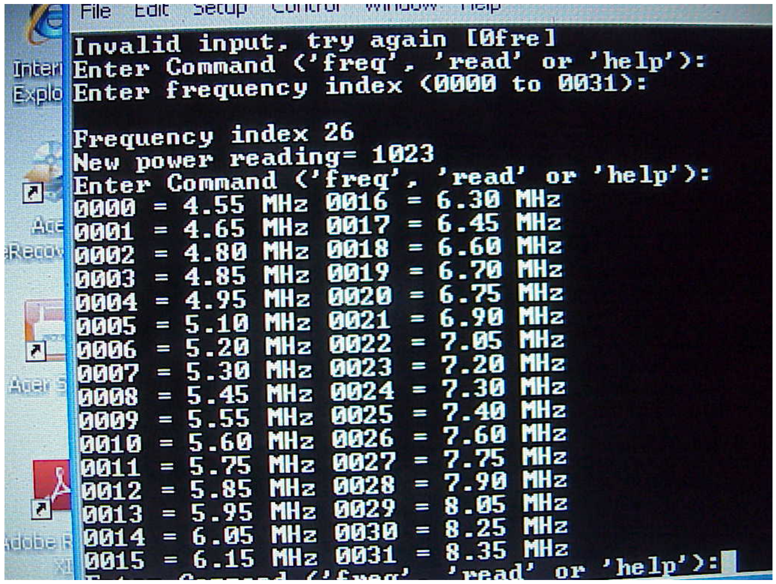
Shown above during step 5 of its 31-step automated tuning process and having pressed the RESET button on the Scalar Wave Starter Kit, the user interface echoes its activity. Sweeping through 32 available tuning frequencies, 0 to 31, it displays the relative power level 0-1023 attributed to the receiver chracteristic at each tuning step. After all 32 steps are recorded the microprocessor selects the tuning step with the highest reading, and under certain conditions this will illuminate the receiver LED. For example the display above shows 5:151 with meaning it is on step 5, and it is reading 151 out of 1023 of relative receiver power. The LED became illuminated brightly at a count of 26 out of 32.



Teraterm User Interface is useful to store frequency response data in a text file for review. Teraterm has a quirk where the text file name must, to prevent loss of data, be specified before recording test data. The receiver's LED is illuminated above and has been re-tuned using the laptop and user interface, after RESET and cycling through 32 tuning frequencies. Observed the illuminated receiver LED was brightest at frequency index 26 in this case, with the 25-foot coil of one-wire shown above.



Examining the power level during adjustment of the frequency index: at this close range the receiver reports 1023, it is at maximum. Frequency index 26 (7.6MHz) corresponded to the bright LED illumination as seen by eye. Each typing error shown above echoes the user's invalid input and beeps.

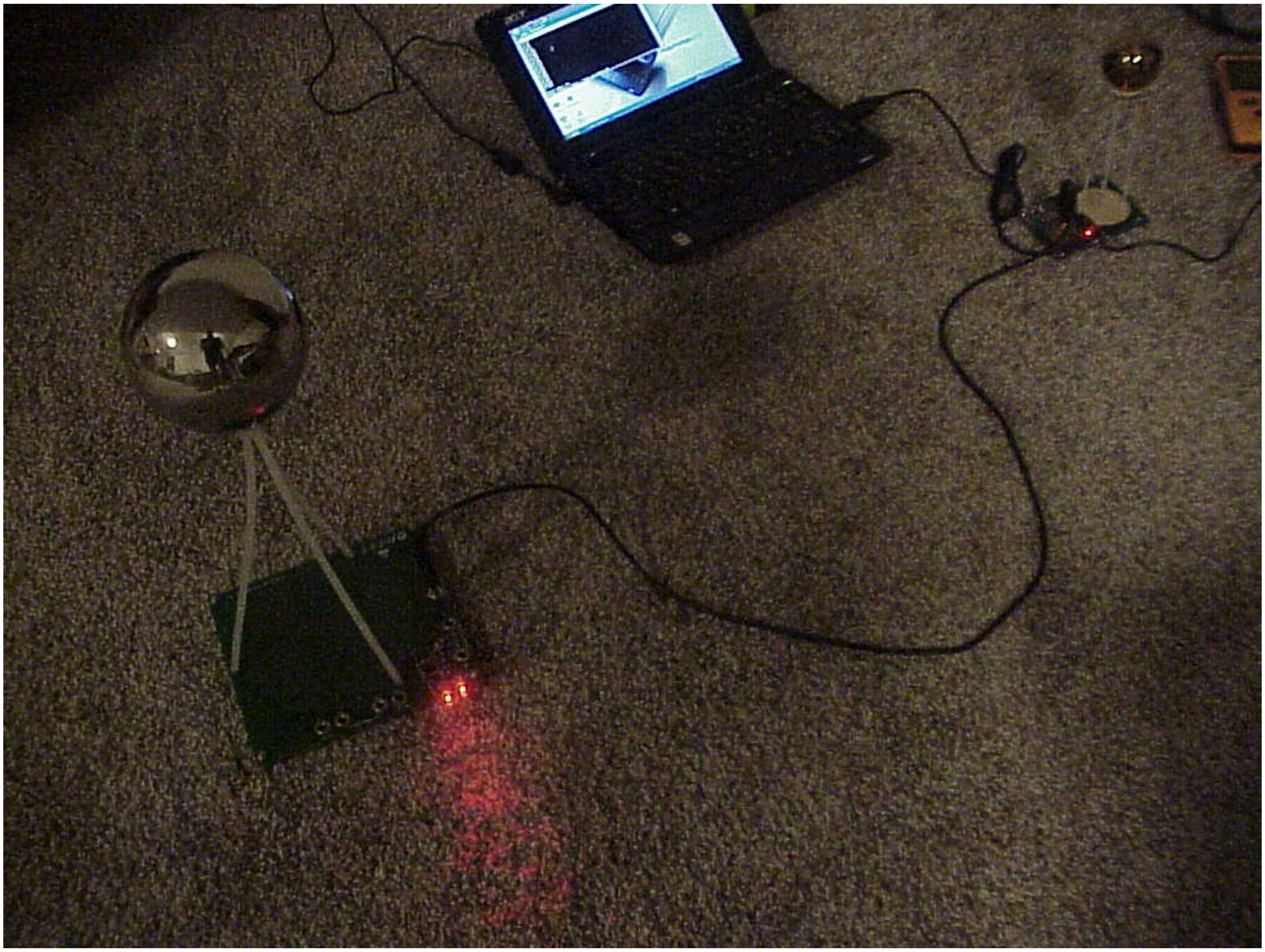


Type “help” (see above) to look-up the frequency, ***see how index 26 is really 7.60MHz***? The displayed power reading was 1023 at illuminated frequency index 26; any higher than that, the reading becomes inaccurate due to over-driving the circuit card's sensor input (transmitter and receiver are too close together in this instance). The receiver to transmitter distance is preferred to be far away and out of direct line of sight for enabling accurate power readings over all 32 frequencies the transmitter is capable of producing. The Transmitter reading near 1023 implies to move the receiver farther away.

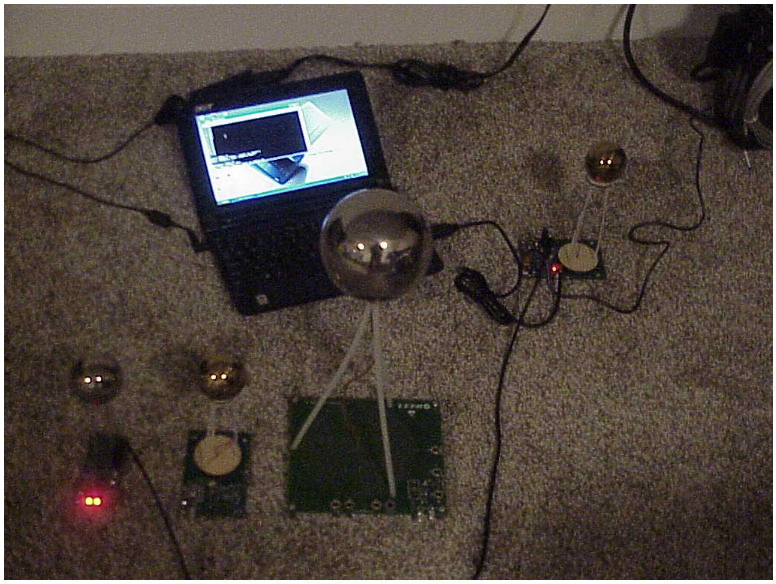
Plotting these readings indicates where in frequency the two peaks of interest lie (The lower frequency Transverse wave and the higher frequency Longitudinal or scalar wave). Which of these waves could dominate at close distance and overload the transmitter's sending amplifier as shown above? The answer is Both, but at long distance the Transverse wave is excluded as it is very weak whereas the Scalar wave can lock-in its resonance and travel long distances.

The Transmitter's self-power measurement feature 'feels' the presence of the receiver and wants to be tuned accordingly. The power measurement feature of the Scalar Wave Starter Kit is intended for use as assisting the operator in far-field measurements. Measurements include different scatterons “Application_Note_Assemble_and_Test_Spherical_Scatterons_27AUG17.pdf”, or measuring the current transmitted to the Receiver, “Application_Note_TransmitFirstToThirdFloor_26AUG17.pdf”.

It is possible to populate the receiver card with electrical components designed to powers-up and then communicate with the transmitter via the Scalar wave channel. A subsequent embodiment of the Scalar Wave Starter Kit transmitter includes a Programmable Gain Amplifier, however the Starter Kit does not contain that feature. Meyl asserted at a recently attended conference in Lyon that when in resonance, audible music can efficiently transferred by this type of scalar wave generator. Meyl offers this information on his website, http://www.k-meyl.de/xt_shop/product_info.php?info=p16_Scalar-wave-transponder.html.



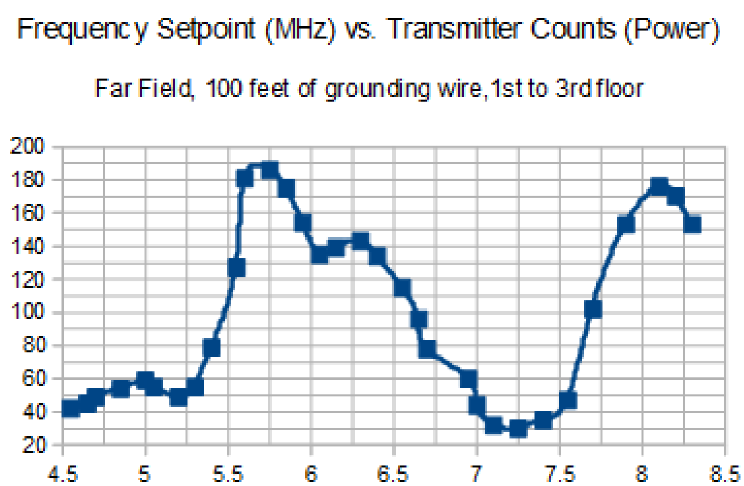
The Scalar Wave Starter Kit is designed to be compatible with Dr. Meyl's Experimental Kit, where it is shown above after the Transitter automatically selected the peak value and brightly illuminated Dr, Meyl's lower-frequency PCBA shown above and purchased as part of his kit http://www.k-meyl.de/xt_shop/product_info.php?info=p7_Experimental-Kit.html. Shown above, Meyl's LEDs are automatically illuminated by the Starter Kit transmitter (with its CPU and sensor) and one-wire connecting both together at a frequency of 7.9MHz.



In fact shown above, the tiny scalar wave circuit card (Above Left, not part of any Kit as of yet) is likewise designed to be compatible with the Transmitter. The medium size card of the Starter Kit (above, second from the Left) works better ergonomically for experimentation. Dr. Meyl's receiver is shown above secod from the Right. Above Right is the Scalar Wave Starter Kit Transmitter including features like its CPU controls the user interface, sensing and amplification.

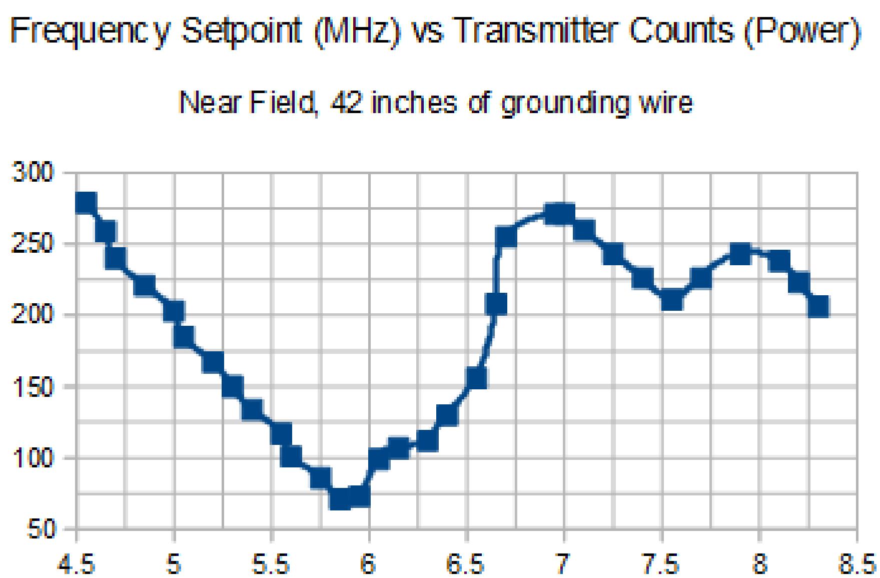
Graphing “Results Displayed” by Teraterm is straight-forward using the Starter Kit. This technology is somewhat finicky in the fact its tuning ability seems related to atmospheric charge, pressure, humidity, proximity to other objects, etc. Once tuned the scalar wave flowing from transmitter to receiver(s) is remarkably stable and free of interference due to e,g, proximity of the person handling the receiver. Further investigation can be performed with techniques described in Application Note, “App_Note_External_Generator_Tests_100ftWire_04SEP17.pdf”.

Discuss “Results Displayed”:



Copied above is the power reading vs. frequency data appearing on Page 3 of the Scalar_Wave_Starter Kit “4-Fold Brochure.pdf” . This plot was obtained (above), Experimentally. A new set of 32 repeatable results is displayed on the Teraterm user interface whenever the RESET button is pressed.

These results demonstrates peaking response recorded by the Transmitter as it “feels” the receiver. The circuit card amplifier recorded firstly a Transverse 5.7MHz then a short time later the Longitudinal 8.1MHz (notice the characteristic ratio 5.7MHz/8.1MHz = 1.4). The receiver LED at the end of the 100-foot of stretched-out one-wire however was observed brightly lit only with the 8.1MHz longitudinal wave frequency. The Transverse wave although higher in amplitude, did not illuminate the receiver LED at the end of the stretched-out 100-foot length one-wire. The Transverse wave has been shown to follow the inverse-square law hence diminishes amplitude rapidly with distance between scatterons. Indeed at close-range between transmit and receive scatterons, the receiver LED will become illuminated at both of these frequency modes. And a fascinating feature of Scalar Waves is demonstrated: at farther distance between scatterons, only the higher frequency longitudinal (scalar wave) is able to transfer enough energy to illuminate the remote LED. That's because the scalar wave is fundamentally different than the Transverse wave and represented as mathematical curl, vortex flow between transmitter and receiver as driven by the Scalar Wave Starter Kit near 8 MHz. A plausible model for how Electric field waves Vortex and flow off of the transmitter and receiver's spiral conductor; travel up the wire and around the scatteron and a portion thereof receivable by other similarly tuned scatterons.

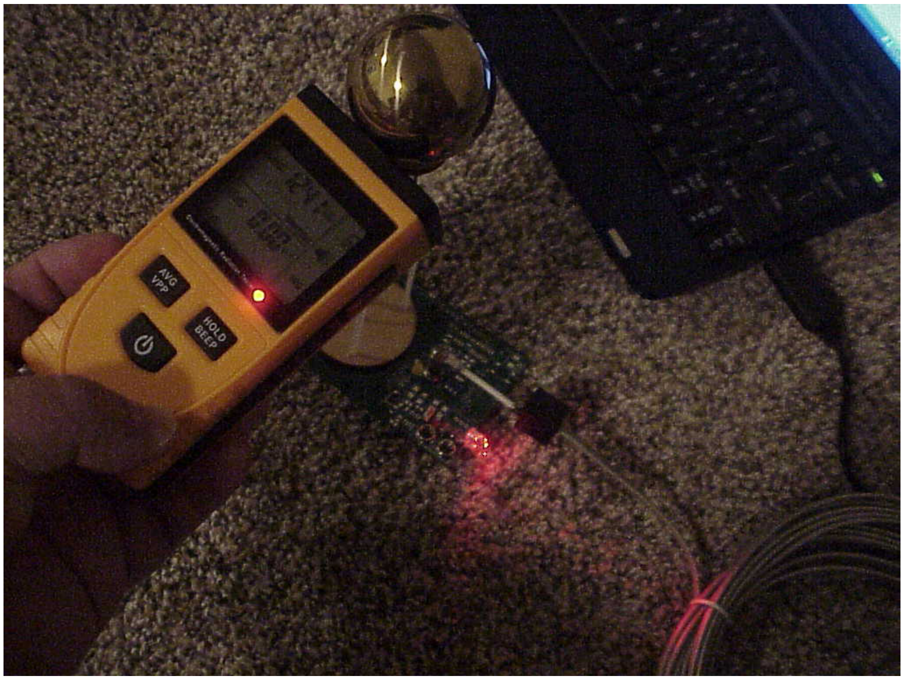


The near-field result is shown above with the transmitter and receiver connected with only 42 inches of one-wire. This near-field result at 8MHz registers a relative power of 250 counts (maximum measurable power level by the Kit is 1023 counts), as sensed by the Transmitter, with the Receiver at the end of 42 inches of one-wire. Comparison is made with a somewhat lower 170 counts power level, recorded and shown above with the Transmitter connected through 100-feet of extended one-wire, attached to its Receiver at the end of 100-feet of extended one-wire.

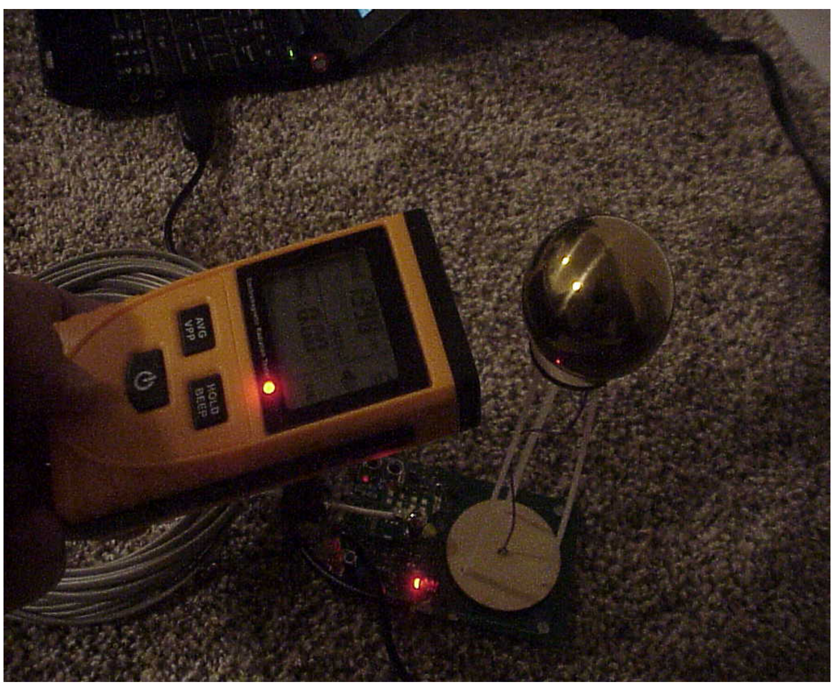
At 8MHz the Scalar waves are readily picked up and collected in the far field (converted to usable power at the receiver).

ELECTROMAGNETIC FIELD STRENGTHS

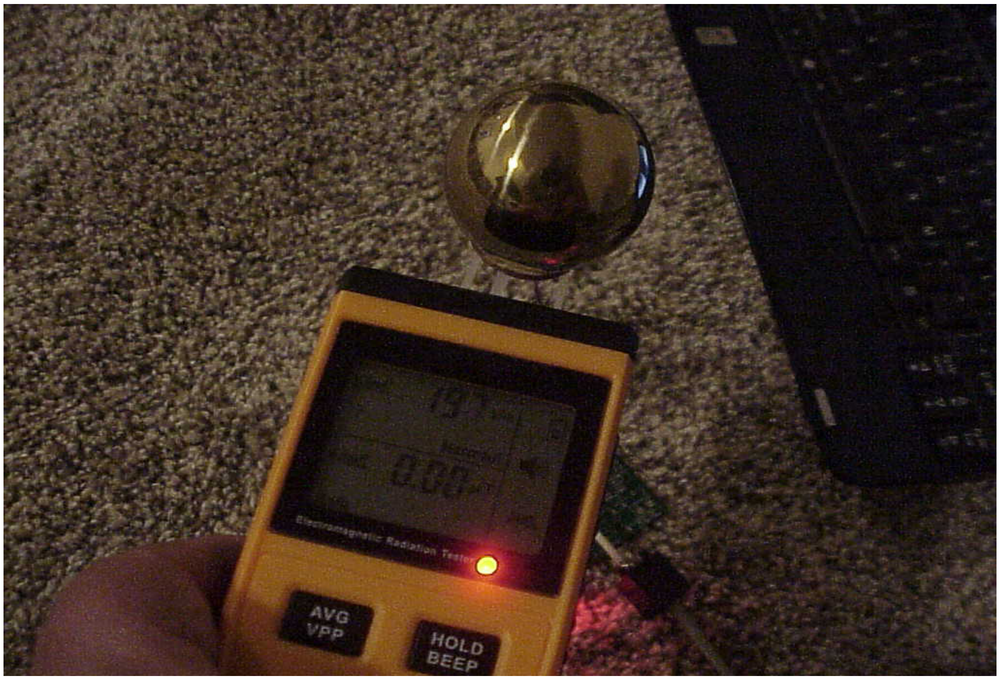
The Starter Kit includes a field strength meter used to quantfy and visualize the field distributions.



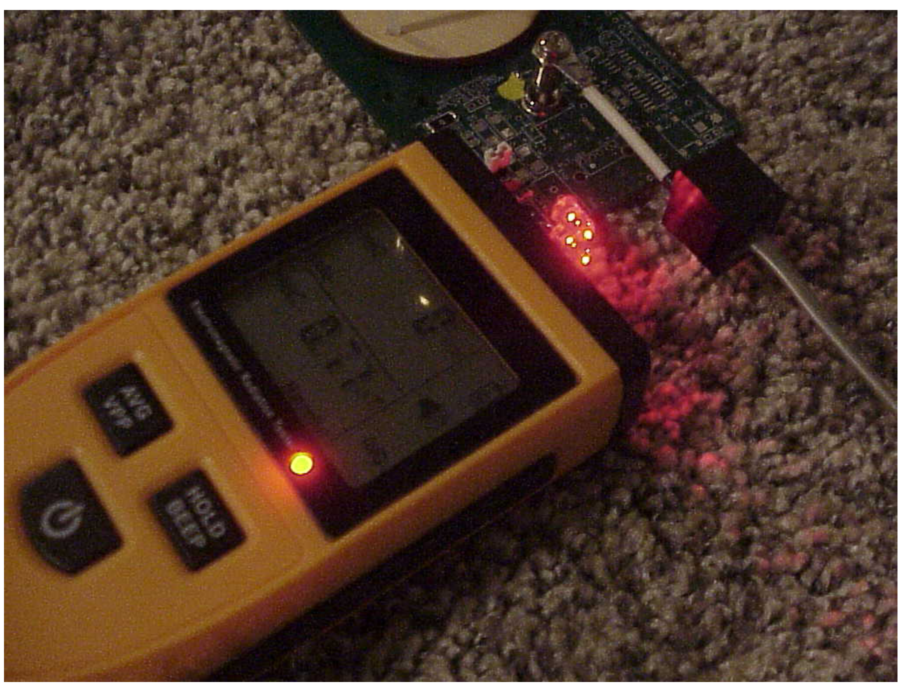
Through 25 feet of one-wire above, the measured electric field at the receiver card reads 1241 V/m. (notice the LED is illuminated because the transmitter is tuned to the receiver). Electric field strength was measured with the handheld meter placed against the receiver.



The transmitter emitted 1398V/m electric field strength one inch away (and 0 uT).

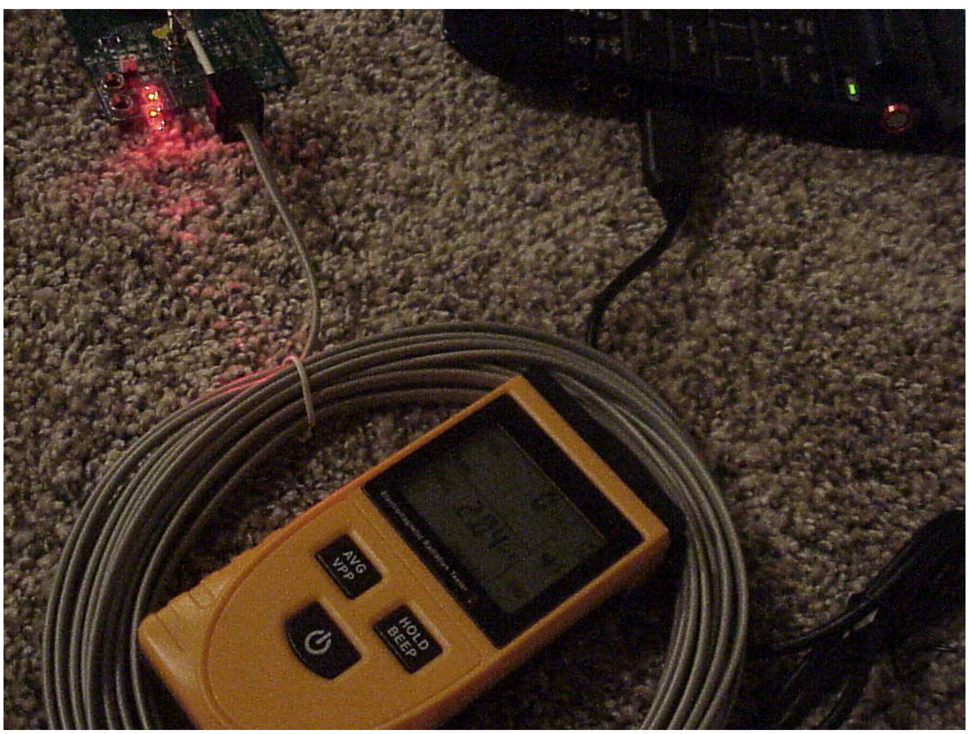


The receiver registers 197 V/m electric field strength near the scatteron. These scatterons are too close together. Moving them apart might be a good idea, as described in "Application_Note_TransmitFirstToThirdFloor_26AUG17.pdf", wherein the peak electric field strengths were nearly equal and at much greater distance. The maximum value the meter can read is 2000V/m.

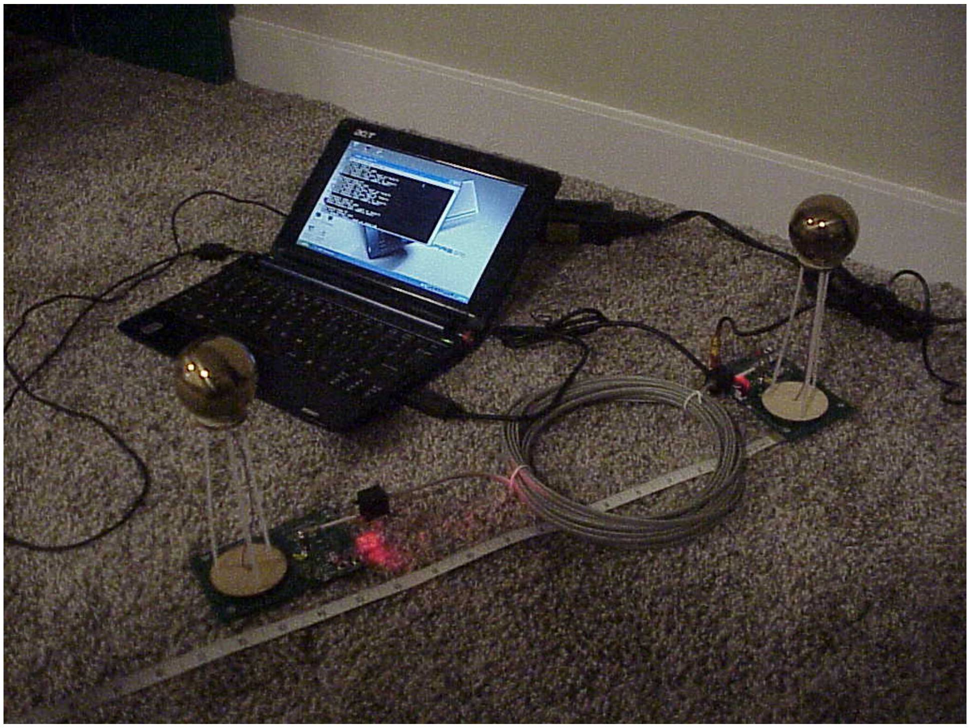


The RF meter reads 0V/m and 0.77uT adjacent to the illuminated receiver LED's, powered by 25-feet of coiled one-wire, connected from the transmitter card to the receiver card.

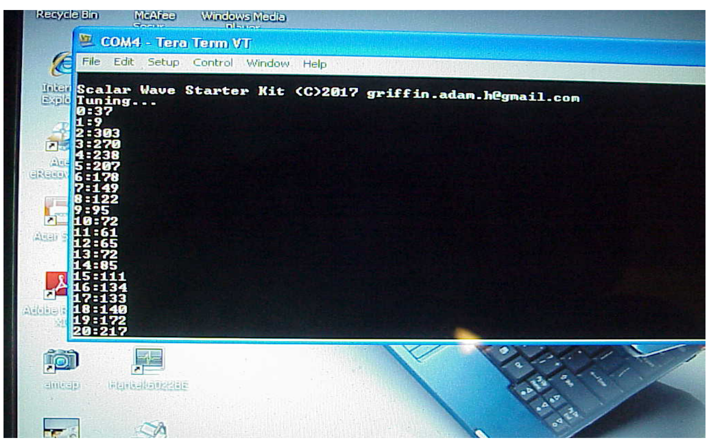
The 25-foot coiled one-wire measures 64V/m on its outer diameter and 4.3uT, mostly magnetic energy picked up and electric field strength is small around its perimeter (while the receiver is tuned and its LEDS brightly illuminated scatterons and 25-foot coil of one-wire).

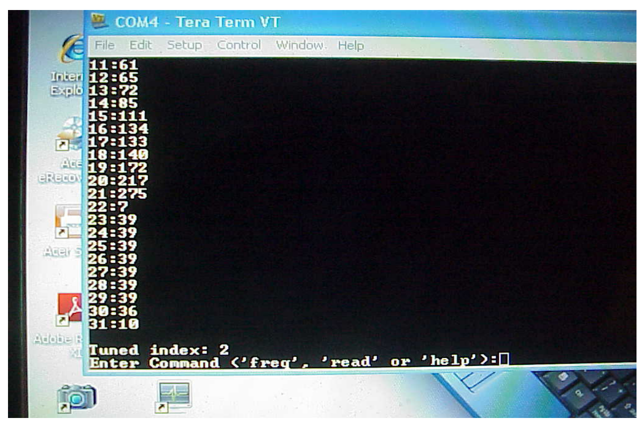


The 25-foot coiled connecting wire measures 2.2-2.4uT inside its diameter and electric field strength of 0 V/m was measured (while the receiver is tuned and its LEDs brightly illuminated through this 25-foot coil of one-wire and the scatterons).



Test setup with visible inch-marks on the measuring tape. The two scatterons are globe-shaped. The scatteron sits above a pancake-shaped spiral coil on the surface of its attached circuit card. The transmitter is illuminating the receiver LED through 25 feet of coiled one-wire and returning through the globe shaped scatterons. This effect of lighting Receiver LEDs through 100 feet of extended wire is in Application Note, “App_Note_External_Generator_Tests_100ftWire_08SEP17.pdf”.





Observe the false values of 39 seen above Right, with a 42-inch one-wire, during Self-Tune subsequent to pressing the RESET button - steps 23 to step 29 saturated the fixed-gain input amplifier. The actual values are actually very large (larger than 1023) but the saturated amplifier analog input causes instead false report of a low value, in this case it is incorrectly reported as 39. The algorithm in this case incorrectly selected the highest measured relative power value of 303 at frequency index 2 or 4.8MHz.