Future Piano

Want to vastly improve your piano's action and tone, turn your piano into a computer music workstation, or take a lesson with a teacher 3,000 miles away? It's not the future we're talking about

by Ernie Rideout

The multitude of star-studded celebrations and exhibits honoring the tercentennial of the piano have amazed us with the beauty, tradition, and music of the piano. The instrument is, quite simply, a technical marvel. The influence it has had on the course of Western music history is immense.

That's nice. So what's happened lately to bring the piano into the 21st Century?

Plenty. You may not be able to tell at a glance the difference between the piano of the future and those of previous centuries, but the results of these under-the-hood improvements are mind-blowing. Imagine being able to change the feel of your piano's action as easily as dialing up a velocity curve on a digital piano. Or take a lesson in real time from a distant teacher as easily as getting your email.

And that's just for starters. The biggest news is that the piano of the future is the one already in your living room, studio, or rehearsal hall. You can add almost all of the innovations in this article to your piano as retrofits.

These aren't quick fixes, however. Nothing mentioned below will cover up poor playing technique, obviate the need for good in-person piano instruction, or eliminate quality piano regulation and voicing. Quite the contrary. But if you're enough of a pianist to be able to appreciate the improvements that these systems can bring to an instrument, they may inspire you to new heights of achievement and musical satisfaction. If you're just starting out, they can remove some of the obstacles that playing on a poorly regulated instrument can put in your path. In all cases, the idea is to get the most out of your instrument and your technique for the sake of your music. Now that's a future we can use.

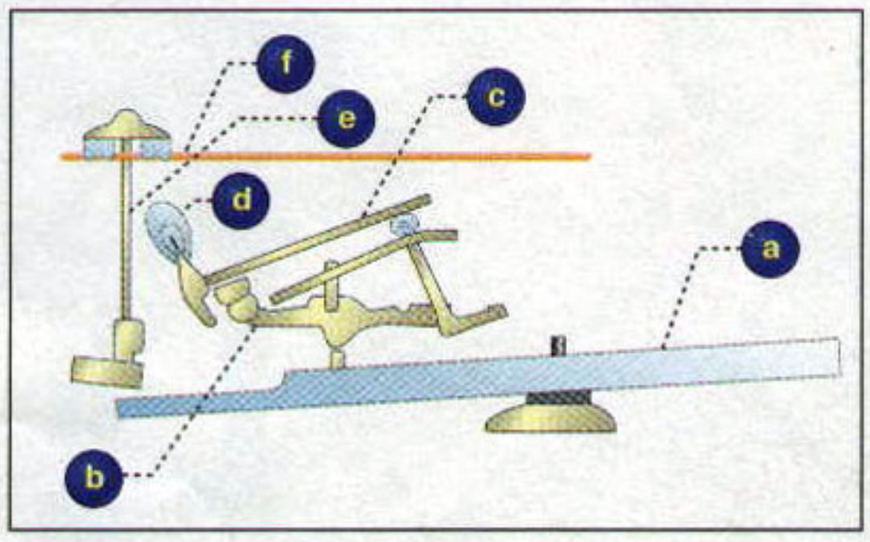

Fig. 1. This simplified diagram of a grand piano action shows the key (a) where key leads may be added, (b) the whippen with the location of helper springs, (c) the hammer shank, and (d) the hammer itself, showing its felt. Pressing the key also raises the damper (f).

Touch Weight & Adjustable Touch Weight Systems

If you've played more than a handful of grand pianos, you've probably found that some actions feel light, others heavy, and a few feel downright uneven from key to key. In my conservatory days, we referred to these latter instruments as PSOs: piano-shaped objects. To a piano technician, the physical factors affecting the feel of an action are collectively called the *touch weight*. Far too complex a subject to discuss adequately in this article, suffice it to say that the touch weight of a key includes such factors as the *down weight*, the weight or force necessary to push the key down, and the *up weight*, which is the measurement of the key rebounding against the finger.

While the quality of piano actions improved vastly in the 20th Century, the techniques for regulating actions for performance largely remained unchanged. The traditional methods for balancing a key include dealing with any friction problems in the various parts, leverage modification, adding or removing lead weights to or from the key, and adding or removing weight to or from the hammer. In the hands of a skilled technician, these procedures are adequate for achieving a fairly even feel from key to key.

They don't, however, address the likelihood of differences in mass from one key to the next. The weight of the hammers themselves, for example, is not standardized in the industry, largely due to inconsistencies in the weight of felt from manufacturer to manufacturer. Because of this and other factors, Middle *C* may be some five to ten grams or more heavier than the adjacent *C*♯. So while the force required to set the keys in motion may be similar, the actual weight your fingers are moving is quite different. The resulting effect on your technique, according to piano technician and designer David Stanwood, "is like a dancer trying to dance down a flight of stairs that are uneven."

After years of research, Stanwood determined there were a lot of factors that traditional action regulation wasn't addressing — and he came up with a way to deal with them. Among the new measurements he developed is the effect of the hammer and shank weight, which he calls the *strike weight*. The strike weight has a direct bearing on the tone of the piano as well as playing the most significant role in weight inconsistencies from key to key.

Stanwood's method, called the Precision Touch Design, uses actual weight measurements (hence the name of his patent: "New Touch Weight Metrology") to deal with touch weight. Previously, technicians could only estimate touch weight using geometric measurements. Using his system, Stanwood provides a set of high-precision specs for every part in the complex action of a piano, based on the existing weights of the parts in the particular instrument. In short, a technician weighs all of the parts in your piano's action and sends the results to Stanwood, who runs the figures through his proprietary computer app. Stanwood studies the profile and returns a set of specs that the technician uses to set the precise weight of the components of your piano's action.

In the finished regulated action, each key moves a precise optimum mass, which includes hammers that are the exact weight required to get the optimal tone. The best part is that you get to determine what the optimal tone and touch are. Since Stanwood's specs include the weights required for a heavier or lighter action, your technician can create the exact feel you've always wanted on your piano.

"I frequently go shopping for pianos with clients," says Chris Solliday, technician for Keith Jarrett, Eugene Albulescu, Fred Hersch, and others, and an associate of Stanwood's. "Very often they'll love the tone of a piano, but not the touch. The tone may not speak as well as it should because the action is hampering it. We now can decide to buy a piano because of its tone or voice, and we can fix the action and touch. We can listen to what the artist says about what they'd like the touch to be, and we can give it to them. It's made my work exciting."

Another level that can be added to the Stanwood process is to make the balance weight of your action adjustable by adding adjustable helper springs to the whippen. Whippen springs are not a new idea: Steinway, Bösendorfer, Samick, and other manufacturers have employed them as a means to reduce the amount of key lead necessary to balance the action and to provide a snappier key return. Often, however, such springs are required to take as much as 50 grams off the touch weight — Stanwood's never take more than 25. More significantly, they're adjustable. With

Fig. 2. Yamaha's Disklavier Pro 2000 is in many ways the piano of the future, here today. But at $300,000, the future is when you'll be able to afford it. The very distant future.

Stanwood's helper springs installed, a technician can dial in a heavier or lighter action on your piano in about 30 minutes.

Before a technician will perform any of these procedures on your piano, they'll attend to all of the normal voicing and regulation adjustments to make sure your action is in good shape to begin with. Other than that, there really is no restriction on the type or level of piano that can benefit from this process. The cost of the Precision Touch Design, including adjustable helper springs, is approximately $2,500. Is it worth it? Well, after having the process done to his piano, Keith Jarrett commented that it opened up a whole new world of dynamic control to him.

And Precision Touch Design isn't high-tech enough for you, consider the system used on the Fazioli pianos. Famous for their tone, action, and precise hand-construction, Fazioli pianos also have an adjustable action touch weight. This system, called the Magnetic Balanced Action, was invented by Evert Snel and Hans Velo, and it will be available soon as a retrofit for uprights and grands. Magnets are located in each key, with contacts under the key and on the key frame on either side of the balance rail. One set opposes, the other attracts. Adjusting the relative positions of the magnets affects the touch weight. Adjustments are made globally, for groups of keys, or for individual keys. With this method, changing the feel of your action takes about 30 seconds. It does not, however, take into account any problems that may exist in your action due to incorrect leverage, weight inconsistencies, or friction.

Manufacturer Contacts

Baldwin, 800-876-2976, www.baldwinpiano.com
Gulbransen, 800-677-7374, www.gulbransen.com
Online Conservatory, www.onlineconservatory.com
Piano Technicians Guild, www.ptg.org
PianoDisc, 916-973-8710, www.pianodisc.com
QRS Pianomation, 716-885-4600, www.pianomation.com
Solliday Piano Service (Stanwood technician), 570-420-9588
Soltan, 914-353-3515

Touchscreen Computer Systems

MIDI retrofit and sound expansion systems have been available for acoustic pianos for years from companies such as Solton, Gulbransen, PianoDisc, and QRS Pianomation. The Yamaha Disklavier and Baldwin ConcertMaster systems have added electronic player piano capabilities to the MIDI interface concept. And companies such as Baldwin, Korg, Technics, and Yamaha have introduced touchscreen interfaces on many of their electronic keyboards.

It was Van Koevering, however, who pioneered the integration of personal computers with digital pianos. Each of the three models in their line comes with a full-on Pentium PC integrated into the instrument so it can run commercially available music software, including how-to-play programs such as Harmonic Vision's Music Ace, notation software from Sibelius, Cakewalk, and Sonic Foundry's Acid. Control of the computer is via a touchscreen interface that's mounted into the music rack. The system's interface includes a DVD drive, MIDI input and output, as well as a modem output.

If you've dreamed of being able to combine your beloved acoustic piano with a computer, you've come to the right century. This system is now available as a retrofit for any acoustic or digital piano. The model for acoustic pianos is called the Philharmonica, and includes a MIDI sensor strip, DVD drive, sound module, computer, touchscreen interface, and optional speakers. For a digital piano, the Expantia system offers the computer, touchscreen, DVD drive, and audio/MIDI interface, with an option for a sound module and speaker configuration. The price is as yet to be determined, but the preliminary estimate is around $3,000 for either system. The thin touchscreen can be positioned anywhere on your music rack. Imagine being able to create Acid loops of your favorite Hanon exercises without ever getting up from your piano bench — boggles the mind.

This vision of the future has also materialized in the form of Yamaha's Disklavier Pro 2000 (see Figure 2). Currently on a demo tour, this acoustic grand piano features a futuristic cherry wood and aluminum case, an integrated Pentium III processor with touchscreen interface, a DVD drive that reads QuickTime movies, and voice control. We're not sure, but we think you can just play it, too — although if you can come up with the $300,000 for it, you may want to hire someone else to play it.

Internet Piano Instruction

Now that the Internet has spawned a workforce of telecommuters, the time may be ripe for a generation of tele-educators, too. The Online Conservatory has established a website where students can search for teachers according to the style they'd like to learn to play. Unlike traditional one-on-one instruction, the student and teacher need not be in the same city, state, or country: They meet on the Online Conservatory's website.

The system uses proprietary free software that can be downloaded from the website. The software puts a virtual keyboard on the teacher's and student's computer screens, where either party can see the notes played by the other. Both student and teacher play on their own MIDI keyboards or MIDIed pianos. Other than the onscreen virtual keyboard, the lesson itself is all audio: Using two-way audio technology, the teacher and student talk to and play for each other through microphones.

One drawback is that this technology is PC-only; Mac users will have to wait — or take lessons in person. And while teacher and student can hear each other, the teacher can't observe the student's technique. So it's certainly no substitute for in-person instruction, though it can be great for picking up on a new style of music.

Payment is made directly to the teacher, who sends a percentage of the fee to the Online Conservatory. Reports are that the faster your Internet connection, the better the results, assuming online congestion is equal. At least an online teacher isn't going to rap your knuckles with