

TENTlabs XO, XO2 and XO3 low jitter clock oscillators

The sound quality of all CD players and DACs is directly affected by the clock quality. A jittery clock degrades the sonical performance of your CD player too. Most, if not all clocks implemented in commercial CD players or drives show rather disappointing jitter performance, as they are often designed by digital engineers, and even more often implemented the wrong way around.

Substituting the standard clock with a new clock oscillator, designed with low jitter in mind, will greatly enhance the sound quality. This new clock oscillator is now made available at a very reasonable price. The performance of your player or drive will greatly benefit from substituting for an XO.

OPTIONS

(to serve you all)

1. XO, a separate module, intended for the experienced hobbyist who rolls his own
2. XO2 = XO + low noise supply, sitting on a neat PCB. Just connect power supply and change a few components inside the player yourself - the fast and easy solution!
3. XO3 = XO + low noise supply + reclock circuit. Now extended with an SPDIF reclocking circuit. This greatly enhances sound if the CD player is used as a drive for your external DAC

PRICES

(shipment and mounting not included)

- XO - XO separate (ferrite suppression bead included) € 27
 - XO2 - XO + low noise supply PCB € 105
 - XO3 - XO + low noise supply PCB + reclock circuit € 129
- Upgrade from "1" to "2" or from "2" to "3" possible - you'll only pay the difference

PROPERTIES

(what is so special?)

- XO2 and 3 come fully stuffed, tested and adjusted PCB, ready to be built in your player right away !
- Total jitter below 3 ps rms (3-sigma, rms)
- Improved low noise supply exhibits only $5nV / \sqrt{Hz}$ total noise (20 Hz - 100kHz)
- Available frequencies [MHz]: 8,4672, 11,2896, 16,9344, 18,4320, 24,5760, 27.0000, 33,8688, 45,1584

How to implement the XO

(instructions)

Building the XO (PCB) in your player isn't that big hassle, though you need some experience and patience, for a happy end. Nevertheless hundreds of people succeeded already. To support you, a document with generic instructions is made available. Please apply.

HOW DO I ORDER

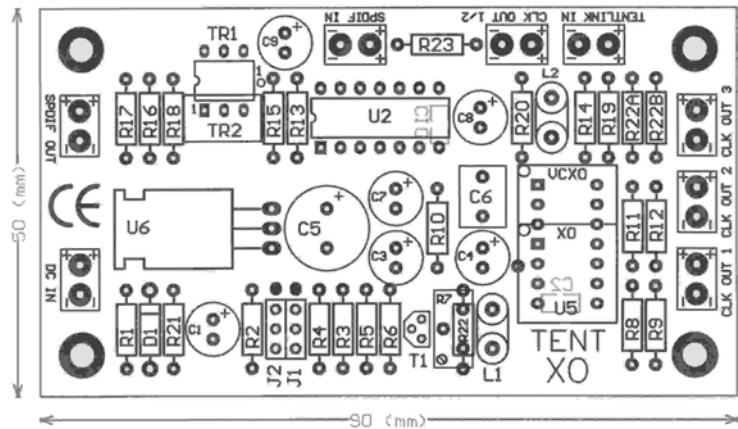
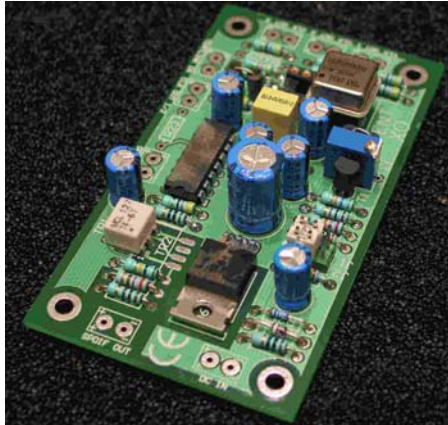
- Send me an email with required frequency and shipping address, to get the train rolling

Guido Tent can be contacted at: Info@TENTlabs.com - Lower the noise, your ears will like it !!

The module

WHAT's ON THE PCB

(generic information)



VERSIONS

(the choice is yours)

The PCB module shown above is available in 2 versions

- XO2 - XO + low noise supply, intended for CD/DVD player upgrade
- XO3 - XO + low noise supply + SPDIF reclocking circuit, intended for CD/DVD player upgrade, once an external DAC is used as well
- XO is the canned module only, intended for the true DIY. It needs a clean 5V / 10mA power supply and puts out a squarewave in turn.



WHAT CUSTOMERS SAY

(some feedback)

- *So Guido, bill me because the oscillator is not coming back!*
 - *The new low jitter oscillator definitely brought more definition, more resolution to the music. More can be heard. Details come to life.*
 - *I think both of these electronic modifications (re-clock and passive-out) can be done to most CD Players and bring an improvement.*
 - *Yesterday night I mounted that tiny clock inside my Marantz 17K1 and the result is stunning! Never before the stereo image was that deep and high, with all other aspects that came along. The definition is better, less time smear, the tone of instruments containing low frequencies is better, instruments can be followed more easily and focus is better. In conclusion, this is a huge upgrade! Just wanted to let you know!*
 - *To me the XO is the upgrade of the year, or another miracle has to happen !*
 - *Today I finally found some time to include the XO in my TL5100. My first impression after 5 minutes: seemingly shocking. Much more is happening, space, echo, clean, rhythm, all better, with more power involved*
 - *Now the sound is more relaxed... and more energetic. It is not like changing a capacitor for a better one, it's not a matter of transparency, or detail (although now they are better), but the music sounds more... like music. Everything sounds less 'thick', but at the same time much more expressive. Particularly with female voices, yesterday night I heard one after the other all my favourite singers, till 3am. with a shiver with each song... a memorable night.*
 - *So thanks Guido for making this available, the kind of high quality part that was lacking for the aficionado*
 - *The parcel has been delivered rapidly and I mounted the XO2 unit right away. I did not expect that much of a result, as many of the so-called tweaks are just disappointing. However, this is phenomenal!! Instruments are really clean, super, and wow, Angela Gheorghiu **can** sing.....*
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WHAT PROFESSIONAL CUSTOMERS SAY

(more feedback)

- *Dear Guido,
The improvements on the Sony CD (XA 50 ES) player is huge. More detailed top, smoothed mid, defined bass, and "relaxed" presentation. I might sell my D/A converter if I can gain just a little more elsewhere in the Sony. (Written by a manufacturer of impressive sounding horn loudspeakers - the best I heard yet)*
- *Hi Guido
Last weekend I finally got some time to incorporate your low noise clock into my Marantz CD6000OSE CD player. In one word, the experience was fantastic.

Immediately noticeable is the largely improved focus of single instruments in the large sound-field of a big symphony orchestra. Concert hall space is transferred in to my listening room.

But there is much more, I list them in order of importance (to me). Explosive dynamics, best noticeable in bass impact and transients on drums. Man, this effect really blasts you away and I never anticipated that a clock circuit could have such a big impact. Bass is much tighter and you hear the textures in bass sounds in the sound-field from different bass instruments.

Transparency, harmonic texture, reality of instruments like violin, cello, piano, trumpets, also voices improved a lot, although I did not have much vocals tried out. The sound of these instruments is more as in reality also in presence of hundreds of other instruments. Results in much more contrast and more pleasure in listening: a life experience.

Details such as fading echo's not detectable before are now experienced. It looks like the resolution of the DAC improved. Also noise in the recording seems to be highlighted. Not that it is more disturbing, but you can hear that it is located. In the noise you hear contrasts between electronic noise in the recording and noise coming from the environment of the concert hall like fans, air streams, echo's fading away, the people etc. (Sent to me by a manufacturer of very good sounding transistor amplifiers)*
- *The moment of truth is there, the player is placed back in the system and connected. After 2 seconds my jaws are at my chest, completely dull and unconscious. This thing now really smokes my old player, in every aspect !.....This improvement made me play many CDs again. Playback was more relaxed, more smooth and tight. Spaciousness now seems convincing and the bass is amazing.....Even after a month I am still very convinced.....this is a vital modification it looked like the player with the old clock was seriously ill You must be an absolute audio-nut if you do not immediately change your CD players clock for an XO a better audio mod, more easily to implement, with and higher quality to price ratio cannot be found
(Reported by a professional tube amplifier designer)*

Warrantee

(does that count ?)

Yes, it does. Once you spend money on a decent product, you will know it will last - Long ! All XO modules carry a **5-year warrantee** on their intended function, assumed that you took care building it in your player, according the prescriptions. So a long period of listening satisfaction is guaranteed....

PAPERS

(on related subjects)

I wrote the following papers:

- How to implement XO clocks in your CD player. A generic mounting instruction, comprising pinning information of most used chips.
- Jitter, some fundamental issues and an introduction on understanding how it affects sound
- Power supply decoupling and layout. A guide to fundamentally improve (digital) circuits

Papers are available in electronic form, please mail me with your request: Info@TENTlabs.com