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 decent) badge for bungling, clumsiness, and willful inattentionness 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 conglomeration 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 catchphrase, if they mean what they say, then highest-fidelity playback of 15/30ips, two-channel, reel-to-reel master tapes is what they mean.
available in any aluminium anodised color, milgauss stainless steel and titanium
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 once claimed to be to other loudspeakers—a clearer window on the music, a window through which you can not only look at the performers as they were when they were originally recorded, in the light of a day long past, but at the you who once was when you first heard the music that they made, in the noontime of your life.
At $36,000 (equipped with record and playback heads), the Metaxas & Sins Tourillon 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.

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 the 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."
Thank you for your kind interest in my work.

The Papillon 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 playback and capture music exceeding the best recorders produced in the past.

Each Papillon is totally handcrafted like a horological instrument by either myself or one of my sons.

I consider them all objects of art.
In horology, a Papillon (French: “butterfly”) is a reference to a shapely organic object. It’s normally referred to the bridge which supports the delicate watch gears, pinions, mainspring and jewels of the mechanism.

The Metaxas & Sins “Papillon” Analog Tape Reproducer is the first Tape Recorder to use the same concept to support the rollers and mechanics of the delicate tape path.

It is an entirely newly designed professional reel to reel tape studio recorder and playback machine which challenges the notion that we’ve been able to extract all the information from magnetic tapes and meets and exceeds the highest demands of recording engineers and the most serious audiophiles.

It accomplishes this by using an ARM-CORTEX “controller” which synchronises 4 of the latest high-torque-low-speed Maxon BLDC [Brushless DC] 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.

The audio “SOUL” of the Papillon’s external 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 its original venue. Combining 2020’s technology with 1960’s “soul”
Visit www.metaxas.com to view a QUICKSTART video to help you use the machine:

Before operating your machine, do a simple check to make sure that the two TENSIO METERS are able to move freely. Then, simply check that the rollers are spinning freely.

Also, make sure that the HUB Clamps are secure so the tape path tension is kept taught and tensiometers can function correctly.

Please be mindful that the Papillon 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.
Here is some simple information to help you “get started” with your Papillon.

The Papillon is supplied in 2 flight cases - one case houses the “transport” which handles the movement of the Tape and the second flight case houses the Audio Playback and Recording preamplifiers [electronics], 2 separate power supplies, connecting cables, hubs and spare parts.

The Parts are as follows:

1. Two power supplies [3 pin for transport and 4 pin for preamplifiers] with connecting cables.
2. Artist Brush [to brush away tape shedding/dust]
3. Spare 2.5mm and 4mm high [9mm diameter with 4mm mounting holes] bearings.
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 Hubba adapters [Aluminium].
7. Carbon Fibre 10” blank take-up reel.
papillon transport in flight case no.1
papillon preamps and power supplies in flight case no.2
very important

papillon studio 15pin din “tape head connection”

You MUST connect the 15pin connector from the TRANSPORT HEADBLOCK to the lower PREAMPLIFIER case.
3 position SLIDER SWITCH:

Position 1 = 15 & 7.5 ips
Position 2 = 30 ips
Position 3 = 15 & 7.5 ips

15 pin DIN Connection between transport and preamplifiers
Please follow this diagram when threading the tape from the left to right reels. When turning on the Papillon, the machine is in a “LOAD TAPE” mode so you can thread the tape.

Please follow the path otherwise the machine will not operate if you place the tape on the wrong side of the rollers/guide.

PLEASE VISIT WWW.METAXAS.COM FOR A QUICKSTART GUIDE.
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
24. 30/15/7.5 speed switch
25. REC safety switch
18. Noritake LCD Screen
19. Functions Keyboar
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. VU meter bridge
24. Preamp OUT
25. Preamp IN
26. 3 pin DC Power Connector
27. 4 pin DC Power Connector
28. Record Inputs
29. Playback Outputs
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. VU Meter Bridge
The Papillon 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 next to the SPEED SWITCH. 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 [10 seconds], you can engage the individual keypad functions.
There is no doubt that the absolute best “source” for reproduced music is analogue tape recorded at 15 ips. 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 30 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 ~ $1 million.”

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.
Playback only or recording machine?

Are you a serious listener or a recording engineer?

If you are a serious listener, you should purchase a PLAYBACK ONLY machine. This is because the Playback is optimised for the best possible listening performance. It has a much simpler audio path since it doesn’t require bias traps and extra electronics and the head alignment is dedicated to one playback head. A Playback-only machine is the ultimate machine to make tape copies from.

If you are a recording engineer, then clearly your priority is the RECORD HEAD which is in the middle optimal position in the tape path, and Playback is secondary in importance to you since it is for monitoring the recording. Also, to align three heads is a compromise for playback listening.

A RECORDING machine has the following extra components:
1. Extra heads - An Erase, Record and Playback head
2. Extra electronics: Two Line input stages, Bias Frequency Oscillator, Relay switches.
calibrating the equalization
1. R1 - High Frequency adjustment 5K
2. R2 - Low Frequency adjustment 100K
3. C1 - 1kHz level adjustment

The Papillon is adjusted as “standard” for 15ips speed using 468/911 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.
In simple terms, a “Bias Trap” is a notch filter which is necessary in a 3-head Tape Recorder to remove the 150-200kHz Bias Frequency Signal [at ~100V pp] from overloading the playback electronics and following amplification.

In the Papillon, we wind our own inductors which use a special trimmer ferrite screw to adjust the inductance by 0.5 to 1.0mH.

To refine the notch filter even further, we also trim the capacitors to allow the inductor more notch precision.
The Papillon 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.
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 9in DIN connection
This connects the PLAYBACK HEAD to the playback electronics.

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 standard VU.

53. Bias Oscillator Circuit.
calibrating the vu meters
wow and flutter testing
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 OPULENCE [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 PP1 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!”
METAXAS & SINS certifies that this instrument was thoroughly inspected and tested prior to leaving our factory and is in accordance with its specifications.

We guarantee the products of our own manufacture against any defect arising from faulty manufacture for a period of two years from the date of delivery. This guarantee covers the repair of confirmed defects or, if necessary, the replacement of the faulty parts, excluding all other indemnities. All freight costs, as well as customs duty and other possible charges, are at the customer’s expense.

Our guarantee remains valid in the event of emergency repairs or modifications being made by the user. However we reserve the right to invoice the customer for any damage caused by an unqualified person or a false maneuver by the operator.

We decline any responsibility for any and all damages resulting, directly or indirectly, from the use of our products.

We reserve the right to modify the product, and / or the specifications without notice.

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

The Papillon 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.

North America: 120VAC
Europe: 230VAC
Japan: 100VAC
The heart of the Papillon is 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”.
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 speed.
The rotating motors used 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 2054 position encoder embedded into the motor.

The separate controller modules - ESCON and EPOS 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 Papillon is well ahead of any machine manufactured in the past.
The ERASE, RECORD and PLAYBACK heads currently used in the Papillon are PHOTOVOX [Italy] also used by STELLAVOX in their TD9 machines. We can offer 1/4”, 1/2” and 1” two track heads.

The flexibility of the detachable headblock allows us to offer other heads but would need to check the inductance which is critical for compatibility with playback levels and equalization.
photovox [italy] tape heads
am [belgium] tape heads
tape heads direct out accessory
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.
Gli ampli con la valigia

SANDRO TAGGHERI

Stereoplay

HiFi Stereo phonie

Aristokraten

4 der teuersten Vorverstärker

HiFi-Magazin

the 1980s
“The original goal of the Papillon & Tourbillon was to exceed my current references which include Stellavox machines from the 70’s, 80’s and even a heavily modified SI8 transport in terms of record and playback sound quality.”
MY REFERENCES FROM 1985-2015 - tdq and sm8
“The SI8 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.”
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.
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.
swiss millgaus steel rollers and other parts
OVER 500 CONCERTS RECORDED,
MORE THAN 300 ON ANALOG TAPE
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
some highlights

sir neville marinner

chick corea
some highlights

jex saarelato
k d lang

il giardino armonico

some highlights

paul lewis
some highlights

royal melbourne philharmonic orchestra and choir
Audio Recording and Playback
Nominal recording level: 0dB @ 514nWb/m
Maximal peak rec level +4dBm
Erase efficiency at 1 kHz >65dB
Recording / Playback: 19cm/s [7.5ips], 38cm/s [15ips] & 76cm/s [30ips]
Frequency response [+/- 2dB] 30Hz -20,000 Hz
Distortion 1 kHz 514 nWb /m: <1%
Crosstalk: > 55 dB
Signal to noise ratio: 38cm/s ASA flter 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, these specifications are subject to change without notice