



# 2BC multiCORR

User Manual

MAAT Inc.

MAAT Inc.  
101 Cooper St  
Santa Cruz CA 95060 USA

*More affordable yet essential tools & tips at:*

[www.maat.digital](http://www.maat.digital)

# Table of Contents

<b>Introduction</b>	<b>5</b>
<b>Installation &amp; Setup</b>	<b>6</b>
<b>Product Installation</b>	<b>6</b>
macOS	6
Windows	6
<b>License Installation</b>	<b>6</b>
Plug-in & Native	7
<b>In Depth</b>	<b>8</b>
<b>Metering</b>	<b>8</b>
CORRELATION	8
multiCORRELATION	8
BALANCE	9
<b>Monitor Controls</b>	<b>10</b>
L • R Flip	10
SOLO Modes	10
<b>Friedemann on Using 2BC multiCORR</b>	<b>11</b>
<b>Balance Meter</b>	<b>11</b>
<b>Listening To The Whole Mix</b>	<b>11</b>
<b>Correlation Meters</b>	<b>11</b>
<b>Why Should I Care?</b>	<b>13</b>
<b>LF &amp; Vinyl</b>	<b>13</b>
L • R Flip	13

Left-Only & Right-Only .....	13
MONO & DIFF Buttons.....	14
<b>Specifications .....</b>	<b>15</b>
System Requirements .....	15
Supported Platforms .....	15
Supported Sample Rates .....	15
Supported Hosts .....	15
<b>Updates .....</b>	<b>15</b>
<b>Credits.....</b>	<b>15</b>
<b>Support .....</b>	<b>16</b>
FAQ .....	16
Troubleshooting.....	16
<b>Share The Love.....</b>	<b>16</b>
<b>About This Manual .....</b>	<b>17</b>

## Introduction

Thanks for installing your copy of MAAT's 2BusControl multiCORRELATION, also known as "2BC multiCORR." We've worked hard to make this an exceptionally useful and usable toolset for speeding up your audio workflows.

2BC multiCORR is a universal combination L/R plus M/S monitor control for your stereo master bus. 2BC multiCORR also incorporates metering for balance and correlation, the latter includes interchannel L+R and multiband versions.

Most correlation meters are derived from analog models. Being MAAT, we take a more informed route. Our correlation meters work on a linear scale, meaning 50% of the "distance" between 0 and 90° is 45, not 60 as it is for other gear. That approach yields improved resolution, and better correspondence between meter readings and what's heard.

Available for all major plug-in formats, including VST 2, VST 3 and AAX for macOS and Windows plus Audio Units for macOS, 2BC multiCORR offers five essential options for specific monitoring modes. Plus, you get a display of left/right balance, an intuitive correlation meter as well as spectrally segregated correlation meter segmented in 32 bands. A standalone, native version is also included to run any time you'd like metering and audio stream manipulation.

The top half of the interface contains a left/right correlation meter, along with 32 bands of correlation across the audio spectrum. Monaural solo is available post-metering with a single button push. Left only/right only soloing can be chosen, or an equally useful M/S or Mid/MONO and Side/DIFF(ference) rendering of the soloed signal. In addition, the stereo perspective can be swapped or "flipped," with the left and right channels changing places. Each solo control is a single button, situated along the bottom of the user interface, allowing you to check placement and amplitude easily for all aspects of your mix. Usable metering is another essential for any engineer, with stereo balance occupying the space above the Solo and Flip controls.

Unlike prior products that provide similar metering functions, 2BC multiCORR's measurement and display algorithms adhere to our guiding philosophy of enhancing your workflow and improving ergonomics through careful attention to the way you actually work. Ballistics are meticulously tuned to achieve the best match between the aural impression you hear, and the optical rendering by the meters.

All of 2BC multiCORR's functionality is wrapped in an information rich yet visually unobtrusive user interface that occupies only a small portion of screen real estate. Likewise, the product is "light weight," demanding a minimum of CPU resources so it won't slow down your host.

## Installation & Setup

In preparation, we recommend that you quit all audio applications prior to installation. After downloading but prior to installation, we also recommend that you temporarily disable all anti-malware measures you may have running on your host computer after you have scanned our installer package.

### Product Installation

#### macOS

To install 2BC multiCORR, simply double click on the downloaded Installer. The installation process will guide you through the install procedure. After the installer completes, restart your host to allow all background processes to restart.

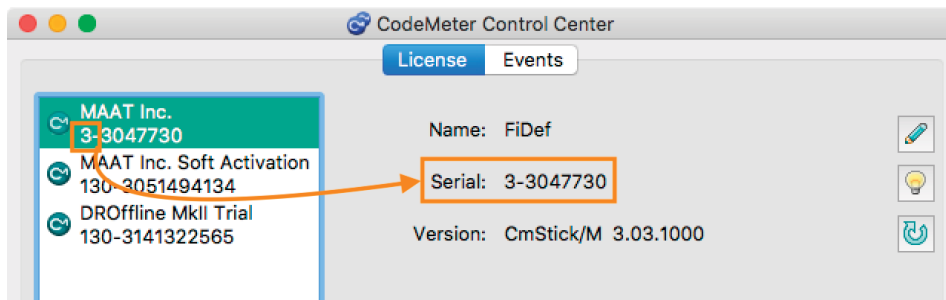
#### Windows

Locate the downloaded 2BC multiCORR installer file. Right-click the dot EXE installer, and select “Run as admin.” Then, follow the normal installation instructions.

### License Installation

As with all of MAAT paid products, 2BC multiCORR is licensed with Wibu-Systems’s CodeMeter framework. Whether you choose a file-based license residing on your local host, or a hardware-based license residing on our portable CmStick, we’ve got your investment covered with the most secure fraud protection scheme in the industry.

Our hardware-resident licenses require the current generation of Wibu’s CmStick. Serial numbers of 3-Series sticks have a leading “3”.



*Figure 1: In this CodeMeter Control Center example, the Series 3 Stick is selected*

You will need to install your product before licensing 2BC multiCORR. Our Support page has step-by-step How To Guides for licensing. Head to:

<https://www.maat.digital/support/>

...for more information. All our paid software installs as a trial and will run even if you don’t own a license yet. If you have purchased a Product Key, simply copy then paste that Product Key to activate your MAAT

software. This is a quick and easy way to always stay up to date with the current version. If you experience any issues with 2BC multiCORR, check out our Support page at the link above or contact us at support@maat.digital.

### Plug-in & Native

The 2BC multiCORR installer places two versions on your host, a plug-in version and a standalone, native version for use where screen real estate is limited. The plug-in appears in your DAW as MAAT 2BC multiCORR, while the native version appears in the MAAT folder. While their appearance differs, their functionality and use are basically identical.

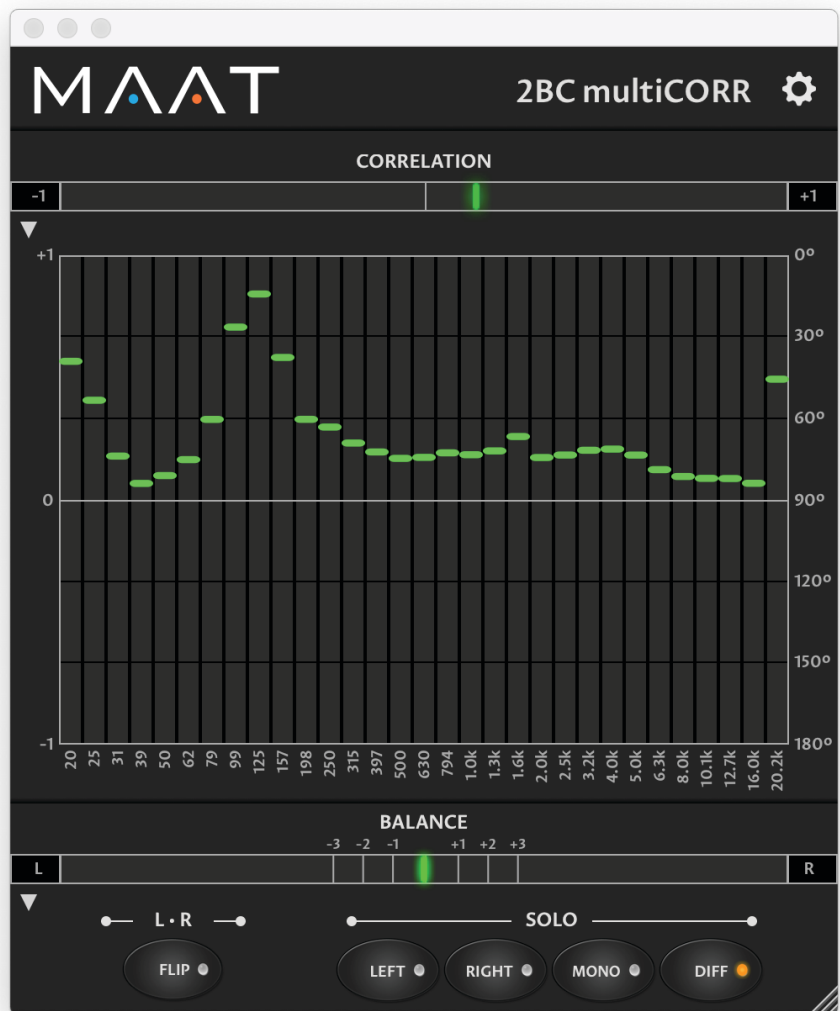


Figure 2: The 2BC multiCORR native user interface

# In Depth

## Metering

### CORRELATION

Horizontally oriented, the stereo Correlation meter at top displays the phase relationship between left and right channels. This meter can also be thought of as graphically displaying mono compatibility, by measuring the phase relationship between left and right.

In-phase content is shown in green, while out of phase content pushes the meter “into the red” to warn you something may be amiss.

0° of difference between channels = hard right (green is good)

90° of difference between channels = meter center

180° of difference between channels = hard left (red equals caution with possible amplitude reduction or total cancellation when summed to mono)

### multiCORRELATION

Below the Correlation meter is a grouping of 32 bands of spectrally segregated correlation, with significant resolution aimed at the critical bands and below. Each band behaves in a similar fashion to the large Correlation meter at top, though in a vertical orientation and reduced size. A disclosure triangle located just above the multiCORRELATION group allows you to minimize or visually hide this entire group to avoid visual distraction or reduce screen real estate needs.

Interpreting the multiCORRELATION group

First of all you need to understand the limitations of a stereo correlation meter. Think of it as showing the correlation or phase similarity between left and right channels.

If you have a very solid mono kick and bass, this will drive the stereo correlation meter to show you positive values, despite possibly having some really bad phase cancellations in the mid range or highs, simply because the bass and kick is the energy which drives the meter. When using the stereo correlation meter on the 2Bus in your mix, you can check that by soloing each group and checking if any display red values.

That said, you will never see in which particular frequency areas phase cancellation occurs. In mastering you even don't have the chance to solo groups unless you do stem mastering! Thus multiCORRELATION, which gives you far better feedback on where specifically phase cancellation occurs. This becomes even more relevant with the popularity of multi-band stereo enhancement plug-ins which quite common these days.



Is RED Always Bad?

Not always: Use the multiCORRELATION group in conjunction with the MONO button and listen to the respective frequency bands which show red values. It's always a good idea to keep the bass region, up to ~200Hz, well within the green zone. Red values in reverb are pretty common as reverb tails tend to be decorrelated. If, however, the mid-range goes red when the vocals drop in, check with the MONO button. If the color tends toward red, and the level of your vocals suffer heavily in MONO, adjusts your vocals so that they stay in the green zone.

The same is true for the highs. If the highs show constant red values, your hi-hat and overheads may suffer in MONO. Simply narrow the stereo width of your overheads, or back off with your stereo spreader if one is in use. If a super-stereo synth sound causes red values, simply decide based on toggling between MONO and STEREO. Then, make an artistic decision if the super stereo sensation of the synth is more important for your sound image than the loss of information when played back in MONO. Not all red things are evil, but it's good to keep an eye on it and be able to remedy trouble before it's too late.

Meter Scaling & Sample Rate

Note that 2BC multiCORR is sample rate-agnostic. The horizontal frequency scale for the multiCORRELATION group covers the bandwidth of baseband AES/EBU digital audio, which also happens to be the bandwidth of ideal human hearing. Regardless of either input or output sample rate settings, the user interface and operation does not change.

Gating

The multiCORRELATION group incorporates a per-band threshold. If the signal strength drops below -90 dB in any band, that band's meter will return to the 0° mark. This filters out any low level noise and other possibly distracting information.

For more tips on how to use 2BCmC, see the section below; Friedemann on Using 2BC multiCORR

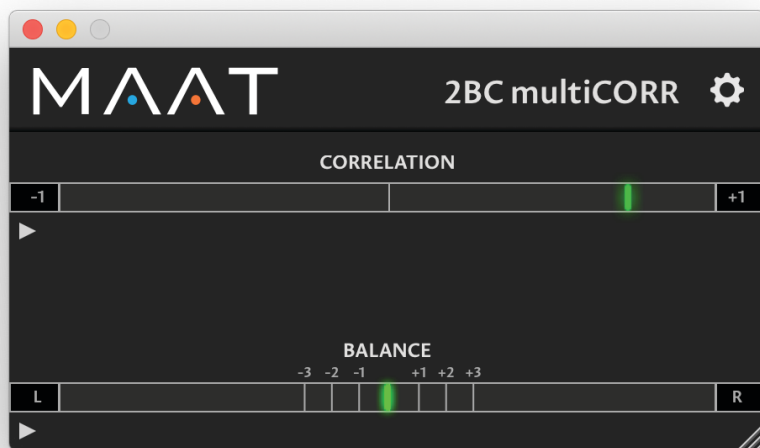
## BALANCE

Also horizontally oriented, the Balance meter displays traditional left/right balance, with left-heavy signals appearing in blue, and right-heavy signals appearing in orange. Center panned or mono audio is shown as an extra bright green center indicator. The green area spans from 0.5 dB left to 0.5 dB right. Left and right from perfect center, there are +1, +2, & +3 tick marks indicating that the respective channel has 1, 2, or 3 dB more RMS loudness than the other channel. This allows you to see, judge, and react to imbalances appearing over a sustained period of time in a stereo mix.

Note that, unlike our DRMeter and DRMeter MkII, standard R128 Loudness meters display mono measurements, so they can't provide any indication of actual left/right balance.

## Monitor Controls

As with the disclosure triangle located just above the multiCORRELATION group, a disclosure triangle just below the Balance meter allows you to minimize or conceal the monitor control group to avoid visual distraction or reduce screen real estate needs.



*Figure 3: The 2BC multiCORR interface in minimalist mode*

### L • R Flip

Situated below the Balance meter, the FLIP or left/right swap button causes the left signal to appear in the right monitor channel and vice versa. This monitor mode button is useful for confirming actual amplitude when your room, monitors or “ears” are not quite calibrated. When active, FLIP mode displays a blue indicator.

### SOLO Modes

#### LEFT/RIGHT

The LEFT and RIGHT buttons provide monaural soloing of either the left or right channels.

#### MONO/DIFF

The MONO mode provides monaural soloing of the sum of left and right channels. This mode behaves as a typical mono button, summing left plus right channels. Technically, mono and the M or “mid” channel of an M/S matrix are the same.

The DIFF mode provides monaural soloing of the difference between the left and right channels. This is a mono subtraction of left minus right, and can also be thought of as the “side” or difference information from an M/S matrix..

## Friedemann on Using 2BC multiCORR

Why, when and how do I take advantage of this plug-in when mixing? Well, reading this will let you get the most out of your copy of 2BC multiCORR...

### Balance Meter

Insert the 2BC multiCORR onto your 2Bus, also known as the Master Bus or Stereo Out track as the last instance. When your mix is already set up to your liking, you can check all center-focused instruments to see if they really do sit in the center. This will yield a mix with a good left/right loudness balance. Simply solo the bass, kick, snare, and lead vocal tracks individually, and verify that the green center LED is right in the center and brightly lit. In this position, the LED will be actually a bit brighter than the small green area surrounding perfect center. It may reveal that weird routing, unbalanced insert tool adjustments, or inserted hardware that has caused off center results as well as off center EFX returns. Correct any problems if desired.

### Listening To The Whole Mix

The Balance meter should move within the green area,  $\pm 0.5$ dB loudness deviation, though sometimes it can go further to the left or right depending on the elements and events happening on the sides. However, if the Balance meter shows long term emphasis to either the left or right, you may want to reconsider your panning strategy or verify if some of your center events are off center.

Especially when using an R128 Loudness Meter, which just shows one loudness value for both left and right, the Balance meter is a great complementary support to keep an eye on your overall loudness balance.

### Correlation Meters

The world is in order as long everything happens “in the green.” This means that you won’t get phase cancellation if your mix is played back in mono. Don’t get too nervous if the meter sometimes moves toward the red zone, especially within breaks when reverb tails become more prominent. Convincing reverberation is uncorrelated, and reverb tails always have the tendency to go wild in terms of phase — it *is* reverb after all. But, if your mix or any band goes constantly and strongly into the red zone, it’s time to use the MONO button. Toggle between MONO and normal STEREO mode, and check the mix for things which drop out of your mix when listening in mono.

Remember, it’s not the Correlation meters which make the decision that you are “too red,” they just remind you to press MONO to check and decide based on your ears and taste, and what you consider to be acceptable losses for monaural playback.

If you have too much red, indicating signals which will cancel each other out when summed to mono, here is a simple trick: Often this situation

results from stereo overhead tracks which are hard panned full left and right. Just back off the panning to 90% left and 90% right and the problem should be gone. The same is true for reverb EFX returns. Remember: “red” means that you have signals on the left which would cancel out with signals on the right when switched to mono. By bringing left a bit closer to right and right a bit closer to left you have less cancellation potential. If this won’t solve the problem, look for the problem’s source by soloing through your groups and you’ll quickly find the source.

Also be aware of parallel processing tracks. This can be your complete drum kit mic’d with multiple mics, or a doubled bass track or layered kick... basically any time a similar signal takes two different paths to your 2Bus. If you’re mixing, our [RSPhaseShifter](#) is a pristine quality tool built specifically to address phase incompatibilities between multiple signal paths.

Use the Correlation Meter in conjunction with the MONO button. In fact, the Correlation Meter and MONO button are complementary tools and should be used together. The Correlation meter informs you that something in mono may be a problem.

In modern music, especially in electronic music, producers tend to layer multiple kicks upon each other to create a super kick. Sometimes it works and sometimes it doesn’t because of phase issues. You need to decide which kick is the “mother” and reference the next kick with your mother whether it sits in phase or not. Use the MONO button! Does the secondary kick add something good, especially in the low end, or does it take away something essential? If the latter, move the kick a few samples so that it actually sums nicely. Then, go and check every kick again against your mother because one kick must be the phase reference. With phase aligned kick drums, you have a far better chance to create the “infinite” kick.

To be technically precise and correct with my kick advice, you must be aware of the abilities of the stereo Correlation Meter. I want to point out the difference between phase cancellation of stereo signals and mono signals: This meter is a stereo correlation meter, thus it shows the correlation of your stereo channels. A kick is mostly monaural, so you won’t see any mono phase cancellations on the stereo correlation meter because one mono kick could possibly cancel out another mono kick. Such cancellation happens equally on both left and right channels, so the correlation meter can’t “see it.” You simply need to use your ears by hearing where the kick sums in the best way, which is where you hear the most bass.

Also, be aware that the stereo correlation metering is energy-based. As an example, when you have a lot of in-phase LF signals and an out of phase vocal in the higher mids, there is a good chance that the stereo correlation meter won’t move far towards red. This is where you should use the MONO button and your ears to hear if the vocals lose energy in the high mids in mono mode.

## Why Should I Care?

...about mono?! Monaural playback is more prevalent than ever, with the rise of battery-powered, hand held party speakers and the seemingly ubiquitous “smart speaker.” Though a product may advertise stereo playback, the simple fact is that size matters. At low frequencies, playback from any single point, diminutive device is essentially monaural. Also, small sources usually cannot reproduce the bottom octave at all and many begin to roll off below 80 Hz. So make sure to maximize the appropriate amount of LF energy for the material you’re working on.

## LF & Vinyl

If your material is destined for LP distribution, also keep in mind that lacquer cutting has difficulty with large amplitude, out-of-phase information at very low frequencies. 2BC multiCORR provides four bands of analysis for the critical bottom octave, six additional bands of metering covering frequencies up to 200 Hz, plus three additional band for the 200 to 400 Hz range.

In general, it is recommended to be more cautious with low frequency phase problems than with high frequency phase problems as the chance of mono cancellation is higher due to longer LF (low frequency) wavelengths. If you expect to be pressing vinyl, you should take phase issues seriously as phase cancellations below 400 Hz will force your cutting engineer to mono out low frequencies, changing your mix. When the vinyl cutter folds your phase-troubled bass into mono, there’s a high risk of ending up with weak bass, so be proactive.

Stereo widening tools are also the natural enemy of the green zone. Those tools usually work by messing with phase. Once again, don’t leave the decision to a Phase Meter. Instead, be inspired to use the MONO button and make decisions based on your taste and experience.

## L • R Flip

The Flip button swaps channels, it’s just nice to have it at hand! I tend to mix everything from the audience perspective. Unless I know that I have to deal with a left hand drummer, I always have the hi hat on the right side. This is the fastest way to get there.

Also, sometimes you may hear a subtle issue that you think may be in one channel or the other. The Flip control, along with the Left-Only/Right-Only buttons discussed below, quickly helps to confirm or identify any problems.

## Left-Only & Right-Only

Why the heck should you use them? Well, most of the time both loudspeakers are not 100% matched and sometimes neither are your ears. Having the possibility of swapping Left to your phantom center, and comparing it with Right swapped to your phantom center makes it easier to figure out if you have problems on either channel. Let’s say the

ride cymbal on the left channel has an awful component frequency at 14 kHz, while the right channel is fine. You instantly know that you just need to get rid of the problem on the left channel without harming the right one.

### MONO & DIFF Buttons

As I mentioned before (haven't I?), MONO is the same as Mid or Sum. Basically it's left summed with right, or left plus right. Besides using MONO mode for identifying potential phase issues, you can also use it to figure out the "properties" of the monaural signal opposed to the "properties" of your DIFF(ERENCE) or side signal. Sometimes you can support the lead vocals with the use of an M/S EQ by just altering the M portion rather than the whole mix. As another example, you may find harsh cymbals on the DIFFERENCE channel, which informs you that you might want to apply multi-band compression to the DIFF signal with the use of a proper M/S multi-band dynamics processor. The DIFF signal can also reveal potential to give the mix more warmth, or to control the low frequency region. You usually don't want to have too much low frequency information on this signal portion, so you would roll off the bass.

M/S tools have become very popular over the years, but you often miss the possibility of monitoring your Mid and Side, or MONO and DIFF signals, as a phantom center. I find it quite annoying to set up M/S tools with MONO on the left speaker and DIFF on the right one. With 2BC multiCORR, you have a better way always at hand.

### **WARNING!**

Remember to switch off the SOLO buttons before closing the user interface! Since the tool will continue to work in one of the solo modes, this will really mess with your monitoring!

## Specifications

### System Requirements

- Mac: macOS 10.8 and newer
- Win: Windows 7 and newer, 32 & 64 bit
- Pro Tools 10.3.10 and newer
- 4GB RAM minimum

### Supported Platforms

- AAX, AU, VST 2/3 Mac, VST 2/3 Win

### Supported Sample Rates

- 44.1 to 384 kHz

### Supported Hosts

Ableton Live, Cubase, Logic, Nuendo, Pro Tools, Sequoia, Studio One, Wavelab

## Updates

Please always use the latest version of the software! You can find your current version on the License/Info tab of the back panel. You can always have the latest version simply by downloading and installing a new trial version from the product page. With the help of your Product Key, the trial automatically becomes a perpetual version once you instantiate or run 2BCmc. You should always stay up to date with Operating System revisions, and we keep up with compatibility changes to our products. We also continue to optimize for reduced CPU load, and this very user manual gets its own improvements.

To stay up to date with the latest version and product releases, please subscribe to our occasional newsletter. You'll find a opt-in form on our [Contact](#) page. Don't worry, we know you are busy so we only send out an average of 10 or 12 mailings a year.

## Credits

Initiator & UX Concept

Friedemann Tischmeyer

DSP Concept & Algorithms

Dr. Christoph M. Musialik

Agent Tad Nicol, MAAT Inc.



Product Management & UX

Oliver Masciarotte

Plug-In Programming

Agent Tad Nicol, MAAT Inc.

VST is a trademark of Steinberg Media Technologies GmbH

## Support

For product support, e-mail us at:

[support@maat.digital](mailto:support@maat.digital)

and we'll get back to you as quickly as possible.

## FAQ

Frequently asked questions are addressed in our web site's Support section. Also, comments, suggestions, and words of encouragement regarding all our stuff is always welcome. Ping us at our Support address above.

## Troubleshooting

Want to get started troubleshooting a problem on your own? Then run the following utility we've included, and send us the ZIP file that's created:

For macOS, launch;

`/Applications/MAAT/Shared/Utilities/DiagnosticsReporter.app`

For Windows C drive;

`\\Program Files\\MAAT\\Shared\\Utilities\\DiagnosticsReporter.exe`

## Share The Love

Would you like to help us in our quest for better sound quality? Help support MAAT by sharing the love...Like us on Facebook!

<https://www.facebook.com/maatdigital/>

and Twitter too:

[https://twitter.com/maat\\_digital](https://twitter.com/maat_digital)

Please tell your friends and colleagues about us. We really appreciate it!  
<https://www.facebook.com/maatdigital/>

and Twitter:

[https://twitter.com/maat\\_digital](https://twitter.com/maat_digital)

and please tell your friends about us!



# About This Manual

## Introduction

This manual was written in Adobe InDesign CC, and is set in Robert Slimbach's Minion Pro and Myriad Pro. The cover page is set in Aldo Novarese's modernist geometric Eurostyle.

This documentation, as well as the software described in it, is furnished under license and may only be used or copied in accordance with the terms of such license. The information in this manual is furnished for informational use only, is subject to change without notice, and should not be construed as a commitment by MAAT Incorporated. MAAT Incorporated assumes no responsibility or liability for any errors or inaccuracies that may appear in this document.

Except as permitted by such license, no part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, recording, or otherwise, without the prior written permission of MAAT Incorporated.

## Notice of Liability

The author and publisher have made every effort to ensure the accuracy of the information herein. However, the information contained in this document is provided without warranty, either express or implied. Neither the authors, MAAT Incorporated, nor its dealers or distributors will be held liable for any damages to be caused either directly or indirectly by the instructions contained in this book, or by the software or hardware products described herein.

MAAT INCORPORATED MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, REGARDING THE APPLE SOFTWARE. MAAT INCORPORATED DOES NOT WARRANT, GUARANTEE, OR MAKE ANY REPRESENTATIONS REGARDING THE USE OR THE RESULTS OF THE USE OF THE MAAT INCORPORATED SOFTWARE IN TERMS OF ITS CORRECTNESS, ACCURACY, RELIABILITY, CURRENTNESS, OR OTHERWISE. THE ENTIRE RISK AS TO THE RESULTS AND PERFORMANCE OF THE MAAT INCORPORATED SOFTWARE IS ASSUMED BY YOU. THE EXCLUSION OF IMPLIED WARRANTIES IS NOT PERMITTED BY SOME STATES. THE ABOVE EXCLUSION MAY NOT APPLY TO YOU.

IN NO EVENT WILL MAAT INCORPORATED, ITS DIRECTORS, OFFICERS, EMPLOYEES, OR AGENTS BE LIABLE TO YOU FOR ANY CONSEQUENTIAL, INCIDENTAL, OR INDIRECT DAMAGES (INCLUDING DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, AND THE LIKE) ARISING OUT OF THE USE OR INABILITY TO USE THE MAAT INCORPORATED SOFTWARE EVEN IF MAAT HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. BECAUSE SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

©2019 MAAT Inc. — All rights reserved.

MAAT, 2BusControl multiCORRELATION, 2BC multiCORR, 2BCmC and the MAAT logo are trademarks of MAAT Incorporated. All other company or product names are either trademarks or registered trademarks of their respective owners.

190419-1.3