



FOZGOMETER V2 Azimuth Range Meter Owner's Manual

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FOZGOMETER V2

FOZGOMETER V2 Azimuth Range Meter



INTRODUCTION

Correct azimuth alignment of your phono cartridge's stylus assures the best sound and stereo imaging from your records. To achieve the best performance, your cartridge's azimuth must be calibrated. The FOZGOMETER V2 incorporates a very sensitive "Log Ratio Detector" to measure the channel separation and channel balance of your phono cartridge. It features higher sensitivity, a new meter design, and AC or battery power for more accurate azimuth calibration. Readings are made directly from your tonearm. The FOZGOMETER V2 optimizes your cartridge's azimuth using the Analogue Productions Ultimate Test LP. Line contact and Micro Line styli have a very small groove contact area as compared to elliptical styli, thus requiring finer adjustment. Proper azimuth will result in the highest channel separation and best channel balance. The FOZGOMETER V2 measures channel separation and channel balance as you horizontally adjust your cartridge's azimuth to get the best readings. The very sensitive FOZGOMETER V2 can measure small differences between the cartridge's left and right channels, based on the cartridge design and construction. Achieving the closest measurements, even if not identical, will result in higher performance and better sound. Matching the readings for the 2 channels is the goal. The strength of the readings, or how high the needle goes up in the meter, is based on the cartridge's generator design and output. The strength of the readings is less important than the close matching of the 2 channels.

Prior to Azimuth Measurement Procedure

Mount your phono cartridge with appropriate screws and attach the 4 lead wires, observing proper color connection. Right channel is red plus+ and green minus-. Left channel is white plus+ and blue minus-. Set the Vertical Tracking Force (VTF) per your cartridge manufacturer's instructions. Align your cartridge (overhang & offset for a radial arm, tangency for a linear arm) and recheck the VTF. Next, set the Vertical Tracking Angle (VTA/SRA) and anti-skate per your cartridge and tonearm specifications.

FOZGOMETER V2 Power

Connect the supplied outboard power supply to the FOZGOMETER V2 and plug into an AC power socket. You will need a plug adaptor for non-UL sockets. To switch to battery operation, open the unit, removing the four large Phillips head screws in the faceplate. Disconnect the internal connector and install the supplied 9-volt battery.

Close the unit and reinstall the 4 screws. Please note you can only use AC or battery power based on internal configuration.

FOZGOMETER V2 Connection

Connect your tonearm cable left and right RCA connectors to the corresponding left and right input jacks on the FOZGOMETER V2. You can also connect the FOZGOMETER V2 to the output of your phono preamp and when using an optical cartridge with equalizer.

Analogue Productions Test LP

Use the Analogue Productions Test LP #AAPT1, available from your Fozgometer dealer, for azimuth calibration. The following instructions detail using the FOZGOMETER V2 with Side 1, track 1 for channel balance, and Side 1, tracks 2 & 3 for channel separation.

Analogue Productions Test LP tracks

- Track 1: 1 kHz sine wave, Both left and right channels
- Track 2: 1 kHz sine wave, Left channel only
- Track 3: 1 kHz sine wave, Right channel only

Mechanical Meter Check

Check your FOZGOMETER V2 with the power both off and on to verify that the meter reads 0. See figure 1. To adjust, power on and turn the black meter trim screw located at the lower middle of the meter until the needle points closest to ZERO.

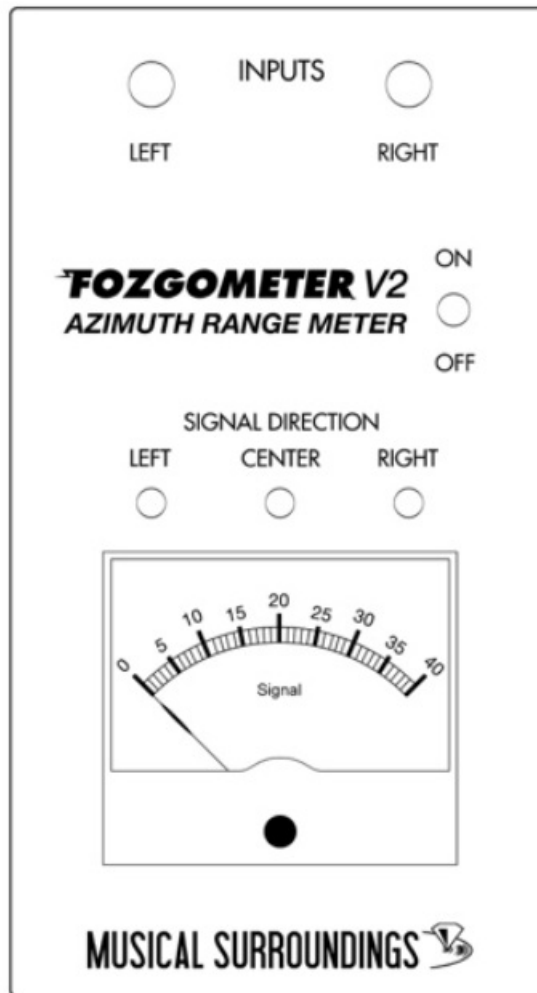


Figure 1, Meter 0

Patience is a Virtue

Given the small profile of modern styli, adjusting azimuth may require many small adjustments.

Azimuth Measurement Procedure

Lower your phono cartridge on the stationary Test LP. Visually examine cartridge lowered on test record, viewing from the front. Adjust tonearm headshell so top of cartridge is parallel to record surface. You will use this physical adjustment of your tonearm headshell later to fine tune azimuth. Cue up your tonearm.

Channel Balance

Turn on your turntable to 33.3 RPM and play Track 1 on the Test LP. If the channels are balanced, the meter will read near zero and only the CENTER light will illuminate. See figure 2.

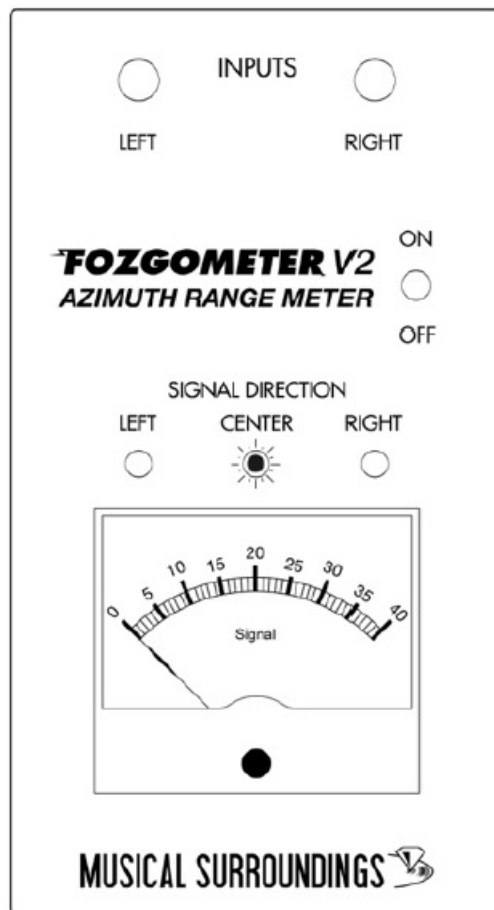


Figure 2, channel balance ideal

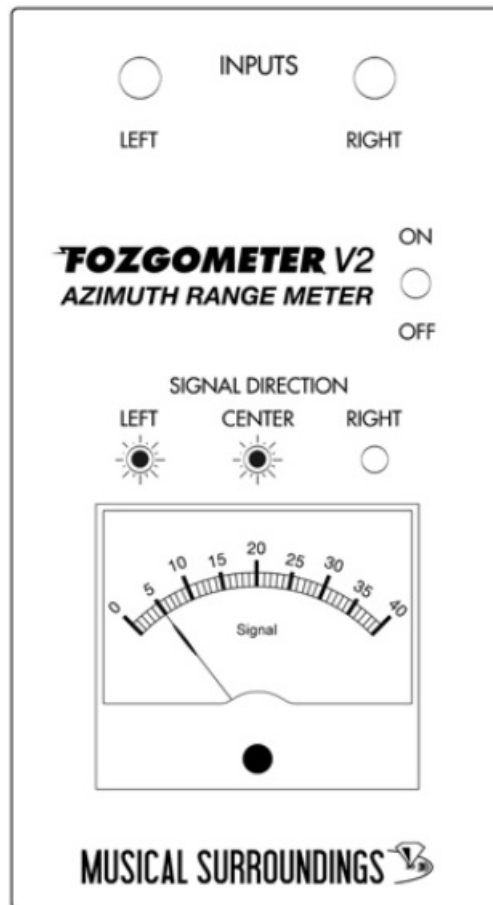


Figure 3, Left channel balance off

If channel balance is off, the CENTER light will illuminate and a channel light, signifying that channel's imbalance, will illuminate with the meter displaying the amount. The more intense the illumination also indicates higher channel imbalance. Take note of the imbalanced channel and the amount. After adjusting azimuth as detailed below, re-check your channel balance.

Azimuth Adjustment

1. Turn the power switch to the "on" position. With no track playing, only the SIGNAL DIRECTION CENTER light will illuminate, and the meter will read zero.
2. Play Track 2 on Test LP and the LEFT SIGNAL DIRECTION indicator should light (if the right indicator lights, the channels are reversed and need to be corrected). Note the meter reading as in figure 4.

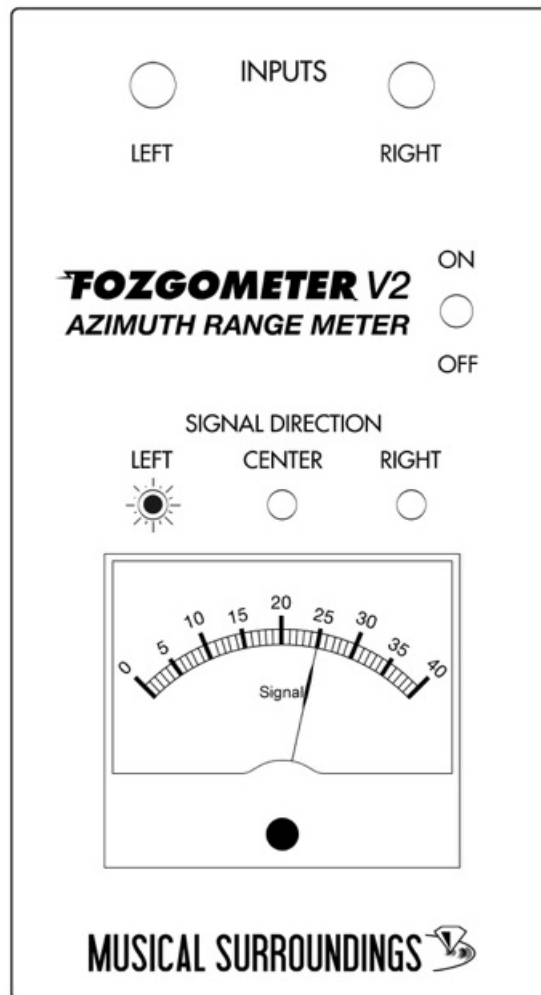


Figure 4, Left 25

3. Play Track 3 on Test LP, the right signal indicator should light. Observe the reading as seen in figure 5.

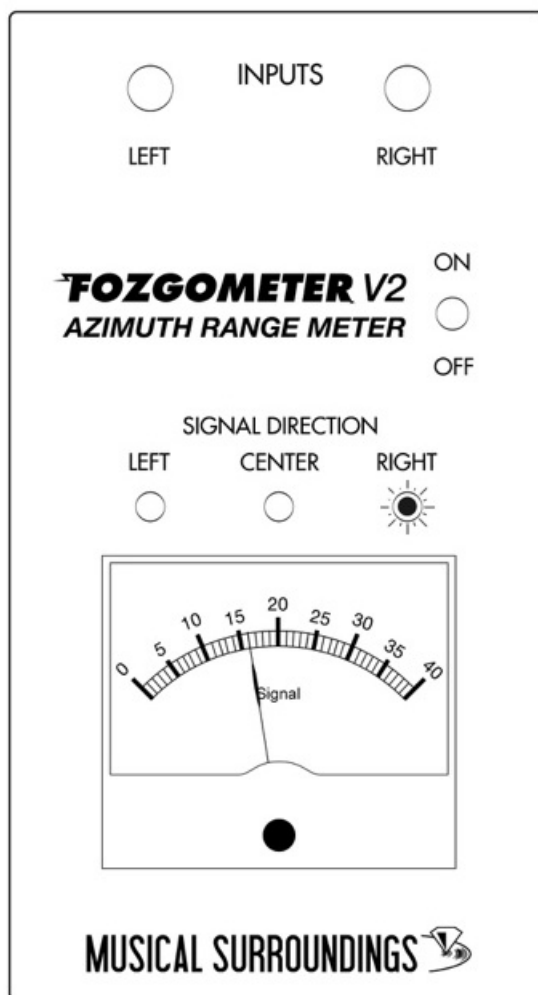


Figure 5, Right 16

Phono Cartridge Adjustments

Alternate playing track 2 (left) and track 3 (right) test tracks and make small adjustments in Left and Right tilt of the headshell and cartridge until both readings are the same or as close as possible. If the right channel reading is lower than the left channel, as in figures 4 and 5, you typically turn the headshell and cartridge “counter-clockwise” when looking at the tonearm from the front. If the right channel reading is higher than the left channel as in figures 6 and 7, you typically turn the headshell and cartridge “clockwise” when looking at the tonearm from the front.

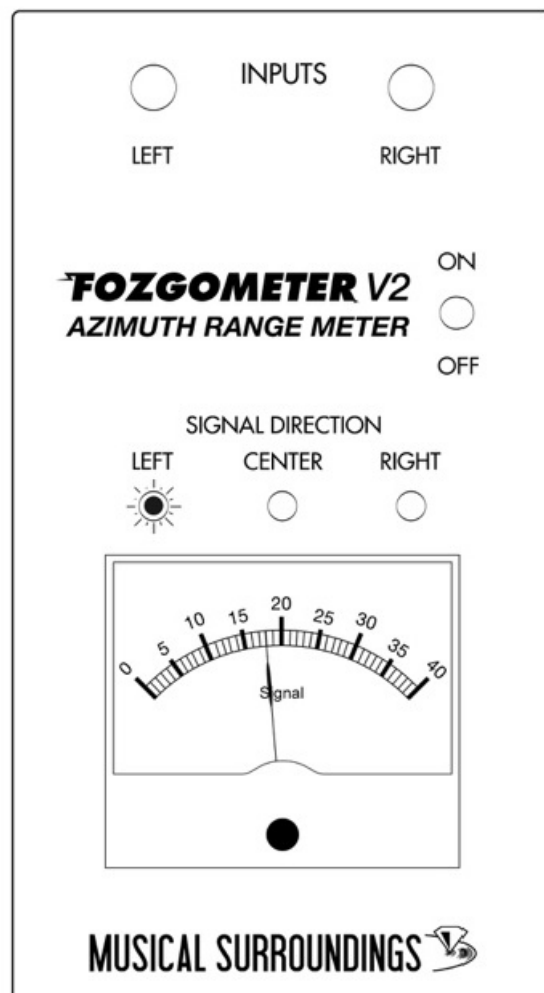


Figure 6, Left 18

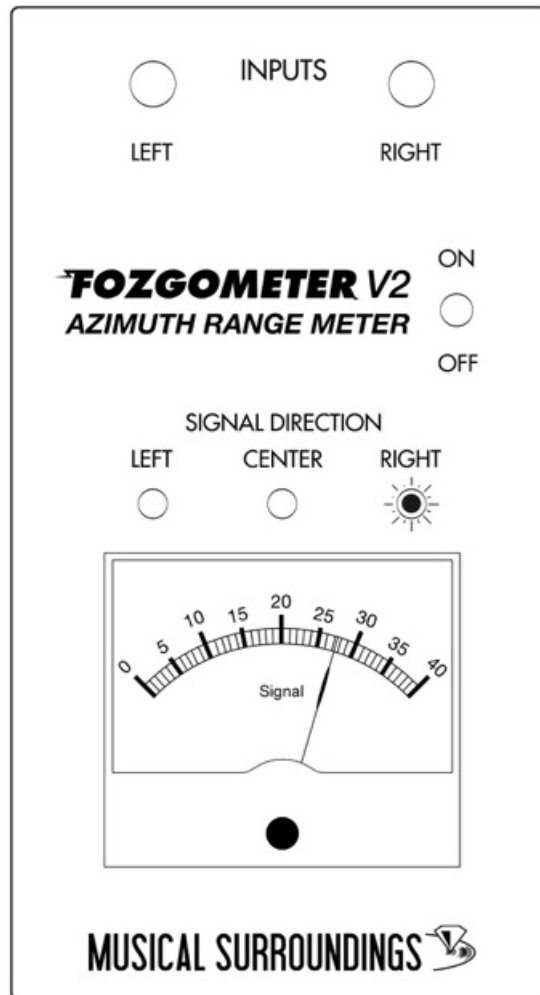


Figure 7, Right 27

As you adjust Left/Right tilt, you will see the higher channel coming down and the lower channel reading rising. If the readings for both channels are getting closer, continue to adjust the cartridge in that direction. One channel reading may remain constant as the other channel reading is changing. Adjustments should always be done in very small increments. If you overshoot ideal azimuth, the readings may reverse and become more unmatched.

Locking Azimuth adjustment on Tonearm

If your headshell or tonearm features an Azimuth locking device, you should lock the arm after each adjustment. Always double check your readings after locking to assure best accuracy.

Getting both channels to match or read as close as possible is the key.

Azimuth is calibrated when the left and right signal readings read as close as possible, as in figures 8 and 9 with Left at 21 and Right at 19. Optimal azimuth is achieved as seen in figures 10 and 11 with both readings at 18. Matching the reading of the 2 channels is the goal. The key is to get both channels to measure as close as possible, ideally the same. The strength of the readings, or how high the needle goes in the meter, is less important than the matching of the 2 channels.

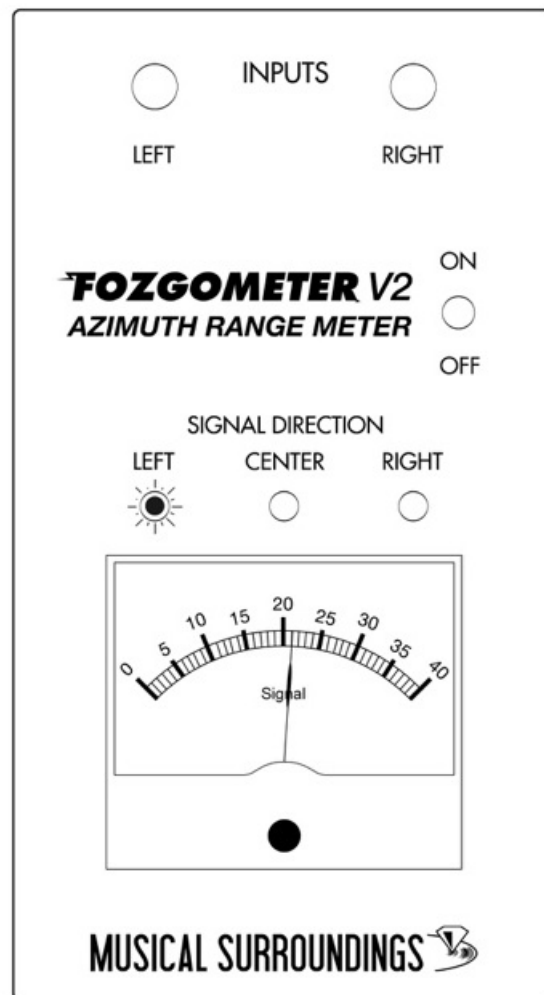


Figure 8, Left 21

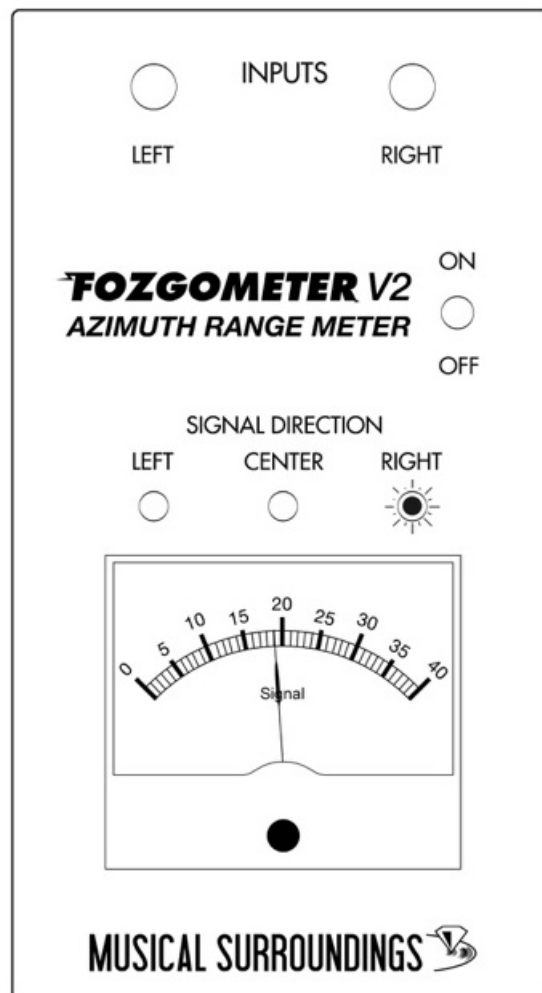


Figure 9, Right 19

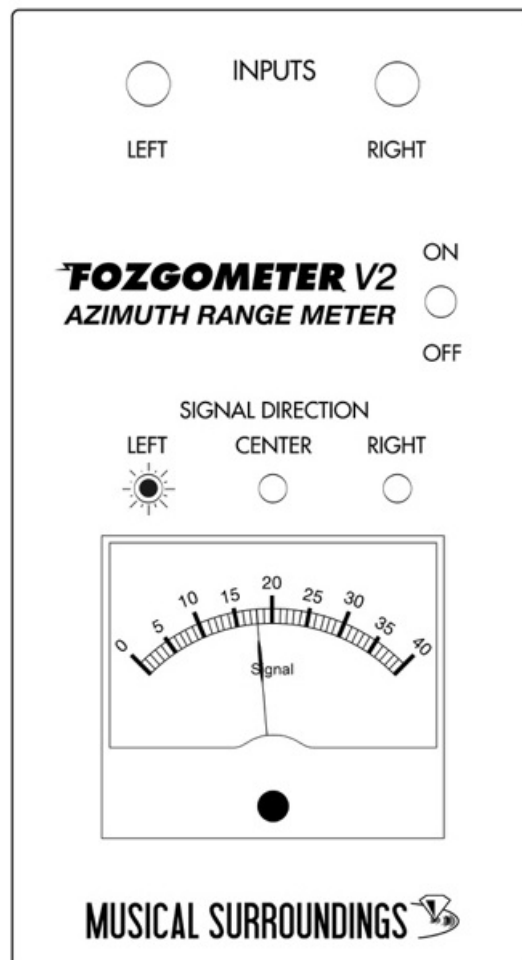


Figure 10, Left 18

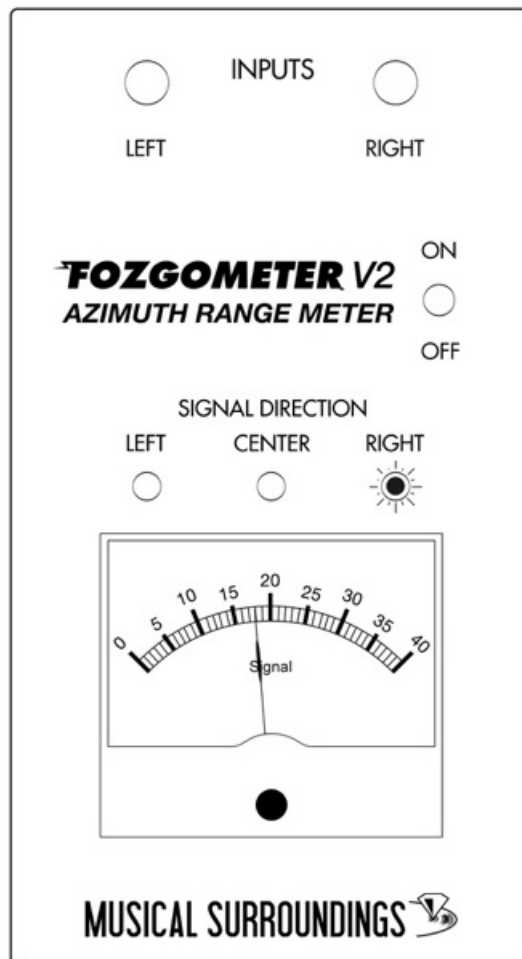


Figure 11, Right 18

Channel Balance Check

After setting azimuth, go back and check channel balance. If it is not measuring better than your first channel balance reading, you should redo azimuth adjustment for best readings for both channel separation and balance.

Optimal Azimuth Achieved – Channels Match

Extraneous Meter Movement and Lights

Minimal meter movement may occur with warped or off-center test records or uni-pivot tonearms. The LEDs may illuminate from the system noise floor with no test signal. Disregard these readings until a signal is present.

False” Azimuth Readings

If your cartridge is turned too far in either direction, you may get a false reading. Always start with your cartridge visually parallel to the record to avoid false readings

Set-up Tips

All cartridge set-up parameters are inter-related, so always check all parameters of your set-up after making any changes. Re-check your set-up on a new cartridge after the break-in period. Check your cartridge set-up every year to verify everything is properly adjusted to ensure your system is sounding its best.

90 DAY LIMITED WARRANTY TERMS AND CONDITIONS

TO THE EXTENT PERMITTED BY LAW, THIS WARRANTY AND THE REMEDIES SET FORTH ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL, WRITTEN, STATUTORY, EXPRESSED OR IMPLIED. MUSICAL SURROUNDINGS DISCLAIMS ALL STATUTORY AND IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND WARRANTIES AGAINST HIDDEN OR LATENT DEFECTS, TO THE EXTENT PERMITTED BY LAW. IN SO FAR AS SUCH WARRANTIES CANNOT BE DISCLAIMED, MUSICAL SURROUNDINGS LIMITS THE DURATION AND REMEDIES OF SUCH WARRANTIES TO THE DURATION OF THIS EXPRESS WARRANTY AND, AT MUSICAL SURROUNDING'S OPTION, THE REPAIR OR REPLACEMENT SERVICES DESCRIBED BELOW. SOME STATES (COUNTRIES AND PROVINCES) DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY (OR CONDITION) MAY LAST, SO THE LIMITATION DESCRIBED ABOVE MAY NOT APPLY TO YOU.

1. **LIMITED WARRANTY** – Musical Surroundings warrants the product designated herein against defects in materials and workmanship when used normally in accordance with Musical Surrounding's published guidelines or owner's manual for a period of 90 days from the date of original retail purchase by the original purchaser ("Warranty Period"). If the purchaser registers the unit with Musical Surroundings by mailing in the warranty card, together with a copy of the bill of sale, within 14 days of the date of purchase, the Warranty Period will be extended to 1 year from the date of purchase by the original purchaser.
2. **CONDITIONS** – This warranty is subject to the following conditions and limitations. The warranty is void and inapplicable if the product has been used or handled other than in accordance with the instructions in the owner's manual, abused or misused, damaged by accident or neglect or in being transported, or the defect is due to the product being repaired or tampered with or modified by anyone other than Musical Surroundings or their authorized repair stations.
3. **WARRANTY SERVICE** – To obtain warranty service, you must first contact Musical Surroundings at 510 547-5006 or info@musicalsurroundings.com to obtain a Return Authorization (RA) number. The product must be packed in its original carton and returned to Musical Surroundings or authorized repair station by the customer at his or her sole expense. A returned product must be accompanied by a written description of the defect and a photocopy of the original purchase receipt. Musical Surroundings reserves the right to modify the design of any product without obligation to purchasers of previously manufactured products and to change the prices or specifications of any product without notice or obligation to any person.
4. **REMEDY** – In the event the designated product fails to meet the warranty, and the above conditions have been met, the purchaser's sole remedy under the limited warranty shall be to return the product to Musical Surroundings where the defect will be rectified without charge for parts or labor.
5. **LIMITED TO ORIGINAL PURCHASER** – This warranty is for the sole benefit of the original purchaser of the designated product and is NOT TRANSFERRABLE.
6. **DURATION OF WARRANTY** – This warranty expires 90 days after the date of original purchase. If Musical Surroundings receives the warranty registration card, this period is extended to the first anniversary of the date of purchase or no later than the second anniversary of the shipment to the authorized Musical Surroundings dealer, whichever comes first.
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8. WARRANTY OUTSIDE THE USA – Musical Surroundings has formal distribution in many of the countries in the world, in each country the Musical Surroundings importer has contractually accepted the responsibility for product warranty. Warranty should normally be obtained from the importing dealer or distributor from whom you obtain your product

Specifications

- **Input signal:** 1KHZ sine wave
- **Input level:** .3mV RMS minimum, 2.7V RMS maximum
- **Input Load:** 86.6K
- **Power:** Supplied Power Supply or 9V Battery
- **Dimensions:** 6 1/2" H, 3 1/4" W, 2 3/8" D

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Documents / Resources

	FOZGOMETER V2 Azimuth Range Meter [pdf] Owner's Manual V2 Azimuth Range Meter, V2, Azimuth Range Meter, Range Meter
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References

-  [Musical Surroundings](#)