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.

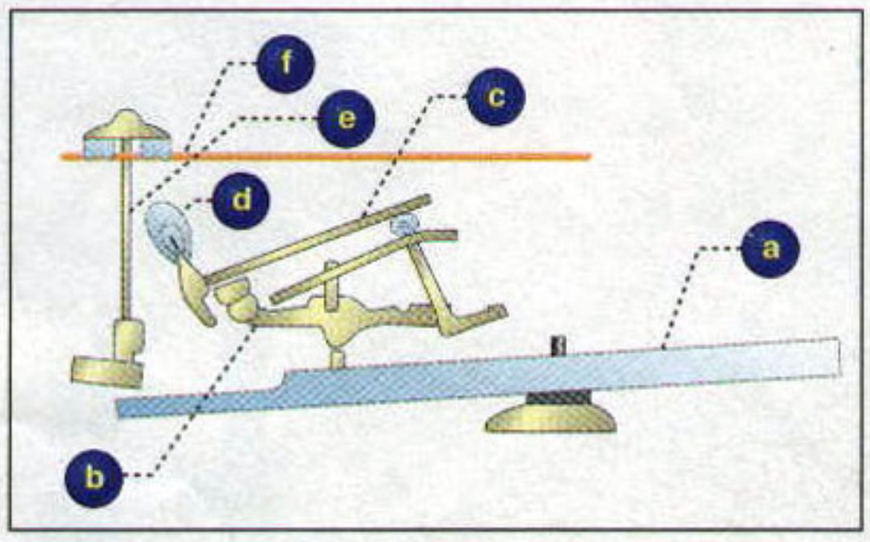

Fig. 1. This simplified diagram of a grand piano action shows the key (a) where key leads may be added, (b) the whippen with the location of helper springs, (c) the hammer shank, and (d) the hammer itself, showing its felt. Pressing the key also raises the damper (f).

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