



# Special REPORT

THE SWISS AUDIO JUGGERNAUT



Daniel Weiss shows off his latest, with his "factory" behind him.

professional-grade digital gear, and Nagra, known for its unique design aesthetic and skill at miniaturization. The newcomers were Souldation, the electronics builder familiar to any who read these pages, and **CH Precision**, another electronics firm that is less familiar in the States but well-established in Asia.

I realize, as will anyone perusing the above list, that I somehow neglected to include a single turntable or speaker company. That was not intentional; it just worked out that way. Nonetheless, the cross-section of new and old hands I visited proved invaluable to my search for insights into what has given rise to this new force in audio. Those insights did not come all at once. Rather, they came piece by piece, conversation by conversation. It wasn't until the end of the week that I felt I had a firm grasp on the unique nature of the Swiss audio industry.

## Spin(-off) City

If there is a small town in Switzerland that isn't charming, I haven't seen it. Weiss Engineering's home base of Ulster is no exception. The cobblestone streets are adorned with fountains and flowers. Daniel Weiss and I enjoyed a typically simple, typically expensive lunch at one of the many cafes. This was my first exposure to the country's stomach-wrenchingly high cost of living.

A short walk beyond the city's central area leads to what the Swiss consider an industrial zone. No smokestacks here, though; instead, there are paved streets filled with non-descript buildings that house both offices and assem-

bly areas. Within one such building, Daniel Weiss has been turning out simple, elegant, high-performance digital products since 1984.

How Weiss came to found his own company is emblematic of the Brownian motion of the Swiss audio industry. Prior to striking out on his own, Daniel worked at Studer, the legendary builder of professional tape machines. He was on the team charged with bringing Studer into the digital era. Disenchanted with certain management decisions, Daniel left and founded his own company—one of many Studer off-shoots. There he built a pro-market digital mastering system that comprised a sprawling seventy modules. Weiss soon discovered that his pro customers and audiophiles had much in common, and that the same technology could be sold to both. This led to Weiss' first DAC in 2000, followed quickly by a series of lauded DACs that became more and more consumer-oriented.

The founding of Weiss Engineering could serve as a blueprint for virtually every Swiss audio company. CH Precision is another perfect example of the Swiss penchant for spin-offs. Co-founder Florian Cossy was hired by Goldmund upon his graduation from the prestigious EPF University in Lausanne. He spent four years at Goldmund, working his way up to amplifier designer. Goldmund's original designers, who had themselves been contracted from a company called Swiss Physics, designed the original products and initiated the concept of wide bandwidths and high slew rates.

Florian was content to follow the Goldmund design blueprint—but only so far. When he proposed changes that he felt



Ulster, Weiss' home base, is a typically charming Swiss town.

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Florian Cossy holds a CH Precision transformer.

would have resulted in greater stability and more consistent performance, Goldmund chief Michel Reverchon balked. In the same time frame, Florian's longtime friend Thierry Heeb was encountering his own frustrations working in Goldmund's digital arm. The two commiserated, ultimately deciding to leave. They started Anagram, which became renowned for its digital advances. Finally, in 2005, after having split Anagram into three parts and, yes, spinning them off, the two were ready to form CH Precision.

As a result of these rampant spin-offs, the Swiss audio industry is unusually close-knit. That facilitates cross-pollination, such as Florian being invited to design Soulution's CD player. But

## A Swiss Audio Dealer

Fisher Hi Fi is what you might call "centrally located"; it's in the middle of nowhere, a solid hour from virtually any populated point in Switzerland. The store sits in the middle of a bucolic pasture, and as you audition its gear you can gaze through the picture windows at cows grazing. I can't imagine a more peaceful setting in which to listen to music.

Fisher's strategy is to lure customers from distant (in Swiss terms) cities by offering both "standard" and high-end audio under one roof. Sales people are trained to show every customer the full range of gear on offer, no matter what price range he's interested in. This savvy technique pays off; it's very common for first-time customers to buy a mid-priced system, then upgrade a year or two later.

The building contains two "apartments," each of which is set up like a real apartment, complete with bathroom and patio. The idea, obviously, is to make the customer feel at home. I certainly did—except for the otherworldly view.

the primary benefit is that it expedites the evolutionary process. When a company is moving too slowly for creative talent, the talent forms its own spin-off that takes the best of what went before and works hard to improve upon it. For instance, Florian liberally borrowed Goldmund's pioneering work in "mechanical grounding," even while improving upon the basic circuitry.

Of course, none of this would be possible if it weren't a straightforward matter to create a new Swiss company. But the country is well aware of this, and has gone to some lengths to make that process quick and painless. "Due to the very low bureaucracy," Florian explained, "you can start a new venture literally in hours. In France, it takes months." Furthermore, Switzerland offers its citizens a generous safety net, off-setting entrepreneurial fears about their employees' fate should the new company go under. Finally, startups need not worry about shouldering health care costs, as health insurance is provided by a combination of public and private means, but never through employers.

All told, Switzerland has created an atmosphere conducive to spin-offs and startups, and the audio industry is taking full advantage of it.

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**The Telsa factory is set at the foot of ski slopes.**



## The Telsa Factory

Very few Swiss audio companies undertake their own manufacturing, because there is no need to. A swarm of specialized factories has developed to support all those audio designers, and their scale allows them to build products—or at least core components—better and cheaper than most companies could by themselves.

A case in point is the Telsa factory. Built in 1982, it is still family owned. Just as Switzerland boasts audio dealers in cow pastures, you can also find factories set at the foot of some of the world's finest ski slopes. Here, in the tiny town of Sion, Telsa does PCB work for audio high-fliers like Soullution, Nagra, DartZeel, and CH Precision. Most Swiss firms do their own final assembly, but CH delegates even that to Telsa. Such is the level of trust between designers and builders.

Telsa employs thirty-seven people, fourteen of whom are occupied full-time with audio electronics. Their enthusiasm, dedication, and typically Swiss meticulousness were evident during my tour. Perhaps one reason morale seems so high is the reward that management provides. At the end of each day, on a loft overlooking the factory floor, wines are opened and begin to flow. What sort of wine? Swiss, naturally.

## The Swiss Mind

Ask Daniel Weiss why there are so many Swiss audio companies and his answer is immediate: “Because there are so many watchmakers.” The Swiss fascination with—and prowess at—detailed work is recognized worldwide. But how does this apply to audio? “The two industries share the same need for precision, and require the same love for detail,” Daniel maintains. Later in the week, Florian echoed the identical sentiment. “Precision manufacturing is a tradition in Switzerland. It started with watches.”

I could see where they were coming from with respect to turntables and tape decks. Those components require a great deal of precise mechanical engineering. Indeed, legend has it that Willi Studer was so obsessed with mechanical detail, he made his own screws. Yet I still failed to see the connection between watches and audio electronics. Daniel explained: “The field of audio electronics is not so detailed in mechanical terms; but it is in electrical terms. As with watches, you have to have a reason for every part.”

I observed this obsession with detail in every one of my visits. Soullution spent literally years perfecting a new, powerful-yet-compact power supply for its amplifier line. Nagra still winds its own coils, insisting it would be impossible to duplicate externally the expertise they have developed internally.

A penchant for detail is not the only thing that animates Swiss audio designers. Although every designer I met loves music, scientific challenges are their creative fuel. Weiss proudly proclaims that his new designs are justified strictly by improved measurements. “In digital,” he says, “if it measures well, it will sound good.” Those measurements include timing, which explains why the company's original DAC 1 was well ahead

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of its contemporaries in incorporating extensive de-jittering.

When Cyrill Hammer and his business partner Roland Mans formed Soullution, the two went about product planning in typically pragmatic Swiss fashion. They framed their challenge not in musical but in scientific terms. They decided, for example, that vacuum tubes present problems with amplifier current stability and power output, and so would be avoided. Cyrill describes their thought process as follows: “Once you decide on solid-state, you have to apply negative feedback to reap those advantages. But that can compromise sound. The only way around this is to make the feedback process as fast as possible. This is what led to a high-bandwidth, high-slew-rate, high-damping-factor design.”

As with Soullution, CH Precision’s founders made some early decisions. No op-amps. Only discrete analog. Digital would not be tolerated. Although CH Precision’s circuit designs differ in significant ways from those of Soullution, both exhibit the design philosophy of extremely wide bandwidth and high slew rate that has been handed down since Goldmund days. CH Precision’s U.S. importer and lover of all things Swiss, Gideon Schwartz of Audio Arts in New York, says this consistent approach has sonic ramifications. “There is definitely a ‘Swiss sound,’” he says. “Just put different Swiss amps side by side and listen. They are all fast, linear, and take control of the speakers.”

In keeping with their focus on science in the service of art, Swiss audio products are decidedly un-showy. When I suggested to Daniel Weiss, over dinner one night, that he could elevate his visibility by producing a performance flagship with a thick aluminum chassis and a dazzling display, he was uninterested. “Actually,” he whispered conspiratorially, “steel is just as good.” Similarly, Soullution’s Cyrill Hammer noted that “while our components are large and heavy, they are decidedly understated. There is nothing flashy about Soullution gear. Look at the small size of the logo.”



CH Precision models roll off the Telsa factory line.



An after-hours drink at Telsa with (l-r) Gideon Schwartz, CH Precision’s importer; Michel Jonvaux, Telsa’s production manager; CH’s Florian Cossy; and TAS senior writer Alan Taffel.

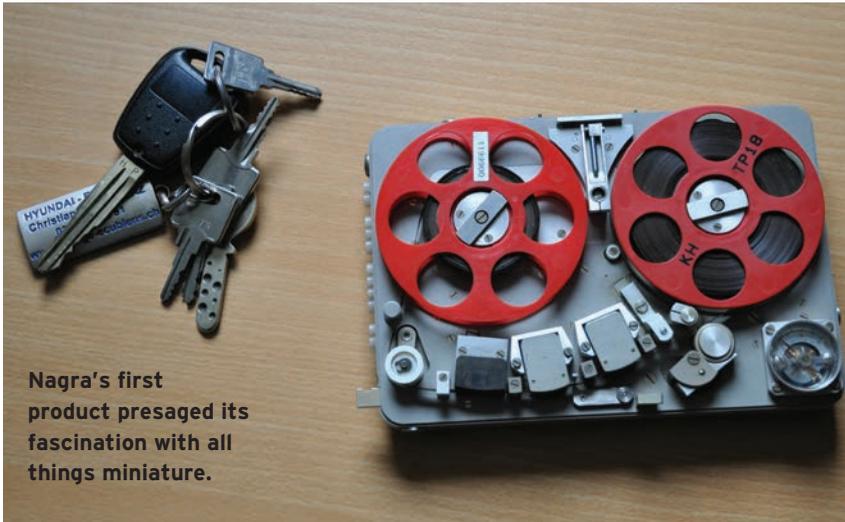
These elements of the Swiss mentality—detail, pragmatism, modesty—stand in stark contrast to the sensibilities of many American and other audio companies. The audio industries in other regions are replete with technical issues addressed with force rather than finesse, and products packaged with an eye as much to form as functionality. The Swiss approach is different but, clearly, equally valid.

## The Institutional Advantage

Swiss audio companies have help in the form of the country’s institutions. By “institutions,” I refer to the university system and the government. Regarding the former, Zurich is home to the ETH technical university, one of the most prestigious in the world for EE degrees. There are equivalents throughout the country. Audio is a major emphasis on these campuses. Why? Because the country is investing in that industry, of course.

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**Nagra's first product presaged its fascination with all things miniature.**



**Nagra's Matthieu Latour and Philippe Chambon.**

and their innovative ideas to flow freely. But this is only the start of the highly favorable business environment the Swiss have cultivated. According to Florian, taxes are much lower in Switzerland than in other parts of Europe. Further, anyone with sufficient talent and smarts can attend the highest of universities for next to nothing: about \$1000 a year. Finally, there is a national program called KTI that proactively coordinates projects between industry and academia, with government-assisted financing.

Here, clearly, is another ingredient of Switzerland's "secret sauce." Not only does the Swiss character readily lend itself to audio, but the institutions of government and academia cooperate to ensure a steady supply of well-qualified workers in the field.

## **The Swiss Business Model**

Cyrill Hammer, the driving force behind Soudation, took an unusual path to audio. He began his professional career as a consultant for the Swiss arm of the international Boston Consulting Group. His father, meanwhile, worked at Spemot, a diversified Swiss industrial manufacturer of, among other things, motors and appliances. Hammer Senior eventually bought Spemot, but died shortly thereafter, leaving Cyrill to take over.

What happened next illuminates why the Swiss focus on the high end of their chosen industries. Upon taking Spemot's reins and analyzing its situation with his practiced business consultant's eye, Cyrill realized that the firm could not survive as it was currently structured. Spemot existed in an industry characterized by extreme price sensitivity. Unfortunately, like all Swiss products, Spemot's prices were high.

Why, you might fairly ask, didn't Cyrill simply lower them? The answer is that Swiss products are expensive not by choice, but by necessity.

Here is the Swiss price calculus: Switzerland's cost of living is high, which means salaries must be high or no one could afford to live there, which means the cost of goods and services produced in Switzerland must include the cost of those salaries, which means prices must be high to cover those costs and make a profit. Cyrill could not have lowered Spemot's prices and still had a viable business.

But the Swiss also know that the world will not buy their expensive products if those products do not deliver commensurately

The Swiss academic community doesn't just teach audio in the abstract; students get their hands dirty. Indeed, the ETH created Studer's first mixing console, as well as its early DSP hardware and software. That's a level of academic/industry cooperation rarely seen elsewhere. Even more conveniently for Swiss companies, the ETH mandates that every student take a six month internship within an industry of interest. Weiss Engineering, like most Swiss firms, takes advantage of this situation by offering intern positions, then hiring the graduates it especially likes. Audio is a popular choice among ETH students. As Daniel points out, "If you like music, it's logical to get into this profession."

The government helps, too. I've already mentioned the low bureaucratic hurdles to forming new ventures, which allow people

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high quality. This explains why the country makes Rolex and Patek Philippe watches, not Seiko and Timex. It also explains why you won't find the Swiss in industries that place a higher premium on price than on quality. According to Cyrill, Spemot did make better motors than its competitors, but none of their customers was willing to pay the uplift.

Cyrill had to find another industry, one that could follow the Swiss model and leverage the engineering talent he had on staff. He selected audio because he was a musician and his business partner, Roland Manz, was a long-time audiophile. Most importantly, though, was the fact that the audio industry has a segment—the high end—that is not especially price sensitive. Ultimately, Switzerland's demography and sociology conspire to make exactly one business model work: high price, combined with high value through quality. High-end audio fits it perfectly.

## Swiss Tradition

At thirty-one employees, Nagra was the largest company I visited by an order of magnitude. My time there included a tour of the design center, the factory, with its in-house CNC machining, the listening room, and, unique on my trip, a museum. Nagra's long history is plain for all guests to see.

If Weiss Engineering typifies the pragmatic Swiss nature, Sou-lution typifies the Swiss business model, and CH Precision typifies the old boy's network that populates Swiss startups, Nagra embodies the country's mechanical soul and the value it places on tradition.

Stefan Kudelski founded Nagra in 1951. Along with Thorens and Studer, it was one of first Swiss audio companies. Nagra

earned fame by creating a tiny portable tape recorder. Drawing on Switzerland's reserves of watchmaking expertise, the Nagra unit was revolutionarily small, allowing it to be used in new applications such as security and field recording. In the late 90s, Nagra moved into hi-fi. Recently, the company spun off—there it is again—from its owners to become a stand-alone entity.

Given its start in diminutive tape machines, Nagra's product heritage as it moved into audio was to be as small, light, and energy-efficient as possible. But this triple mandate necessarily adds complexity to products. In order to meet the challenge, Nagra became the first company in Europe to use surface-mount technology. And the intricacy of its transformers—with their multiple windings for superior phase linearity and mu-metal cores for better shielding within tight spaces—requires Nagra to wind its own. Fortunately, this comes naturally due to the experience gained from building its own tape heads.

Nagra was the last company I visited, and its CEO Mattieu Latour confirmed all that I had learned earlier, but added one additional point. He wanted to be sure I understood that the Swiss obsession with quality is not simply a matter of economic necessity—it is an inalienable tradition. "Swiss people have a high intrinsic sense of responsibility and quality. It would be impossible, for example, to ask a worker to go faster but sacrifice quality. He simply wouldn't do it."

Matthieu also believes geography dictates some of Switzerland's strategy, and in describing why he unwittingly summed up the entire Swiss formula for success. "We are a small country surrounded by much larger countries, so we had to find a way to be different and somehow better." Apparently, the Swiss have. **tas**