

# WALLYANALOG SHOP OWNERS MANUAL

## **I. Introduction**

Your WallyAnalog Shop is engineered to overcome the inaccuracy and limitations that other azimuth alignment methods are subject to without having to use expensive test equipment and complicated procedures. With the WallyAnalog Shop, it is not necessary to know anything about electronics or engineering to properly adjust your azimuth.

Your WallyAnalog Shop has been designed to provide the following functions necessary for the optimization of your analog system:

1. WallyAzimuth Alignment
2. WallySpeed Calibration (turntable RPM)
3. System Burn-in with adjustable current for:
  - a. Electronic Components
  - b. Speaker Cables
  - c. Interconnects *\*(Deluxe model only)*
  - d. Phono Cable/Tonearm Wires *\*(Deluxe model only)*
4. MC Cartridge Passive Degaussing *\*(Deluxe model only)*

### **The WallyAnalog Shop includes:**

- ?? WallyAnalog Shop interface box
- ?? Digital multi-meter capable of measuring frequency (hertz)
- ?? Connector Accessories: *\*(Deluxe model only)*
  - ?? Dummy cartridge adapter (for phono cable burn-in)
  - ?? DIN adapter (for phono cable burn-in)
  - ?? female-to-female RCA connectors (for burning-in multiple pairs of interconnects.)
- ?? Cardas Frequency Sweep and Burn-In Record
- ?? Ayre System Enhancement CD
- ?? Volt-dB conversion table
- ?? WallyAzimuth Measurement Chart (worksheet)

## **II. WallyAzimuth Alignment Procedure**

Please refer to the Wally Turntable Setup Instructions to determine that cartridge alignment, tracking force, VTA and anti-skating have been setup properly. These adjustments should be optimized before proceeding with the WallyAzimuth alignment.

1. Set your preamp volume to zero and make sure your system is powered off. Place the WallyTractor (or other thin mirror) on top of the platter without a record. Drop your stylus onto the WallyTractor in an area that does not have any tracings on it. Use your magnifying glass (4X power) to roughly adjust your geometrical azimuth so that the stylus/cantilever/cartridge is perfectly in line with the reflection in the mirror. Lift the tonearm and place it safely on the armrest.

2. Disconnect your speaker cables from your speakers and connect to the binding posts on the WallyAnalog Shop.
3. Insert the pointed leads from your multi-meter into the terminals on the front of the WallyAnalog Shop. You must have the black lead in the "COM" jack and the red lead in the "V?" jack at the meter. Set your meter's dial to the 20 Volt setting (about two o'clock on the dial) and the upper right hand slide switch to read "AC". Turn the meter power on. Set the channel toggle switch on the WallyAnalog Shop to "Left Channel" and the function switch to "Azimuth". Power up your system.
4. Queue up the start of the fifth track on side one of the Cardas Frequency Sweep and Burn-In Record. The first part of this three-part track (5a) gives a very stable and accurate 1 kilohertz tone into both channels followed by the same tone into the left channel only (5b) and then the right channel (5c). For azimuth adjustment, you need only the last two parts of the track, but for now you will start at the beginning of track 5 to determine the proper volume setting and channel balance. With the beginning of the track playing (5a), increase your volume control until the meter reads between 4 and 5 volts. Do not increase past 8 volts, as you could burn out the fuses.
5. With track 5a still playing, flip the channel switch to the "Right Channel" position and note the Voltage reading. If the Voltage readings for left channel and right channel are off by more than 5% (about 0.2V), use your balance control to equalize the output between channels. Once balanced, flip the channel switch back to the "Left Channel" position.<sup>1</sup>
6. Once the second part of the track begins (left channel signal – track 5b), note the Voltage reading.<sup>2</sup> Do not worry about slight fluctuations in the reading - this is normal and is simply surface noise on the record itself. Take the lowest reading that appears and write it in the appropriate cell on the WallyAzimuth Measurement Chart. Referring to the conversion chart, find this Voltage (or round to nearest) and record the Decibel conversion on the WallyAzimuth Measurement Chart.
7. With the second part of track 5 still playing (left channel signal – track 5b), flip the channel switch to the "Right Channel" position and take another reading from the meter. Again, the reading will fluctuate a bit. Take the lowest reading you see and refer to the conversion chart and record the corresponding Decibel level in the appropriate cell on the WallyAzimuth Measurement Chart.<sup>3</sup>
8. When the third part of track 5 begins (right channel - track 5c), take a new meter reading with the channel switch still in the "Right Channel" position. You are now reading the Voltage level of the right channel with the signal coming in on the right channel. Again, record the Voltage and convert to Decibels.
9. Flip the channel switch back to the "Left Channel" position before track 5c comes to an end. Record the Voltage and convert to Decibels.
10. To determine crosstalk, follow the instructions on the WallyAzimuth Measurement Chart: subtract the right channel Decibel reading from the left channel Decibel reading for the left channel signal only. Do the same for the right channel signal: right Decibel channel reading minus the left channel Decibel reading.
11. You are now left with two figures: the crosstalk between channels as measured from the left channel signal and the right channel signal. Your goal for proper azimuth setting is to get the two crosstalk readings (in Decibels) to equal each other. 1.0dB is very good and 2 to 3dB is

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<sup>1</sup> Do not use your azimuth alignment as a balance function in your system. Use only the balance control on your preamp for this purpose.

<sup>2</sup> There is a four second delay between tracks. You will notice this when your meter readings suddenly drop.

<sup>3</sup> You may wish to momentarily switch to the 2V setting on the meter to take a more precise reading.

acceptable. Cartridge manufacturers do not all install their coils in a perfect 90 degree relationship to each other nor in a 45 degree relationship with the top of the cartridge mounting surface. Therefore, is no rule as to which direction you must tilt the cartridge in order to minimize crosstalk and have it equal in both channels. You must experiment at this point and have at least two measurements in order to determine which way to tilt. Apply azimuth correction to your tonearm NOTING WHICH DIRECTION YOU HAVE TILTED THE CARTRIDGE.<sup>4</sup>

12. Repeat steps 6 through 11 as necessary. Compare your new crosstalk numbers (in Decibels). If the two numbers are getting closer together, you are adjusting the azimuth in the proper direction – unless, of course, you have gone too far and passed the proper azimuth alignment. If, for example, your right channel exhibits a higher crosstalk and after an adjustment the left channel crosstalk is higher, you have tilted the cartridge too far. Alternatively, if the difference between two channel's crosstalk increases you have gone in the wrong direction. Take your time here to make as many measurements as necessary. Your efforts will pay off in better stereo effect (staging, instrument location and separation.)

**!!Very Important Note!!** After finding the point of even crosstalk between channels, if you can clearly see that the top of the cartridge is tilted (viewed from head-on), DO NOT USE the alignment setting. The mounting of the coils in the cartridge is faulty. The extreme tilt of your stylus may cause damage to your precious records. Contact the manufacturer of the cartridge for realignment or replacement.

### III. WallySpeed Calibration Procedure

1. Power off your system. Disconnect your speaker cables from your speakers and connect to the binding posts on the WallyAnalog Shop. Power-up your system and turn the preamp volume to zero.
2. Insert the pointed leads from your meter into the terminals on the front of the WallyAnalog Shop. You must have the black lead in the “COM” jack and the red lead in the “V?” jack at the meter. Set the meter's dial to the 20 Volt setting (about two o'clock on the dial) and the upper right hand slide switch to read “AC”. Turn the meter power on and queue up the start of the fifth track of side one of the Cardas Frequency Sweep and Burn-In Record. Slowly turn up the volume at the preamp until the meter reads 3 to 4 Volts.
3. Set the meter to read frequency (Hz). It is not important what channel you have the WallyAnalog Shop set to read for this test. Set the function switch to “Azimuth”.
4. With the turntable spinning at 33 1/3 rpm, re-start the fifth track on side one of the Cardas Frequency Sweep and Burn-In Record. The first part of this three-part track gives a very stable and accurate 1 kilohertz tone into both channels followed by the same tone into the left channel only and then the right. Keep in mind that if you have the channel switch to read the right channel, you will not get a signal when the test tone is only in the left channel.
5. You want to get a reading as close to “1.000 kHz” as is possible. Adjust your speed control as necessary to get this reading. For 45 rpm calibration, adjust the speed to read “1.350 kHz”. It is recommended to use 1 or 2 Hz over 1kHz.

Note: The digital multi-meter that is sold with the WallyAnalog Shop has been calibrated for maximum accuracy. A perfect 1kHz signal was fed through the multi-meter and the resulting

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<sup>4</sup> You may use the “notes” box on the WallyAzimuth Measurement Chart to remind yourself which way you have tilted the cartridge.

meter reading was taken. The calibration sticker is on the backside of the meter. You will have to adjust your frequency reading according to the number written on this sticker. If the read-out says "1.005kHz", this means the rotation speed of the platter is too fast by 0.5%. A read-out of "0.994kHz" indicates the rotation is 0.6% too slow.

#### **IV. System Burn-in Procedures**

The WallyAnalog Shop is designed to provide an 8-ohm resistive load for your amplifiers. You can now safely break in all of your components and cables without having to listen to the atrocious burn-in tracks day and night! The WallyAnalog Shop can be used to burn-in:

- ?? Electronic Components
- ?? Speaker Cables
- ?? Interconnects *\*(Deluxe model only)*
- ?? Phono Cable/Tonearm Wire *\*(Deluxe model only)*

Since the stereo system does the work of burning-in, the electronic components used in the chain will all get a full burn-in whether you want to burn-in speaker cables, interconnects or phono-cables.

#### **General Burn-in Procedure**

After powering off your system, disconnect your speaker cables from your speakers and attach to the binding posts on the WallyAnalog Shop. Insert the pointed leads from your meter into the terminals on the front of the WallyAnalog Shop. Set the function switch to "Burn-in" *\*(Deluxe model only)*. You must have the black lead in the "COM" jack and the red lead in the "V?" jack at the meter. Set your meter's dial to the 20 Volt setting (about two o'clock on the dial) and the upper right hand slide switch to read "AC". Turn the meter power on. Power up your system with your preamp volume all the way down.

To begin burn-in, play tracks 4, 5 and 6 of the Ayre System Enhancement CD (the brown noise on track 6 has the closest spectrum to a musical signal.) Program your CD player to repeat these three tracks continuously.

Slowly turn up your volume control until the meter reads about 5 Volts (6V maximum), but no higher. This is the level you should burn-in your system and cables at (with the exception of the phono cable/tonerarm wire as noted below.) You may now turn off and disconnect the multi-meter. Allow burn-in as long as you like! The WallyAnalog Shop may get a bit warm during burn-in. Do not obstruct the ventilation holes on the chassis.

#### **a. Speaker Cables**

The WallyAnalog Shop is designed to burn-in your speaker cables without the annoying noise generated by speakers. At 5 Volts input, the speaker cables will be carrying approximately 0.6 Amps AC. For effective burn-in, allow at least 12 hours at 5 to 6 Volts.

#### **b. Interconnects *\*(Deluxe model only)***

The procedure for interconnect burn-in is identical to the instructions above with the exception that the interconnects must be connected to the WallyAnalog Shop Deluxe interface box via the RCA connectors on the rear of the box. Connect one end of the interconnect to one red (right) RCA jack and the other end of the interconnect to the other red RCA jack. To burn-in multiple sets of interconnects simply place the female-to-female RCA connector between interconnects. *See illustration for details.* Do not bridge interconnects between the red and white RCA jacks.

It is not important which orientation you choose for hooking up interconnects for burn-in. It is a widely held audio marketing myth that wire is directional. Think about it...there is no direction to alternating current – it travels both directions equally. It is the location of the termination of the shielding of some interconnects that can have an effect on the sound and does constitute ‘directionality’. Properly terminated interconnect shields are terminated at only one end of the cable. Because shielding is terminated at only one end, current does not flow through the shield, leaving nothing to burn-in as far as the shielding is concerned. Therefore, do not concern yourself with the orientation of interconnects during burn-in.<sup>5</sup>

By using only 5 Volts for burn-in, the interconnects are carrying 100 milliAmps AC. This is several thousand times higher than the interconnect carries during normal music playback.

c. **Phono Cable/Tonearm Wire** *\*(Deluxe model only)*

**DANGER: DO NOT ATTEMPT TO BURN-IN PHONO CABLE WHEN TONEARM WIRES ARE CONNECTED TO THE CARTRIDGE. SERIOUS DAMAGE TO THE CARTRIDGE WILL RESULT.**

**\*\*Phono cable/tonerarm wire burn-in is recommended before installation of the cartridge\*\***

Follow the General Burn-in Procedures above for phono cable and tonearm wire burn-in but **do not exceed 2 Volts!!** This will limit the current through the phono cable and tonearm wires to 40 milliAmps AC. At 40 milliAmps, you are using several thousand times the current you get when playing music through the cartridge!

Connect the RCA plugs of the tonearm cable to the left and right RCA outputs on the rear of the WallyAnalog Shop Deluxe interface box. Included with the WallyAnalog Shop Deluxe is a dummy cartridge. Disconnect the clips from your cartridge and, if possible, remove cartridge from tonearm altogether. Plug in dummy cartridge to the tonearm wire clips according to color codes. *See illustration for details.*

For removable phono cables with DIN terminations a DIN adapter will be available in the future. This option, however, does not burn-in the tonearm’s internal wire.

**V. MC Cartridge Passive Degaussing** *\*(Deluxe model only)*

There is a belief that after prolonged usage of moving coil cartridges, the coil assemblies develop residual magnetism. There are two opposite philosophies existing to deal with this problem. The first is the belief that the level magnetism in the coils is so low as to be insignificant to musical reproduction. The second school of thought is to use “active demagnetization” to eliminate any residual magnetism.

The typical cartridge demagnetizer generates a low Voltage alternating current. White papers have been published by at least one cartridge manufacturer stating that usage of active demagnetization can actually deteriorate the primary magnetic structure within the cartridge. Repeated active demagnetization will deteriorate overall cartridge performance. In order to

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<sup>5</sup> In the case of mono-crystal metallurgical technology there could be some micro-diodic effects that would have an influence on sound during music playback. However, for burn-in it is simply not important to pay attention to directionality.

provide coil demagnetization while avoiding damage to the cartridge's magnetic structure, the WallyAnalog Shop Deluxe performs passive cartridge demagnetization. The principle of operation is based on allowing the maximum current to flow through the coils when the cartridge plays pink noise with the left and right channels out of phase with each other.

On side 2/track 3 of the Cardas Frequency Sweep and Burn-In Record are 32 locked grooves with vertical modulation. These 32 grooves are all identical with the left and right channels out of phase with each other. This track is very suitable for passive degaussing using the WallyAnalog Shop Deluxe.

Disconnect the tonearm cable from your phono section – making sure the tonearm clips are connected to the cartridge. Connect the phono cable's RCA plugs to the dedicated jacks on the front of the WallyAnalog Shop Deluxe. Play any one of the 32 grooves from side 2/track 3 of the Cardas Frequency Sweep and Burn-In Record.

Each minute of continuous play in one of the 32 grooves creates similar wear patterns as having played an entire record 33 times. Therefore, it is recommended to change the groove every one or two minutes. The demagnetization process requires approximately 10 minutes of playing time.

The passive demagnetization provided by the WallyAnalog Shop Deluxe is very safe for the magnetic structure of your cartridge, yet allows 10 to 1000 times more current to flow through the coils versus having the tonearm cables plugged into your phono section. Unlike musical recordings, the Cardas track gives you out-of-phase signals in the left and right channels - the most suitable for eliminating any residual magnetization in the cartridge coil structure. Repeat degaussing procedure every 200 hours of play.

## **VI. Troubleshooting**

Below are a few of the issues owners may encounter from time to time when using the WallyAnalog Shop. Should the answer to your issue not be included here, please feel free to contact Wally Malewicz directly at 763-478-6685 from 9am to 9pm CST on any day of the week.

<b><u>Problem</u></b>	<b><u>Remedy</u></b>
No meter reading for Voltage in one or both channels	Fuse may be burned out. Touch the probes to the speaker terminals to ensure a signal exists. If Voltage is present at the speaker terminals but not the meter terminal, the fuses are probably blown. Replace with slow blow 1.25 to 1.50A fuse.  Meter may be set incorrectly or low on battery. Ensure your probes are inserted in the proper holes and the settings are for AC volts and the dial is at the proper range.
No meter reading for frequency (Hz) in one or both channels	Switch meter to 20 Volt range to determine whether a signal is reaching the meter. If no Voltage is present, make same measurement

at the speaker terminals. If a signal exists at the speaker terminals but not the meter terminal, a fuse has probably blown. Replace with fast blow 1.25 to 1.50A fuse.

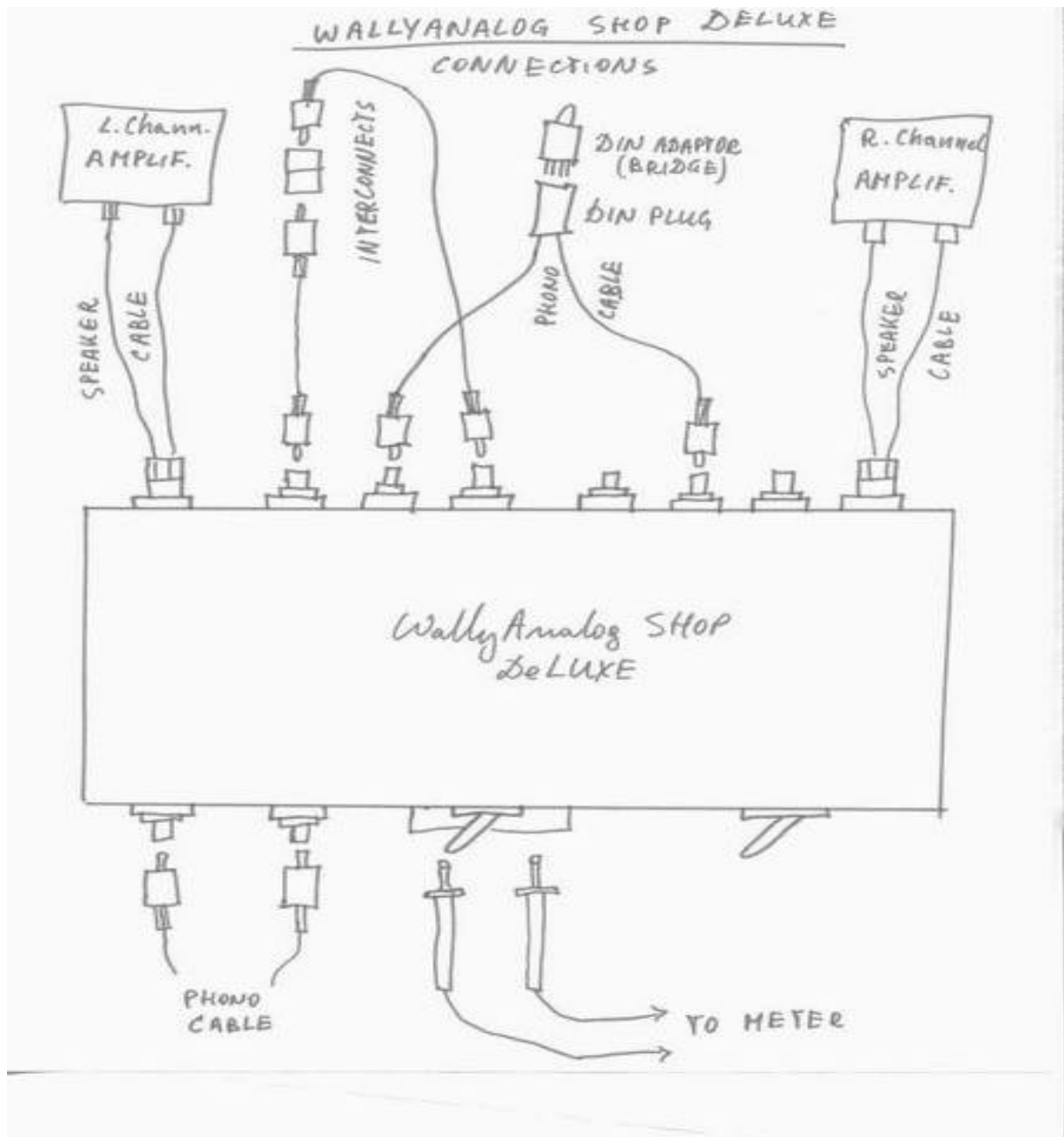
## **VII. FAQs**

***Why does proper azimuth alignment matter to music playback?*** Proper azimuth alignment allows for the greatest separation between left and right channels in your analog playback. This means a wider, deeper soundstage with pinpoint imaging.

***If I set the azimuth once, is it good forever?*** It is recommended to check the azimuth twice per year, particularly when the temperature and humidity changes because such atmospheric changes can cause mechanical shifts in the cartridge. If you have the cartridge re-tipped or repaired, you must check it again. No two cartridges (even of the same make and model) will have the same azimuth setting. Certainly, when you change arms, you must check as well.

***How is it that the WallyAnalog Shop can find perfect azimuth alignment irrespective of possible system-wide channel imbalances?*** The answer is simple: the significant numbers for our purposes are not the dB levels at the outputs, but the difference between the output of the first channel minus the output of the second channel when the signal is playing only in the first channel (and visa-versa).

***Why not use the often-suggested method of adjusting azimuth alignment using a mono track and inverted polarities at the cartridge – seeking minimum output from the speakers?*** This method is completely at the mercy of channel imbalances that almost invariably exist throughout the system. You simply cannot reliably find the point of maximum stereo separation between channels with this method. Channel imbalances frequently exist in every component – the cartridge coils, phono stage, preamp, amp and speakers. This is in addition to room reflections that can be more intense from one side of the room versus the other.



**CONNECTION DIAGRAM**



**Other WallyTools available:**

**WallyTractor** – The one and only! No other product gives you this accuracy in cartridge alignment. Each WallyTractor is specifically designed for your tonearm's effective length and not only aligns stylus positioning for overhang, but horizontal alignment of the cantilever for calculated offset angle as well.

**WallySkater** – The only product of its type on the market. Even the best tonearms have internal horizontal mechanical resistance. Find exactly where your anti-skating should be set in relation to your tracking force (recommended 8-10% of tracking force.)

**WallyScale** – The best tracking force meter bargain available. Two models – ?0.1 gram accuracy and ?0.01 accuracy – take tracking force readings exactly at record level.

**WallyVTA** – The most accurate vertical tracking angle referencing tool. To find your preferred VTA, knowing where your parallel reference lies is invaluable.

***ENJOY ANALOG MUSIC FOREVER!!!***