

# Customizing today's lightweight racquets

By David Bone, USRSA Executive Director (May 2001)

Bigger is better, longer is better, lighter is better. The choices facing today's players are many, but are these choices necessarily better and for whom? Does your style of play lend itself to a particular racquet and do the specifications of that racquet fit your personal preferences? That is the magic question. While the answer might seem like bad news, customizing your racquet is good news.

There's been a lot of talk lately about the fact that racquets keep getting lighter and the possible negative consequences this can have on players' health. But, I think this is a good thing. Not because I want to see players get hurt. Instead, I see the lighter racquets of today as a tremendous opportunity for players, teaching professionals and racquet service professionals. It is a lot easier to add weight to a light racquet than it is to take weight away from a heavy racquet.

For players, it means that the few smaller, physically weaker players that need these lightweight racquets can now find a maneuverable and powerful racquet. But, perhaps more importantly, it gives all other players the opportunity to have racquets individually customized to their own unique needs, helping them become even better players.

That sounds great for players, but how does that help you, the tennis-teaching professional? Well, assuming you are aware of a few basic concepts, it means you can recommend changes that will help your students become better players (a pretty important part of your job). Besides just making recommendations, you can also do the work yourself with a very small investment. This represents another source of income for you that might reduce the number of hours you have to spend in the sun each day. Here is a list of basic concepts about tennis racquets, written by Steve Davis, director of research and development for Prince Sports Group, that can help you recommend which changes your students should make to their equipment,

All other things being equal:

- A heavier frame generates more power;
- A heavier frame vibrates less;
- A heavier frame has a larger sweet spot;
- A stiffer frame generates more power;
- A stiffer frame has a larger sweet spot;
- A stiffer frame transmits more of the shock load to the arm;
- A stiffer frame provides a more uniform ball response across the entire string bed;
- A larger frame generates more power;
- A larger frame is more resistant to twisting;
- A larger frame has a larger sweet spot;
- A longer frame generates more velocity and therefore more power;
- The stringbed in a longer frame generates more spin due to increased velocity.

OK, so you probably already knew most of those. Good, that means you don't have that much to learn to start giving professional customization advice to your students. But, remember, it is not enough to just memorize these facts. You have to understand them so you can explain them to your students and apply the concepts when giving equipment advice.

Did you notice a pattern? Heavier racquets seem to be better in almost every way. They are more powerful, more stable, have bigger sweet spots, have less vibration and shock, and they can offer better directional control. About the only thing going against heavier racquets is they are harder to maneuver. That's a pretty important drawback though. If you can't get the racquet where you want it when you want, none of the other features will be much help. What this means is that players should be playing with the heaviest racquet they can handle. If they are playing with lightweight racquets, you can start putting the weight back where it will do them the most good.

There are also several basic facts related to stiffness, headsize and length of a racquet. These facts are all very important when helping a player select a racquet because these are features that cannot easily be changed after a player selects his racquet. This is why manufacturers make so many racquets with different stiffnesses, head sizes and lengths. The key here is to have your students try (or demo) a variety of different frames before they purchase. Once they have narrowed their choices down to the racquet that feels best to them and made their purchase, that's when the real work of customizing begins.

Your student has hopefully chosen a racquet that feels pretty good to him right away, so drastic changes should not be needed. If your student is resistant to changing the characteristics of his frame, you might remind him that even tour players who are very careful to choose just the right racquet for themselves still customize their equipment.

The main factors to be aware of when customizing a player's frame are weight, swing weight, torsional stability and sweet spot. What are these factors and how are they important?

Weight is fairly obvious. It is how much the racquet weighs if you were to put it on a scale. Weight is important because it tells how hard a racquet is to move forward. Remember, even short choppy strokes still travel forward.

Swing weight is a little more complicated. It refers to how difficult a racquet is to swing “around.” It is measured using special equipment to see how hard it is to pivot a racquet around a pivot point (usually 4 inches from the butt of the racquet). This is important because it is a measure of how hard it is to get the head around to the point of contact. You might say I don’t teach my students to use a lot of wrist, but almost every stroke involves some rotation of the racquet as well as some forward movement. Remember that even a very short stroke can involve more than 90 degrees of rotation for the racquet. In fact, swing weight is probably the No. 1 thing that players feel when they swing their racquet.

If you don’t have access to equipment to measure swing weight, you can use weight and balance as a substitute. Balance is the point on the racquet where it will balance if placed on a balance beam. This point is measured in inches or centimeters from the butt of the racquet. If the racquet balances closer to the head than the handle, it is called head heavy. If it is balanced closer to the handle, it is called head light. If all other things are equal (especially weight), the more head heavy a racquet is, the higher its swing weight would be.

Torsional stability refers to how hard a racquet is to twist along its length. This is important because it will determine how much a racquet will spin in a player’s hand when they hit the ball to one side of the center. This is the issue that can cause players to switch to a bigger grip size or a racquet with a bigger head size when all they may need is to increase their racquet’s torsional stability. Sweet spot refers to the area on a string bed where you will get the optimum power and directional control. This is important because a player should hit the sweet spot for the majority of their shots. One way to tell where a player is hitting most of their shots is to look where the strings are most worn.

The most common way of adding weight to a racquet is with lead tape, which can be purchased from most string distributors. How much weight to add and where to add it is determined by the factors we just discussed. When adding weight, we recommend you add 2 to 4 grams at a time until the player tells you it feels too heavy. Then go back down to the point where they last felt improvement. Here is how adding weight effects these main factors:

**Weight** – No matter where you add weight, it will increase the overall weight the same.

**Swing weight** – The further from the handle that you add weight, the more it will increase swing weight.

**Torsional stability** – The closer you add weight to the 3 o’clock and 9 o’clock positions of the racquet face, the more stable the racquet will be on off-center hits.

**Sweet spot** – Wherever you add weight to a racquet, you will be pulling the sweet spot of the racquet in that direction.

Now let’s look at some basic positions where weight can be added and explain what advantages each could offer to players.

Remember that wherever you add weight, it will help reduce shock, which can help relieve tennis elbow.

1. Handle - Adding weight to the handle will increase weight while having little or no effect on swing weight. This can make a racquet more stable for a player with whippy strokes who does not want to lose maneuverability. More weight can be added here without sacrificing maneuverability.
2. 6 o’clock or throat – Adding weight here will have the same affect on weight, but will have a bigger affect on swing weight. It will also tend to pull the sweet spot down in the string bed closer to the throat for players who tend to make contact near the throat. The racquet will be more stable, a little less maneuverable, and a little more powerful. If you add the weight at the point where the racquet currently balances or in equal amounts on both sides, the balance point will remain the same.
3. 3 o’clock and 9 o’clock – Adding weight in these two locations will pull the sweetspot out to the sides of the racquet, allowing for more off-center hits. Adding weight here will also have an even bigger effect on swing weight. So, it will make the racquet more powerful and less maneuverable. But, the biggest change will be felt in increased torsional stability.
4. 10 o’clock and 2 o’clock – Adding weight in these two locations will expand the sweet spot up and to the sides for people who hit high on the string face and a little off center. It will also increase swing weight. This position offers increased power and torsional stability.
5. 12 o’clock (tip) – Adding weight here will have the greatest possible effect on swing weight. It will also expand the sweet spot upward for players who hit above the center of the string bed. So, the racquet will be more powerful and more stable. But, it will not help increase torsional stability.

Even if you don’t want to do this kind of work for yourself or your students, it is very important that you understand and can explain all of the concepts discussed in this article. As teaching pros, your job is to help your students become better players and enjoy more injury-free tennis. This information can help you do both. For more information, visit your nearest USRSA Master Racquet Technician or certified stringer or visit [www.RacquetTECH.com](http://www.RacquetTECH.com).