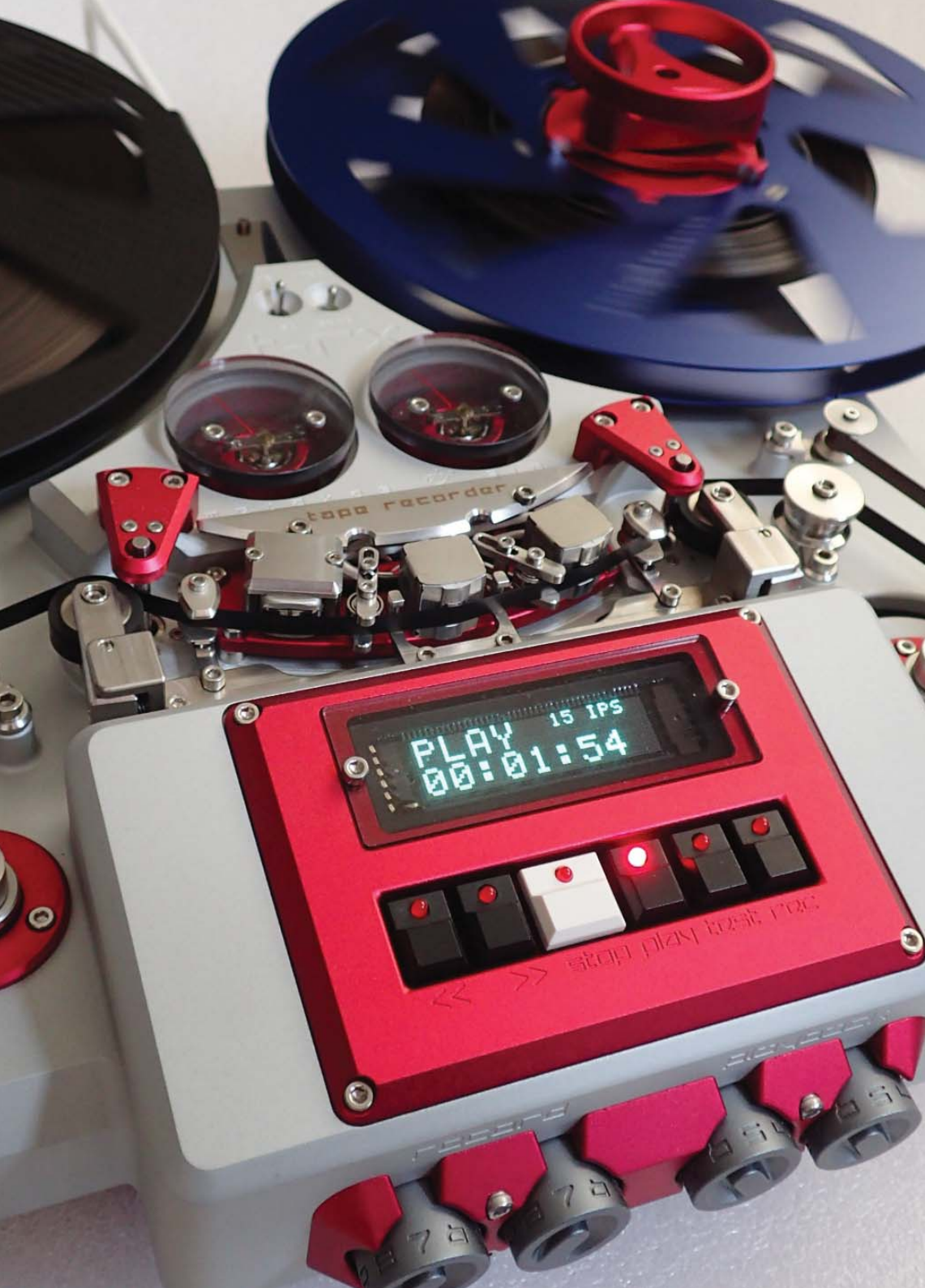


t-rx "tourbillon"
tape recorder

motaxos & sins
SINCE 1981



In horology, a tourbillon (French: “whirlwind”) is an addition to the mechanics of a watch lever escapement to increase accuracy. It was developed around 1795 and patented by the French-Swiss watchmaker Abraham-Louis Breguet on June 26, 1801.

The Metaxas & Sins T-RX Analog Tape Reproducer is the first Tape Recorder to use the same concept to absolutely regulate the speed of the tape through the use of An ARM-CORTEX “controller” which synchronises the 4 Maxon motors [2 reel motors and 2 capstan motors] with the 2 linear ACTUONIX motors which control the “Dual-Capstan” rollers on a fully retractable bar.

It is an entirely newly designed professional reel to reel tape location recorder and playback machine that meets and exceeds the highest demands of recording engineers and the most serious audiophiles.

It is a tool to record and playback magnetic tape at the absolute highest levels.

The T-RX also combines the highest precision “milgauss” stainless steel mechanical parts mounted onto a chassis which is CNC’d from a solid block of aluminium.

The audio “SOUL” of the TRX electronics borrow from intensive recording work conducted over the past 35 years with Swiss Stellavox portable recorders which use single-ended transistor purist electronic paths developed in the 1960s.

The result is a machine that is capable of recording and playback with a level of realism that gives the listener the sense of being present at the live music performance in it’s original venue. Combining 2020’s technology with 1960’s “soul”

GREAT GEAR
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the absolute sound

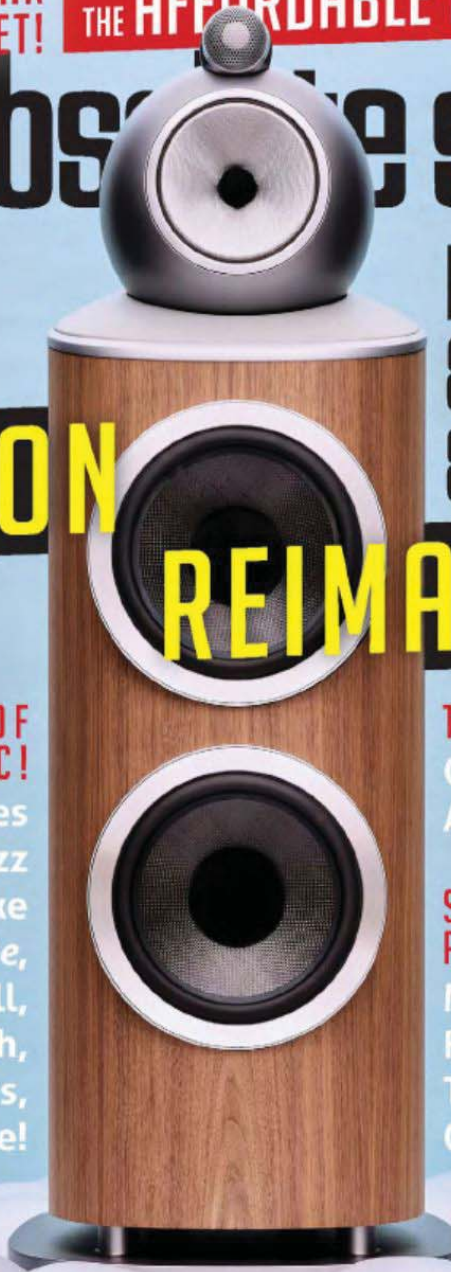
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Johnny Cash,
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TUBE PARAGON!
Conrad-Johnson
ART 150 Amp

SPECIAL
REPORT

Metaxas & Sins'
Fabulous Tourbillon
Tape Deck +
Open-Reel Primer

FEBRUARY 2022
\$6.99 US / \$8.99 CAN



DISPLAY UNTIL FEBRUARY 20, 2022

Special Feature



The Birth of the Cool

Metaxas & Sins Tourbillon
T-RX Tape Deck

Jonathan Valin

I'm not going to kid you: I am among the mechanically inept—high among them, I would say. If there were a merit (or demerit) badge for hastiness, clumsiness, and willful inattentiveness around machinery of any kind, I'd be wearing it (and would have royally earned it). And yet I very much doubt whether I would have gotten into this hobby when I did, which was as a teenager, or stuck with it as long as I have, which has been a lifetime, if it weren't for the spell that complex, finely crafted mechanical objects have cast on me from youth to old age.

Now, in the world of high-end audio, there is nothing as intricately or as spellbindingly crafted as a reel-to-reel tape deck. You can see this simply by looking at one. (Of course, if you're like me, you will look at one at your peril for, once seen, that spell will be wound up.) Here is the ultimate in high-end-audio mechanics—a concoction of motorized reels, motorized capstans, motorized retractable capstan bars, tension arms, metal rollers, and rubber pinch rollers, with an electromagnetic transducer (the record/playback head assembly) at its center—that when fed a spool of pre-recorded tape comes closer to recreating “the absolute sound” than any other playback medium extant. Indeed, if the words “absolute sound” are something more than a catch phrase, if they mean what they say, then highest-fidelity playback of 15/30ips, two-channel, reel-to-reel mastertapes is what they mean.

getting started



Here is some simple information to help you “get started” with your TRX.

Attached, are photos of spare parts that will arrive with your TRX [apart from the separate Power Supply/Power supply cable].

The Parts are as follows:

1. 4 x EVA FOAM squares to put under your machine [so that the machine vibration isn’t amplified by your bench] Please put 2 squares underneath the two large reel motor “tubes” and the other 2 squares underneath the “Carry Handle”.
2. Artist Brush [to brush away tape shedding/dust]
3. 2 spare 2.5mm SKF bearings...just in case [we use these in most things, so it might be a good idea to find your local stockist]
4. A bag full of Alun keys - you should check that none of the bearings have become loose during transport - but NEVER overtighten.
5. A pair of NAB Hub adapters - our “Hubba-Hubba” NAB clamps/adapters.
6. LEMO/CAMAC 4 pin connector which plugs into the side of the machine. The Pin configuration is attached on next page.



Special Feature Metaxas & Sins Tourbillon T-RX Tape Deck

Specs & Pricing

Nominal recording level: 0dB @ 514Wb/m
Maximal peak level: +4dB
Wow efficiency: <65dB, 14Hz
Recording/playback speeds: 7.5ips, 15ips, 30ips
Frequency response: 30Hz-20kHz, <2dB
Distortion: <2% at 1kHz, 514Wb/m
Crosstalk: <55dB
Signal-to-noise ratio: 67dB, 38cm/s ASA filter, 514Wb/m
Wow & flutter: <0.25%
Input impedance: 16k ohms
Output impedance: 560 ohms
Price: \$36,000

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Part of the reason that mechanical objects like tape decks are so endlessly intriguing is that you have to lay hands on them to make them work. These aren't "black box" components like DACs or solid-state amps or almost everything else in hi-fi nowadays. Tape decks have to be manually operated, like view cameras or stick-shift gear boxes (or toranema and sumbala, for that matter). Part of that manual operation involves the tape itself, which must be loaded by hand onto a hub and spindles, threaded through a series of idlers and tension arms on either side of the playback head, and wound (initially by hand) onto a take-up reel. (It, as is usually the case with 15ips decks of production mannequins, the tape is delivered to you "back out"—which is to say, wound backwards, so that the reel starts with the end of the recording rather than with the beginning—you will have to rewind it and then re-thread it from the playback reel back along the tape path to the take-up reel before it can be audited.)

Yes, reel-to-reel machines are a lot of work, and there is more to that job than simply loading and/or rewinding the tape. But there is something important to be said for committing yourself to all this labor. As anyone seriously interested in camera or cars can tell you, being compelled to lay hands on an object to make it work lends a connection that goes a lot deeper (and a bit more intensely satisfying) than merely pressing a button on a DAC or a virtual button on a computer tablet. It not only gives you a sense of proprietorship, but of active participation. The thing literally can't do its job without you. Speaking for myself, this sense of psychological and physical involvement is a large part of why high-end audio has not (yet) lost its charm. Whether it is wholly true or not, the feeling that your physical assistance is necessary to make something function—that you are the missing piece it is designed around and that your gradually acquired skills and

expertise will make it function better—generates a pride in and satisfaction with your purchase that only comes with active engagement. All of this brings me to an electromechanical object that is simply so damn marvelous that I haven't seen its like in decades: the Metaxas & Sins Tourbillon T-RX tape deck.

Unlike Greg Beroff's fabulous UHA SuperDeck (reviewed in Issue 319), the Tourbillon is not a completely updated and beautifully refurbished machine from the heyday of analog playback. It is an entirely new creation, built from scratch by tape maven Kostas Metaxas in his own home. He is also a gifted, award-winning visual artist, whose creations simply don't look like the more or less utilitarian boxes that everyone else builds. (Trust me: You won't confuse a Metaxas component with the work of any other audio designer.)

Since he began recording Metaxas is also a highly skilled tape recorder, whose many 15ips reel-to-reel live-concert tapes are available from Jodelo Demaree at Master Tape Sound Lab (master tapes@jodelo.com) and also directly from Metaxas himself. Since he began recording back in the 1980s, Metaxas has been obsessed with finding the very best tools for the job. Eventually, this quest led him to the celebrated Swiss company Stellavox, whose tape decks were at one time ranked among the finest money could buy. From the 1960s through the 80s, Stellavox offered two lines of tape recorders—a portable deck (the SP58M series) for location recording and a larger

machine (the TD series) for the studio. After considerable research, Metaxas bought one of each.

In time, Metaxas became friends with Georges Queller, founder of Stellavox. Though Queller's Swiss-made decks were the quintessence of Swiss craftsmanship—some of the finest examples of electromechanical engineering made in the post-war—his company was eventually done in by digital. After taking a sabbatical from his DAT recorder (the Stellavox Queller retired from a field that was simply changing too quickly for him to keep up with, especially since he and his small staff built everything by hand, in production cycles that often took months and years to complete.

Stellavox was hardly the only casualty of the digital revolution. By the end of the 1990s, any manufacturer of analog tape decks had succumbed. (Which is why, until very recently, the only decks that diehard R2R tape-lovers could purchase were refurbished models.)

Then two things happened. In the mid-2000s, Dan Schmale, Mike Romanowski, and Paul Schildebrandt founded The Tape Project and began demoing with refurbished R2R tape machines at hi-fi trade shows, playing back two-track 15ips copies

Special Feature Metaxas & Sins Tourbillon T-RX Tape Deck



of master tapes that The Tape Project had secured the rights to copy and sell (in limited quantities). Within a decade, the number of exhibitors using R2R tapes and tape machines to demo with at audio shows had grown substantially. Even mainstream analog record companies and record retailers—such as Acoustic Sounds/Analogue Productions, Chasing The Dragon, Funky Groove Notes, Opus 3, and Varlog—started to dip their toes in the R2R market, releasing limited numbers of their own set of classic titles on 15ips tape.

If The Tape Project got the R2R ball rolling on the source side, it is United Home Audio's Greg Beroff who got it going on the hardware side. An avid lot of audiophiles, including many of you reading this review, got your first taste (or first reminder) of how good reel-to-reel playback can sound via one of Greg's modified Marantz machines, either in a manufacturer's showroom or at one of Greg's and MBL guru Jonny Bryan's after-hours gatherings at RMAF, ANXPONA, Capital Audio Fest, THLE Shows, etc.

Thanks to Greg and The Tape Project, the number of R2R tape enthusiasts (and R2R tapes) has greatly increased over the past decade. While I can't say that their numbers come anywhere close to the hungry masses who have rediscovered the joys of vinyl, there are now enough upstarts to constitute a niche market—gigs and gigs with the money and the "absolute sound" incentive to reach for the highest-fidelity playback possible.

As a side benefit of this mini-revival, some companies have begun to build and market R2R tape decks again—brands new, not refurbished items. Which brings us to the Metaxas & Sins Tourbillon T-RX.

In the light of this tape renaissance (and with the advice and blessing of Georges Queller), Kostas decided to build his own, enhanced versions of the Stellavox S88 portable and TD9 studio machines (among the best—and best—commercially available analog Stellavoxes). After three-and-a-half decades of working with both machines, Metaxas was as familiar with their design strengths and those areas where they could be improved upon as anyone in the tape-recording business. Having to Queller's engineering principles, employing the very best, often bespoke parts on the planet (some identical to those found in the Stellavox originals, many new and greatly improved), hand-building, testing, and fine-tuning everything himself (or with the help of his sons), giving free rein to his own artistic gifts in the looks and ergo-

nomics of the things, Kostas brought forth two visually stunning, socially commanding, and completely head-turning, and completely hand-made products: the Metaxas & Sins Tourbillon T-RX portable deck (reviewed here) and the larger, pricier Tourbillon studio deck.

To give you some idea of how the Tourbillon looks in life, let me tell you how my tape-loving friend Andre Jennings—a guy not prone to bouts of wild enthusiasm—reacted when he saw the Metaxas machine. After five minutes, Andre finally spoke up: "This thing looks like a work of art. It's beautiful. I'd love to have it in my living room."

Unlike the Stellavox S88, the Tourbillon T-RX doesn't require hub-adaptors and motor pulleys to accommodate and play back 15ips or 30ips tapes on 10 1/2" reels. It'll do that (and more) just as it comes. All you have to do is load a tape, drive a switch on the top panel to select playback speed (30ips/15ips/7 1/2ips), throw a second switch setting heads in to choose between BEC and NAB equalization, and begin to play.

The T-RX's other controls are simple but not minimalist: two pairs of large red volume knobs on the skinny front panel of the unit's main-driver chassis—one set for left and right second gain, the other for left and right playback gain; two circular VU meters on the top panel above the record/playback/erase head assembly for monitoring record/playback levels; an oblong Neoflex LCD screen below the operational status of the unit; and beneath that the customary bank of playback controls for rewind, fast forward, stop, play, test, and record (there is also a record safety-switch to prevent accidental erasures on decks equipped with a record head).

It's better for me to refer you to the photographs of the Tourbillon than to try to describe it. It's just so...cool.

Special Feature Metaxas & Sins Tourbillon T-RX Tape Deck

On the far left of the narrow back panel are the left/right output jacks for your preamp—you can choose to order the deck with pseudo-balanced XLRs (the T-RX uses single-ended circuitry, thus the "pseudo") pair or with standard RCAAs—followed to their right by a multi-pin input for the outboard power supply cable, followed in turn by a pair of XLR inputs for your microphones (assuming you have specified a unit with record heads). The only other I/O is a four-pin LEMO jack on the right side of the chassis for headphones or a meter scope.

Inside the explosion-free chassis, which has been CNC-milled from a solid block of aluminum, is more tech than I can possibly detail. But to give Metaxas' mechanics and circuitry a cursory look, let's begin with why the T-RX is called the "Tourbillon." As many of you may already know, in horology a tourbillon is a complication added to a watch (a rotating cage in which the escapement and balance wheel are mounted) that increases time-keeping accuracy. The T-RX uses a 64-bit ARM Cortex microprocessor (yes, a digital part) to perform this same function—to regulate the speed of tape travel (and braking) with unprecedented 0.001% accuracy, by synchronizing the four, Swiss-made, NASA-grade Maxon motor/controllers (two motor heads and two capstan motors) with the two linear Antonov motors that control the dual, mid-gauss-steel, capstan rollers mounted on a removable bar, which automatically shifts forward when the play or record button is pressed (to allow the tape to contact the playback and record heads). The heads themselves are the same type used in Stellavox's TD9 machines—Phonon Bhanerji units made in Torino, Italy. (Headstocks are hot-swappable: In case you dig up a vintage Reagen or Wiedell, the unit can accommodate both quarter-inch and half-inch tape, although bias still needs to be reset for 30ips if you plan to use the machine to record.) (The unit comes braced for 15ips and Scotch 488 tape; Metaxas claims that, at 15 or 7 1/2ips, there is no need to adjust bias for any other tape formulations. At 30ips, however, you may have too much high-frequency energy with the bias set as it comes from Metaxas & Sins, so re-biasing via an MRI calibration tape and the adjustment of two rotary trimmer pots is recommended. For details on the biasing procedure, consult Metaxas website at metaxas.com.)

The electronic heart of the Tourbillon is the playback circuit, which is based on Queller's patent design from the 1960s, but with significant upgrades. Unlike every other deck that he is familiar with (and he's seen audio-grade Ampexes, Studers, Orbits, as well as Stellavoxes), my pal Andre tells me that the signal from a Stellavox only passes through four or five transistors from input to output, where the signal in other machines is wound through scores of active electronic parts. The result is a native purity and fidelity that set the sound of Stellavox apart. When this playback purity is enhanced by the markedly improved accuracy with which the Tourbillon moves the tape and transmits its signal, the result is, well...I've never listened to anything quite like it. I put the cart before the horse (or maybe the horse in the cart), this is, simply, the most neutral and complete presentation I've heard from any audio component. This is the absolute sound: the definition of those words that make the hair come to me: the sound that was recorded in the studio or the concert venue.

To a large extent, I've already commented on the Tourbillon's sonic in my review of the outstanding Etchells N. Diamond M8 II load-speaker system in issue 323. The unusually natural and lifelike, virtually uncolored reproduction of the tapes Beroff discussed (Chet Baker Sings, A Tribute to Ella Fitzgerald, and Joan Baez), the many new things that I learned about the singers, the instrumentalists, and the recording techniques and the old things I re-learned about myself and about the way music has shaped my life are owed equally to the Metaxas & Sins Tourbillon T-RX, which is to tape recording what the original Quads were to stereo recording (yes, a digital part) to perform this same function—to regulate the speed of tape travel (and braking) with unprecedented 0.001% accuracy, by synchronizing the four, Swiss-made, NASA-grade Maxon motor/controllers (two motor heads and two capstan motors) with the two linear Antonov motors that control the dual, mid-gauss-steel, capstan rollers mounted on a removable bar, which automatically shifts forward when the play or record button is pressed (to allow the tape to contact the playback and record heads). The heads themselves are the same type used in Stellavox's TD9 machines—Phonon Bhanerji units made in Torino, Italy. (Headstocks are hot-swappable: In case you dig up a vintage Reagen or Wiedell, the unit can accommodate both quarter-inch and half-inch tape, although bias still needs to be reset for 30ips if you plan to use the machine to record.) (The unit comes braced for 15ips and Scotch 488 tape; Metaxas claims that, at 15 or 7 1/2ips, there is no need to adjust bias for any other tape formulations. At 30ips, however, you may have too much high-frequency energy with the bias set as it comes from Metaxas & Sins, so re-biasing via an MRI calibration tape and the adjustment of two rotary trimmer pots is recommended. For details on the biasing procedure, consult Metaxas website at metaxas.com.)

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I could leave it at that and feel as if I'd done the Tourbillon justice, only I know that you want more. So, let's take another step down Tourbillon Lane, beginning with a Strakoska-sounding, studio album, Vanessa Ferrando's *The Way*—a collection of R&B songs (penetred by the likes of Marvin Gaye, Curtis Mayfield, Isaac Hayes, Al Green, and Bill Withers) on the Groove Note label, recorded in 2004 by Michael C. Ross at Ocean Way (now United Recordings), and mastered by none other than Benjie Grantham at his own studio, Benjie Grantham Mastering.

Even on first listen, I was smitten by how outstandingly good this tape sounded. No, it isn't an all-acoustic recording made in a real space. This is pre- and post-assembled pop music, sung by a gifted female vocalist from Singapore (of all places), backed by good journeyman musicians (bass player, guitarist, drummer, and keyboardist) from the States, taped in a Hollywood recording studio with vintage microphones, and mastered in a different Hollywood studio with vintage tube electronics. I don't know what was escaping from *The Way* (I haven't always loved previous Groove Note artists and releases), but it certainly wasn't what I got. Tanned out the playlist was great, the vocal quite entrancing (post-softhead, with a bit of a lisp-y vibe), the instrumentalists well played, the arrangements good, and the sound...well, the sound was *The Way*. With the exception of certain titles from Jonathan Horowitz at PPI and digitally recorded pop cuties like Patricia Barber's *Café Blue*, I haven't listened to a lot of contemporaneous jazz/pop recordings on tape. However, if there's all *The Way*, then I've clearly missing out in a big way.

Except, they're out all *The Way*. What the Tourbillon was telling me wasn't to run out and buy a whole batch of twenty-first-century soul and funk R2Rs; it was telling me the reason why *also* postwar soul and folk R2R was so in-

"I've never heard anything quite like it. To put the cart before the horse (or maybe the horse in the cart), this is, quite simply, the most neutral and complete presentation I've heard from any audio component. This is the absolute sound in the definition of those words that makes the best sense to me: the sound that was recorded in the studio or the concert venue."

"The unusually natural and lifelike, virtually uncolored reproduction of the tapes therein discussed (Chet Baker Sings, A Tribute to Ella Fitzgerald, and Joan Baez), the many new things that I learned about the singers, the instrumentalists, and the recording techniques, and the old things I re-learned about myself and about the way music has shaped my life are owed equally to the Metaxas & Sins Tourbillon T-RX, which is to tape recorders what the original Quads were to stereo recording (yes, a digital part) to perform this same function—to regulate the speed of tape travel (and braking) with unprecedented 0.001% accuracy, by synchronizing the four, Swiss-made, NASA-grade Maxon motor/controllers (two motor heads and two capstan motors) with the two linear Antonov motors that control the dual, mid-gauss-steel, capstan rollers mounted on a removable bar, which automatically shifts forward when the play or record button is pressed (to allow the tape to contact the playback and record heads). The heads themselves are the same type used in Stellavox's TD9 machines—Phonon Bhanerji units made in Torino, Italy. (Headstocks are hot-swappable: In case you dig up a vintage Reagen or Wiedell, the unit can accommodate both quarter-inch and half-inch tape, although bias still needs to be reset for 30ips if you plan to use the machine to record.) (The unit comes braced for 15ips and Scotch 488 tape; Metaxas claims that, at 15 or 7 1/2ips, there is no need to adjust bias for any other tape formulations. At 30ips, however, you may have too much high-frequency energy with the bias set as it comes from Metaxas & Sins, so re-biasing via an MRI calibration tape and the adjustment of two rotary trimmer pots is recommended. For details on the biasing procedure, consult Metaxas website at metaxas.com.)



the absolute sound

2022 ANNUAL EDITION



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2022 HIGH-END AUDIO BUYER'S GUIDE



TAPE DECKS

dynamics, which run like a ramp from soft to loud, just as they do in life. When you add unrivaled resolution, astonishing transient speed, and simply gorgeous tone color to the package you get playback that cannot be equaled by any other kind of source, save, perhaps, for highly select direct-to-disc LPs, though a steady diet of *Lincoln Mayorga and Friends* and *I Got the Music in Me* sure ain't JV's idea of fun listening.



Metaxas & Sins Tourbillon T-RX €35,000

Before he heard Metaxas & Sins' Tourbillon T-RX—one of the first brand-new (i.e., non-refurbished) R2R tape decks in decades—JV would've bet big money that nothing else out there could compete with Greg Beron's UHA decks. Turns out, however, Mr. V. would've lost his wager. This relatively petite, portable tape player from the fertile mind of Kostas Metaxas is not only an object of great physical beauty and Swiss-watch-like mechanical workmanship; it is also a sonic wonder. The 15ips (it will also play at 7½ and 30ips), two-track Tourbillon with user-selectable (CCIR or NAB) equalization is Kostas' attempt to improve upon the build-quality, sonics, and ergonomics of Stellavox's celebrated SP9, which many professionals considered the best portable tape recorder ever made. Having had no experience with the SP9, JV cannot say whether Mr. M. has succeeded in outdoing his long-time reference. What he can say, with complete confidence, is that the T-RX is gorgeously made, performs flawlessly, and sounds fabulous. One of JV's R2R references. (forthcoming)

United Home Audio SuperDeck \$89,995

This completely refurbished, three-box, 15ips, Tascam reel-to-reel tape deck, with bespoke enclosures, boards, parts, damping, and wiring, is the best effort yet from tape maven Greg Beron—and, along with the Metaxas & Sins Tourbillon, the best (which is to say, the most lifelike) source component JV has yet heard in his home. Though the speed, color, resolution, and, above all else, vanishingly low noise of the DS Audio Grand Master optical cartridge and EQ units have pushed vinyl playback considerably closer to the sound of tape,

LPs still aren't as naturally full in tone, continuous in duration and intensity, or audibly complete in their presentation as the UHA SuperDeck. Of course, two-track open-reel tape has several built-in sonic advantages—not the least of which is the sheer amount of information laid down in its wider tracks (and the higher resolution with which those tracks are scanned)—all of which you can hear, *par excellence*, with Greg's great new machine. If you have the dough and a hankering for the sound of the real thing, it will be tough to find a better source component. JV's other R2R reference. (319)

ROOM CORRECTION

Legacy Audio Wavelet II DSP Room Correction System

\$7950

Legacy designed the highly sophisticated Wavelet DSP speaker- and room-correction processor (recently updated to the Wavelet II, review forthcoming) to bundle with its own speakers, but this version can be used with any speaker. Functionally, the Wavelet is a preamp with integral DAC, digital crossover, and multi-band digital equalizer. It will correct for speaker and room frequency-response variations, as well as change the time-domain behavior of the wavelaunch from the speaker to reduce the deleterious sonic effects of room reflections. (287)

RECORD CLEANERS

Spin-Clean Record Washer MKII

\$99

The Spin-Clean System is a purely manual design—nothing to plug in. A little elbow grease and fresh air do all the work. Fill the taxicab-yellow basin with distilled water, add a capful of the cleaning solution, and spin the record between the brushes. Ambient air and a couple of swirls of the supplied lint-free cotton cloths do the rest. It's also a truly green product, totally off the grid. And the results speak for themselves—clean surfaces mean less noise and more fully



HIGH-END AUDIO BUYER'S GUIDE 2022

resolved music. For lighter duty it's tough to beat. (201)

Walker Audio Prelude Quartet Record-Cleaning System

\$215

There are many excellent record-cleaning solutions out there, but this one, developed by analog guru Lloyd Walker, is (in JV's opinion) supreme. The four-step, enzyme-based Prelude system really does reveal more details that have gone unheard beneath layers of dust and wear than the competition. Though the Prelude's hand-applied, brush-and-fluid cleaning procedure is time-consuming (a record-cleaning machine is only used to vacuum-dry the disc—not to wet or scrub it) and can only be applied to LPs one record-side at a time, for fanatics the effort will be worth it, as no automatic disc-washing machine, conventional or ultrasonic, can achieve quite the same astounding results. (not reviewed)



Record Doctor VI

\$329

For those who love and care for their vinyl but don't want to break the bank on a cleaner, the Record Doctor VI (its latest iteration) offers a smart design compromise that keeps its—and your—costs down: Most of its functions are performed manually, as the system eschews the complex mechanics and motors that upper-tier record-cleaning machines employ. But the Record Doctor still uses a powerful motor-driven vacuum to handle the final step of fluid, dust, and dirt extraction. Setup and operation are a snap. The new VI is significantly upgraded, with a more rigid chassis along with cooler and quieter operation. (Version V reviewed in 274)

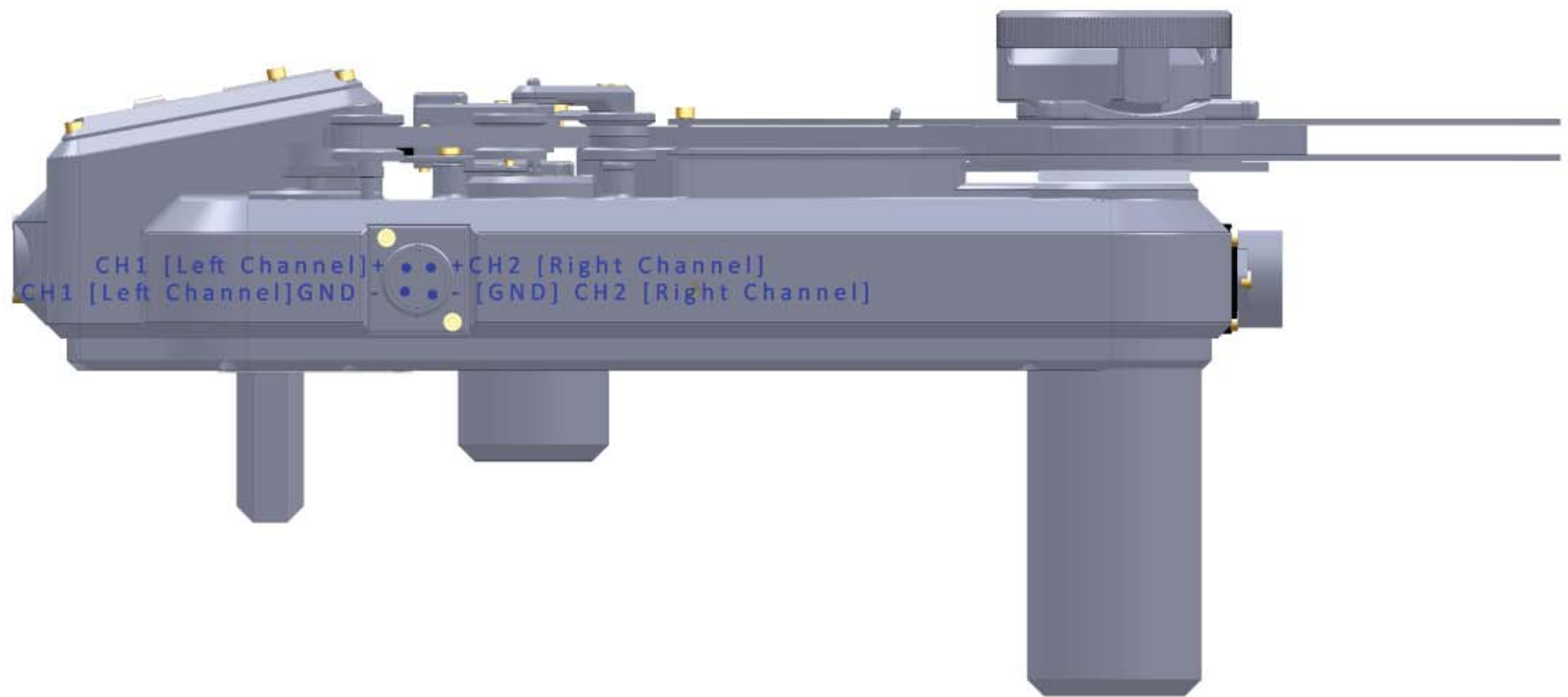


Pro-Ject VC-E

\$499

A clean record not only sounds better, with less surface noise; a clean record also makes your cartridge last longer since there are fewer abrasive elements left in the grooves after a proper cleaning. So, it simply stands to reason that every vinyl enthusiast should own a





This LEMO connector carries either the "Playback output" when the machine is in "PLAY" mode, or Line-in "REC outputs" [before equalization] when the machine is in TEST or REC mode. This allows you to monitor the incoming signal [in REC mode] or Playback Out. The signal is EXACTLY the same signal that is fed into the VU meter amplifier inside the machine. So you can also use it for precision VU monitoring with an external VU meter.

Here is a QUICKSTART video to help you use the machine:

<https://www.metaxas.com>

Please be mindful that the T-RX is run by an "ARM CORTEX" computer so if it doesn't respond to the commands on the keyboard, simply turn it off, wait 20 seconds and turn it on again.

VERY IMPORTANT: There is no relay on the output, so the "Single-ended" amplifiers on the outputs will make a "pop" sound when turned on or off until they settle [-30seconds], so when you have your TRX connected to your system for PLAYBACK, Please make sure your amplifier volume is set to ZERO.

Special Feature Metaxas & Sins Tourbillon T-RX Tape Deck

jobable. That aspect can be summed up in a word: quality. The quality of the performance and the sound, the quality of the mics and tape deck used to record them, the quality of the engineering at the session and the mastering after the session, and the quality of the tape transfer itself. When the T-RX was so faithfully reproducing and what I was consequently hearing, were the warmth and body of the Neumann U87 mic that recording engineer Mike Ross used for Fernandez's vocals (and of the similar vintage mics he used on the instrumentals), the warmth and body of the tube electronics with which mastering engineer Bernie Goodman mastered those vocals and instrumentals, and something else... something that I couldn't put my finger on until Goodie Noto's propounder Ying Tan told me what I just called the quality of the tape transfer.

As is the case with LPs, where the generation and level of wear of the production master tape (and of the metal work pulled from it) make marked differences in the sound of vinyl pressings, R2R tapes will vary in sound quality with the generation and level of use worn by the master tape they are dubbed from. All other things being equal, dubs made from early production masters are likely to be better sounding than dubs made from later-gen ones, just as dubs made from tapes that have seen a lot of use (and/or rough handling and long storage in inadequate conditions) are likely to sound worse.

Thanks to Greg Beron, I've heard proof of this proposition. As an experiment, Greg kindly loaned me a pristine production master tape of the great Gerry Mulligan *Meet the Horner* album from Norman Geatz and Verve Records. Note that I said a "production master tape," and not a dub of same. King, who is as connected in the world of reel-to-reel as a person could be, knows someone in Europe whose father worked at an LP pressing plant and who, when digital came along, rescued all the production master tapes that came to him to be turned into vinyl records. On direct comparison with a dub, the actual production tape sounded better, richer, fuller, more "complete"—very much like the difference I heard with Ying's master tape through the Tourbillon.

As it turns out, there are good reasons for this. To begin with, Goodie Noto tapes like ULM were made quite recently (his one just eight years ago); consequently, they haven't had occasion to be overused or poorly handled or badly stored. More importantly, Bernie Goodman, who also handles the mastering of Goodie Noto R2R tapes for the small market, doesn't dub from a second-generation 15ips production master but from the original 5ips master itself. Since no additional generation dubbing master is used, the Goodie Noto R2Rs are one audibly important step closer to the definitive sound magically preserved on that 5ips master tape's dual sides.

Even though I didn't know precisely how to interpret them at the time, the Tourbillon was telling me three things in the unassuming quality of its playback. In other words, this is one exceptionally neutral, faithful, and transparent source component, as I said earlier, the most neutral, faithful, and transparent I've ever heard (albeit the UHIA SuperDeck).

Let's move from recording and mastering revelations to musical ones.

You hear recorded music with a fidelity and completeness that are unrivaled in my experience.

The highly celebrated album *Thelma Houston with Job Casave* (Jazzland/Piglet Sound Studio) has an interesting backstory. Though famous for deconstructing a pivotal moment in jazz history when two young bebop and hard bop joined forces, *Thelma Houston with Job Casave* almost didn't come to be. Though it was released in 1961, it was assembled from outtakes recorded at three different studios in 1957, at the time when the Monk Quartet was enjoying its fabled residency at The Five Spot in NYC.

Catrine wouldn't have been able to join Monk's group if he hadn't recently been fired by Miles Davis from Davis' first great quintet/sextet, ostensibly so that "Tina could shake his horns in hell." (He was rehired by Davis in '58.) Monk himself wouldn't have been able to form a quartet and play in a high-profile New York City nightclub if he hadn't had his cabinet card renewed that very year, after it had been put off in 1951 following a marijuana bust. But such is life. The stars aligned, and Monk, Tina, and the rest of this groundbreaking group (Willie Ware on bass and Shadow Wilson on drums) got that gig at The Five Spot, where their music-making proved to be so popular (particularly with the jazz cognoscenti) that they were held over for half a year.

It was around this time that Catrine began experimenting with his so-called "sheets of sound" improvisational style.

Though I recognize what the T-RX can tell about one of the great classical recordings—Edvard Elgar's gorgeous, free-song rhapsody for Piano (EMI/Horch House), with incomparable mezzo-soprano Dame Janet Baker singing and the great Sir John Barbirolli conducting the London Symphony Orchestra. People have sometimes complained about the initial "quality" of the piano Elgar set to music in this piece—as if contemporaneous composers like Mahler or Schoenberg were orchestrating sonnets from Shakespeare. But the fact, as someone once said, is that the quality of the verse is now inseparable from the quality of the music, and the quality of the music is sublime.

The performance on this 1965 recording has long been considered a benchmark (as is the Barbirolli/Jacqueline du Pré performance of the Elgar Cello Concerto on the flip side). Recorded by Christopher Parker at EMI's Abbey Road Studios 1 in St. John's Wood, *Job Casave* was mixed with a Brampton pair of Neumann KM50s (what EMI called its "two-headed monster"), and also with various Neumann outtakes scattered among the orchestra for added coverage, and a separate M49 or KM50 for Baker herself.

When listening to this fusion recording on LP, you might think that it was made (as the Cello Concerto was) in Kingsway Hall. It has a warm, dark, also-like-soul balance that is very familiar and attractive. On tape, however, *Job Casave* sounds far more like what it actually is: a great recording made in a studio. The Kingsway hall ambience and timbral warmth are somewhat reduced, but the clarity of parts and articulation is increased—markedly. The harp glissandi, the scaled woodwinds, the divided strings, the Egyptian *awala* miasma of "Sabbath Morning at Sea," the slow, stately, lapping of the low-string arpeggios of "In Haven," in sum, everything about the orchestra, the score, and the performance is suddenly more fully available to the ear.

If you were worried on the LP this new clarity of orchestration, scoring, and inner detail will come as a bit of a shock. Oh, it's there on the LP, but you have to work (which is to say, deliberately concentrate on this or that individual chair of instruments) to find and hear it. Here, it comes to you unbidden, as it would in a concert hall. Such effortless transparency is one of the wonderments of the slow, steady, lapping of the low-string arpeggios—a slight overall timbral darkness, an added touch of treble sweetness, an extra dollop of low-to-midrange punch, or, commonly (particularly with big studio decks from back in the day), a slight overall scintilla. As far as I'm able to tell, the Tourbillon T-RX is unlike any of these. With the Metaxas deck, you hear what is there—no more and no less—reckless, as I've indicated, the quality of the transfer. But you hear it with a fidelity and completeness that are (let me say it yet again) unrivaled in my experience (or only rivaled by the far larger and more expensive UHIA SuperDeck).

Functionally, the Metaxas & Sins Tourbillon T-RX is by a completely careerist degree. You may need to adjust playback

Special Feature Metaxas & Sins Tourbillon T-RX Tape Deck

at least, you won't hear it with the same paradigmatic clarity unless you hear it through a Tourbillon, whose neutrality and completeness, as I can only say once again, unparalleled in my experience of source components.

Let us finish this jaunty down Tourbillon lane with what the T-RX can tell about one of the great classical recordings—Edvard Elgar's gorgeous, free-song rhapsody for Piano (EMI/Horch House), with incomparable mezzo-soprano Dame Janet Baker singing and the great Sir John Barbirolli conducting the London Symphony Orchestra. People have sometimes complained about the initial "quality" of the piano Elgar set to music in this piece—as if contemporaneous composers like Mahler or Schoenberg were orchestrating sonnets from Shakespeare. But the fact, as someone once said, is that the quality of the verse is now inseparable from the quality of the music, and the quality of the music is sublime.

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Functionally, the Metaxas & Sins Tourbillon T-RX is by a completely careerist degree. You may need to adjust playback

And yet the T-RX is considerably less money than other top-line tape decks.

balance via the front-panel volume knob to compensate for any channel-to-channel imbalance in the output of the playback heads or in the tape recording itself. (But this will be true regardless of deck.) It can also be a chore to load a tape on the T-RX, as Kostas doesn't use the easily adjusted "ratchet" hub-spindle design with built-in flanges that you find, for example, on Greg Beron's UHIA model. Instead, he employs a large, removable device he calls the "Hubsie Hubbie," which has two parts (one counting washers and springs)—a flanged bottom section onto which the reel is fixed, and a screw-on top piece that tightens the reel down to the turntable. Like everything else Kostas makes, it looks very cool. The trouble is that the flanges on the bottom part of the Hubsie don't always fit smoothly into the corresponding slots on the reel.

Though it is intended to be a low-maintenance, easy-to-use system, whereas you simply loosen the top clamp and lift the reel on and off the bottom part, the occasional tight fit of the flanges sometimes requires you to take the entire mechanism off the turntable and disassemble it—in order to tap the bottom part off of (or onto) a tight-fitting reel. I don't take a lot of time or force to do this, and it only happens occasionally—most reels slip on and off as designed. But it is less convenient and careerist than what

I'm used to with Greg's decks. There is this, as well. Though the online instruction manual warns you about it, you need mute your preamp whenever you load the T-RX, or your preamp power supply on or off. If you don't, you'll hear a series of loud pops through your speakers—some of which are good for your ears, your preamp, or your drivers.

At \$36,000 (equipped with record and playback heads), the Metaxas & Sins Tourbillon T-RX tape deck is scarcely cheap. And yet it is considerably less money than other top-line tape decks (\$50,000 less than Greg's wonderful SuperDeck, for example). It is also a brand-new item—innovatively constructed from the best parts in the world and warranted for two years (parts and labor). And, oh yes, it is also (albeit the UHIA SuperDeck) the most realistic-sounding, highest-fidelity tape deck I've ever heard, as well as one of the coolest-looking pieces of stereo gear I've ever seen. It will surely be my nominee for TAS's Overall Product of the Year Award in 2022.

You simply don't come across something that is this sonically flawless, functionally innovative and rigorous, and aesthetically breathtaking every day. In fact, I haven't even across anything like it in nearly 60 years of looking. That should tell you something. I'm going to finish by saying something I probably shouldn't say (and have never said in TAS before), but...if you've got the dough and access to R2R tapes—and you aren't wedded to the idea of owning a full-sized machine like the SuperDeck—then don't even think about it just buy the T-RX. I did.

Special Feature Metaxas & Sins Tourbillon T-RX Tape Deck

JV Talks Tape With Kostas Metaxas

You are as much a visual artist as a hi-fi equipment designer and manufacturer. How have you balanced your two careers? And what led you to a career in hi-fi, rather than in the fine arts?

For me, art and design are "visual music." If something is organic, well-proportioned, and beautiful to look at, chances are that it is also literally lyrical and harmonious. My process for design is "art" in a sense of discovery rather than creation. I start on a path, and let it lead me to where it has to go. I remember seeing a well-known Michelin chef—Michel Roux—if creating a plate of food was "art." He answered that it was actually more than art, because it utilized all the senses. Composing a plate of food includes not only the visual for the eye, but texture for the tongue, perfume for the nose, and sounds for the ear. What does me to hi-fi and the artform of music reproduction is, similarly, the balance of sensibilities between technical, visual, and aural. For me, a great hi-fi system has to bring together very complex technologies to be able not just to communicate the very emotional character of the music, but also to itself be an object d'art that gives enormous pleasure to the owner.

I also work in the fine arts through my contributions to companies such as S.T. Dupont (making instruments) and Epelec clocks, amongst others. It's a welcome distraction!

How did you first become interested in tape recording (and tape recorders)? And what is the aesthetic that you follow when you make your recordings?

I had a passing interest in tape recorders when I was a teenager, but I could never afford them. Once I set up my company to produce hi-fi amplifiers, I realized that even the best turntables, somearms, cartridges, and LPs (i.e., sources of the time, such as the Goldmund Reference of the mid-1980s), weren't good enough. By pure chance, a colleague in Switzerland introduced me to Sotilavos records. I knew that the best LPs came from R2R masters, so I logically assumed that tapes would be an improvement to using LPs as my references. The improvement was, in fact, revelatory and looking further into the machines I owned, I realized I could improve them, which I did. Over 100 concerts later, I started to understand that as much as I enhanced a tape deck's electronics (such updates are common nowadays on most old machines from the 60/70/80s), I eventually hit a brick wall because I could not do the same with the mechanics. This led me to build my own machines, the Tourbillon and Pajillon, where the mechanics have been improved.

As for my recording work, I was particularly interested in capturing the entire "soundscape width and depth"—not just an intimate "close-miked" sound, but a real soundscape similar to those of the engineers I admired from the concert recordings of

the 1960s and 1970s (Bob Fin [Mercury], Lewis Lightson [RCA] and Ken Wilkinson [Decca]). As a teenager using Quad ESL57s, I could hear a huge and very realistic soundscape on their recordings. This recording style was my reference. Armed with my portable Sotilavos SMI, I initially used a pair of Blue Kae 1/4" capsules 41335 to record with, then the much-faster V-capacitor 41335, and very sensitive on the sublime sound of my Neumann ULM50s and M1205 15" titanium-capacitor microphones. My initial idea was to start recording with tape, then graduate to an equivalently pure "digital" recording setup, which would be easier to haul in and out of concert halls. Sadly, absolutely none of the digital setups I tried could capture the scale, bloom, detail, density, and sheer naturality of analog tape.

In this digital age and age, what made you decide to build and market a brand-new tape recorder? And how do you see the future unfolding for reel-to-reel tape enthusiasts?

As I said, digital recording, sadly, simply doesn't have the sonic realism of tape. Also, I knew that if I was hitting a brick wall with my Sotilavos machines (and others were, too, with their "updated electronics" machines), then none of us had really heard the true potential of tape as a medium. In other words, I wanted to see how far I could push the realism of R2R in a serious high-end way. Doing some research into the well-known brands of the 1960-80s, I found out that the mechanical engineers and electrical engineers generally didn't work together. Since I'd already spent 30+ years improving the electronics of my Sotilavos SMI, if I was able to develop a tape transport that I could adjust and listen to for improvements (it's a way similar to adjusting a turntable setup), I should be able to hear much more information from my R2R. This has been the case with both the Tourbillon and Pajillon. The improvements with the transport parts, rollers, bearings, and tape heads has also led to further improvements to the electronics and power supplies. It's a constantly evolving process.

As for the future of tape, I believe there will always be a market, not just from enthusiasts, but also from archivists. There are so many tapes that were hidden for decades, which are now starting to emerge.

Will there be more Metaxas & Sins tape-recording-and-playback products beyond the Tourbillon T-RX and the Pajillon decks?

The Tourbillon and Pajillon are essentially a starting point. They have allowed me to investigate the absolute latest technology with motors, encoders, controllers, PID systems, and mechanics for the tape path. I'm hoping that this will give insights to producing an even better and more dedicated system for tape handling and operation in the future. The fun always in the journey. **JB**



"At \$36,000 (equipped with record and playback heads), the Metaxas & Sins Tourbillon T-RX tape deck is scarcely cheap. And yet it is considerably less money than other top-line tape decks (\$50,000 less, for instance, that Greg Beron's playback-only SuperDeck). It is also a brand-new item—innovatively constructed from the best parts in the world and warranted for two years (parts and labor). And, oh yes, it is also (and for one last time) the most realistic-sounding, highest-fidelity source component I've ever heard, as well as one of the coolest-looking pieces of stereo gear I've ever seen. It will surely be my nominee for TAS's Overall Product of the Year Award in 2022. You simply don't come across something that is this sonically flawless, functionally innovative and ingenious, and aesthetically breathtaking every day. In fact, I haven't come across anything like it in nearly sixty years of looking. That should tell you something.

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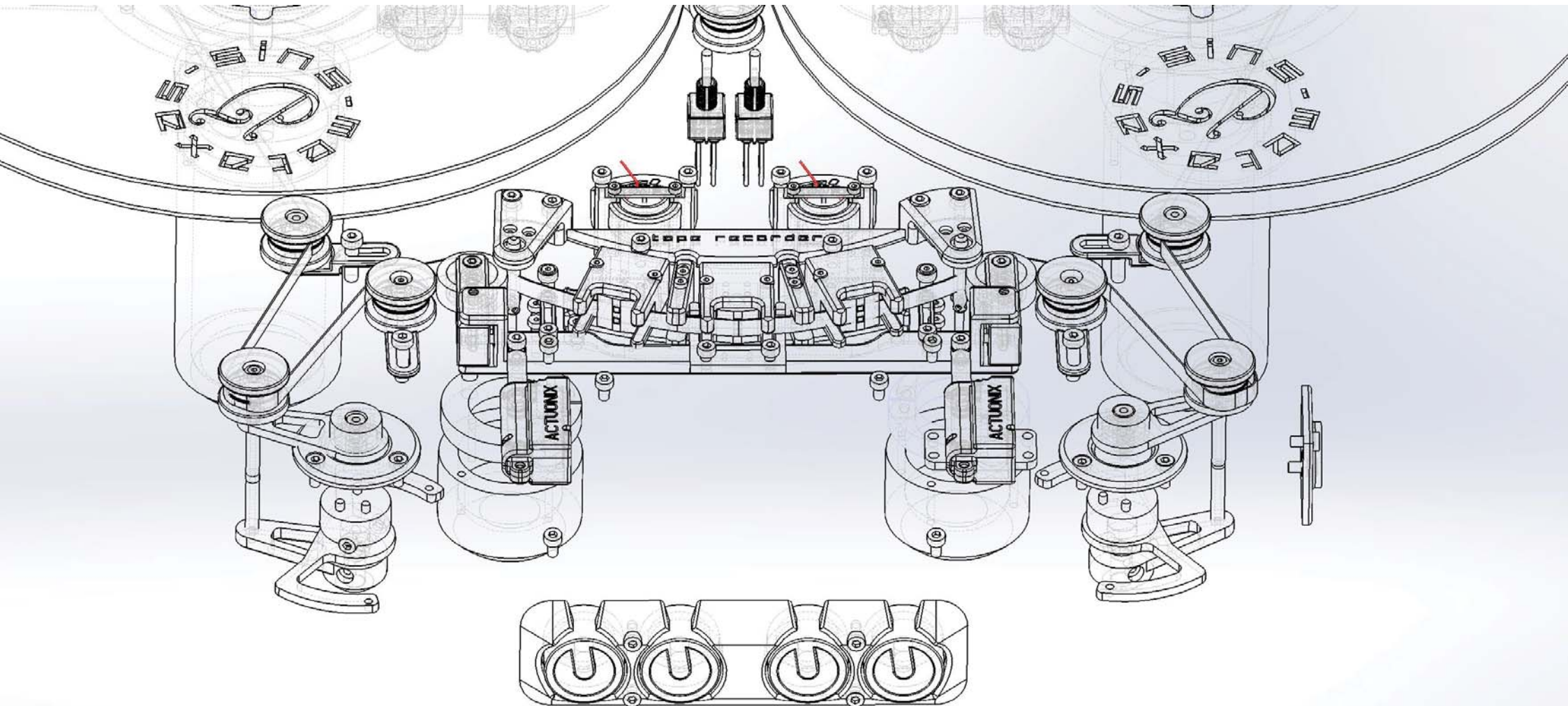
t-rx tape path

IMPORTANT NOTES

The first thing you must always do before using your TRX, is check that the two TENSIMETERS are able to move freely. Then, simply check that the rollers are spinning freely. Any problems with the tape path will adversely affect the operation of the machine.

Please follow this diagram when threading the tape from the left to right reels. When turning on the TRX, the Reel Motor Brakes are not engaged so you can thread the tape. They will engage as soon as you press any of the front keyboard operations [PLAY/STOP etc].

PLEASE REFER TO THE VIDEO ON THE USB DRIVE THAT COMES WITH THE MACHINE TO GIVE YOU A QUICKSTART GUIDE.



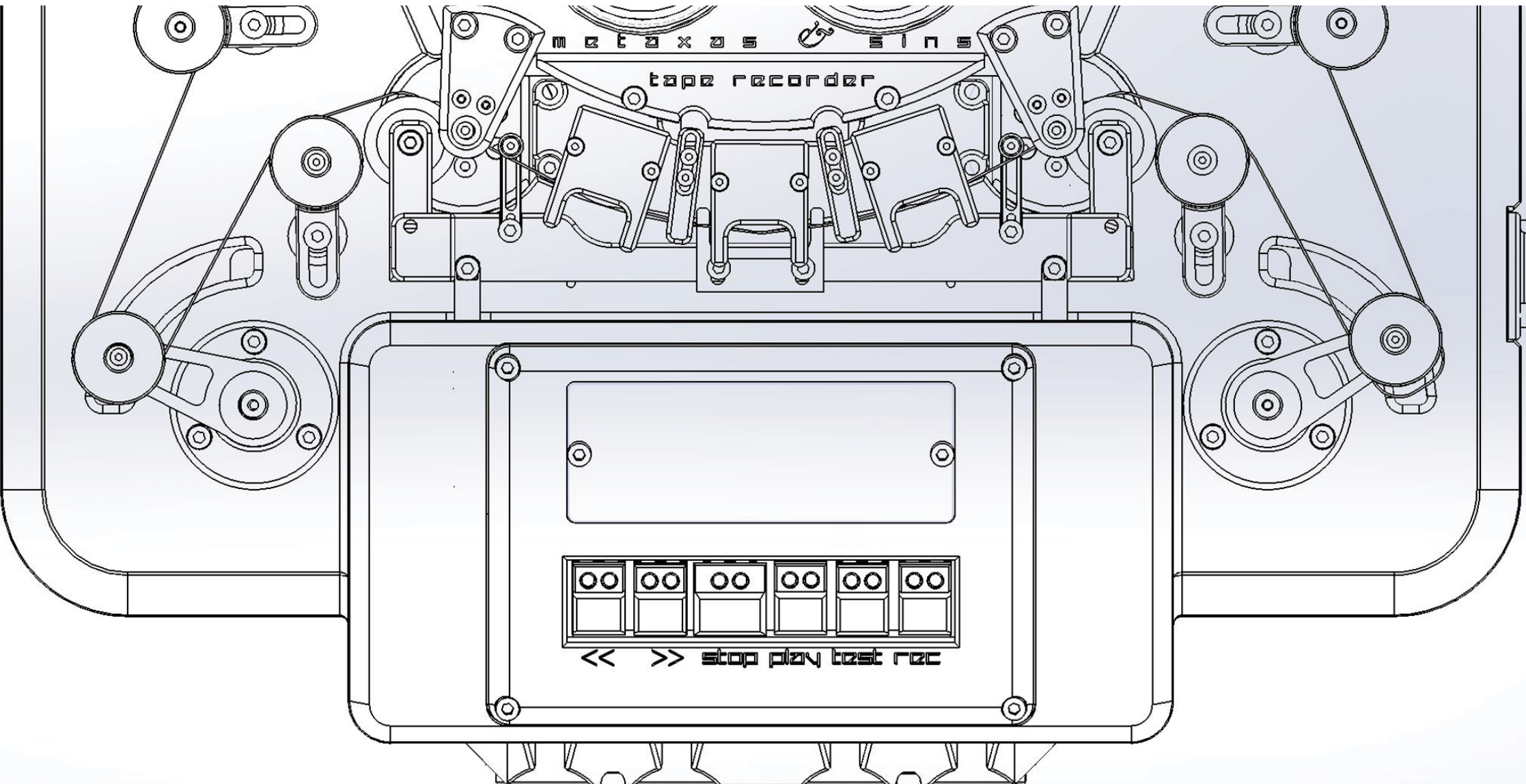
t-rx keyboard

The TRX is operated very simply from its 6 key keyboard. From left to right, the basic functions are: REWIND, FAST FORWARD, STOP, PLAY, TEST and RECORD. [NOTE: There is a RECORD SAFETY switch to prevent accidental recording over your precious recordings.]

Once you switch the power on at the external power supply, a welcome screen will appear on the NORITAKE LCD display.

After the screen has settled, you can engage the individual keypad functions.

PLEASE REFER TO THE VIDEO ON THE USB DRIVE THAT COMES WITH THE MACHINE TO GIVE YOU A QUICKSTART GUIDE.





REWIND
SPEED RATIO 0.948

⏏ ⏪ ⏩ ⏴ ⏵

stop play fast fwd

RECORD

REVERSE

7 5 7 5

why reel to reel?



There is no doubt that the absolute best “source” for reproduced music is analogue tape recorded on 10” reels at 15ips. The same analogue tape reel-to-reel recorders are also the absolute best way to record and capture music [concert recording].

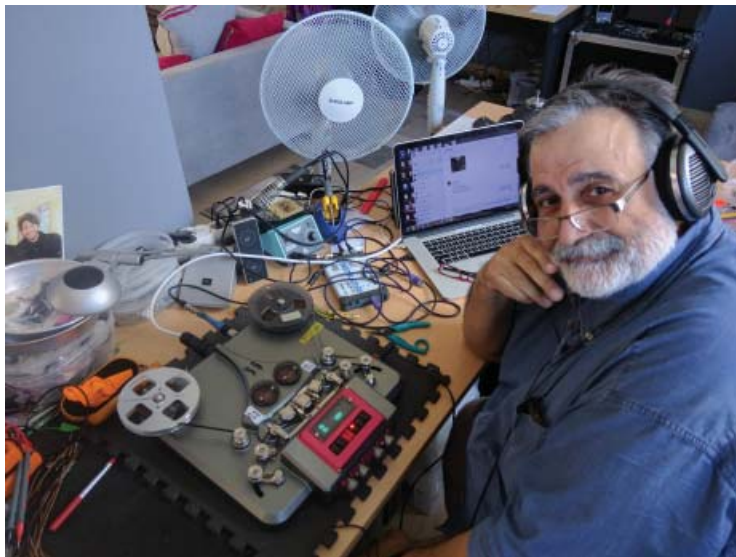
This is a fact not open for discussion and is responsible for the incredible resurgence in interest in Open Reel Analogue Tape Recorders. The High End Audio industry has embraced and acknowledged this over the past 20 years.

Artist and Recording Engineer Kostas Metaxas has not only been aware of this since the mid 1980s, but in fact been using two portable heavily modified Swiss “Stellavox” portable tape recorders, manufactured in the mid 1980s to record over 300 concerts on analogue tape [www.metaxas.com/recordings.html]. He is probably the most prolific recording engineer using analogue tape of the past 20 years.

“When I purchased my Stellavox SM8 and TD9 in 1985, they cost ~ \$50K - the price of a suburban house in Melbourne, Australia. The same house today is ~ \$1million.”

Kostas’ work with Stellavox including some of his recordings on a DVD have been featured in a book on Stellavox by German writer Roland Schellin.

Fueled by this recent interest, Kostas has decided to produce an entirely new tape machine based heavily on the portable Stellavox SM8 recorder which has even received the blessing of Stellavox founder Georges Quellet.



Thank you for your kind interest in my work.

The TRX is a result of my almost 40 year fascination with the art of music reproduction from concert recording, electrical engineering and ultimately, artistic design to produce a recorder that allows you to capture music similar to the best recorders produced in the 1950-1970's.

Each TRX is totally handcrafted by either myself or one of my sons.

I consider them all objects of art.



2018 WINNERS
PRODUCT DESIGN

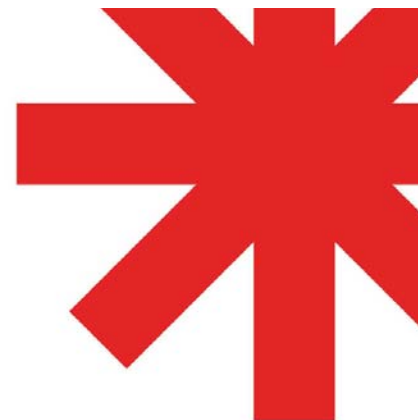
Presented to
Metaxas & Sins Bv

Design
Metaxas & Sins Statement
Amsterdam, Netherlands

Client
Metaxas & Sins

Lead Designer
Kostas Metaxas

Metaxas & Sins Statement has been identified as one of the leading product design by the professional jury of APDC*IDA. Kostas Metaxas is a winner of the APDC*IDA 2018 Design Excellence Awards.



GOOD DESIGN AWARD

2018

The Statement

Designed by
Kostas, Andreas and Alessandro Metaxas

Manufacturer
Metaxas & Sins

THE CHICAGO ATHENAEUM
MUSEUM OF ARCHITECTURE AND DESIGN



ST 1510A TAPE RECORDER/AUDIO TEST SYSTEM
SOUND TECHNOLOGY

UP
DOWN
VERTICAL DISPLAY
EXPAND
SPLIT
INPUT REF
VERT REF
DISPLAY

POWER ON

REMOTE

CURSOR POSITION

LOW SWEEP LIMIT SET

LEFT RIGHT L&R

NOISE FLUTTER (OFF) 148 148 133
FLUTTER (NAR) 148 148 133
WEIGHTED (H&A)

SHFTD 30 30 30
DRUP/OUT 101 105 80

2ND AZIMUTH 3ND DISTORTION 1STED (RES) 2ND (RES) 3RD (RES) 4TH (RES) 5TH (RES) 6TH (RES) 7TH (RES) 8TH (RES) 9TH (RES) 10TH (RES)
SPEED FLUTTER NOISE

H1 & D3 -20dB -10dB 0dB +10dB

D2 & D3 3dB 3dB 4dB 10dB

ALL VOLTS
INPUT REF
CET/FREQ ALL

BALANCED OUTPUTS

1.6dB VARIER DOWN UP
LEFT

-20dB -40dB
RIGHT

OUTPUT MONITOR MINIMAL (NOISE REPEAT) SWEEP NOISE

STOP OUTPUTS BOTH PARTS START

BALANCED INPUTS

DATA STORAGE REVERSE

LEFT

RIGHT



1/2 inch tape



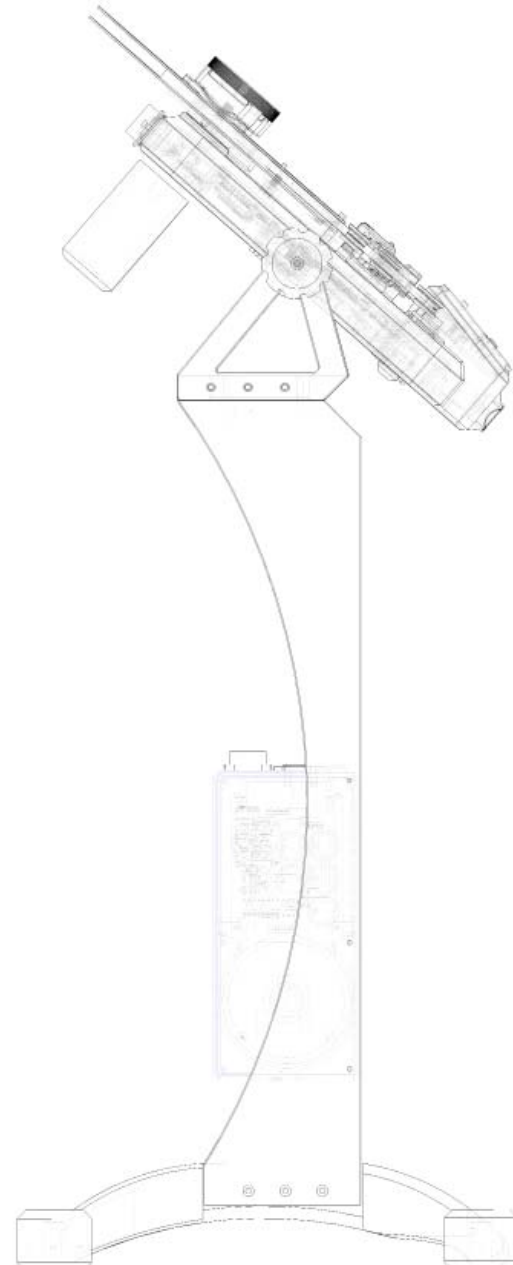
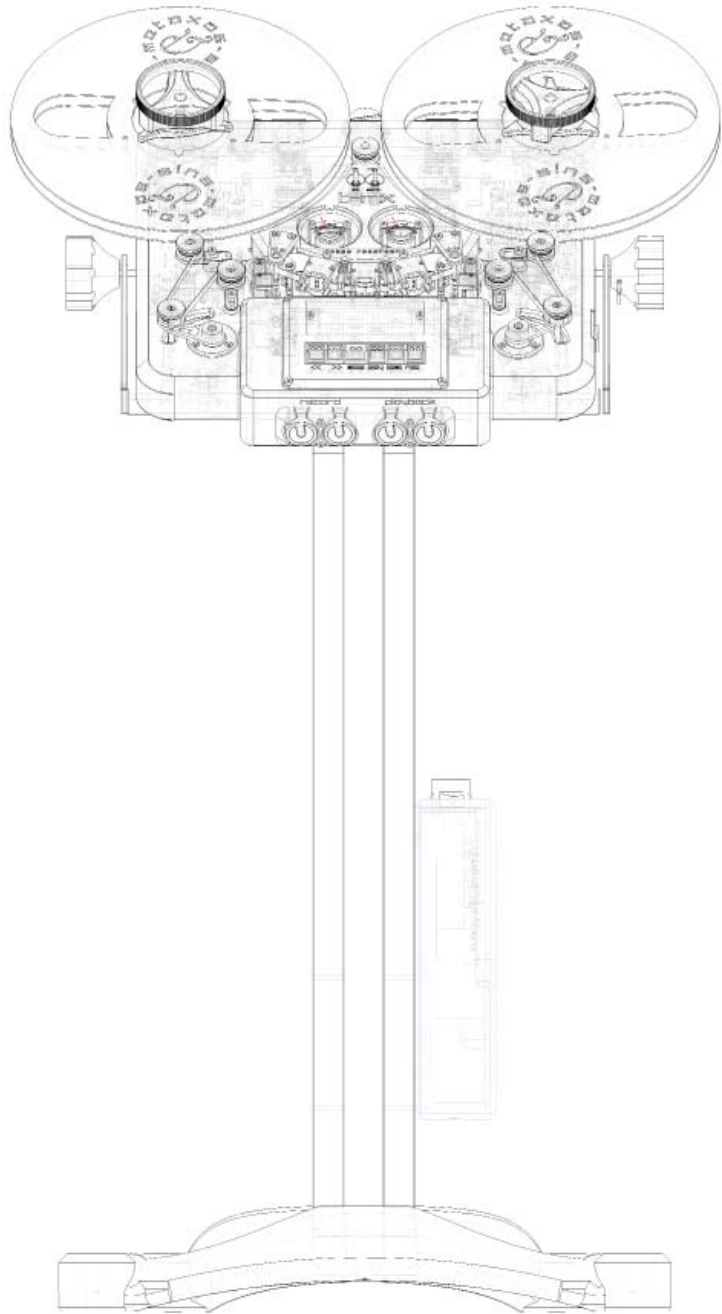


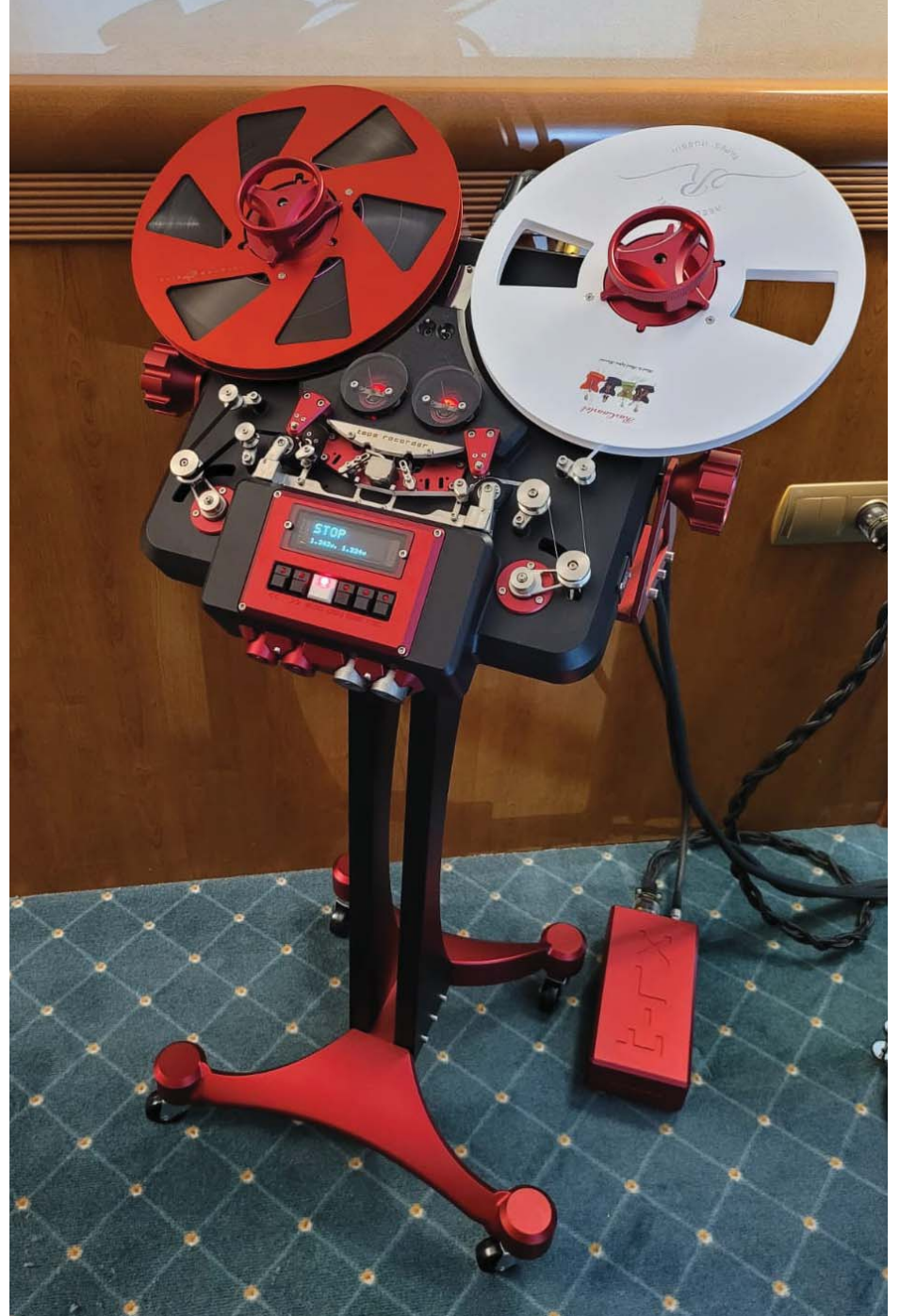


topa recorder

PLAY 15 IPS
00:00:27

Red digital display with a red LED indicator and control buttons.





Kostas Metaxas is an articulate and forceful champion of audio without compromise. He is a connoisseur of fine music, a man for whom second best isn't good enough. In September of 1981, Kostas formed the company which bears his name. Known all over the world today simply by its initials, M&S, Metaxas & Sins was founded for several reasons.

The most immediate of these was to begin producing, his first product, the CP-1 preamplifier in commercial quantities. Whilst studying in Heidelberg, West Germany having transferred from the University of Melbourne, Kostas showed several of his prototype amplifiers to an important German Hi Fi Dealer. He was sufficiently impressed with what he heard to give him a little capital in the form of deposits to reserve the finished products. Thus M&S was born. And the rest as the saying goes, is audiophile history.

Back in Australia, new designs flowed from Kostas' workshop. The PP-1, a moving coil preamplifier appeared early in 1982. Reviewed by Klaus Renner in Das Ohr, the German audiophile publication, it was praised as the finest preamplifier available at the time. Accordingly, a flood of orders from the German audiophile who are known to purchase only the number 1 product in its class, firmly established M&S as a manufacturer of only the highest quality audio equipment.

In February 1988, the GERMAN 'Stereoplay' magazine rated the OPULLENCE [Opus] PREAMPLIFIER its absolute reference against amplifiers from the US, Japan and Europe.

The OPUS preamplifier is a unique audio product. Apart from its outstanding musicality it combines the state-of-the-art in high-technology with an incredible array of options which would excite a Recording Engineer.

Kostas is also a familiar sight at local jazz and classical concerts with his prized Stellavox tape recorders in tow. Built with the exacting precision of a PATEK watch, these state-of-the-art models are indeed rarities and are normally the exclusive province of the professional recording studio. The recordings Kostas makes using Stellavox serve as reference for the design of future M&S systems.

M&S products embody not simply audio excellence but a stylistic design sense that would not be out of place in the Museum of Modern Art. M&S products are not meant to be hidden away like traditional sound systems. They are meant to be appreciated both stylistically as well as musically. Science approaches art for the sheer love of music and for that M&S make no apology.

Similarly, Kostas is unapologetic about the market he serves. He aims, quite simply, to provide the "finest objects money can buy." And what sort of people are M & S customers? Generally they view audio as a well-deserved indulgence. But no matter what their occupation, their preoccupation is to know and appreciate the difference between better and best, to listen with their heart and ears and blissfully "get lost in the music" ..

Each amplifier is entirely handmade by the Master and his sons [sins] in a similar manner to the meticulous assembly of historic Bugatti automobiles.

To put it mildly, Metaxas & Sins is unlike any other audio business.

"Flagwaving? Why Not?" wrote Ralph Neill reviewing the MAS PPI in Australian Hi-Fi in the early eighties. "Australia II proved in a big way that Australian technology can take on the world and win. M&S is doing just the same – on a smaller scale, to be sure, but it's doing it!"

t-rx tape recorder

IMPORTANT NOTES

There are no user serviceable parts inside the machine. It should therefore only be opened by qualified service personnel.

The TRX is configured in the factory for use with a single AC line voltage. Check the voltage rating on the separate power supply panel to ensure it is configured for the correct AC line voltage.

Applying the wrong AC line voltage increases the risk of fire and can cause permanent damage to the TRX.

North America: 120VAC

Europe: 230VAC

Japan: 100VAC

Other areas: Contact us to check for compatibility.

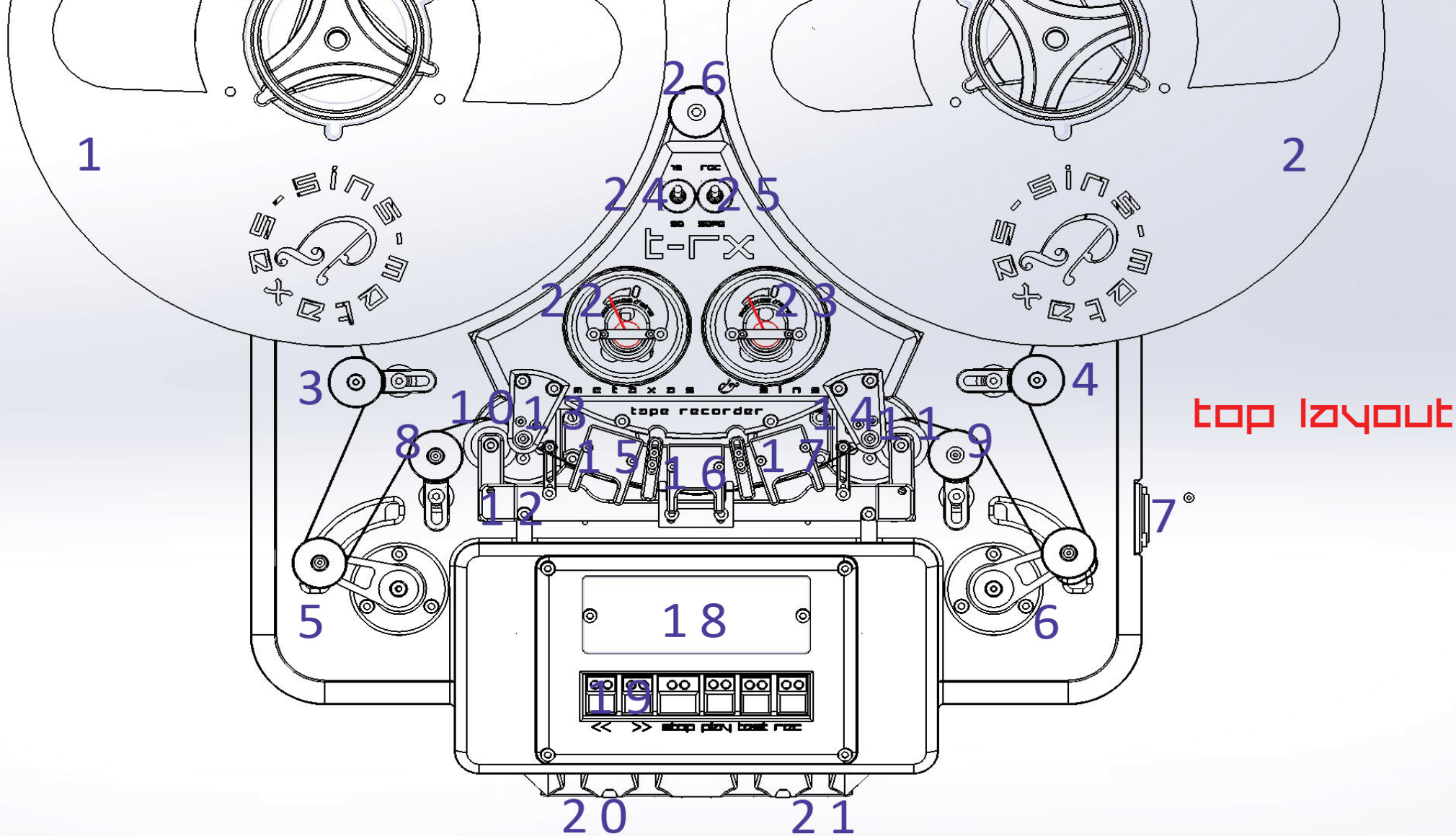
WARRANTY

The TRX is covered by a two year limited warranty on parts and labor from the day of delivery. Excessive wear and tear is not covered.

All details and specifications included in the manual are subject to change without notice.

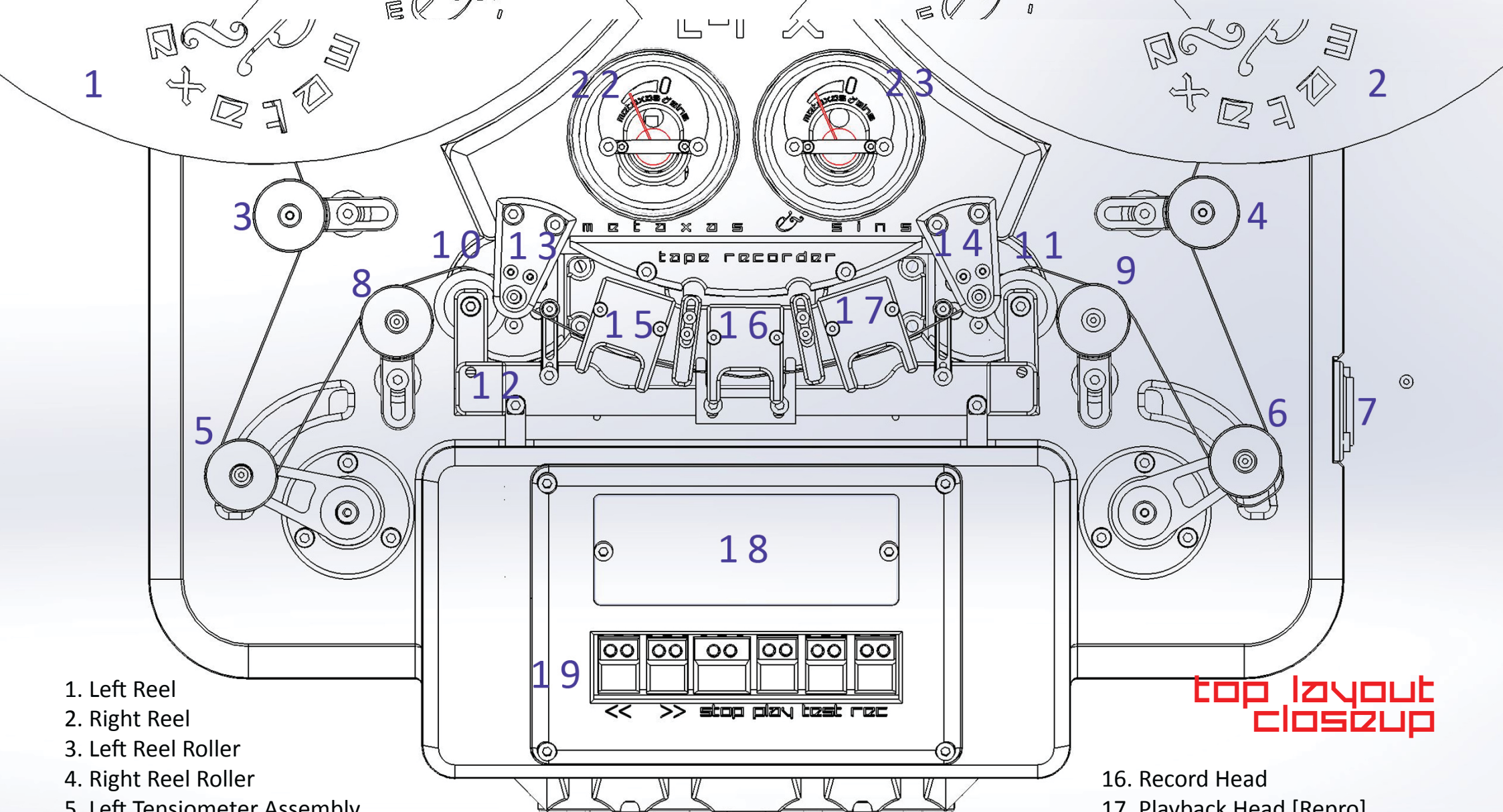


layout description



top layout

- | | | | |
|------------------------------------|----------------------------------|--------------------------------|----------------------------|
| 1. Left Reel | 8. Left Capstan Roller | 15. Erase Head | 22. Left VU Meter |
| 2. Right Reel | 9. Right Capstan Roller | 16. Record Head | 23. Right VU Meter |
| 3. Left Reel Roller | 10. Left Capstan Rubber | 17. Playback Head [Repro] | 24. 30/15/7.5 speed switch |
| 4. Right Reel Roller | 11. Right Capstan Rubber | 18. Noritake LCD Screen | 25. REC safety switch |
| 5. Left Tensiometer Assembly | 12. Retractable Capstan Assembly | 19. Functions Keyboard | 26. Spare Roller |
| 6. Right Tensiometer Assembly | 13. Left Capstan Motor | 20. Record Input Level Pots | |
| 7. 4 pin external VU Meter/Hphones | 14. Right Capstan Motor | 21. Playback Output Level Pots | |

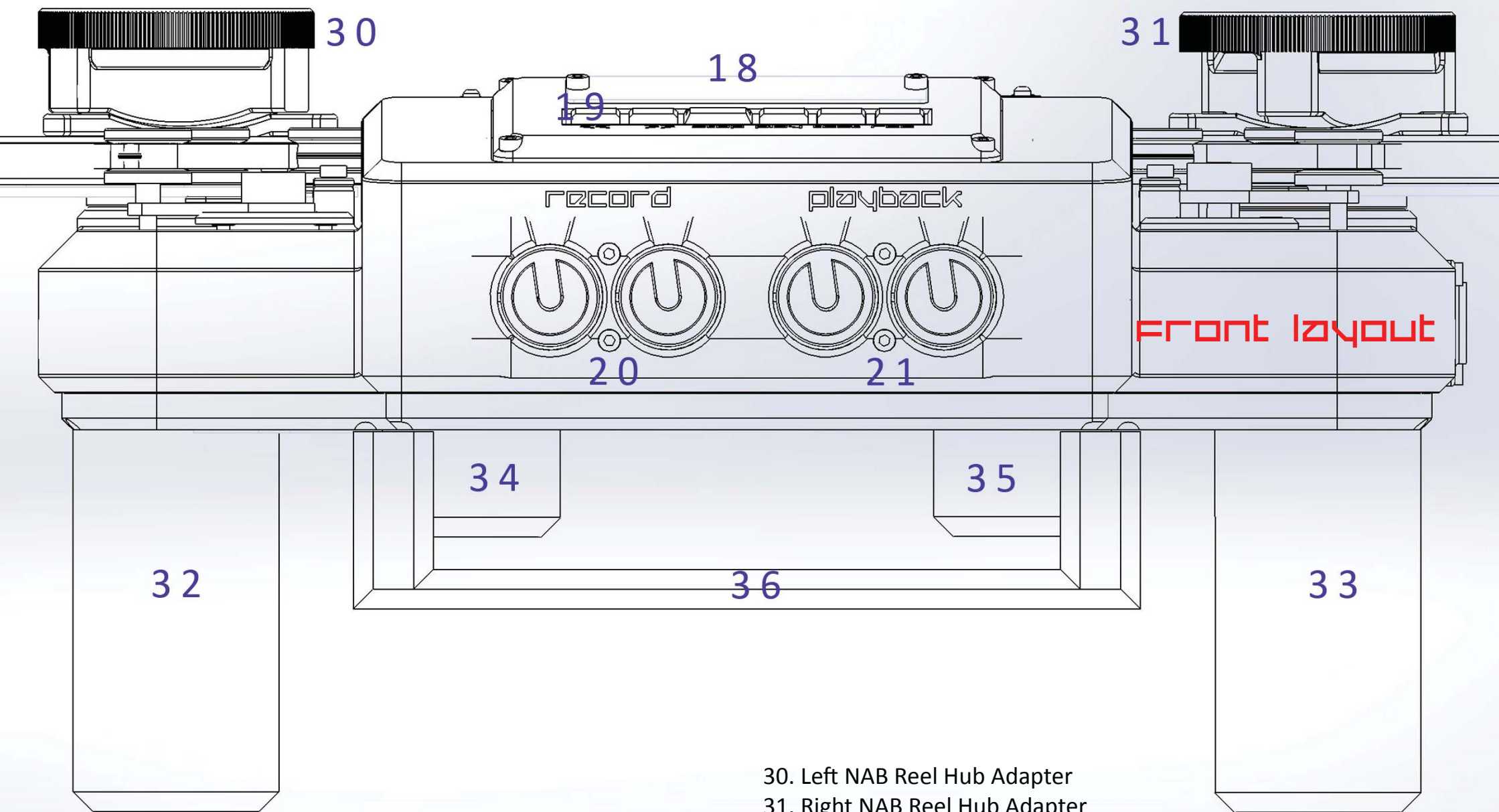


top layout
closeup

- 1. Left Reel
- 2. Right Reel
- 3. Left Reel Roller
- 4. Right Reel Roller
- 5. Left Tensiometer Assembly
- 6. Right Tensiometer Assembly
- 7. 4 pin external VU Meter/Hphones
- 8. Left Capstan Roller
- 9. Right Capstan Roller
- 10. Left Capstan Rubber
- 11. Right Capstan Rubber

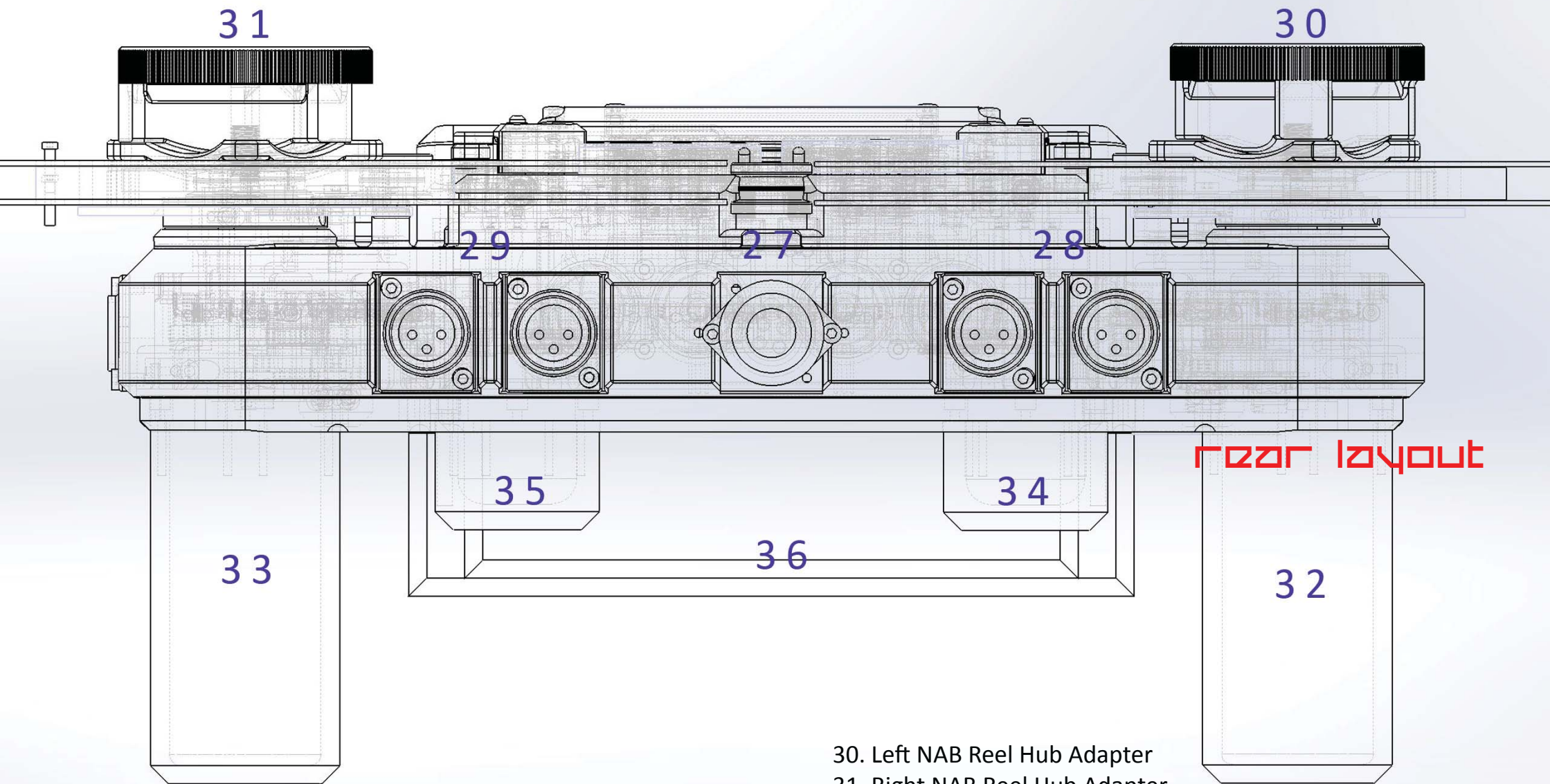
- 12. Retractable Capstan Assembly
- 13. Left Capstan Motor
- 14. Right Capstan Motor
- 15. Erase Head

- 16. Record Head
- 17. Playback Head [Repro]
- 18. Noritake LCD Screen
- 19. Functions Keyboard
- 20. Record Input Level Pots
- 21. Playback Output Level Pots
- 22. Left VU Meter
- 23. Right VU Meter



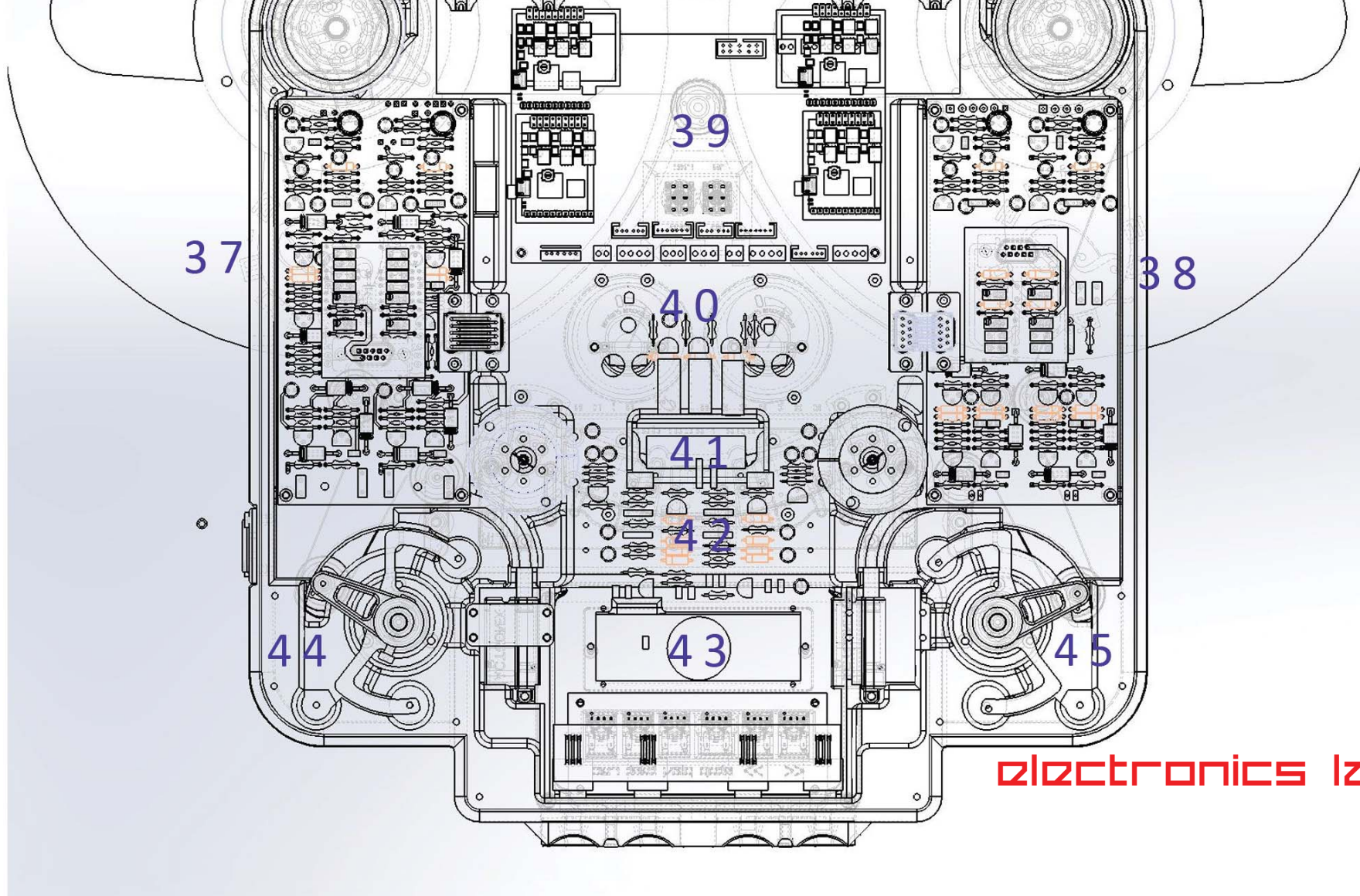
- 18. Noritake LCD Screen
- 19. Functions Keyboard
- 20. Record Input Level Pots
- 21. Playback Output Level Pots

- 30. Left NAB Reel Hub Adapter
- 31. Right NAB Reel Hub Adapter
- 32. Left Reel Motor Cover
- 33. Right Reel Motor Cover
- 34. Left Capstan Motor Cover
- 35. Right Capstan Motor Cover
- 36. Carry Handle



- 30. Left NAB Reel Hub Adapter
- 31. Right NAB Reel Hub Adapter
- 32. Left Reel Motor Cover
- 33. Right Reel Motor Cover
- 34. Left Capstan Motor Cover
- 35. Right Capstan Motor Cover
- 36. Carry Handle
- 27. DC Power Connector
- 28. Record Inputs
- 29. Playback Outputs

rear layout



electronics layout

37. Playback Electronics

38. Record Electronics

39. Computer Controller PCB

40. Relays/VU/Bias Oscillator PCB

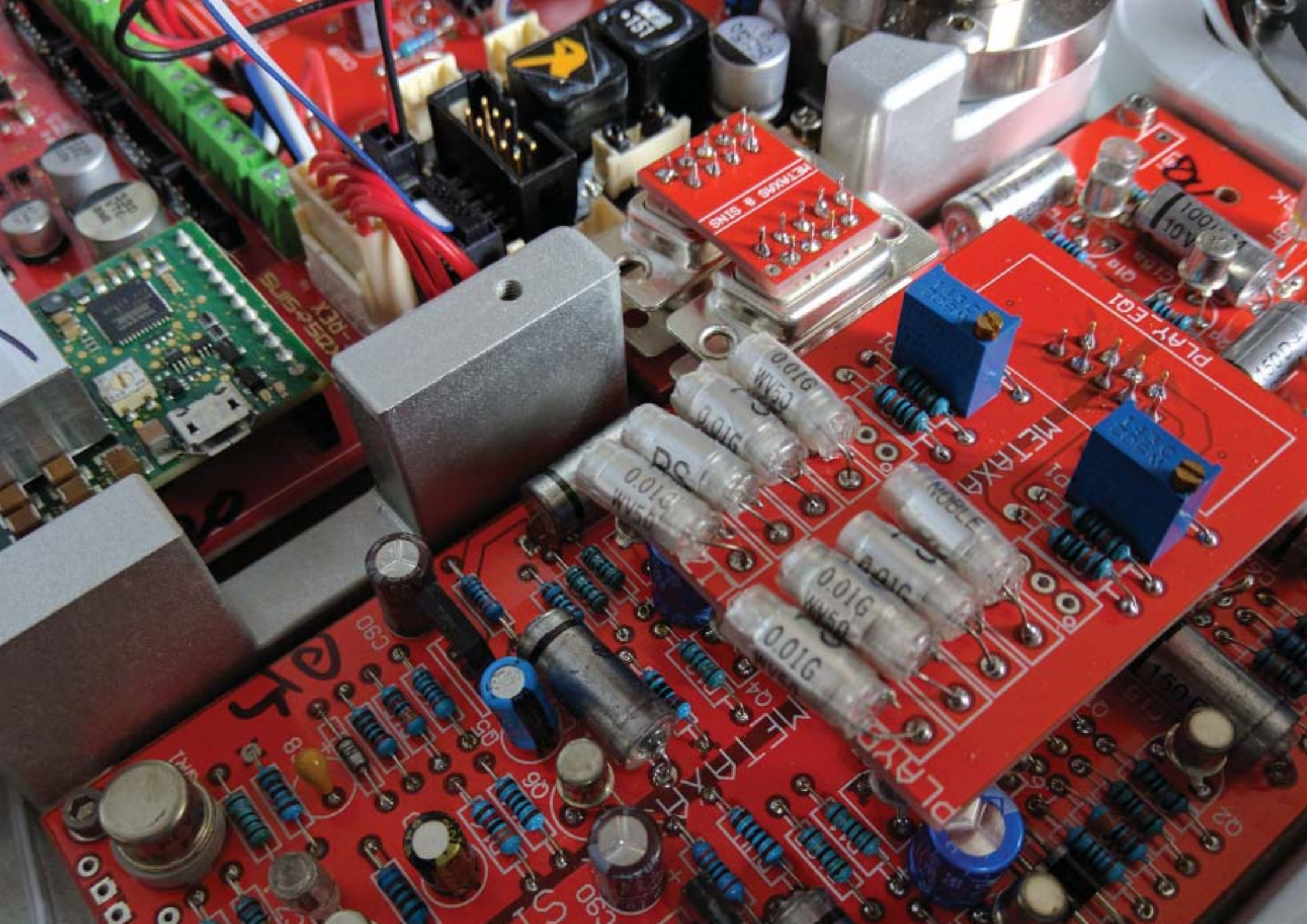
41. Headblock 15pin connector

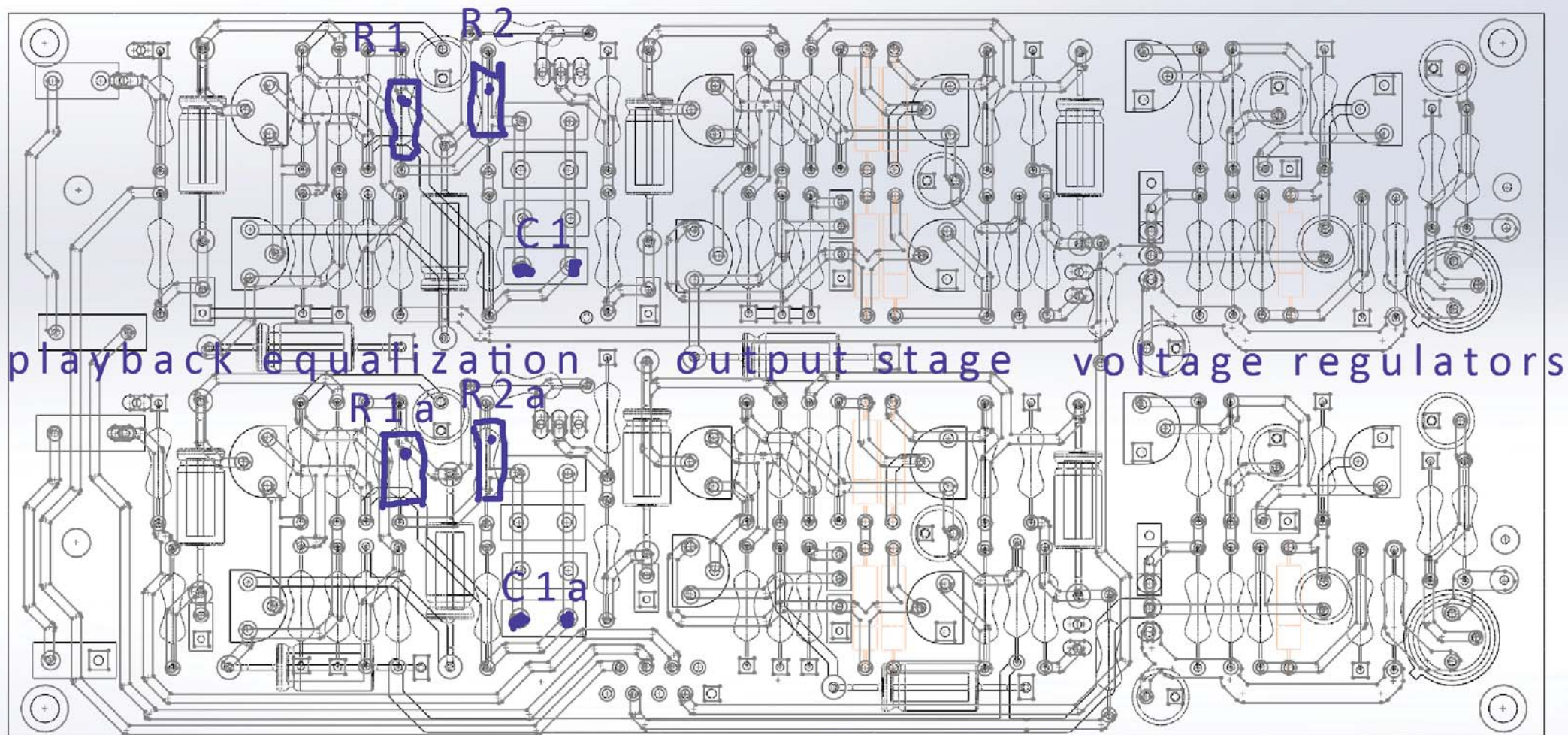
42. VU circuit

43. Oscillator Coil

44. Right Tensiometer Pot Assembly

45. Left Tensiometer Pot Assembly



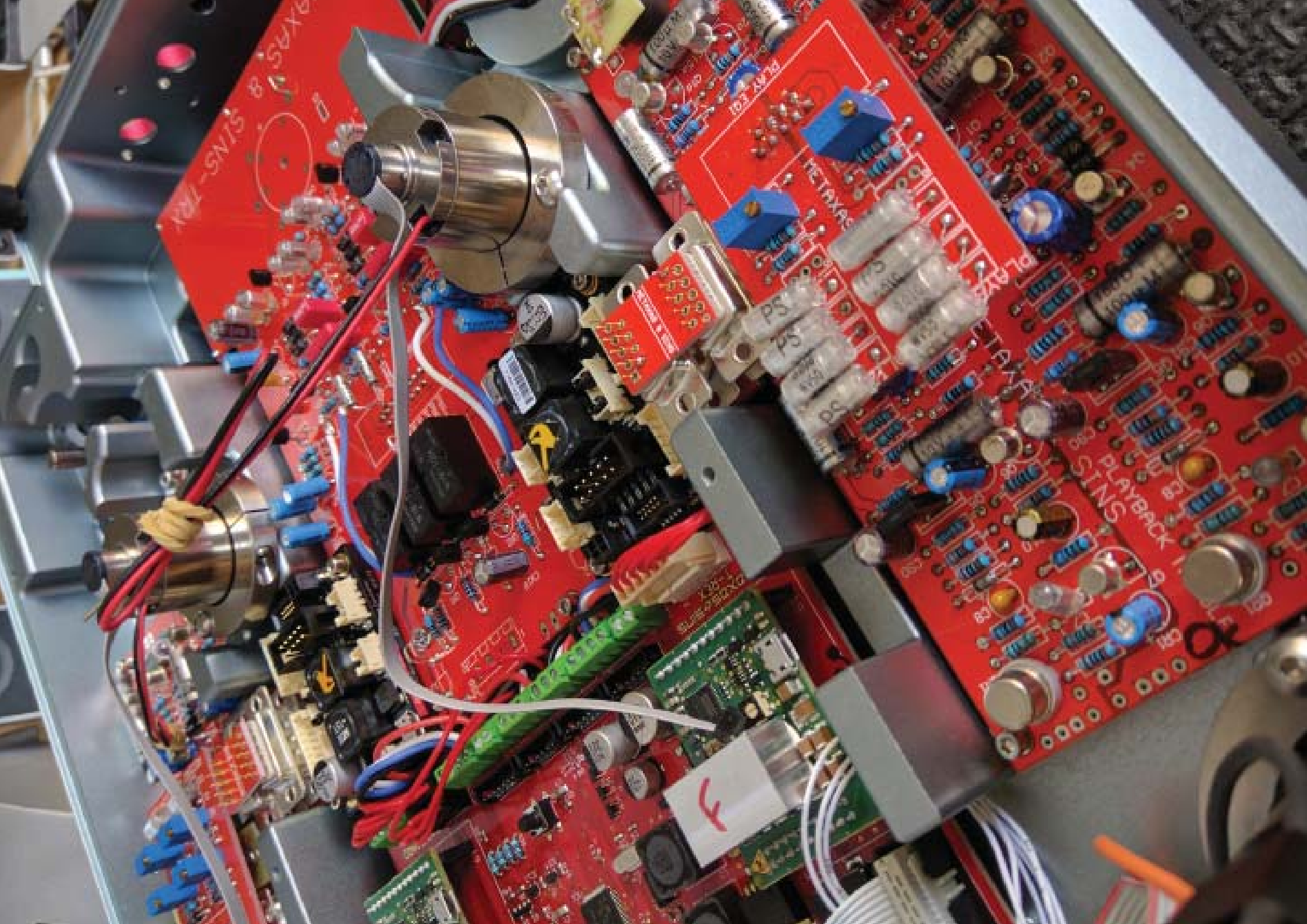


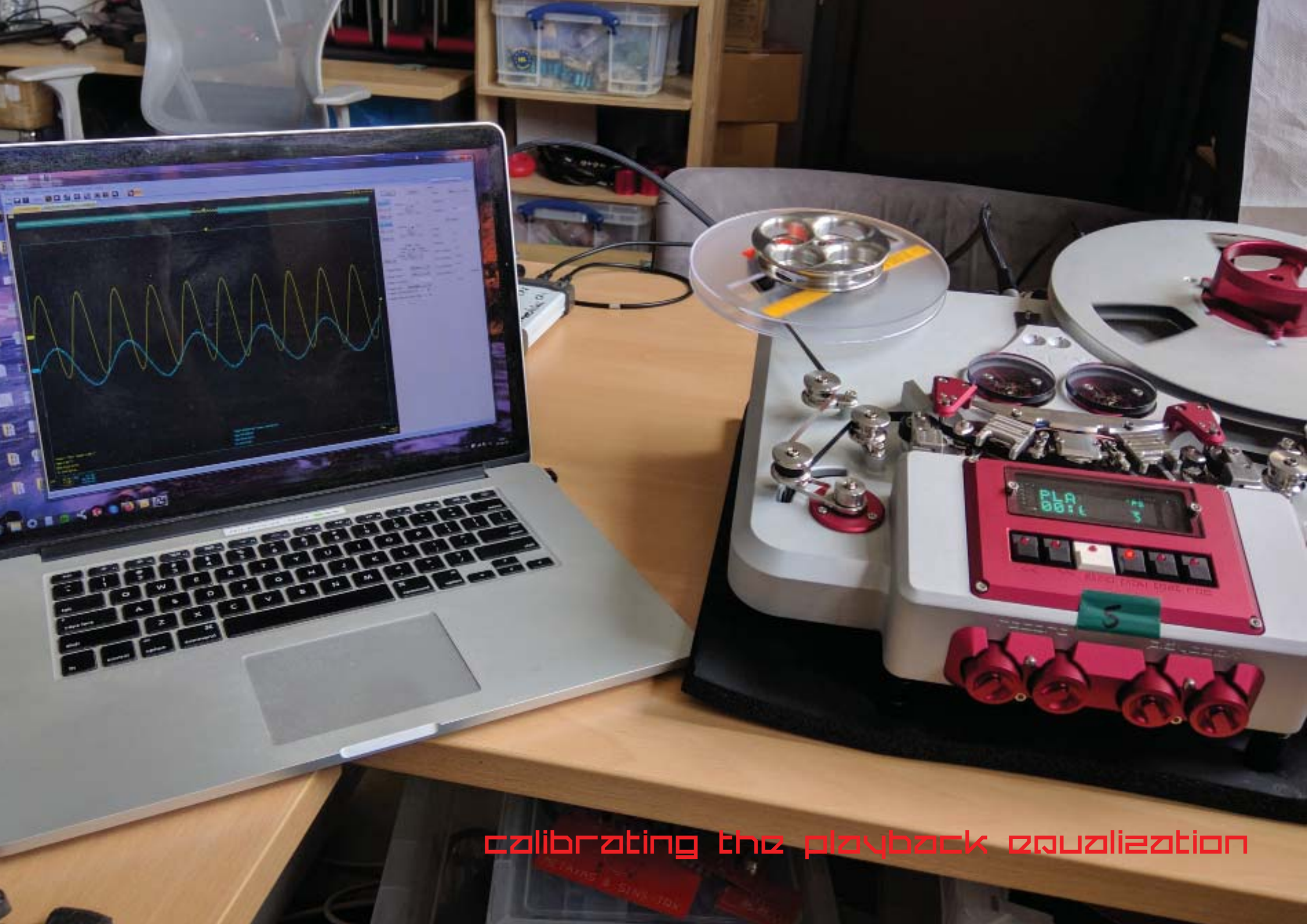
1. R1 - High Frequency adjustment 5K
2. R2 - Low Frequency adjustment 100K
3. C1 - 1kHz level adjustment

playback electronics layout

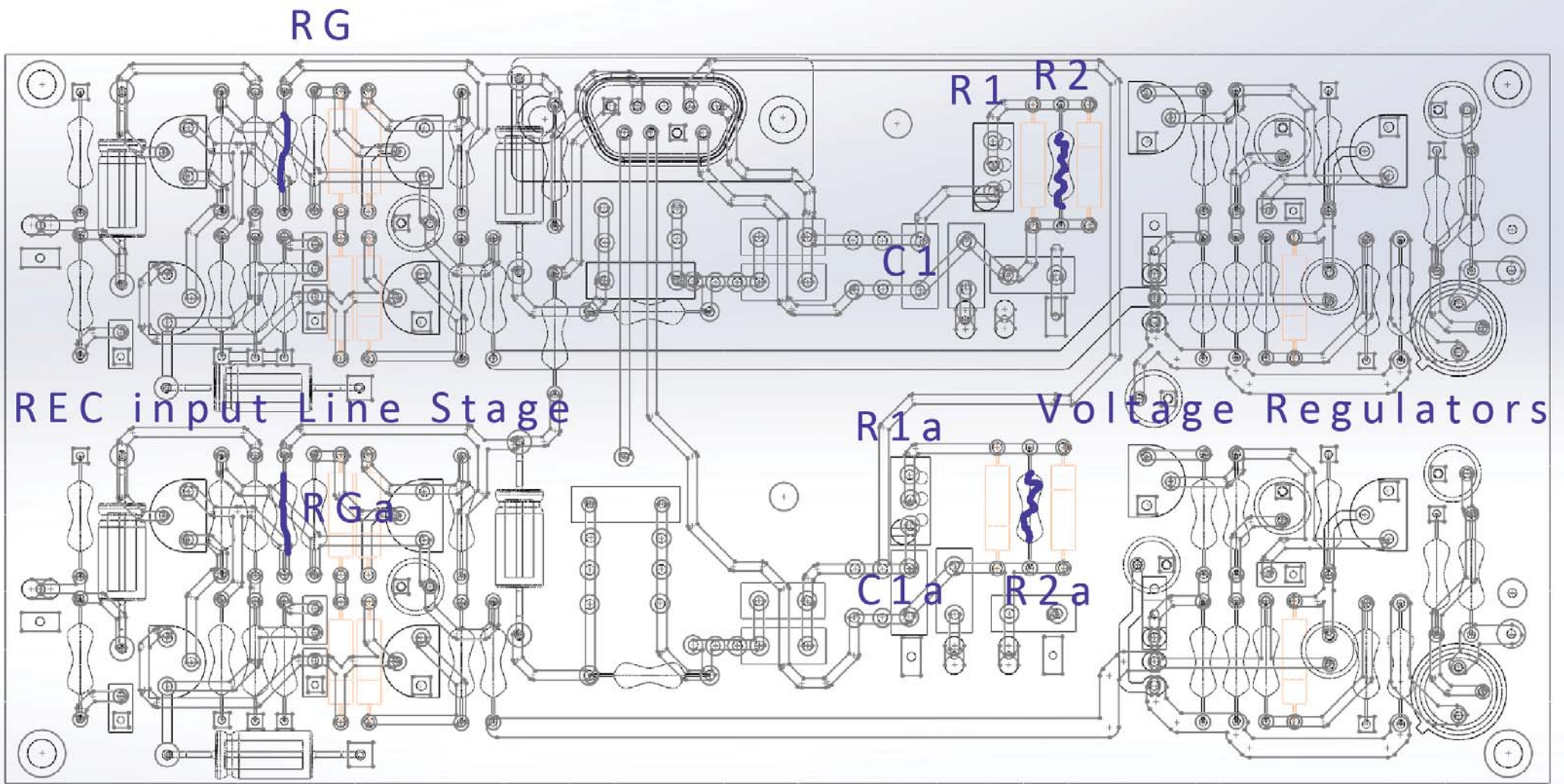
The T-RX comes adjusted as "standard" for 15ips speed using 468 formulation tape. To adjust the EQ, you will require an MRL [or other] calibration tape with test tones from 32Hz to 20kHz. The procedure is very simple. You trim R1 for level gain at ~ 8-10kHz, R2 for best linear gain at ~250Hz. C1 is adjusted depending on the inductance of the Playback head.

For playback at 15ips [and 7.5ips], there is no need to adjust the EQ when using any other tape formulations. The only time you will need to make adjustments would be if you wanted to playback at 30ips. If you playback 30ips tapes on the machine, it will have too much HF energy. You will need to use an MRL calibration tape and adjust rotary trimmer pots R1 and R1a.





calibrating the playback equalization



record electronics layout

1. R1 - REC Tape EQ adjustment 5K
2. R2 - Bias Frequency level adjustment 5K
3. C1 - REC Tape EQ adjustment
4. RG - gain

The T-RX comes adjusted as "standard" for 15ips speed using 468 formulation tape. Our experience with using other tapes [such as SM900 or SM911] is that you can also use them to record with with little difference in EQ - but only at 15ips.

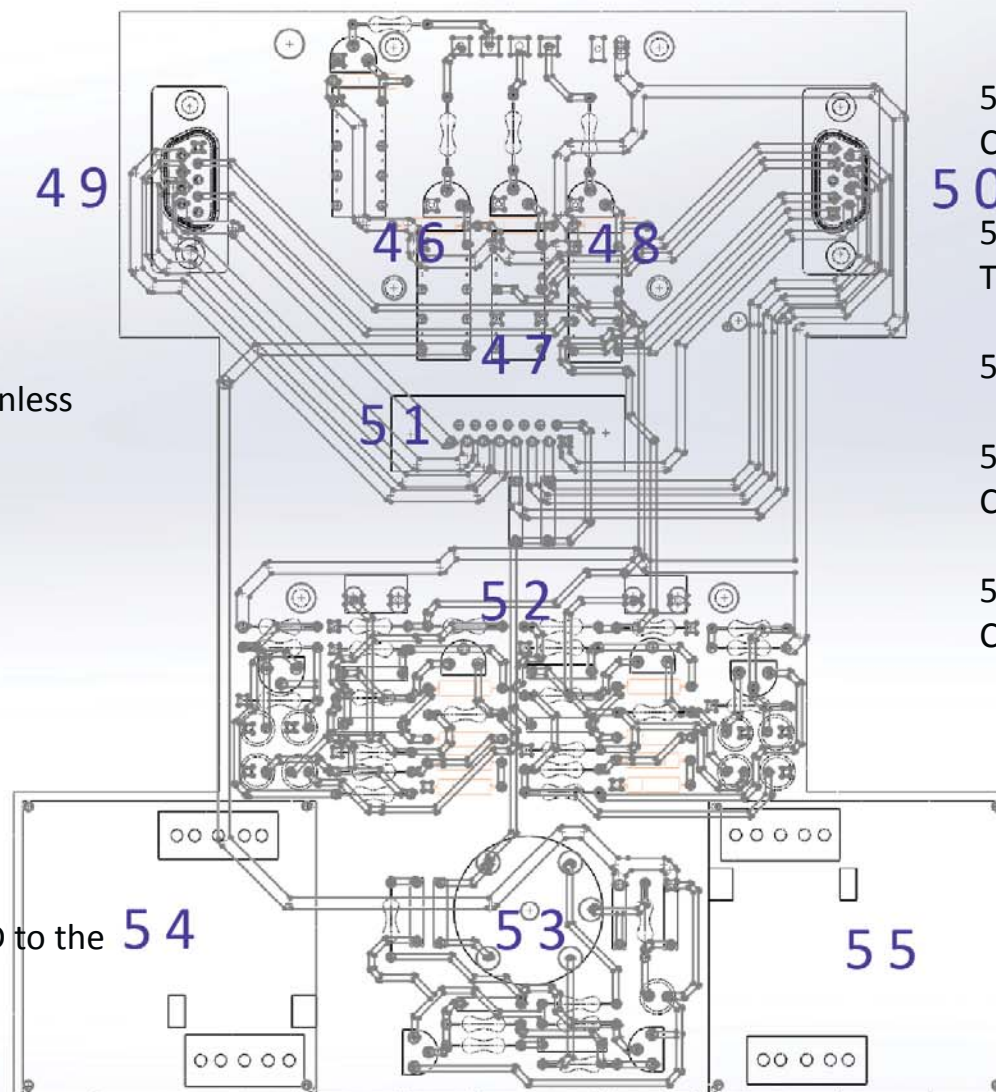
46. Bias Oscillator RELAY
This relay connects the GND to allow the oscillator to work only when TEST or REC is selected on the keyboard.

47. REC Relay
This relay shorts the REC output unless TEST or REC is selected on the keyboard.

48. VU selector Relay [REC or PB]
This relay switches between the Playback output and before EQ of the REC output amplifier. This allows you to monitor the record input or tape output.

49. Playback 9pin DIN connection
This connects the PLAYBACK HEAD to the

50. Record 9pin DIN connection
This connects the REC head to the record electronics



51. Headblock [15pin Din] Connector

52. VU meter circuits [2 channels]
These are calibrated for PEAK VU.

53. Bias Oscillator Circuit.

54. Right Actuonix Linear Motor Controller

55. Left Actuonix Linear Motor Controller.

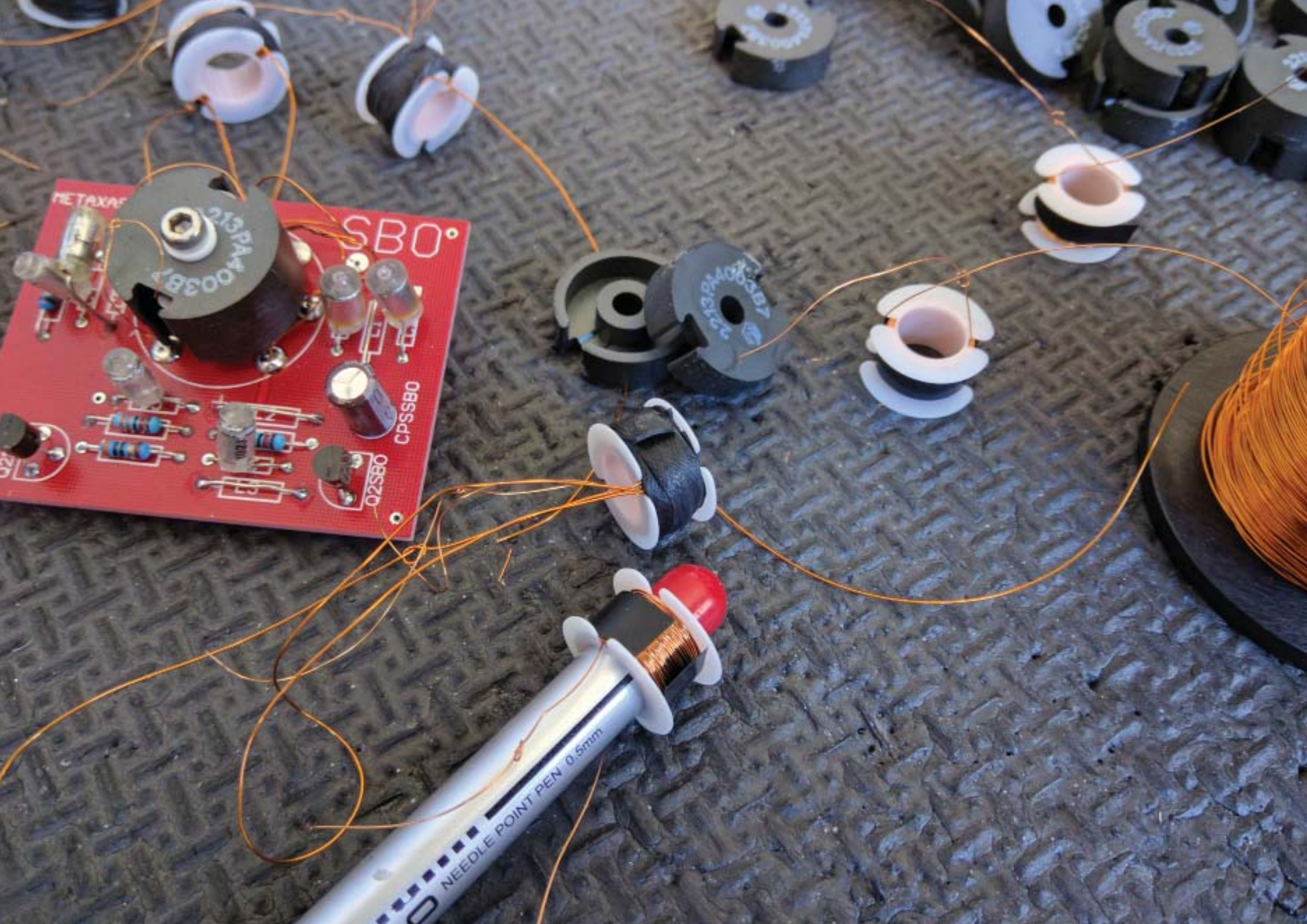
VU, OSC, HEADBLOCK, RELAYS ELECTRONICS LAYOUT



calibrating the vu meters



calibrating bias voltage and frequency



METAXAF

SBO

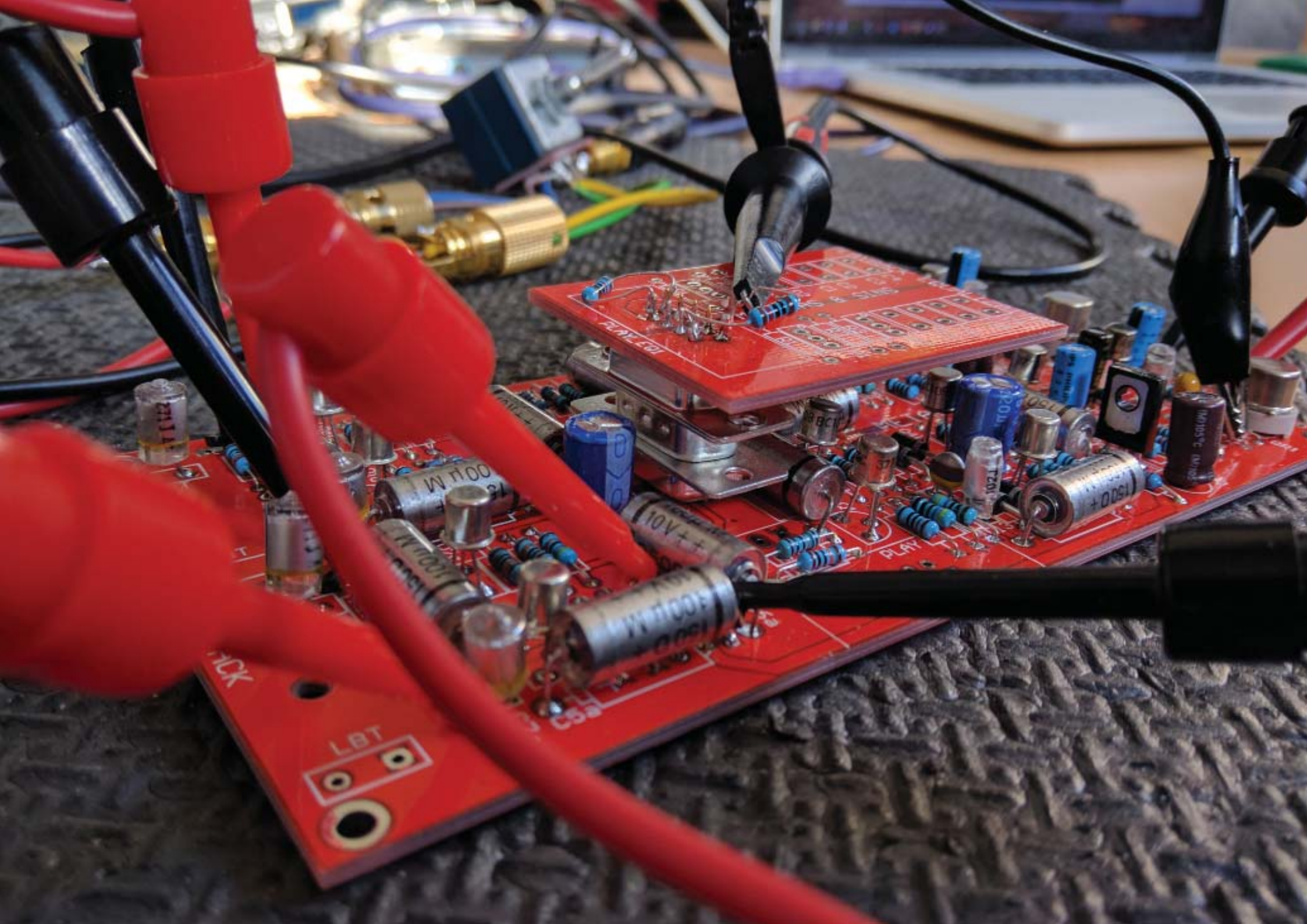
213PA003B7

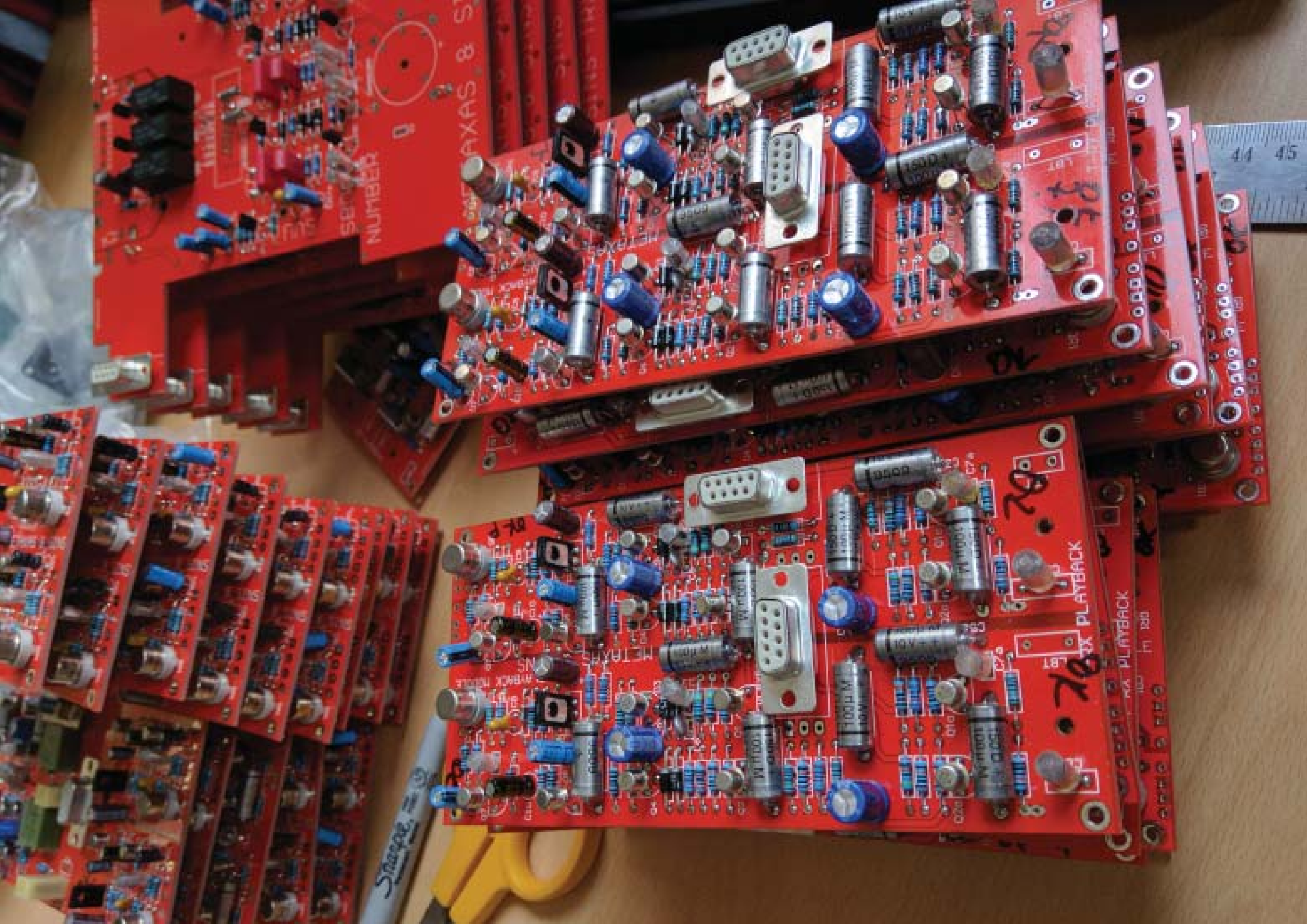
CPSSBO

Q2SBO

NEEDLE POINT PEN 0.5mm







Sharpie



SEQUENCE NUMBER

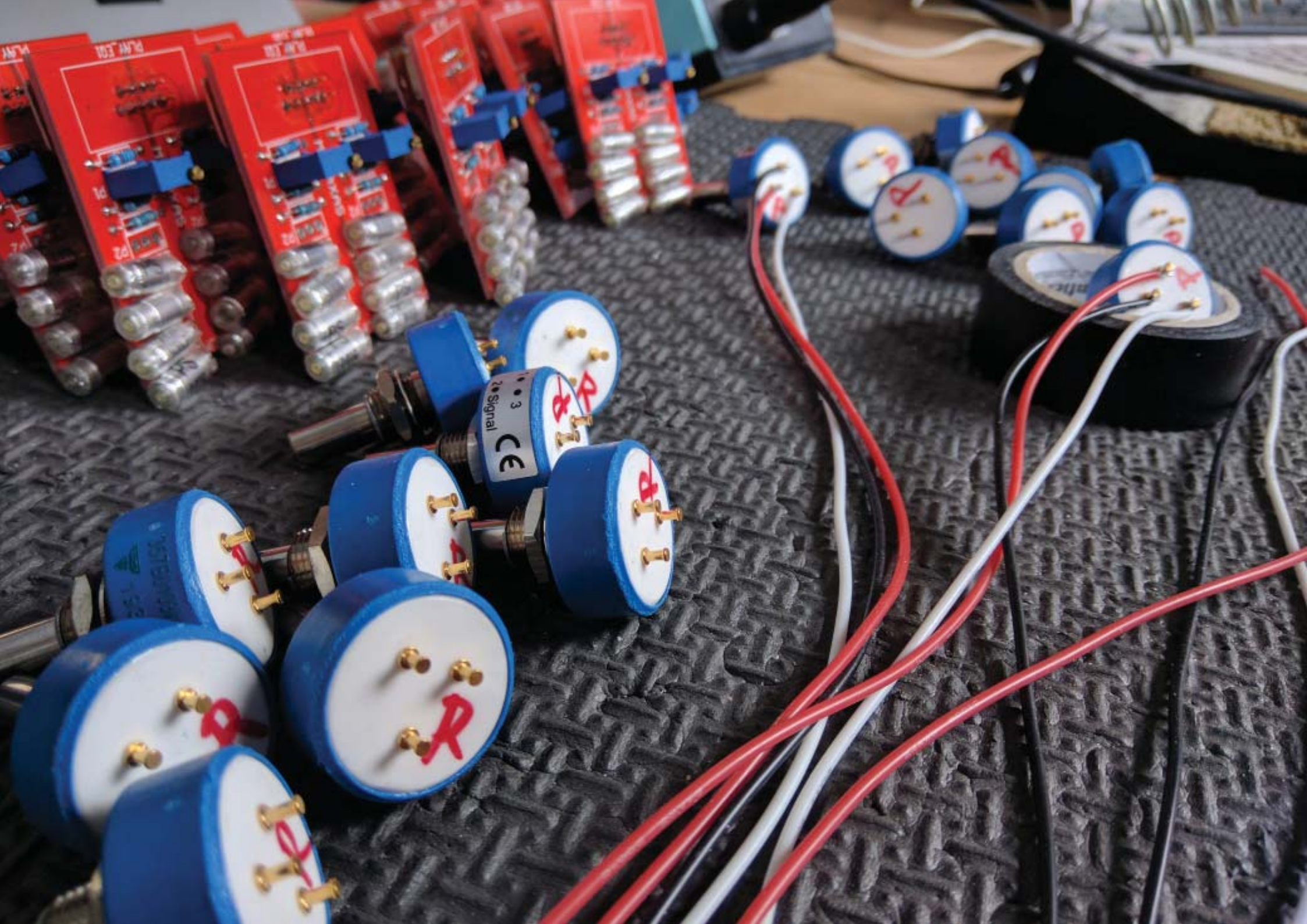
SUBTAXAS 8 S

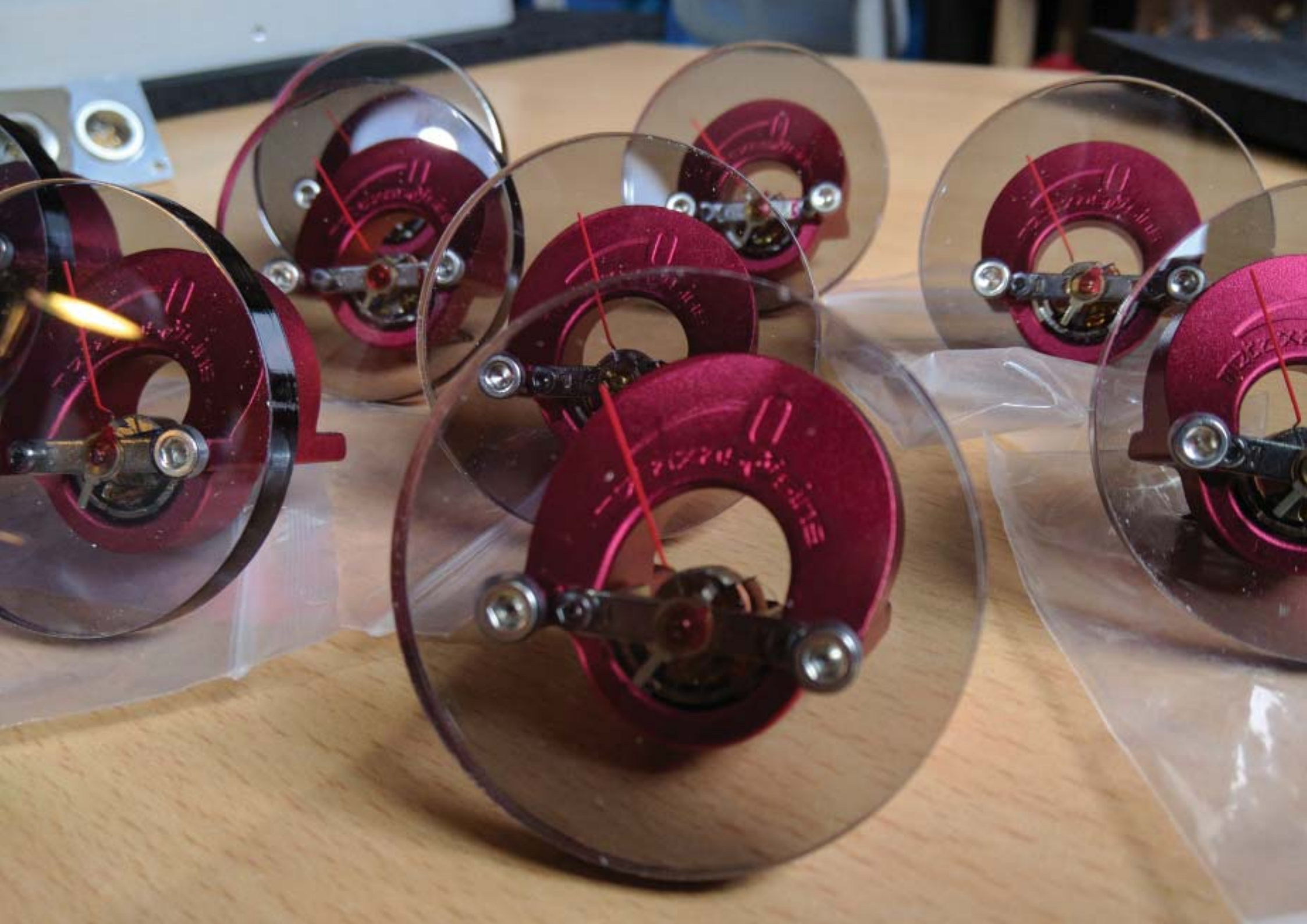
PLAYBACK

PLAYBACK

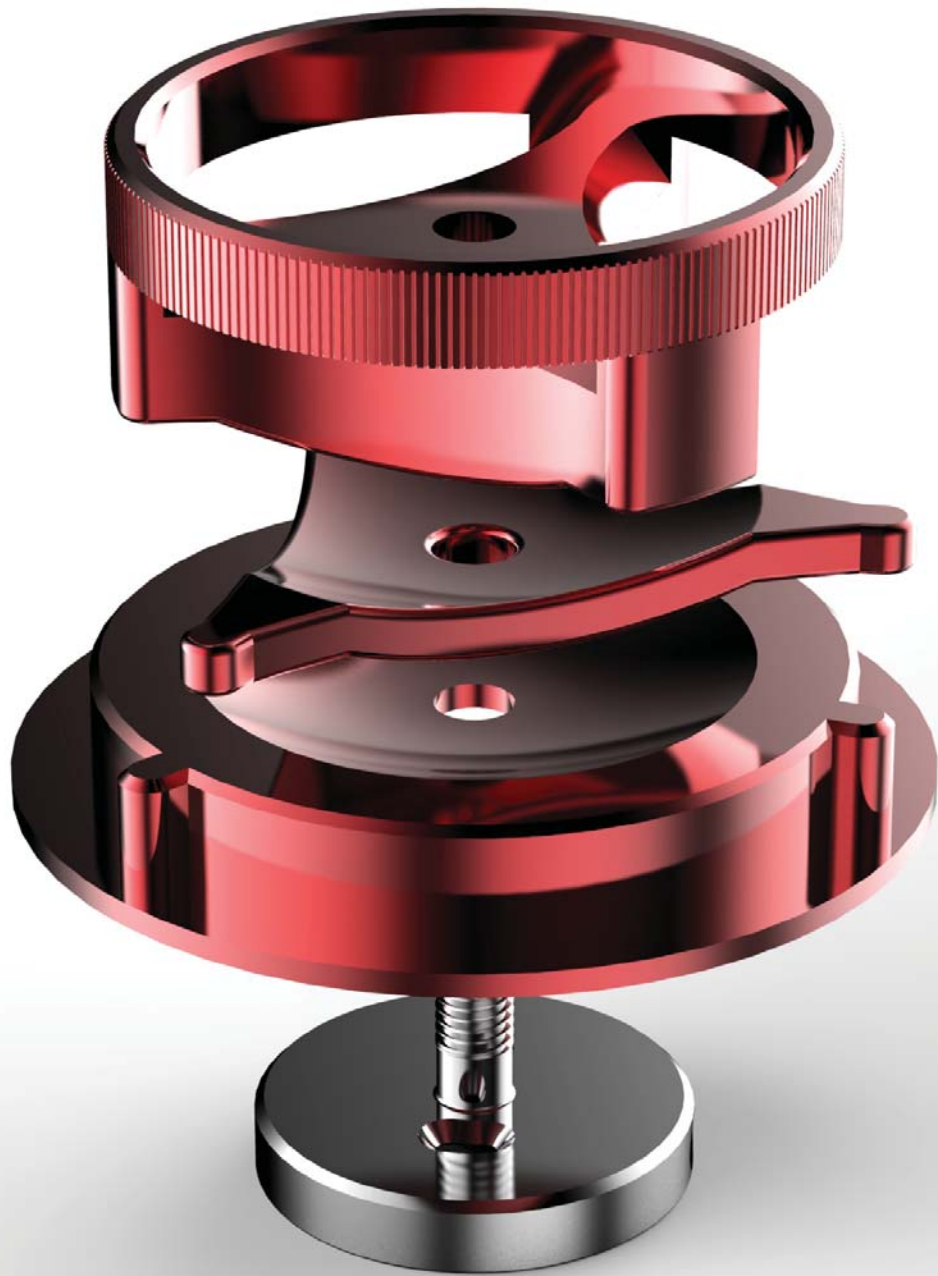
82

81









"hubba-hubba"
nab hub adapter



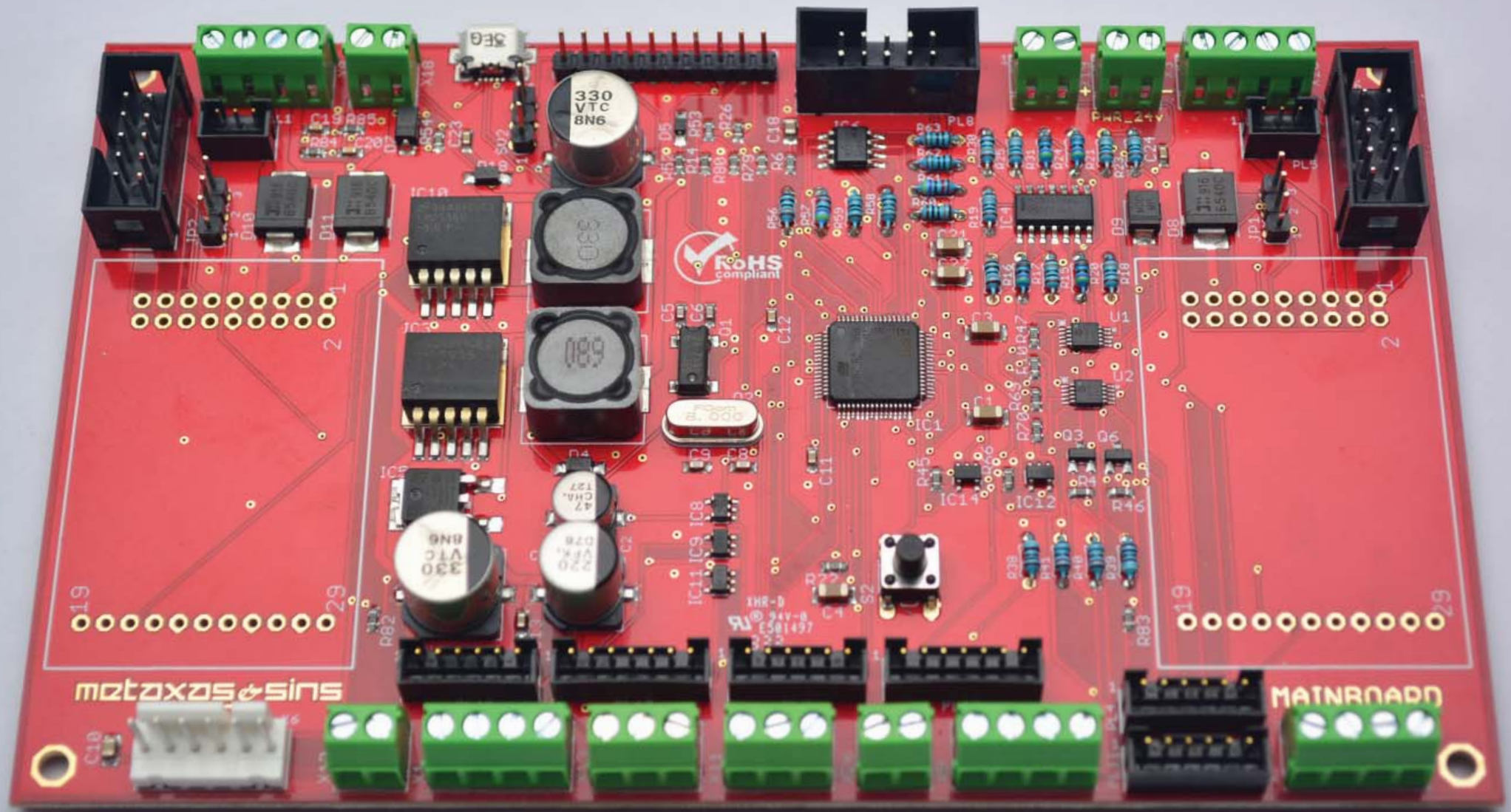
external ac and battery power supply



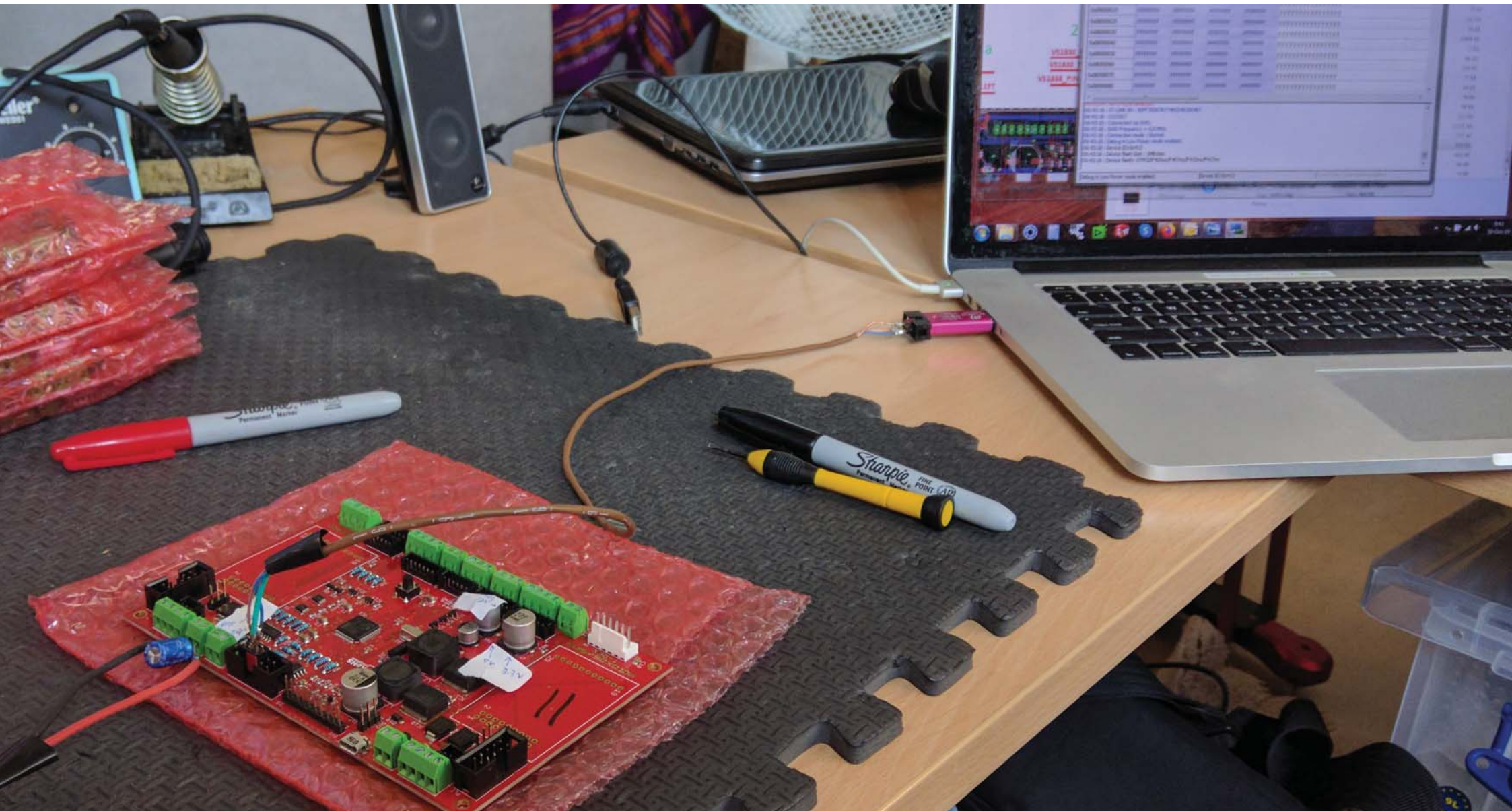


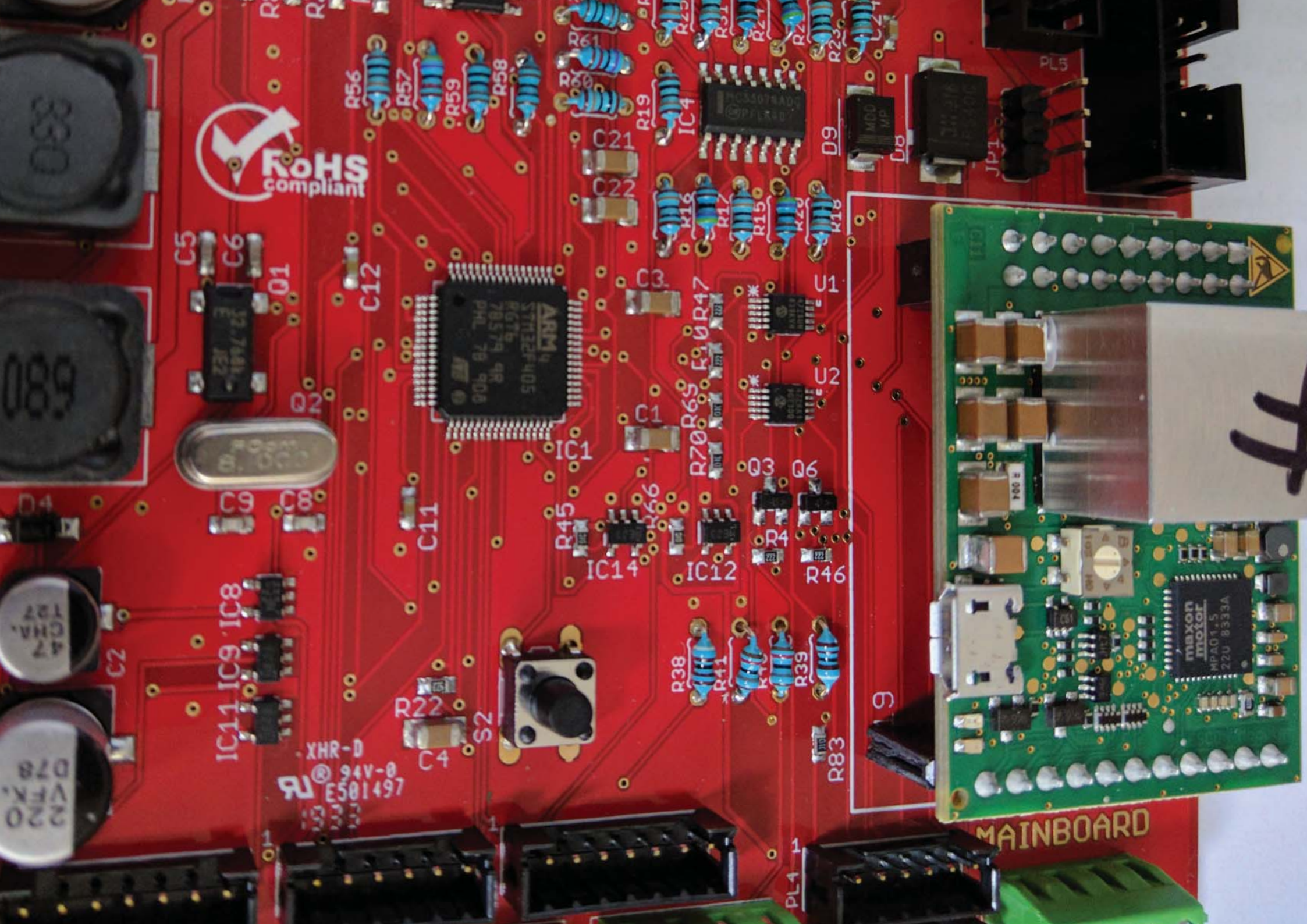


The heart of the TRX is a an ARM-CORTEX computer [similar to a mobile phone].
This takes full control of the 6 motors to control tape tension and ultimately the effortless passage of tape across the tape "heads".



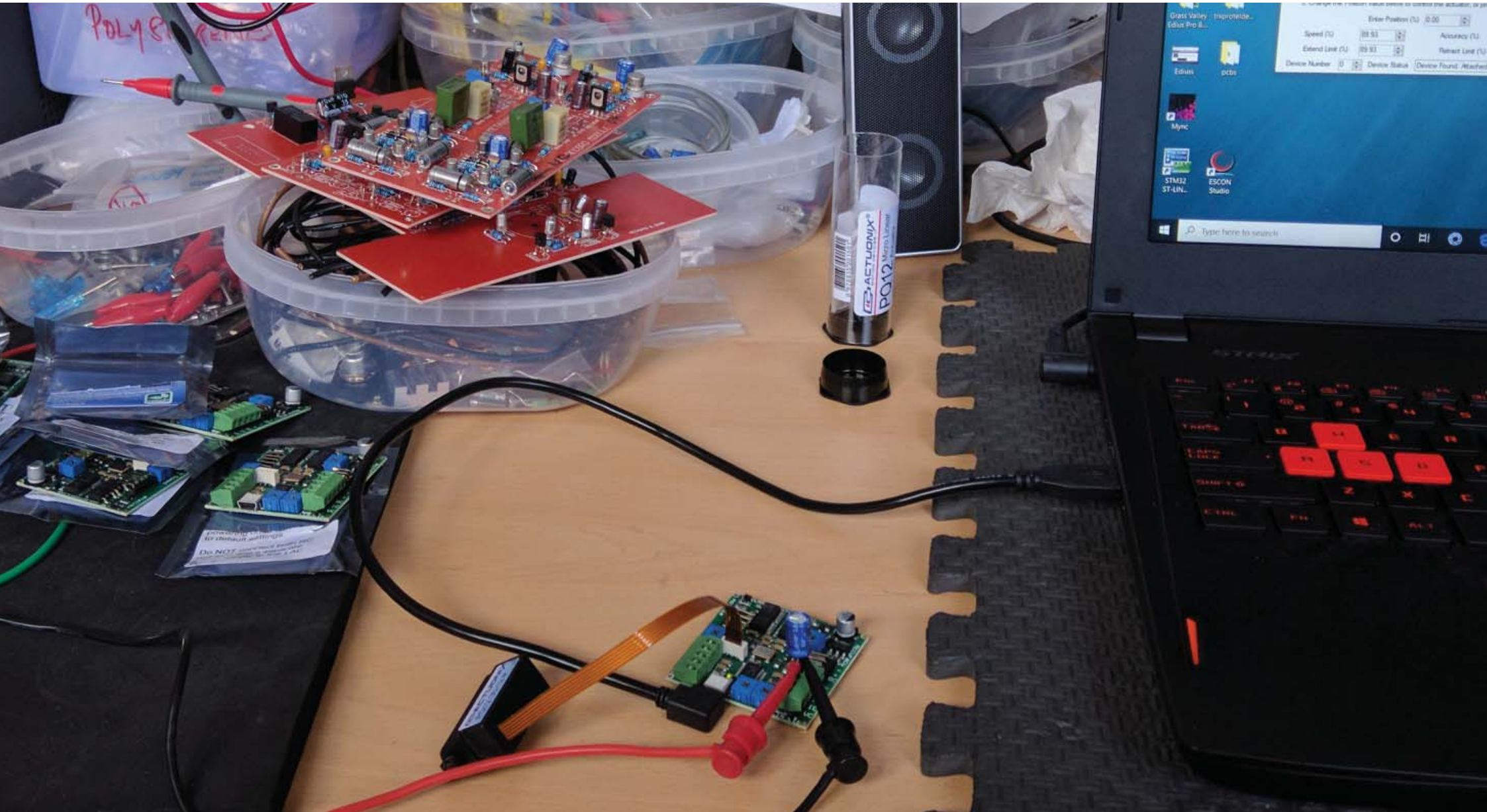
Adding the "firmware" to the controller.

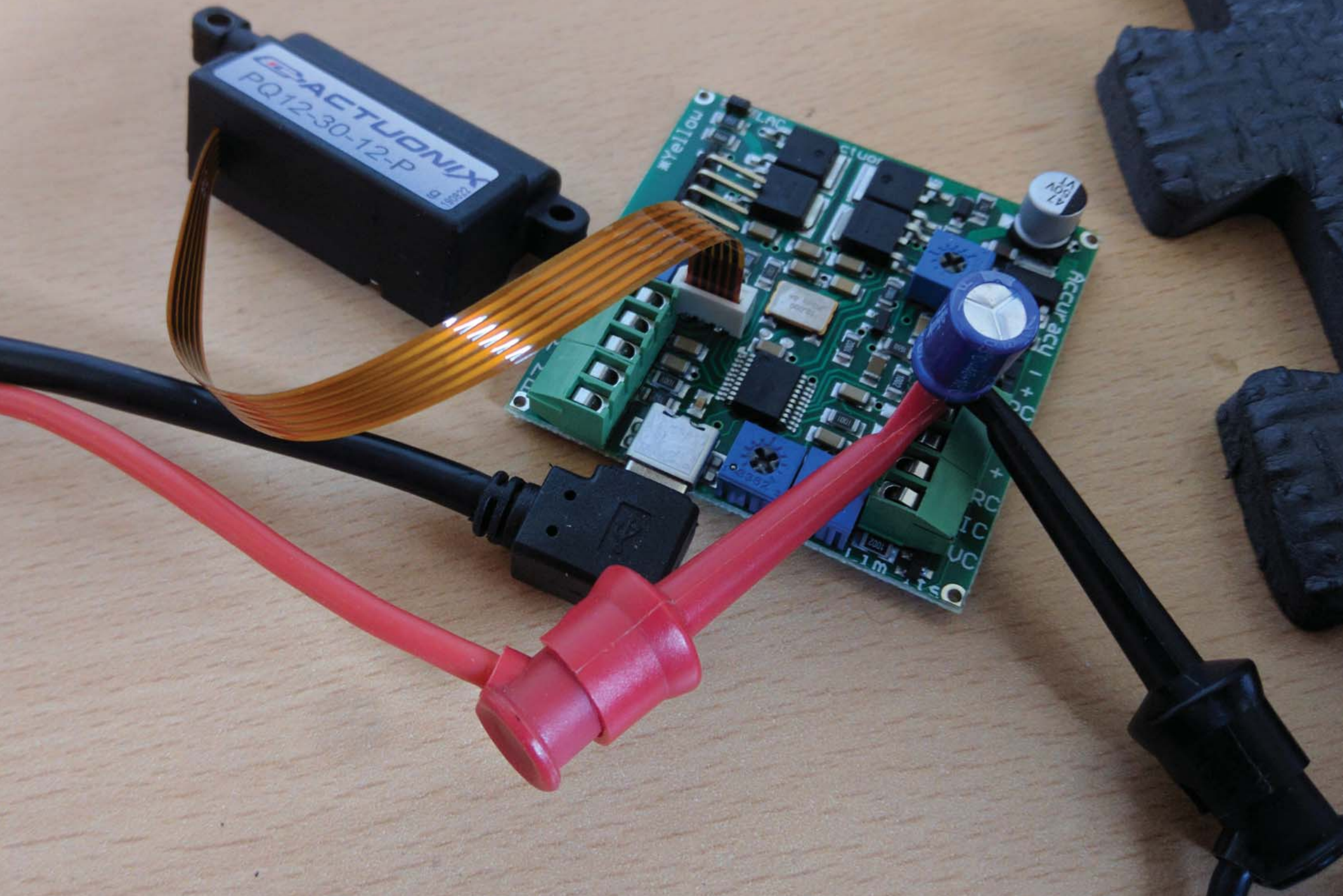


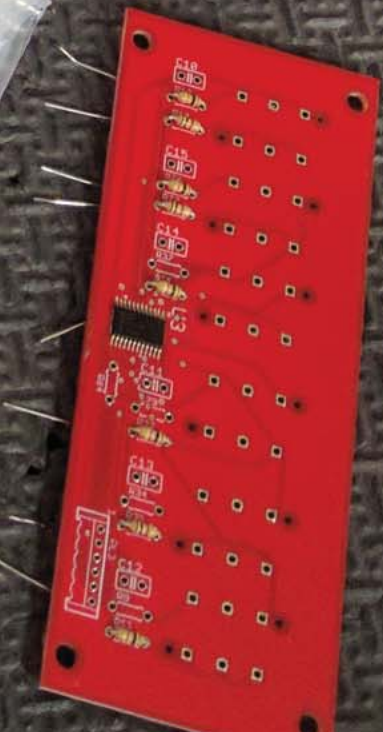


actuonix linear motor controller

The DUAL-CAPSTANS retractable bar is controlled by 2 Actuonix linear motors [from Canada]. These powerful and precise motors position the rubber CAPSTAN rollers carefully on the Capstan Motor Shaft to ensure absolutely perfect "NO WOW" speed in the TRX.



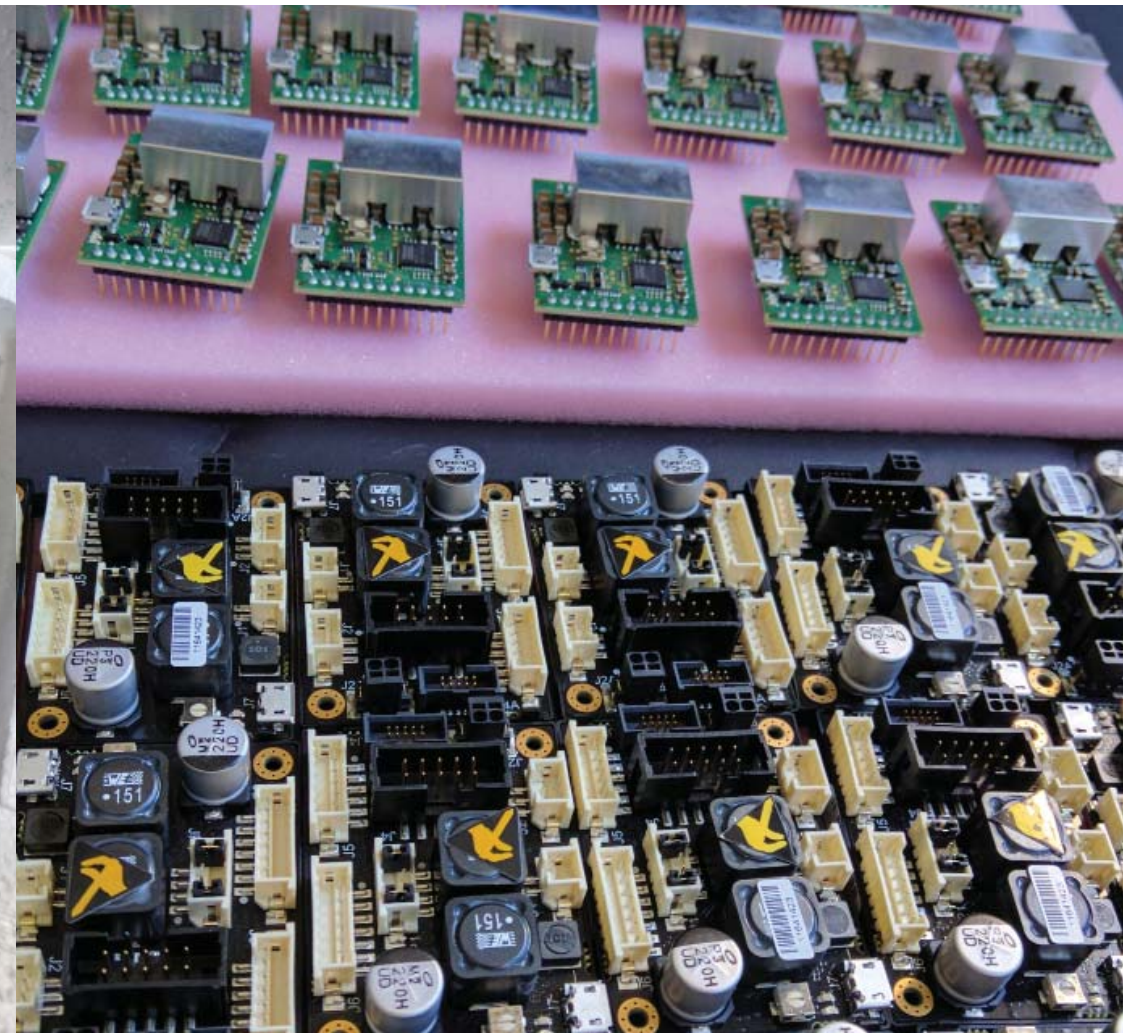
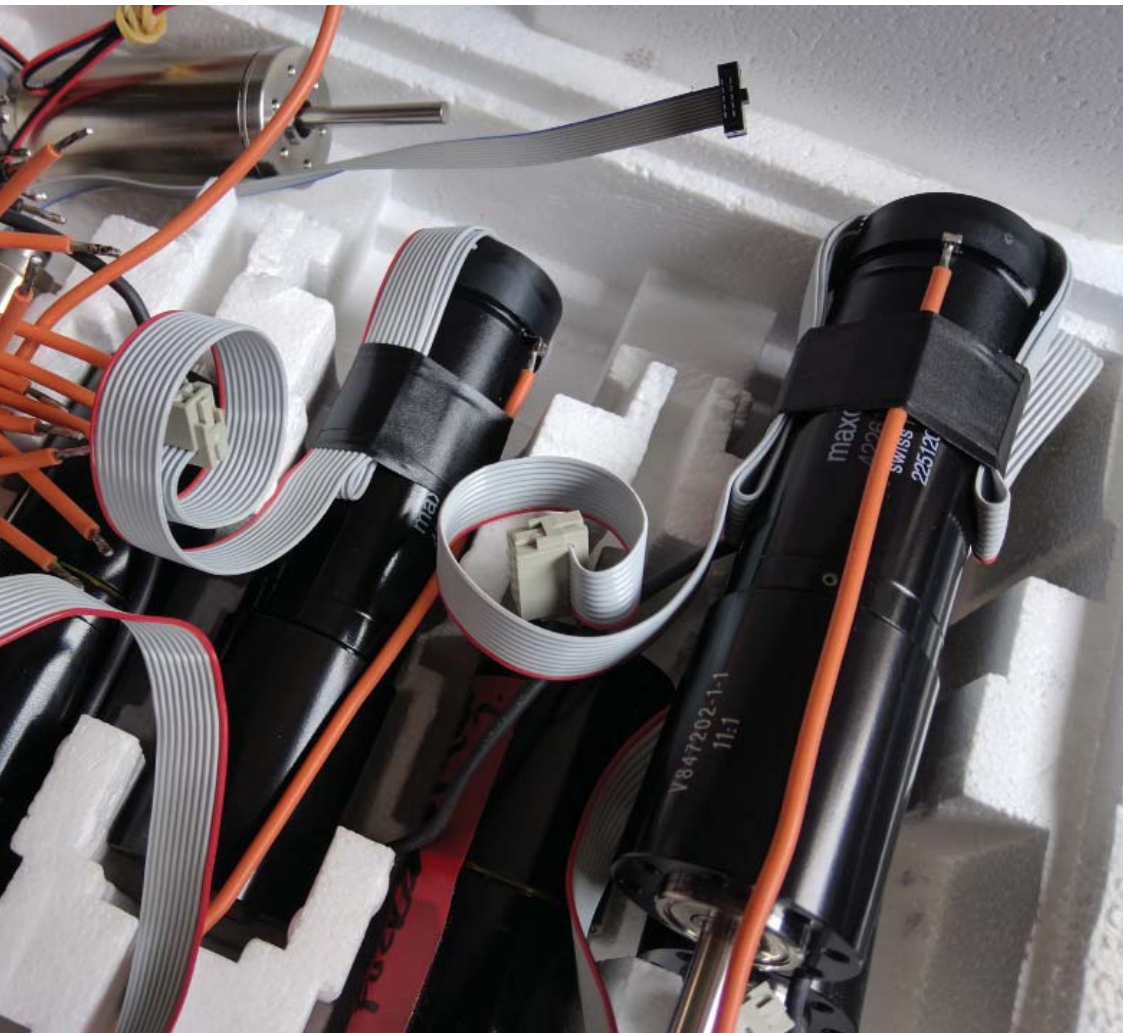




keyboard switches

The rotating motors used in the TRX in the very critical REEL and CAPSTAN operation are all "NASA" standard Swiss Maxon [4 motors, 2 reel and 2 capstan].

MAXON motors were selected as they are currently the most sophisticated motor/encoder/controller system that money can buy. They have developed their own "system" including software to tune and control the PID of their motors well beyond any of their competitors. Pictured below are some of their motors which have a built-in 1024 position digital encoder embedded into the motor. The separate controller modules - ESCON 36/2 and 50/5 provide ultra-precision control when used with our ARM-CORTEX controller. The biggest difference between recorders made in the 1960-1980s and today is the use of software-driven motors with controllers. Things like braking and speed accuracy to 0.001% are the reason the TRX is well ahead of any machine manufactured in the past.

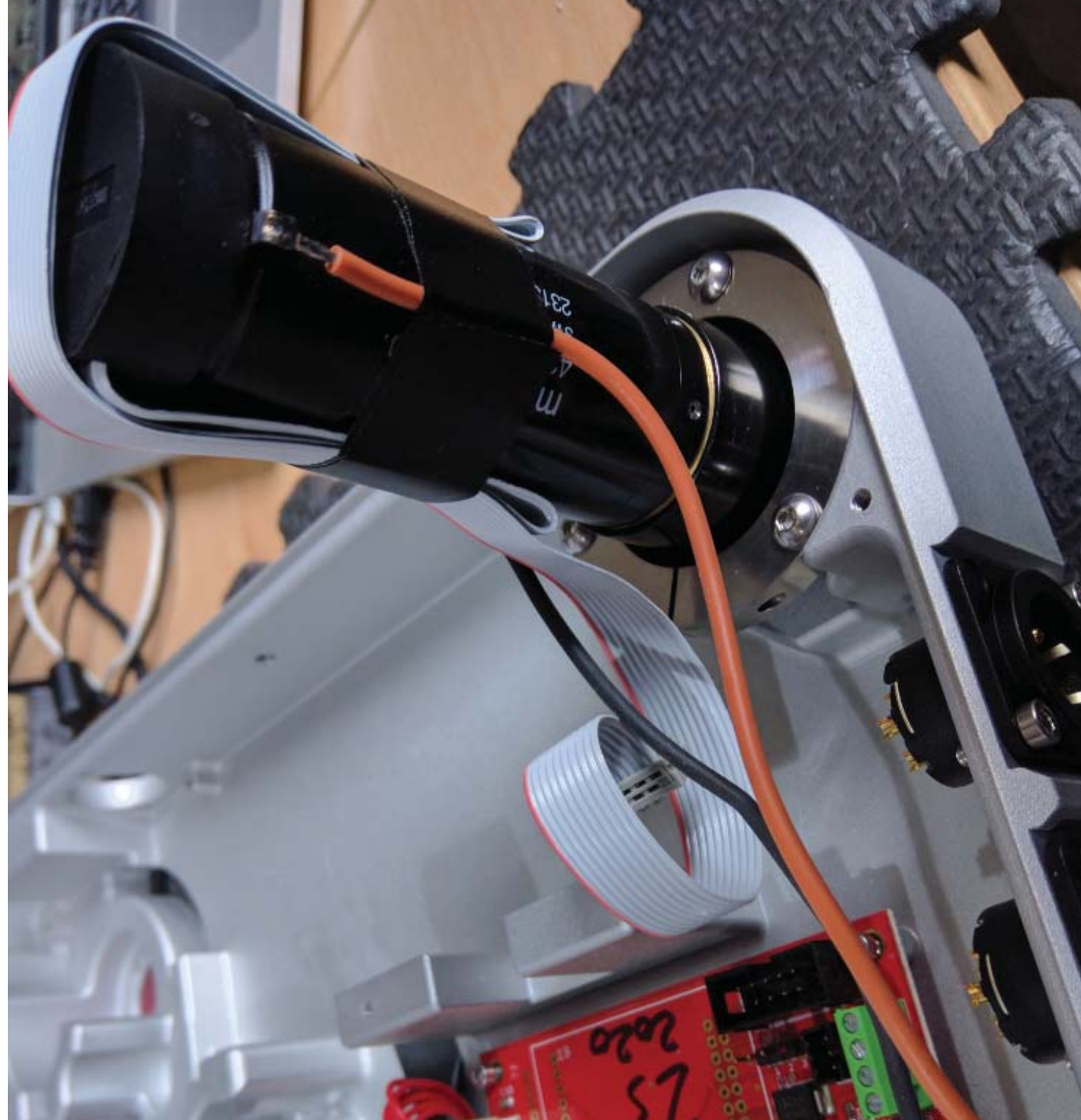




maxon motors

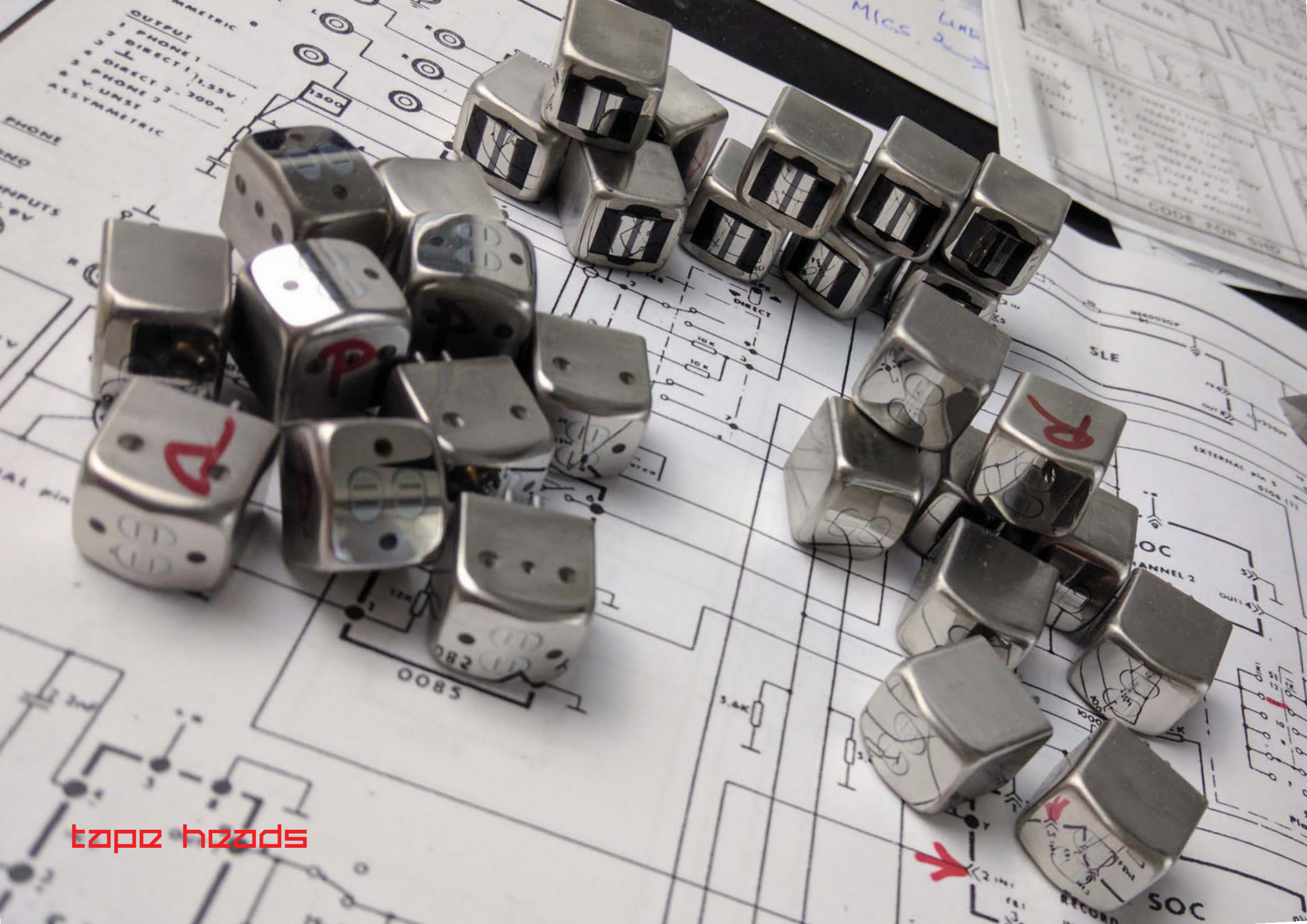
It's not enough to simply use the motor mounting holes to support the motors to the CNC chassis.

The TRX also has a proprietary "clamp" system to make sure the body of the motor is also well supported during the enormous torque forces generated when a reel is being rewinded or fast forwarded.





maxon motors



topaz heads

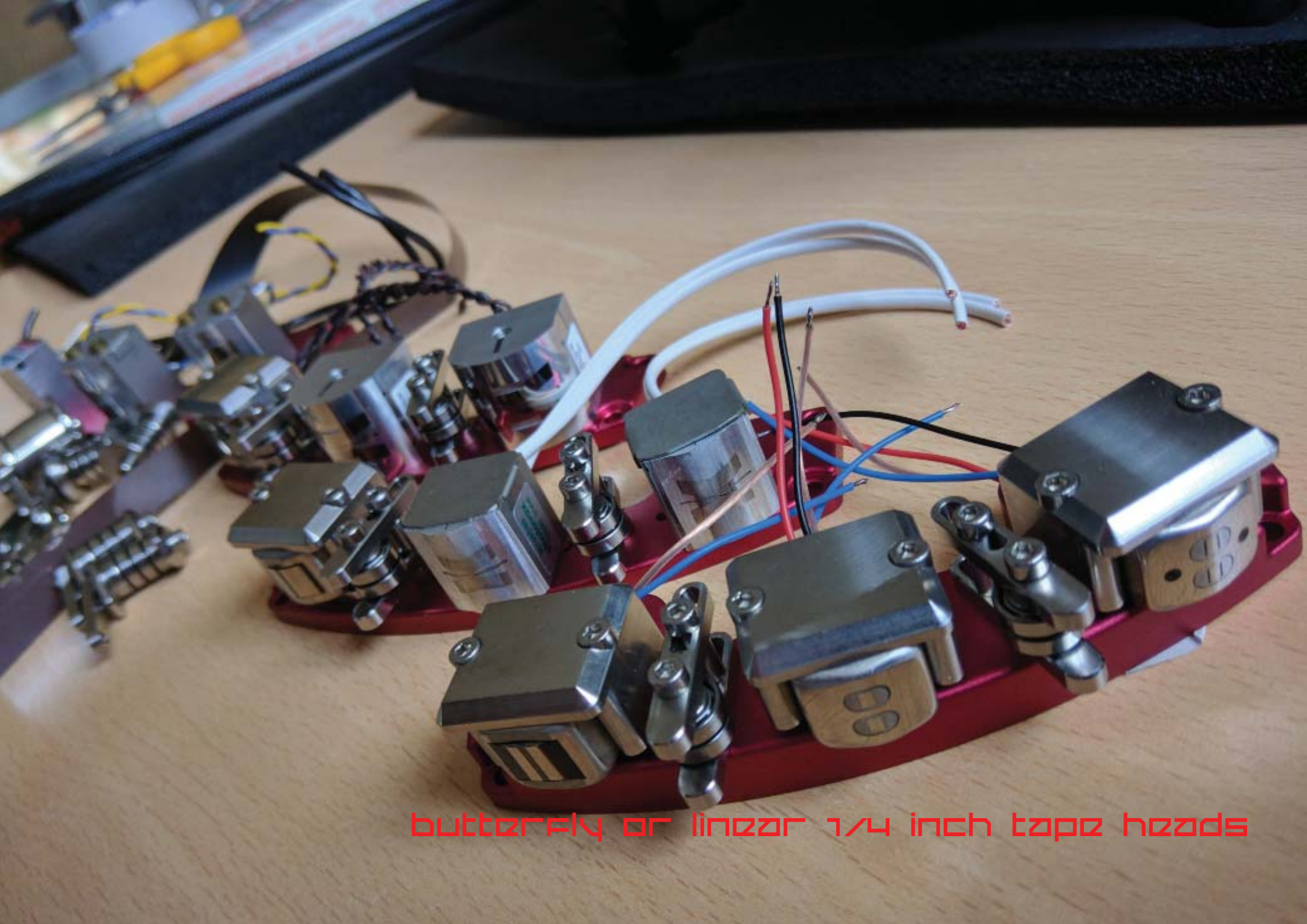
The ERASE, RECORD and PLAYBACK heads currently used in the TRX are PHOTOVOX [Italy] designed by Andrea Barbuto. These were also used by STELLAVOX in their Studio TD9 machine [when they weren't using BOGEN for RECORD/PLAYBACK and WOELKE for ERASE - sadly, BOGEN and WOELKE are no longer in business as well]. These heads can also be easily changed to other heads [of similar size] quite easily - but you need to consult us as the inductance of the heads is critical for playback levels and equalization.





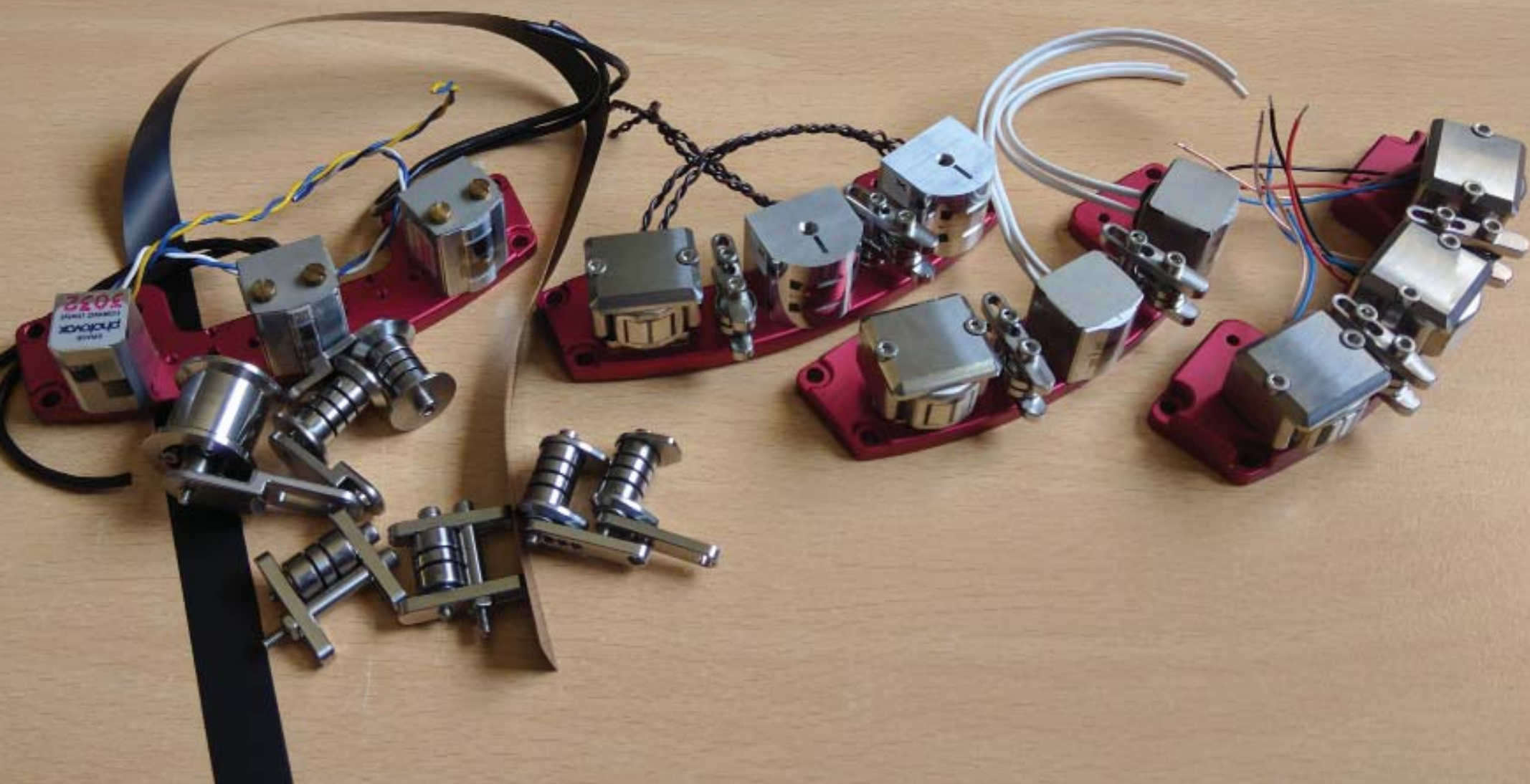
OPENREEL
RECORDS
ITALIAN FINE ARTS

D-SUB CONNECTOR



butterfly or linear 1/4 inch tape heads

1/2 inch tape heads





SM
468
RECORDING FOR MAXIMUM QUALITY

T-RX
TAPE RECORDER

stop play test rec

6

1/2 inch tape



ERASE
phovox
TORINO (Italy)
3032

TAPE RECORDER

TYPE



T-RX
TAPE RECORDER.



<< >> stop play fast fwd



MY REFERENCES

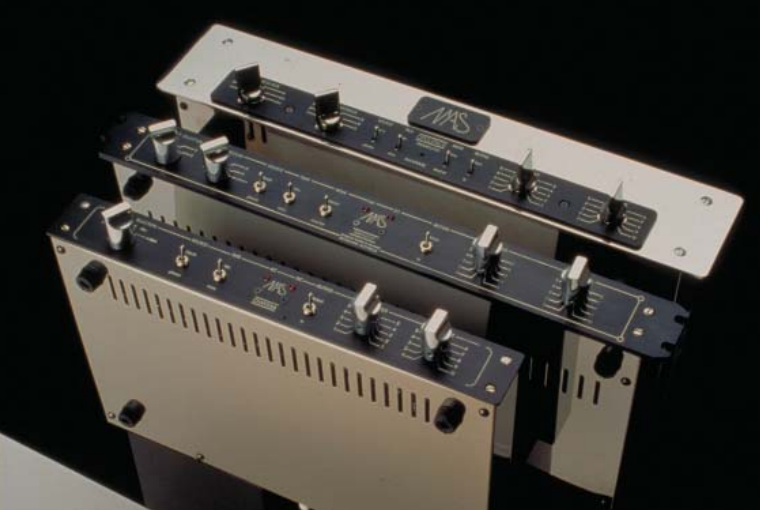
At the time [early 1980s], the reference for most designers was a Linn Sondek or SOTA turntable...Harry Pearson of TAS had just discovered the Goldmund Studio - so I purchased one from Michel Reverchon in Paris, then a Goldmund Reference. My Swiss distributor at the time introduced me to Stellavox - and that was when I had my "Tape Epiphany". When I purchased my Stellavox SM8 and TD9 ~ 1985, they cost ~ \$50K - the price of a suburban house in Melbourne, Australia. The same house today is ~ \$1 million.





the 1980s





BEST GALLERY

Gli ampli con la valigia

di SANDRO RUGGIERI

tenuti da un'inattaccabile barriera di filosofie di progetto, e caratterizzati da un grado di fabbricazione e da una
satilità senza eguali, i pre e finali Metaxas, con i loro inusitati bauletti di imballaggio, entrano inaspettamente
e in grande stile nel Gotha della high-end.



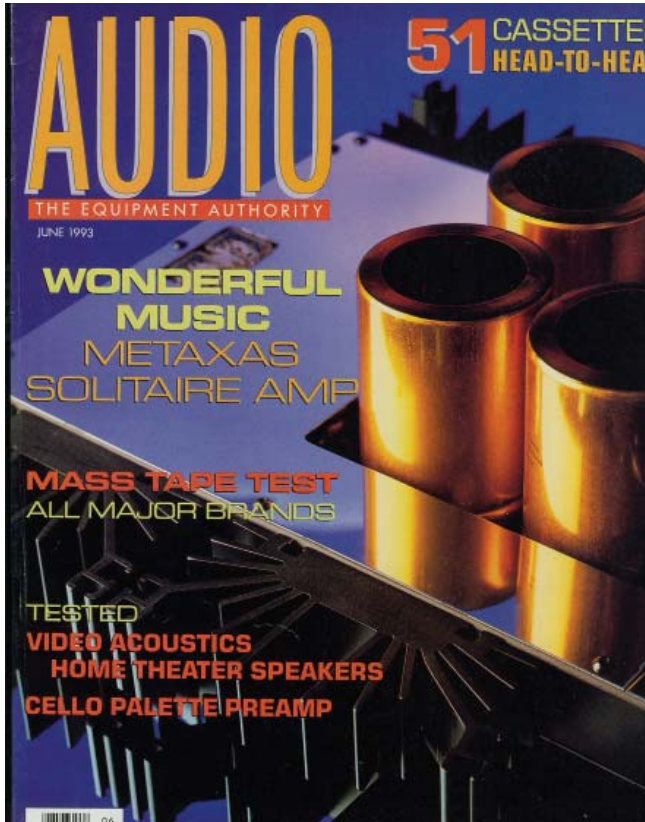
rama della high-end mancava un
che, pur perseguendo senza con-
migliori prestazioni sonore possi-
esse altrettanta dedizione alla ver-
l'affidabilità dei suoi apparecchi.
D. Metaxas sembra l'uomo destina-
re questa lacuna. Australiano di
ca educato in Germania, ha fon-

dato nel settembre del 1981 la Metaxas Audio Systems, di cui è titolare e progettista, dedicandosi alla realizzazione di circuiti di amplificazione «custom» di altissima qualità, da cui sono lentamente scaturiti dei preampli e dei finali di eccezionali caratteristiche, la cui fama incomincia ora a varcare i confini del continente australe.

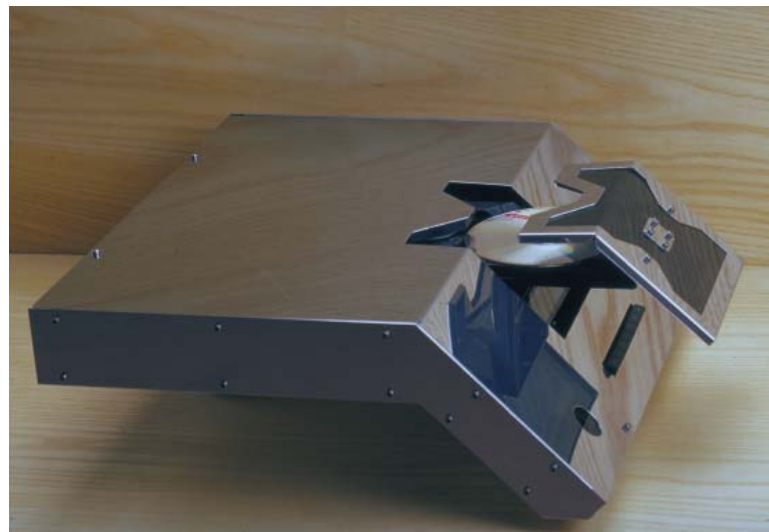
L'equilibratissima molteplicità di requisiti cui tali prodotti si conformano rispecchia poliedricità del loro autore, che conosce esperienza diretta tutti gli aspetti della riproduzione sonora: melomane in primo luogo audiofilo egli stesso, ha fatto esperienza campo della progettazione creando svariati componenti considerati «di riferimento»

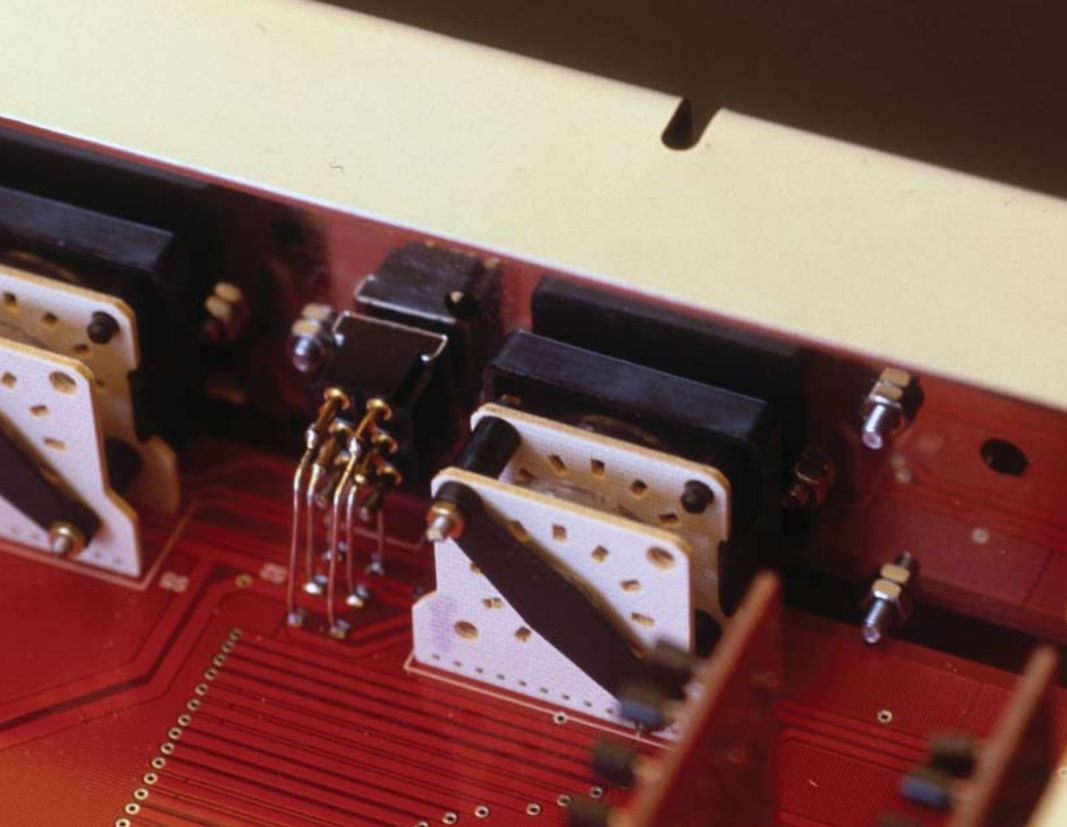


thz 19805

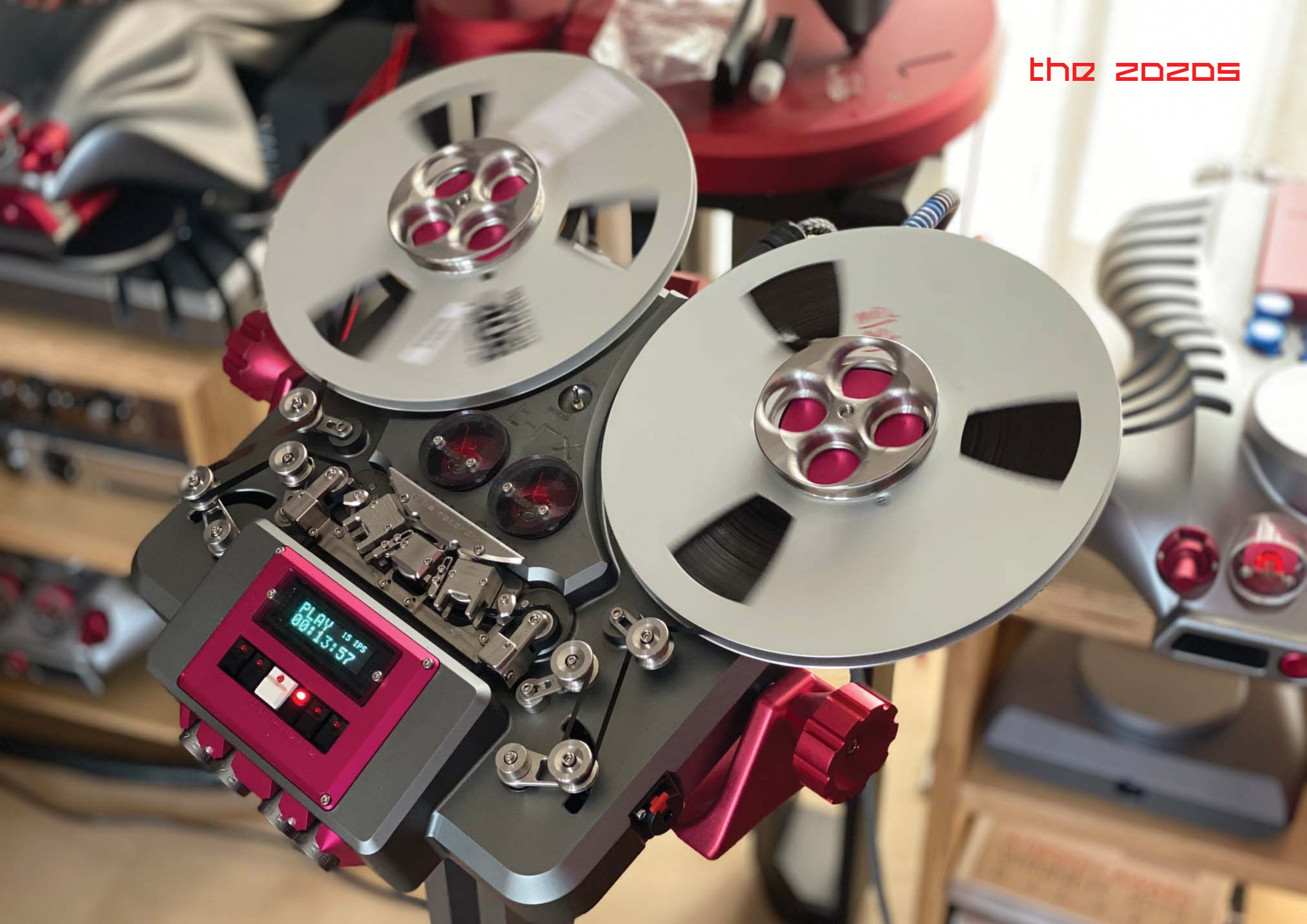


the 1990s





thz 2020s



MY CURRENT REFERENCES



stellavox s18

SM7

SM8

“The original goal of the TRX was to exceed my current references which include Stellavox machines from the 70’s, 80’s and even a heavily modified S18 transport in terms of record and playback sound quality.”

“The S18 was the perfect transport to marry the actual TRX REC/Playback/Bias Oscillator electronics so I could compare directly the sound of my heavily modified Stellavox electronics to the modifications I already carried out to my other Stellavox machines.”



stellavox modified s18



stellavox sm7



STOLLINOX SM7



stellavox smb



MY REFERENCES
FROM 1985 - 2016



MY REFERENCES
FROM 1985 - 2016



stellovox factory visit - 1986





9811 2P0201 835 2014 MIXER AND SWE RECORDER - 1986



view of lake neuchâtel - 1988

SMA RECORDERS - 1986



testing - 1986

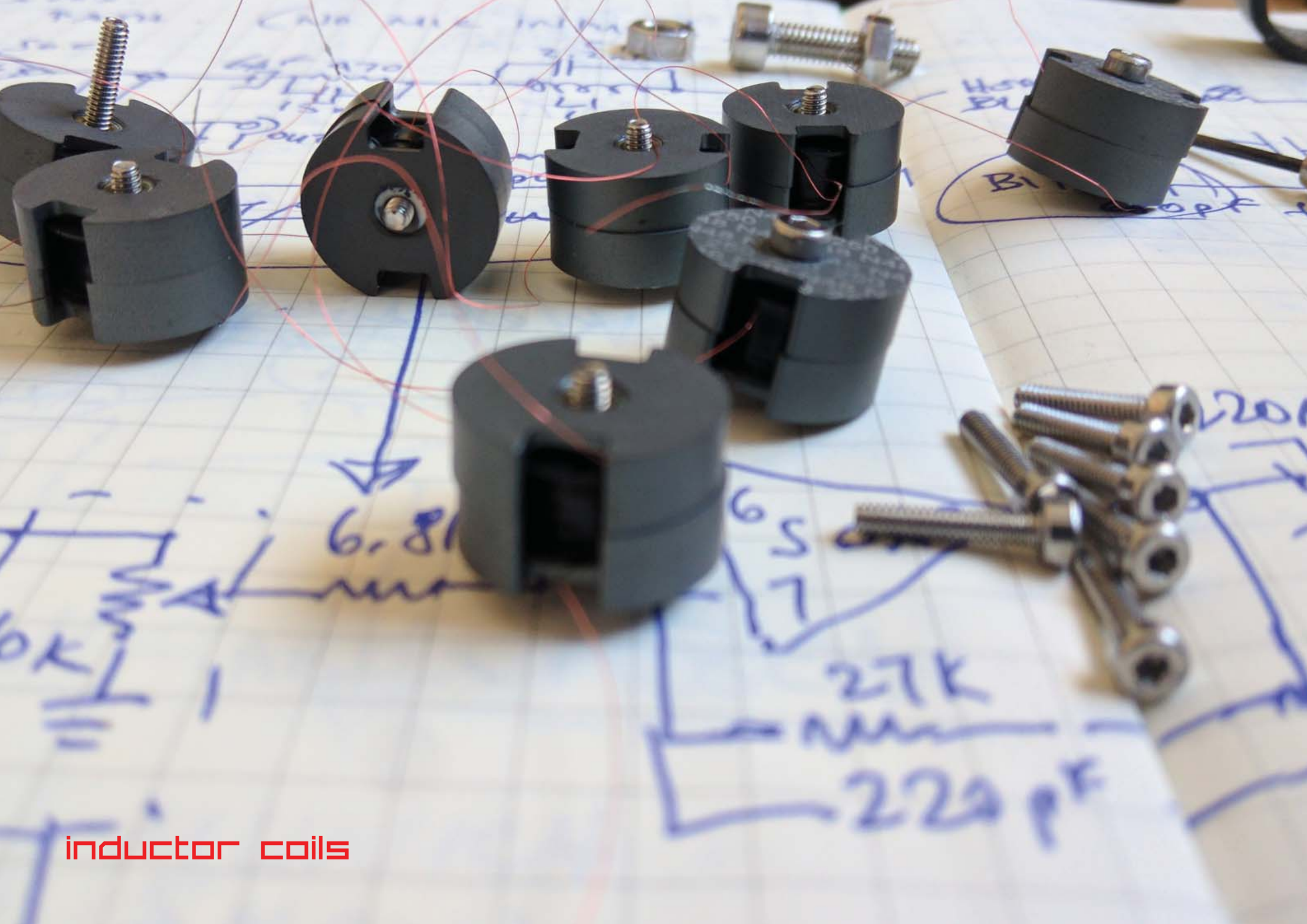


testing and machining - 1986



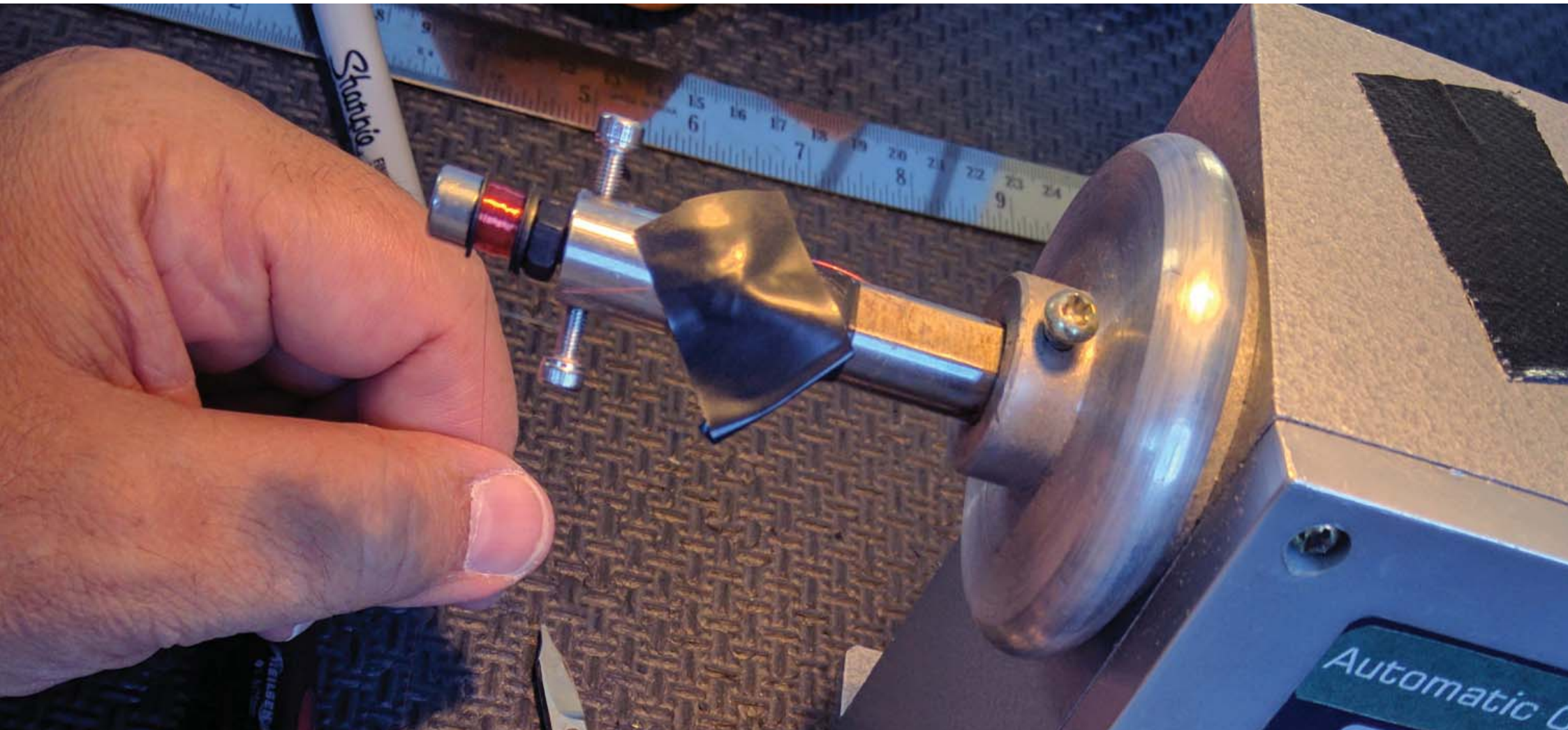
td9 recorder - 1986



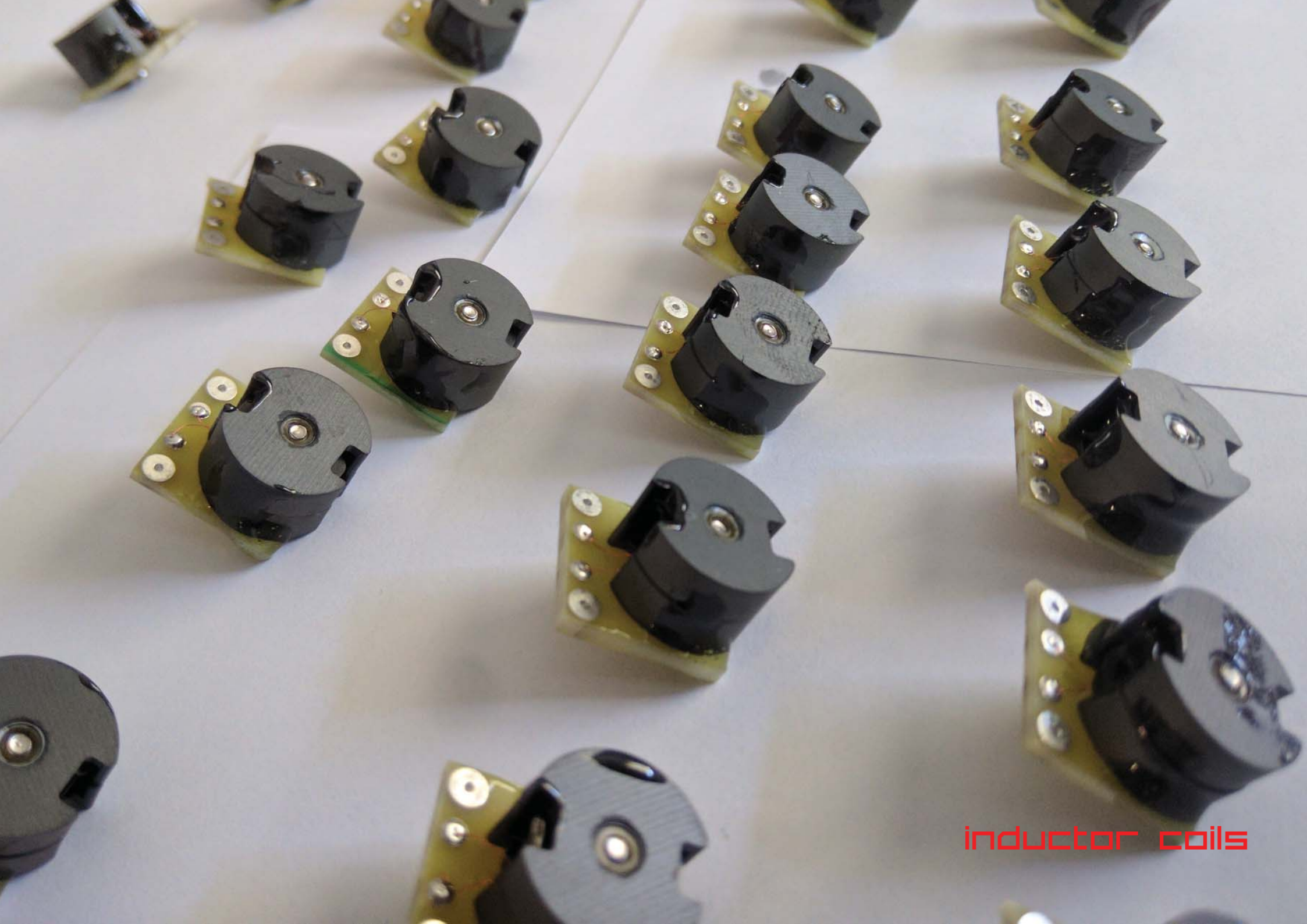


inductor coils

inductor coils



One of the lost "arts" in tape recorder production is the winding of coils [bias traps, bias oscillator] and transformers. Luckily, we can do this in-house.



inductor coils



bias traps



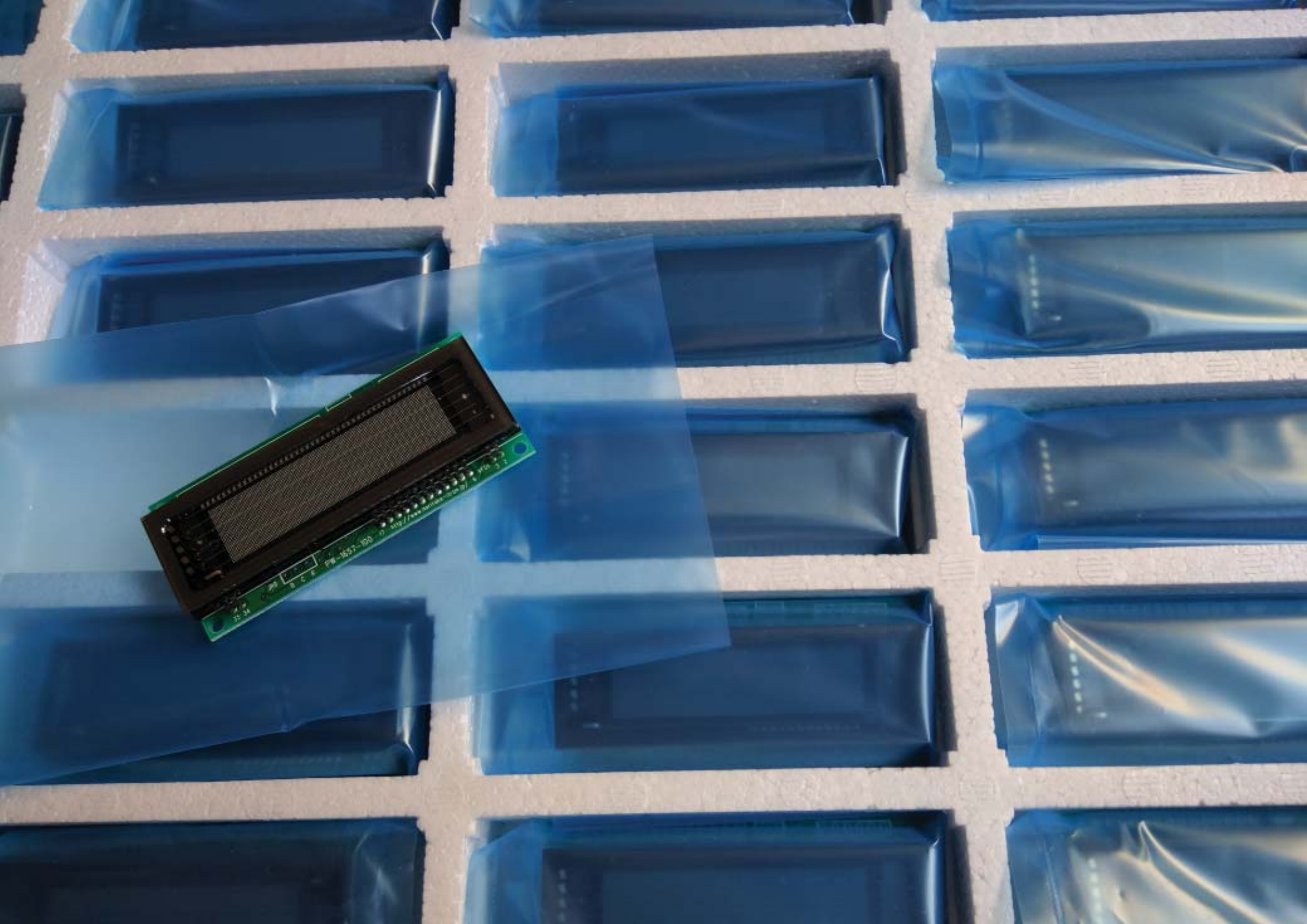
Another lost “arts” is the use of springs...the heart of a R2R tape path is the “suspension” provided by the springs. Absolutely critical and totally misunderstood.

Flight cases

The "LOCATION" part of Location Recorder means that it will need to travel. So a sensible flight case is necessary.







solid construction





This object is the result of my 4th year graduation with the
an AI made recording and reproduction. It has been
meticulously hand assembled by Dillon (read for use of
my best, I promise) in a way of art.

MODEL T-RX
SERIAL NO. 017 DATE May 20
SIGNED K L



swiss milgous steel rollers and other parts



Werder
PERFORMANCE TECHNOLOGY

1707 METAXAS HAUPT ****

T-RX RollerConcave

8049/D

Code: 8049



















OVER 500 CONCERTS RECORDED,
MORE THAN 200 ON ANALOG TAPE

my recordings



With over 35 years of concert recording experience we have learnt a few things about "recording".

Reference Recordings [with videos]:
<http://metaxas.com/recordings.html>

Seminal recordings [downloadable wavs]
<http://metaxas.com/concerts.html>

Munich Hi End in 2012 about recording concerts:
<https://vimeo.com/144719554>



Charmy
Chiffes

Υγεία * Χαρά * Ευτυχία * Αγάπη
Υγεία * Χαρά * Ευτυχία * Αγάπη

CO-100K

CO-100K

CO-100K

CO-100K

some highlights



sir neville martinor



chick corea





nigel kennedy

some highlights



charles dutoit, jean yves thibaudet



takacs

somz highlights



jaz sarolta



melbourne chamber orchestra

some highlights



konstantin lifschitz



some highlights

k d lang



il giardino armonico



paul lewis



some highlights



royal melbourne philharmonic orchestra and choir

some highlights



Richard Tognetti - ACO



straztecar named desire



orchestra victoria



Audio Recording and Playback

Nominal recording level: 0dB @ 514nWb/m

Maximal peak rec level +4dBm

Erase efficiency at 1 kHz >65dB

Recording / Playback: 38cm/s [15ips]

Frequency response [+/- 2dB] 30Hz -20,000 Hz

Distortion 1 kHz 514 nWb /m: <2%

Crosstalk: > 55 dB

Signal to noise ratio: 38cm/s ASA filter 514nWb/m: -67db

Wow & Flutter: <0.25%

INPUTS/OUTPUTS

Line level inputs 10K input impedance,

Outputs: Line level 560 Ohms output impedance

As we are constantly striving to improve the sound quality of the T-RX, these specifications are subject to change without notice

www.motaxos.com