

SpeakerMate CX Combo Amp Expander

Thank you for purchasing this Sherlock Audio product. All Sherlock Audio SpeakerMate products are designed & hand built, one at a time by Gilles R. Grignon in his own shop, in Cornwall, Ontario, Canada. By combining over thirty years of experience in the audio & musical electronics field, using simple, clever innovative designs along with premium grade components from Europe & North America, Sherlock Audio can offer unique and superior quality gear at reasonable prices.

The SpeakerMate Combo Amp Expander by Sherlock Audio Canada was designed after countless requests for a SpeakerMate specifically designed for *combo amps* that shared the same common shortcomings in regard to their available speaker connection options. The majority of combo amps either don't feature an external speaker jack or don't allow the use of the combo's internal speaker along with any additional, external speaker cabinet at the same time.

The new multi-function SpeakerMate CX will now allow any typical combo amp to either power an external speaker cabinet separately, or in tandem with your combo's speaker. A separate function of the SpeakerMate CX also allows a number of different speaker impedance combinations to be used with or without your combo's internal speaker. For example, a typical 50 to 100 watt, 1x12" combo could be used as a "head" to power additional 2x12, 4x10 or 4x12 speaker cabinets with or without your combo's internal speaker. Now you can run your combo on top of a 4x12 as a "stack" setup. Since most combo amps are open back designs that have a tendency to "bottom out" with a lack of bass response, this feature allows your combo to kick it up a notch or two!

SpeakerMate CX was *not* designed to match up power levels between mismatched impedance *pairs* (for example: an 8ohm + a 4ohm spkr cab or an 8ohm + a 16ohm cab) but instead was designed to allow for *multiple* matched imp. pairs as well as several mismatched imp. triple cabinet setups.

SpeakerMate CX was designed to offer a wide variety of connection setups so, please take the time to read these *extensive* instructions thoroughly to fully understand what this specific SpeakerMate CX model can do for you and *your* individual amplifier & speaker setup. A lot of thought and features were designed into this unit to offer as many hookup options as currently possible. They're ALL listed.

BEFORE YOU DO ANYTHING, MAKE SURE YOUR AMP IS UNPLUGGED!

For combo amps that DO NOT have an "external speaker" jack: These types normally have dual wires coming down from the amp chassis. This wire is directly connected to the combo's speaker, either by slip-on connectors or soldered onto to the speaker tags.

Now take note of which wire is connected to the positive terminal of the speaker. This is normally indicated with a "+" sign or a (red, blue or yellow) dot on the chassis nearest this tag. The remaining wire is obviously negative or "-"

If your combo amp's speaker wire uses the slip-on type connectors, use the short "AMP" cable included with the CX. This cable uses mating connectors that you push into the existing connectors on your amp's speaker wires. This will allow you to return your amp to "stock" condition at any time.

Again, make sure to connect the "+" from your amp's speaker wire to the "+" line of the CX "AMP" cable. The "+" is indicated with a red dot. After you've done so, slide the insulating heatshrink sleeve over each metal connector. You can then "shrink" the sleeve with either a hand held hair dryer or quickly with a Bic lighter-carefully! If you're not familiar with any of this, ask a knowledgeable friend who does!

If your amp's speaker wires are soldered directly onto to the speaker tags,then carefully unsolder these,making note which one is the positive "+" lead. On the supplied "AMP" cable,cut off the male "tags". Now,strip,twist & solder the "+" wire from this cable onto the unsoldered "+" wire from your amp.Do the same for the remaining "-" wire.Slip a heatshrink sleeve over each bare exposed wire connection and "shrink" each sleeve.

We've also supplied an additional cable labeled "INNER SPKR" that has a matching set of slip-on connectors for your amp's speaker.Taking note of the + and -,connect these to the proper tags on your combo amp's internal speaker.If your amp's speaker wires were soldered onto the speaker tags,you can either remove the remaining solder on those tags and attempt to slip the connectors onto the tags.If this isn't viable,clip the slip-on connectors off the "INNER" cable and solder the wires into place on the speaker's tags.

You should now have a short "AMP" cable coming from your amp chassis with a 1/4" plug attached, as well as a short "INNER SPKR" speaker cable with a 1/4" plug, coming off of your combo's speaker.

Now,before going further,you must determine the impedance of the combo's existing speaker.This will help you determine what additional speaker setups you can use with your amp & the SpeakerMate CX.With most amps that DO NOT have any external speaker jack,the amp's internal speaker's impedance is 4ohms.You can confirm this easily by checking the amp's owner manual,company website or,with an ohmmeter set to low ohms.(you're actually measuring DC resistance but's it's close enough for this test) Typically, a 4ohm speaker will read as between 3.2 to 4.1 on most ohmmeters
An 8ohm speaker will read between 5.7 to 8.4ohms
a 16ohm speaker will read between 13 to 17ohms
If at any time,you're not sure what the impedance of your "final" spkr setup is, simply disconnect the "AMP" cable from the Speakermate's "AMP" jack. Now plug in an unsoldered 1/4 " connector and with an ohmmeter,measure across the two plug terminals.You should be able to read something close to any of the ohm readings listed.

For combo amp's that have an INNER speaker impedance of 4ohms,use the following setups:

- 1.Plug the newly made "AMP" cable(that now leads from the amp's chassis) to the SpeakerMate's "AMP" jack.
 - 2.Connect the "INNER" cable into the SpeakerMate's "INNER" jack.
 - 3.Depress the "SELECT" switch towards the "INNER" label.
- You'll note the "I" = INNER marking on the switch.
Your combo will now function as before for home practice or smaller gigs.

When you need more speaker dispersion(coverage) for larger gigs:

- 1.You can now connect an EXTERNAL 4ohm (2x12,4x10,4x12etc) cabinet,with another speaker cable,to the SpeakerMate's "OUTER" jack.
 - 2.Depress the "SELECT" switch towards the "OUTER" label. You'll note the "O" =Outer marking on the switch. This will turn off the combo's "INNER" speaker and send the amp's output to the external cabinet.
- This essentially allows you to turn your combo amp into a head & stack setup when required.
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If you want to use your combo amp's INNER 4ohm speaker at the same time as ONE EXTERNAL 4ohm speaker cabinet:

- 1.Plug your combo amp's inner speaker into the SpeakerMate's "A" jack"
 - 2.Plug your external speaker cabinet into the SpeakerMate's "B" jack
 - 3.Re-adjust your amp's volume & eq settings if needed(this is normal!)
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If you want to use one EXTERNAL 8ohm speaker cabinet,along with TWO additional 4ohm cabinets,WITHOUT using your combo amp's INNER 4ohm speaker:

- 1.Plug the 8ohm speaker cabinet into the "OUTER" jack
 - 2.Plug one 4ohm speaker cabinet into the "A" jack
 - 3.Plug the second 4ohm speaker cabinet into the "B" jack
 - 4.Depress the "SELECT" switch towards the "OUTER" label
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If you want to use one EXTERNAL 8ohm speaker cabinet,along with ONE additional 4ohm speaker cabinet,ALONG WITH your combo amp's INNER 4ohm speaker:

- 1.Plug the 8ohm speaker cabinet into the "OUTER" jack
 - 2.Plug one 4ohm speaker cabinet into the "A" jack
 - 3.Plug the combo's 4ohm speaker into the "B" jack
 - 4.Depress the "SELECT" switch towards the "OUTER" label
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If you want to use TWO,EXTERNAL, 8ohm speaker cabinets WITHOUT your amp's INNER 4ohm speaker:

- 1.Connect one 8ohm speaker cabinet into the "A" jack
 - 2.Connect the second,8ohm speaker cabinet into the "OUTER" jack
 - 3.Depress the "SELECT" switch towards the "OUTER" label
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If you want to use TWO,EXTERNAL,8ohm speaker cabinets ALONG WITH your amp's INNER 4ohm speaker:

- 1.Plug your combo's speaker into the "INNER" jack
- 2.Plug one 8ohm speaker cabinet into the "A" jack
- 3.Plug the second 8ohm speaker cabinet into the "B" jack
- 4.Depress the "SELECT" switch towards the "INNER" label

Note: in this type of setup there will normally be a difference in output levels between mismatched type speaker cabinets.If this is the case,there is a number of "workarounds" listed later in these instructions.

For combo amp's that have an INNER speaker impedance of 8ohms,use the following setups:

If you want to use TWO,EXTERNAL 4ohm speaker cabinets WITHOUT your amp's inner 8ohm speaker:

- 1.Plug one 4ohm speaker cabinet into the "A" jack
 - 2.Plug the second,4ohm speaker cabinet into the "B" jack
 3. Depress the "SELECT" switch towards the "OUTER" label
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If you want to use one EXTERNAL 8ohm speaker cabinet,ALONG WITH one EXTERNAL 16ohm speaker cabinet,ALONG WITH using your combo's inner 8ohm speaker:

- 1.Plug your amp's inner 8ohm speaker into the "A" jack
 - 2.Plug your other 8ohm speaker cabinet into the "B" jack
 - 3.Plug your 16ohm speaker cabinet into the "OUTER" jack
 - 4.Depress the "SELECT" switch towards the "OUTER" label
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If you want to use TWO EXTERNAL,16ohm speaker cabinets(like many *marshall vintage cabs with a single jack connector),WITHOUT using your combo's inner 8ohm speaker:

- 1.Plug one 16ohm speaker cabinet into the "A" jack
 - 2.Plug the other 16ohm speaker cabinet into the "OUTER" jack
 - 3.Depress the "SELECT" switch towards the "OUTER" label
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If you want to use one EXTERNAL 8ohm speaker cabinet along with one EXTERNAL 16ohm speaker cabinet,along WITH your combo's inner 8ohm speaker:

- 1.Plug your inner 8ohm speaker into the "A" jack
 - 2.Plug your additional 8ohm speaker cabinet into the "B" jack
 - 3.Plug the 16ohm speaker cabinet into the "OUTER" jack
 - 4.Depress the "SELECT" switch towards the "OUTER" label
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For combo amp's that DO HAVE a single external speaker jack.

These normally come in two versions:

Version #1 allows your combo's inner speaker to operate ALONG WITH any external speaker cabinet connected to the external jack,so you get TWO speakers in operation.In this version,the amp's output gets "split" between the two speakers.This version usually has the following printed next to the single output jack "minimum speaker impedance 8ohms"

Version#2 allows you to connect an external speaker cabinet BUT DISCONNECTS the combo's inner speaker.In this version,all the amp's available power can ONLY be directed to ONE speaker load at a time(internally OR externally-NOT BOTH at the same time).This version usually has the following printed next to the single output jack "minimum speaker impedance 4ohms"

SpeakerMate CX was also designed to operate with either of the above so here's how:

Leave your combo amp's inner speaker connected as is,stock from the factory.

Connect one end of a short speaker cable from the SpeakerMate's "AMP" jack.

Plug the other end of this short speaker cable into the combo amp's "external spkr" jack

With Version#1 combo amps: (where the combo's inner speaker stays "on")

If you want to use TWO,EXTERNAL 4ohm speaker cabinets

- 1.Plug one 4ohm speaker cabinet into the "A" jack
 - 2.Plug the second,4ohm speaker cabinet into the "B" jack
 3. Depress the "SELECT" switch towards the "OUTER" label
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If you want to use one EXTERNAL 8ohm speaker cabinet,ALONG WITH one EXTERNAL 16ohm speaker cabinet,ALONG WITH an additional 8ohm speaker cabinet:

- 1.Plug your one 8ohm speaker cabinet into the “A” jack
 - 2.Plug the other 8ohm speaker cabinet into the “B” jack
 - 3.Plug the 16ohm speaker cabinet into the “OUTER” jack
 - 4.Depress the “SELECT” switch towards the “OUTER” label
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If you want to use TWO EXTERNAL,16ohm speaker cabinets(like many *marshall vintage cabs with a single jack connector):

- 1.Plug one 16ohm speaker cabinet into the “A” jack
 - 2.Plug the other 16ohm speaker cabinet into the “OUTER” jack
 - 3.Depress the “SELECT” switch towards the “OUTER” label
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With Version#2 combo amps: (where the combo’s inner speaker switches “off”)

If you want to use TWO EXTERNAL 8ohm speaker cabinets:

- 1.Plug one 8ohm speaker cabinet into the “A” jack
 - 2.Plug the other 8ohm speaker cabinet into the “OUTER”jack
 - 3.Depress the “SELECT” switch towards the “OUTER” label
-

If you want to use TWO EXTERNAL,4ohm speaker cabinets(like many newer bass cabinets)

- 1.Plug one 4ohm speaker cabinet into the “A” jack
 - 2.Plug the other 4ohm speaker cabinet into the “B” jack
 - 3.Depress the “SELECT” switch towards the “OUTER” label
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If you want to use TWO EXTERNAL,16ohm speaker cabinets(like many *marshall vintage cabs with a single jack connector):

- 1.Plug one 16ohm speaker cabinet into the “A” jack
 - 2.Plug the other 16ohm speaker cabinet into the “OUTER” jack
 - 3.Depress the “SELECT” switch towards the “OUTER” label
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If you want to use TWO EXTERNAL 4ohm speaker cabinets ALONG WITH one 8ohm speaker cabinet:

- 1.Plug one 4ohm speaker cabinet into the “A” jack
 - 2.Plug the other 4ohm speaker cabinet into the “B” jack
 - 3.Plug the 8ohm speaker cabinet into the “OUTER” jack
 - 4.Depress the “SELECT” switch towards the “OUTER” label
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Lastly, some combo amps feature TWO output jacks at the back. One of the jacks will already have the combo's inner speaker plugged into one of these jacks, leaving the other remaining jack "open". Usually it will be labeled "minimum 4ohm total load" or "minimum combined 4ohm load" or similar. This means it's likely that the internal speaker will measure 8ohms. You can confirm this with an ohmmeter. If this is your amp, you can do the following:

1. Disconnect the inner speaker and plug this into the SpeakerMate's "INNER" jack.
 2. Run a short speaker cable from ONLY ONE of the two jacks at the rear of your combo.
 3. Plug the other end of this short speaker cable into the Speakermate's "AMP" jack
 4. Depress the "SELECT" switch to the "INNER" label
- Your amp will function as usual.

If you want to use TWO EXTERNAL 8ohm speaker cabinets WITHOUT your combo's inner 8ohm speaker:

1. Plug one 8ohm speaker cabinet into the "A" jack
2. Plug the other 8ohm speaker cabinet into the "OUTER" jack
3. Depress the "SELECT" switch towards the "OUTER" label

If you want to use TWO, EXTERNAL 4ohm speaker cabinets ALONG WITH your combo amp's inner 8ohm speaker

1. Plug one 4ohm speaker cabinet into the "A" jack
2. Plug the second, 4ohm speaker cabinet into the "B" jack
3. Depress the "SELECT" switch towards the "INNER" label
4. You can select to have ONLY the external speaker cabinets by depressing the "SELECT" switch towards the "OUTER" LABEL

If you want to use TWO EXTERNAL, 16ohm speaker cabinets (like many *marshall vintage cabs with a single jack connector), along with your combo's inner 8ohm speaker.

1. Plug one 16ohm speaker cabinet into the "A" jack
2. Plug the other 16ohm speaker cabinet into the "OUTER" jack
3. Plug the combo's inner 8ohm speaker into the "B" jack
4. Depress the "SELECT" switch towards the "OUTER" label

Note: in this type of setup there will normally be a difference in output levels between mismatched type speaker cabinets. If this is the case, there is a number of "workarounds" listed later in these instructions.

If you want to use one EXTERNAL 8ohm speaker cabinet, ALONG WITH one EXTERNAL 16ohm speaker cabinet, ALONG WITH your combo's inner 8ohm speaker cabinet:

1. Plug your combo's inner 8ohm speaker cabinet into the "A" jack
 2. Plug the other 8ohm speaker cabinet into the "B" jack
 3. Plug the 16ohm speaker cabinet into the "OUTER" jack
 4. Depress the "SELECT" switch towards the "OUTER" label
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The SpeakerMate CX also offers one *more* simple trick for players, allowing you to switch your amp's output between two different speaker cabinet setups over the course of an evening's performance or recording session. For example, starting out the evening with a small, 1x12" cab setup for the low-level bluesy stuff for a first set and playing to a smaller crowd. Then as the night progresses, flick the switch so your amp now feeds your larger speaker cabinet, as the crowd gets noisier and you have to bear down for more output. This feature also comes in handy in the recording studio when trying the same amp thru a number of different speaker setups, in search of "that tone". Here's how:

With a solidstate/transistor amp:

1. Plug your combo's inner speaker into the "INNER" jack
2. Plug the same impedance, larger speaker cabinet into the "OUTER" JACK
3. For the "low-level" part of the performance, set the "SELECT" switch to "INNER"
4. When the performance requires the larger cabinet's output, (between songs or before the next set), turn down your amp's volume and switch off the power. Depress the SpeakerMate's "SELECT" switch to "OUTER". Turn on your amp's power switch, adjust your volume & go!

With a tube/valve output amp:

- Plug your combo's inner speaker into the "INNER" jack
2. Plug the same impedance, larger speaker cabinet into the "OUTER" JACK
 3. For the "low-level" part of the performance, set the "SELECT" switch to "INNER"
 4. When the performance requires the larger cabinet's output, (between songs or before the next set), turn down your amp's volume and switch the amp to "standby". Depress the SpeakerMate's "SELECT" switch to "OUTER". Switch out of standby to restore power, adjust your volume & go!

If NONE of the above amp outputs or setups can be used with your particular amp, please email Gilles at info@sherlockaudio.ca with as much info about your amp as possible, including the model, wattage, speaker size, impedance, etc. We may still be able to offer some solutions. Thanks!

Although the SpeakerMate's *primary* design function is to allow as wide a range of multiple speaker combinations as possible with *MANY* different amps, it *DOES* perform a number of multiple impedance *matching* functions as well.

However, it's worth noting that often a very audible mismatch in output volume can occur. This happens when *that* spkr configuration is out of the SpeakerMate's impedance matching range. This difference in volume levels usually occurs between a set of speakers and one "oddduck" cabinet (usually the oddduck being louder than the rest of the system). However, there are a number of workaround remedies possible for this:

1. In a guitar/bass spkr setup, the "loudest" is placed in the center of the array (in a 3spkr setup)
2. In a guitar/bass spkr setup, the "loudest" is placed on the "bottom" of the stack
3. In a guitar/bass spkr setup, the "loudest" is placed at the far end of the stage, so the bassist can hear the guitarist at the opposite end of the stage (or vice versa) without having to send each other's signal into the monitors
4. In a monitor setup, the "loudest" is placed nearest the drummer (instead of at the front of the stage with the "regular" monitors)
5. In a P.A. setup, the "lower" volume spkr(s) can be installed in the remote locations

6. In a P.A. setup, the “loudest” spkr(s) can be installed in the higher/long throw locations

7. In a studio setup, the “loudest” is the one that “goes” into the isolation booth for close miking, away from the “regular” cabs in the main room.

Additional notes: All readings were done with actual loads (not calculations). Your actual readings may differ slightly, due to varying speakers construction tolerances that can change during performance. It's assumed that the operator of this equipment is going to use this as designed and intended, with a suitably powered combo amp that can deliver the needed power (i.e. DO NOT try to power six, 412" cabinets with a PV 15watt Rage or similarly absurd application!). You won't damage the SpeakerMate but you can start digging a hole for the amp.....

A brief discussion on speaker/cabinet *efficiency*

Even in scenarios with two cabinets having the SAME impedance, it frequently occurs that *one* cabinet still sounds louder than the other. How can this be, if they're BOTH the same impedance? They SHOULD both have the same volume level, we assume. This is where speaker *efficiency* comes into play. In a nutshell, efficiency is a given speaker's ability to take input power (electrical watts) and process/transfer that, into actual (acoustic) watts.

This efficiency is (normally referred to with a test measurement), in db (decibels) with a 1 watt input at 1 meter (some manufacturers test at 3 feet). Without getting knee-deep in “speaker-math”, we'll explain the scenario above as to why one cab sounds louder than the other. For our “imperfect” ears, it takes TEN times the amount of input power for us to notice an increase of TWICE the volume level.

Spkr#1 efficiency : (same impedance as #2)	Spkr#2 efficiency:
100db 1watt input at 1metre (actually 39 inches)	97db 1watt input at 1 metre
103db 10watts input	100db 10watts input
106db 100watts input	103db 100watts input

Assuming two quality guitar speakers, we're pretty much at the maximum input power they'll take (before “nasty things” happen to them). So, no matter how much input power you want to apply to spkr#2, it will never be any louder than spkr#1.

This is only “part” of the story. Read on.

Now, let's assume a *mismatched impedance* between two speakers

(let's say an 8ohm and a 16ohm unit). Based *only* on impedance, we'd assume the 8ohm speaker *should* be “louder” than the 16ohm unit (due to its lower impedance).

We'd actually be *wrong*. How can that happen? Let's take a look. (BTW—we've simplified “the numbers & math” here to make it easier to get the point across, so engineers—put your calculators back in their holsters, please.)

Spkr#1, 8ohms, efficiency	Spkr#2, 16ohms, efficiency
97db 1watt input at 1metre	100db 1watt input at 1metre
100db 10watts input	103db 10watts input
103db 100watts input	106db 100watts input

Now, for the sake of explanation let's power each speaker with its own identical 100watt poweramp and the same input signal going to both amps. At 10watts into 8ohms, spkr#1 is showing up with 100db. Since spkr#2 is getting $\frac{1}{2}$ as much power (5watts) applied to it, because of its 16ohm impedance, you'd think you'd be getting $\frac{1}{2}$ as much actual volume(db) level from it right? Not exactly. Even with 5watts (half of the other speaker's 10watt input), the "assumed" "lower" volume, 16ohm speaker is still capable of delivering an "easy" 100(or slightly more)db! Why? Simply because *this* 16ohm speaker is MORE efficient than the lower impedance 8ohm unit. You can now see that impedance isn't the only thing to consider in a multi-speaker setup.

How does this all apply in the real world? Before dismissing any given setup with *mismatched* impedances (say, 4 + an 8 or an 8 + a 16) connect them and actually *listen*. In many instances, you might be surprised to find there really isn't much of a difference in volume levels, contrary to what "the math" says.

WARRANTEE INFORMATION

All Sherlock Audio SpeakerMate products are warranted for TWO YEARS parts & labour against manufacturing defects when used for their intended purpose.

THERE ARE NO CONSUMER LEVEL/USER SERVICEABLE PARTS IN THIS UNIT.

SpeakerMate features an integral RF shielding sealing all circuit links in place. In order to maintain the operational integrity of the circuitry and protect the internal components against environmental elements, and for safety requirements, the lid & enclosure have been welded at time of manufacture. Any user attempt to disassemble/repair/modify unit will break this continuous seal and render the unit unreliable and/or inoperable and VOID ANY WARRANTY or continued performance to the user.

Do not place this unit near strong magnetic or fields as this will possibly damage the operational integrity of the SpeakerMate.

NO other warranties expressed or implied