

Begali Sculpture Swing – Guide to Setup and Adjustment. One user’s experience.

Bob WO6W 04May2022

The Sculpture Swing is a cootie key, otherwise known as a side swiper or double speed key. A cootie key is entirely a mechanical keying device with no reliance on electronics to generate dits and dahs. SKCC and other organizations group the cootie key with straight keys and bugs as purely manual keys with all timing generated by the operator. No electronic keyer required!

On the off chance that you find yourself here not knowing about side swipers, I’ve provided some basic information about the cootie key below. The Side Swiper Net (SSN) is another fine place to start exploring cootie sending. I’d also recommend taking a look at the SSN site if you are already a side swiper user, but don’t know about SSN! Link here: <https://www.sideswipernet.org/>

The cootie key was first introduced in the early 1900’s and was offered as a solution to telegraphers “glass arm”. Unlike a conventional straight key using an up-down pumping motion with contacts closed only when the key is down, the cootie is keyed with a side-to-side motion. The cootie contacts are closed with travel to either side of center. Unlike a paddle used with a keyer, the contacts on both sides of center are connected in parallel; movement to either side of center appears as key down to a radio configured for straight key input. The side-to-side motion is more efficient and potentially faster than a straight key as the contacts close with movement to either side of a center rest position. For most of us, the side-to-side motion is also easier on the wrist.

Sending with a cootie can be very gentle. The earliest Bunnell Double Speed keys had a hard stop as the finger piece met contacts to either side of center. The Sculpture Swing and many more modern cootie designs provide a soft landing with varying amounts of over-travel of the finger piece after the contacts have closed. I find that a soft landing with over-travel contributes to a fluid style of sending that is both efficient and gentle on the hand and wrist – especially welcome for my older and well-worn joints.

Many cootie designs support a limited range of adjustments – often just contact spacing. A major strength of the Sculpture Swing is the broad range of adjustments for operating “feel” provided. The key can adapt if (when!) an owners keying preference changes over time. It also allows a user to experiment with a broad range of keying feel. The exceptional breadth of adjustment possibilities sets the Sculpture Swing apart from other cootie designs of which I am aware.

Many cootie users, myself included, prefer moderately large travel as the finger piece is manipulated with a “soft” landing as the contacts close. Other users lean toward a more abrupt stop when the contacts close. At the limit, a conventional paddle with no over-travel can be configured as a cootie by connecting the dit and dah contacts in parallel. A conventional paddle used as a cootie in this fashion has the ultimate hard landing; the finger piece hits a hard stop when the contacts close. There are certainly users who like a cootie with a hard landing and there is nothing wrong with it! Many of us just prefer a softer landing.

Hard landing? Soft landing? Small finger piece movement or large? A little or a lot of over-travel? Just not a problem! The Sculpture Swing can be seamlessly adjusted from a very soft to a very hard landing on contact closure. The Swing can accommodate narrow to wide contact spacing resulting in small to large

finger piece movements. The force needed for finger piece movement is adjustable from light to heavy with the balance of force between right and left travel adjustable as well.

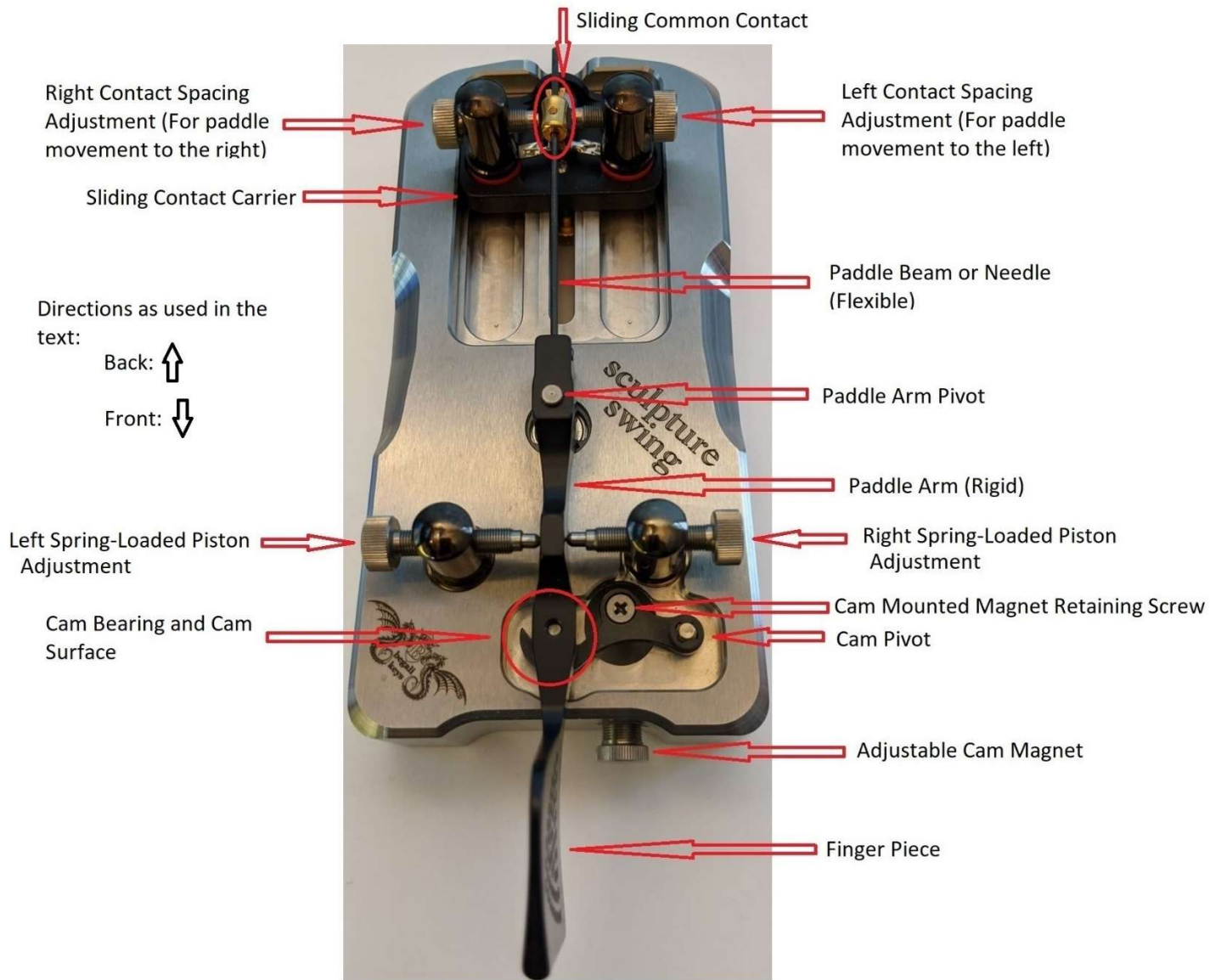
The photo on page 3 with part names labeled shows my Sculpture Swing adjusted to my preference; light touch, modest paddle travel to contact closure with a soft landing. Enjoy your Sculpture Swing and experiment with what works best for you! I'm comfortable that the Sculpture Swing has sufficient flexibility to meet most any cootie user's preference and style. Remember that this is cootie sending... There are few if any rules!

What follows is how I have been adjusting my Sculpture Swing. I'll start by describing the parts of the key and the function of the various adjustments – including how several of these adjustments interact one with the other. It is this interaction between various settings that makes the Sculpture Swing a bit more challenging to adjust than some other designs. The good news is that adjusting the Swing is not especially hard once you understand the functions of the various controls and how the controls interact.

The adjustment method described below works for me and hopefully can be a starting place for you as you grow to know this fine sending instrument.

Cootie on!
Bob WO6W

Begali Sculpture Swing – Part Names and Adjustment Controls:



Begali Sculpture Swing – Summary table of controls, functions and interactions:

The following table provides a short-form summary of the Sculpture Swing controls and how they interact. Please refer to the photo with parts labeled and the text that follows for more detailed descriptions.

Control	Primary Function	Interacts With	Notes
Adjustable Cam Magnet	The Adjustable Cam Magnet is used for coarse adjustment of Finger Piece forces prior to the contacts closing. Turning this control clockwise brings the Cam Magnets closer together increasing Finger Piece forces.	The Adjustable Cam Magnet and Cam Mounted Magnet repel each other.	Moving the Finger Piece to either side away from the center rest position moves the Cam magnets closer together against magnetic repulsion. Setting the Cam Magnets rest position closer together increases the repulsion and increases Finger Piece force needed to overcome the magnets.
Spring-Loaded Pistons	The Spring-Loaded Pistons provide fine tuning of Finger Piece forces prior to contacts closing. The Spring-Loaded Pistons are only slightly compressed with the Finger Piece centered and at rest.	Right and Left Spring-Loaded Pistons interact with each other. Increasing force to the right will decrease force to left. Net fine-tuning forces are added to the primary Cam Magnet forces.	Adjust to balance Finger Piece forces to left and right sides. May also be used to set an intentional imbalance between forces to left and right. Spring-Loaded Pistons provide relatively weak force in comparison to the Cam Magnets.
Sliding Contact Carrier	The Paddle Beam starts to flex only after the contacts close. Beam flex then adds to Finger Piece forces. The longer the section of Paddle Beam bending, the lower the force required for the beam to flex. Positioning the Sliding Contact Carrier to the rear will engage a longer section of the Paddle Beam with lower resulting force from beam flex.	Moving the Sliding Contact Carrier toward the back of the key will decrease Finger Piece movement needed to close the contacts. It may be necessary to re-adjust Contact Spacing after moving the Sliding Contact Carrier.	Position the Sliding Contact Carrier to the back of the key for a soft landing and low additional force after contact closure. Position the Sliding Contact Carrier toward the front for a harder landing with higher additional forces after contact closure. Moving the Sliding Contact Carrier will require moving the Sliding Common Contact. The Sliding Contact will move with gentle finger pressure – no tools and a light touch!
Left and Right Contact Spacing	A primary adjustment for the amount of Finger Piece movement needed to close contacts.	See Sliding Contact Carrier above.	Moving the contacts closer together causes the Paddle Beam to start flexing with less movement of the Finger Piece.

Begali Swing Cam Assembly:

The Swing Cam Assembly detailed below has dual functions. First, this is the mechanism that centers the Finger Piece when at rest. As a second function, the Cam Assembly and Cam Magnets acting together are the primary components setting the force needed to move the Finger Piece off center toward contact closure.

Note that the Begali HST has a nearly identical though less exposed Cam Assembly! This description applies to both the Swing and HST.



Cam Assembly viewed from above:



Cam Magnets shown from below:

These photos show the Cam assembly at the front of the key viewed from above and below. Moving the finger piece to either side of center forces the Cam Magnets to move closer together against the force of magnetic repulsion.

Turning the Adjustable Cam Magnet screw clockwise moves the Cam Magnets closer together increasing the force needed to displace the Finger Piece to either side of the center resting position.

The figure below shows the cam action as the Finger Piece is moved from full left to center to full right. Moving the Finger Piece to either side of the center resting position forces the Cam Magnets closer together. This cam action in combination with the Adjustable Cam Magnet is the primary contributor to keying force prior to the contacts closing. The Cam Assembly also centers the Paddle Arm when at rest.

Action of Sculpture Swing Cam and Spring-Loaded Pistons

Left Spring-Loaded Piston Fully Compressed, Right Spring-Loaded Piston Separated From Paddle Arm

Left and Right Spring-Loaded Pistons Relaxed and In Contact With Paddle Arm

Right Spring-Loaded Piston Fully Compressed, Left Spring-Loaded Piston Separated From Paddle Arm



Paddle Full Left

Paddle Centered

Paddle Full Right

Cam Magnets Close Together

Cam Magnets Separated

Cam Magnets Close Together

Cam Bearing Riding On Left Face Of Cam Surface

Cam Bearing Resting At Center Of Cam Surface

Cam Bearing Riding On Right Face Of Cam Surface

Cam Surface pushed toward front of key

Cam Surface "Relaxed" toward back of key

Cam Surface pushed toward front of key

Adjusting paddle keying force and travel:

Several adjustments contribute to keying feel with the Sculpture Swing. I find it best to describe these adjustments in two stages – first the adjustments controlling Finger Piece forces before the contacts close, and then adjustments controlling Finger Piece forces after contact closure.

The Cam Magnets and Spring-Loaded pistons set paddle forces before contact closure. The Adjustable Cam Magnet is the coarse setting for Finger Piece force. The Spring-Loaded Pistons fine tuning the balance of forces to the left and right – including setting an intentional difference between the forces needed for travel to the left and right.

The Left and Right Contact Spacing Adjustments control the amount of Finger Piece travel needed to make contact to the left and right.

Positioning of the Sliding Contact Carrier controls Finger Piece forces after contact closure. Note that moving the Sliding Contact Carrier will change the amount of Finger Piece movement needed to reach contact closure. Moving the Sliding Contact Carrier will often require re-adjustment of Contact spacing.

Here's the sequence I use and describe below:

- 1) Adjust forces before contact closure:
 - a) Set Adjustable Cam Magnet: This is the primary control for keying force as the Finger Piece moves off the center resting position.
 - b) Adjust Left and Right Spring-Loaded Pistons: Fine tune the keying force as the Finger Piece moves off the center resting position.
- 2) Adjust Finger Piece travel and forces after contact closure: Remember that the Sliding Contact Carrier position and Contact Spacing interact.
 - a) Position the Sliding Contact Carrier: This is the primary setting for additional keying force after the contacts close. Adjust the Sliding Contact Carrier to adjust between a hard and soft landing.
 - b) Adjust Left and Right Contact Spacing: Sets Finger Piece travel prior to contacts closing. Contact Spacing likely needs to be adjusted following a change in position of the Sliding Contact Carrier.

Adjust forces before contact closure:

- Cam and Cam Magnets – The Adjustable Cam Magnet is the primary control for setting Finger Piece resistance to movement away from the center rest position. The Cam also centers the Finger Piece when at rest.
 - Back off the Left and Right Spring-Loaded Pistons until they are just clear of the Paddle Arm when the contacts close. This will allow the paddle arm to move from center rest to contact closure without engaging the Spring-Loaded Pistons.

- Set the Adjustable Cam Magnet for the amount of force you like to deflect the Finger Piece off of center. Move the Cam Magnet deeper into the key body (rotate clockwise) to increase the force required to move the Finger Piece, counter clockwise to reduce the force. This is the initial coarse setting for both left and right forces. The resulting forces required to move the Finger Piece to the left and right of center will be close, but likely not equal.
- Left and Right Spring-Loaded Pistons – The Spring-Loaded Pistons provide for fine tuning of paddle forces prior to contact closure.
 - Adjust the Left and Right Spring-Loaded Pistons so that the Pistons are barely touching the Paddle Arm when it is at rest in the center. The Pistons will be just barely compressed.
 - Further adjust the Left and Right Spring-Loaded Pistons to fine tune the force needed to deflect the Finger Piece to each side. Left and right forces can be individually set and need not be equal. Note that adjusting the left or right control will change the opposite side force – increasing one decreases the other. Increasing force on the right will decrease force on the left. It may take several passes adjusting both left and right-side controls to achieve the balance you are looking for. You may also need a small change in the Adjustable Cam Magnet position if you are looking for a very precise setting.

I aim for minimal compression of the Spring-Loaded Pistons when keying. I use the pistons for fine tuning left and right travel force, and optionally, for introducing an intentional difference in the force required for left and right movement. The Cam Magnets provide most of the keying forces prior to contact closure. The Spring Loaded Pistons are never more than about half way compressed as I have my Swing adjusted.

Adjust forces after contact closure: Finger Piece travel and adjusting for a hard or soft landing:

Moving the Sliding Contact Carrier will change both Finger Piece force after contact closure, and Finger Piece travel to contact closure.

The primary function of the Sliding Contact Carrier is to adjust the additional force required for additional Finger Piece travel after the contacts close. This is the setting that determines how hard or soft the landing will be. A soft landing will have relatively low additional force after the contacts close. Forces after the contacts close are relatively high for a hard landing.

The Contact Spacing Adjustments that ride on the Sliding Contact Carrier are used to set the amount of left and right travel of the Finger Piece needed to reach contact closure.

Positioning the Sliding Contact Carrier close to the front of the key results in a rather abrupt stop as the contacts close with relatively high force needed to move the Finger Piece beyond the point of contact closure. This high force for additional travel is the result of having just a short section of the flexible beam available to flex. The feel with the Sliding Contact Carrier close to the front of the key will approach that of a single lever paddle, such as the Begali HST, when used as a cootie.

Positioning the Sliding Contact Carrier toward the back of the key results in a more gentle contact closure with relatively soft travel beyond the point of contact closure. Forces will be relatively light due to the long section of beam available to flex.

The Left and Right Contact Spacing adjustment screws carried on the Sliding Contact Carrier allow contact spacing to be set independent of how soft or hard the landing.

An example: Changing the Sculpture Swing keying feel from a hard landing to a soft landing:

Adjusting the Sliding Contact Carrier position from the front of the key (hard landing) to the rear of the key (soft landing) is described below.

The example below starts with the Sliding Contact Carrier at the front of the key with relatively hard and abrupt contact closure and little over-travel of the finger piece. Narrow contact spacing is also shown in the starting position of the example. The starting position in this example will feel similar to keying with a single lever paddle such as the Begali HST when configured as a cootie.

The adjustment made moves the Sliding Contact Carrier well to the rear of the key for a soft landing with gentle contact closure and relatively light additional forces as the Finger Piece continues to move following contact closure. Contact spacing is also opened. The resulting feel is light and gentle.



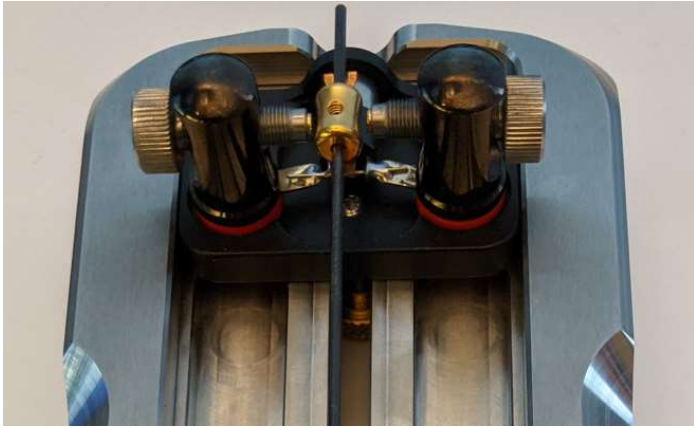
We start with the Sliding Contact Carrier well forward and adjustable contacts set tight for small Finger Piece movements.



Back off the Left and Right Contact Spacing Adjustment screws to allow the Sliding Contact Carrier to move freely past the Sliding Common Contact.

Loosen the Sliding Carrier Lock Screw on the bottom of the key to allow the Sliding Carrier to move.

Slide the Contact Carrier into the new position and finger snug the Sliding Carrier Lock Screw to hold the Sliding Carrier in place. The Sliding Carrier Lock Screw needs to be sufficiently snug to hold the carrier in place and to assure electrical contact between the carrier and base of the key. **Finger snug will do it – tools not required!**



Slide the Common Contact into position between the Adjustable Contacts and set the Adjustable contacts for the spacing that feels right to you.

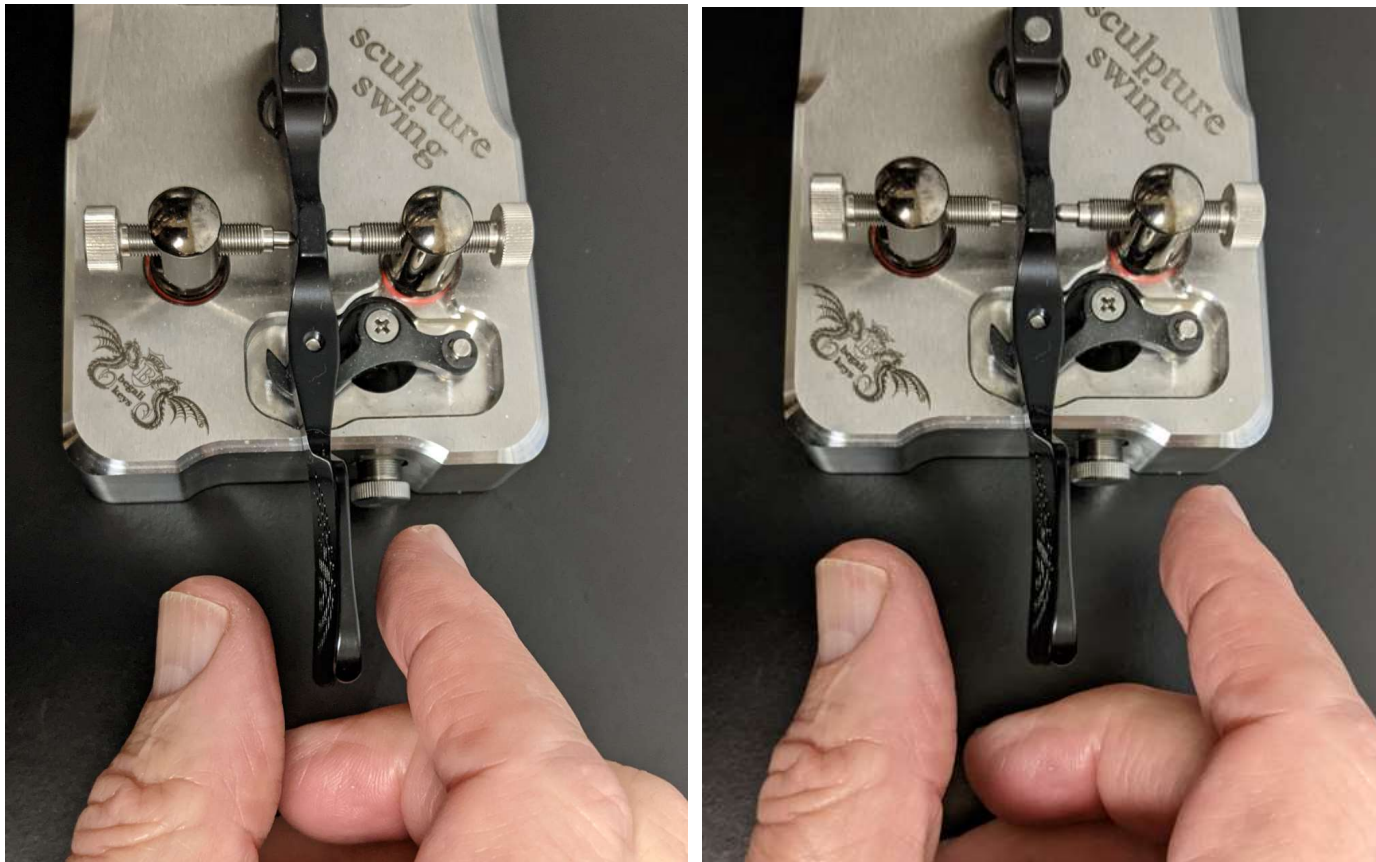
IMPORTANT NOTE: The gold Sliding Common Contact will slide along the beam with gentle finger pressure. Only a little force and no tools required! Take care to center the gold Sliding Common Contact between the two adjustable contacts.

You may want to make a second pass over these adjustments for fine tuning once you are close to your desired settings.

Two more critical adjustments, often overlooked and no tools required... Finger spacing and centering on the Finger Piece!

I find finger spacing is a critical adjustment for my sending with cootie, bug and paddles – I use a narrow finger space for faster sending, wider spacing for slower code. This single adjustment has a big impact on the time it takes my hand to rock from one side to the other.

Centering the Finger Piece between my fingers helps with symmetry as my hand and arm rock side to side. Centering the Finger Piece between my fingers helps me make uniform dits and dahs with movement to either side of center.



Fingers on the left relatively narrow spaced for higher speed sending... more widely spaced on the right when sending more slowly.