

## ***Free Stroke***

Performing quality free-strokes with “i-m-a” is one of the hardest of the early mechanics to learn (and to teach). Free-strokes with the thumb can be much easier. There is considerable disagreement regarding their instruction, including those who believe that they should not be taught to beginners (Glise, pg.26). We will need to divide our discussion into two parts, the thumb free-stroke and the “i-m-a” free stroke

With proper instruction, the thumb strokes are some of the easier mechanics to learn. Many authors recommend that the instructor begin the study of right-hand technique with either the thumb free-stroke or rest-stroke. There are at least two traditions that compete with the modern thumb free-stroke (p-stroke).

The oldest is often referred to the “thumb under” approach, which is inherited from ancient lute technique. This tradition allows for the thumb to pass into the palm and “under” the fingers. It also allows for a finger or two to rest on the face of the guitar. Many modern lute enthusiasts still use this p-stroke. You also still see it used by some modern American finger-style players who use the pinky of the right-hand as a post on the face of the guitar.

I believe that the reason this technique was abandoned was threefold;

1. the thumb can collide with the fingers
2. passing an “arched” (tip joint extended) thumb into the palm creates an impulse for the fingers to extend.
3. posting the pinky on the face of the guitar invokes the **Quadridge Phenomenon**.

Many 19<sup>th</sup> to late 20<sup>th</sup> century instructors taught that the thumb should make a circular path after the stroke. The tip-joint did not flex, but could even be arched, and came into contact with the first finger. Both **Sor** and **Segovia** wrote that the thumb and first finger formed a “cross” (Berg, pg. 31). Some misinterpreted this instruction and ended up with thumbs looking like a “spinning hitch-hikers”. I believe this technique is being abandoned because an extended or arched thumb tip needlessly contributes to a general increase in dysfunctional tension in the hand.

The modern, default p-stroke uses the 20<sup>th</sup> century “Sor/Segovia” style thumb motion combined with the natural **grasping motion** of the hand. This allows for a shallow elliptical path with the flexed thumb tip coming into contact with the first finger. A gentle wrist arch has several anatomical benefits, one of which allows for the thumb to be more aggressive.



In this example, the thumb begins by resting lightly on the 4<sup>th</sup> string, and “i-m-a” are on the 3<sup>rd</sup>, 2<sup>nd</sup>, and 1<sup>st</sup> strings respectively.



In the “after” picture, the thumb has flexed at the tip-joint and has come to rest against the 1<sup>st</sup> finger, making “the cross”. None of the other fingers has moved.

Notice that there is a very small amount of an arch in the wrist.

The conditions upon which good “i-m-a” free-strokes are developed would seem to be a given. Unfortunately, this is not the case; we don’t have a consensus on this most fundamental of mechanics. Our collective understanding of the physiology of the hands and its impact on guitar pedagogy is adolescent at best. Until such a time, instruction of free-strokes with “i-m-a” will continue as a casserole of older traditions spiced with modern research, baked in a crust of personal experience.

The following is what I understand to be the best method for teaching “i-m-a” free-stroke. To get a sense of how one can go about teaching free-strokes with the fingers, we can examine what the “end game” might be and discuss what allows for its achievement.

I think most instructors could agree that the end result of a mature free-stroke:

- consistently reproduces a strong fundamental of the harmonic series,
- has a focused attack,
- can control the follow-through enough to be able to have a separate volume for each finger,
- can be continuously performed above 120 b.p.m. with 4 notes per click for some alternation of “i,m or a”.

To emphasize the fundamental of the harmonic series, we need to limit the energy used in the higher harmonics and redirect it to the fundamental. We do this by adding more flesh of the fingertip on to the string. The wider fingertip contact reduces the volume of the harmonics by damping some of the shorter sub-propagations on the string, depending upon where on the string the finger is playing

We can also contribute to a consistent rich warm tone by displacing the string downward toward the sound hole, thereby setting the string more in phase with the soundboard of the guitar. This rich tone is quite difficult to find if the finger is striking the string at perpendicular/right angle since the arc of the finger will need to be shallow to avoid the adjacent string. At the other end of the spectrum, the tone suffers from a lack of focus as the finger approaches a parallel angle to the string. It is much easier to develop a rich free-stroke if the finger strikes the string at an angle between these two extremes. Assuming the right-hand and arm stay positioned horizontally across the torso, you can adjust the tone of the free-stroke by raising or lowering the angle of the guitar neck (this is one of the reasons why guitarists use a foot stool). Again, a very slight arch to the wrist will likely be helpful to allow for the fingers to be in their mid-range flexed position.

A focused attack is delivered by the fingernail. Much can be said about nail shape and the effects on tone, but in the end, the determining factor is how much nail is contacting the string. The nail-focus of the free-stroke can be warm or “tinny”, depending on the roundness of the nail. (This is why sharp-edged picks can sound “clicky” compared to the rounded “Fender-type” picks). The “front of the envelope” attack will be richer on the unwound strings if the rounded edge of the nail slides along the string. On the wound strings, this nail slide scratches the windings, creating an audible “scrub” or “chuff”. To avoid the chuff, the hand/wrist needs to be adjusted so that the fingers are more perpendicular to the strings.

To summarize to this point, we need to create the conditions for an “i-m-a” free-stroke that can depress the string far enough into the sound hole to engage the face of the instrument. We want enough flesh of the finger on the string to emphasize the fundamental, we need the finger to approach the string at an angle, and we want enough nail contact for a warm focus to the tone. Therefore, the string needs to be seated in the space between the nail and the fingertip (called the subungle) precisely on the fleshy tip of the finger AND in contact with the edge of the nail. The subungle may be large or very thin. The vast majority of players seat the string on the left-side of the fingertips, with the thumb to the left of the first finger.



The thumb is placed to the left of the fingers and is also seated so that the flesh and the nail both contact the string.



You can see the angle of the wrist to the strings in this photo. Notice how this player has used a foot stool to raise the guitar neck so that the right-hand is angled to the strings.



In this photograph, you can see how much of the flesh of the finger is in contact with the string and how much of the nail is below.

The left-side tilt of the fingers is clearly evident.

There are some notable exceptions to the left-side tilt of the hand; Ida Presti comes immediately to mind as one who favored the right-side tilt. The disadvantages of the right-side tilt is that the index finger will be predisposed to extend beyond its mid-range flexion point to reach the 1<sup>st</sup> string, especially if the index finger is shorter than is common. Also, for those with short thumbs, there is a tendency to use the “thumb-under” p-stroke.

To teach free-strokes with “i-m-a”, the pre-positioning of the fingers is critical. The next step is to investigate each individual finger. While placing the thumb on the 6<sup>th</sup> string, have the index finger “sweep” the other 5 strings and follow through into the palm. Do this several times for each finger. This will train the student to displace the string downward enough to sympathetically engage the sound board. It will also train the fingers to follow-through, which is necessary when a single note in a block chord needs to be louder for voice leading concerns. After several full volume sweeps, have the student adjust the stroke so that they are only playing 4 strings, then 3, then 2 for some time, and then finally one string, adjusting the middle joint (PIP) to the flexion side of its midrange position as needed. Be aware that some students will have less range of flexion in the index finger knuckle joint (MCP, or metacarpophalangeal joint), and that the follow through of finger sweep with “i” may not match the follow-through of the other fingers.

This is the point that some students will begin to “bicycle” or lifting/extending from the knuckle joint (MCP). If you see this, the student has not internalized the follow-through. You will need to go back to the finger sweeps and try again. You will be able to hear the loss of tone when the student “bicycles”.

N.B. This lift is not the positive result of the advanced “push stroke”, as detailed by Phillip Hii. Nor is this the end result that a very experienced player develops when the lumbricals muscles take over the primary flexion. See also **Instantaneous Weighted Plant**.

To develop alternating speed in the right-hand, we as teachers need to remove the roadblocks to success. Relaxation is the key. Remember, being relaxed is the result of good technique, not the cause (Berg, pg.18).

Regarding slow practice for accurate contraction and relaxation of the muscles, Berg (pg.18) quotes Dr. Frank Wilson:

*“Slow practice is the key to rapid progress. The cerebellum is a non-judgmental part of the brain; it assumes that any repetitive activity in the muscular system is being repeated because the conscious mind is trying to make it automatic. The cerebellum will be just as efficient automatizer of incorrect sequences of timing as those that are correct. When practicing at a pace too fast for accurate playing, there is little chance for the material to be mastered, and reliable, confident performance simply will not occur. On the other hand, it is true that practice for speed is seldom necessary. The cerebellum can supply all the speed wanted if patterning is correct during practice.”*

Speed happens, as they say, and it happens in the absence of resistance. Some of the resistance may be caused by residual dysfunctional tension, especially in the fingertips. Some resistance is found in improper placement of the right-hand. Some resistance is found in the **covert motor routines**. Usually, it’s found in all of these. Phillip Hii gives a thorough examination in his *Art of Virtuosity for Guitar*.

When all of the roadblocks to speed have been removed, the finger can begin to access the fast-twitch muscle fibers. This usually cannot be done consciously; it most often needs to be “felt”. This mechanic is called **ballistic motion**, and if the student has learned the default right-hand position, they may begin ballistic study at a very early stage (my opinion). The teacher then begins to train the student to “twitch” the fingers. This includes the return of the finger to the starting position BEFORE the next finger plays. A preliminary return exercise can be found in the **Drill** essay. Lastly, it is my belief that ballistic motion free-stroke, combined with sequential-plant/preparation is the foundation for the advanced **Instantaneous Weighted Plant**.

Following is my troubleshooting guide for “i-m-a” free-stroke. Many of the remedies below are chosen to reflect the pedagogical position that effortless ballistic motion eventually, and at least partially, develops from the lumbrical and interosseus muscles, along with other intrinsic muscles in the hands. If you disagree with this position, simply disregard those options.

<p><b>Bicycling</b> defn., the simultaneous flexing of the middle (PIP) and tip (DIP) joints while extending the knuckle joint (MCP) beyond its resting mid-range flexion point.</p>	<ul style="list-style-type: none"> <li>-The student doesn’t understand follow-through. Finger sweeps are needed.</li> <li>- There is continuous tension in the tip joints. There may be no outward sign of this tension. You may need to surprise the student and grab a finger to check. Making the student aware is often not enough, you will need to slow down the stroke and say something like “prepare-relax-play-relax”. 4 Clicks on the metronome to the stroke works well,</li> </ul>
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	<p>too.</p> <p>-Try rest-strokes only for a few weeks. The MCP won't be able to extend when the finger presses into the string. Unfortunately, some students will want to return to bicycling when the rest-stroke regimen is complete.</p> <p>For the advancing player, see the N.B above.</p>
<p><b>Crabbing</b> defn., the knuckles (MCP) joints are straight and all of the flexion is from the middle (PIP) joints.</p> 	<p>-Place “a” on the 1st string, “m” on the 2<sup>nd</sup>, and “i” on the <b>4<sup>th</sup> string</b>, and have the student play a melody on the third string with the thumb. This will force the hand into a semblance of correctness. It's the “nuclear option”, a last resort kind of training, but it works the best in this scenario. I do not use other fingers from this hand shape since it <i>encourages</i> bicycling.</p> <p>-5 string finger-sweeps will help get the MCP active.</p> <p>-The right shoulder and/or neck is tense. This may be the root cause for the problem. Once the shoulder and neck are relaxed, the residual crabbing may still be present.</p>
<p><b>Quiet, brittle, or thin tone</b> defn., the attack is “clicky” and there is little fundamental in the harmonic series present.</p>	<p>-The right hand is bent to the right and is too perpendicular to the strings. Straighten the wrist. You may need to hold their wrist in place while they rediscover the default position.</p> <p>-The guitar neck is too vertical. Adjust the foot-stool lower so that the right-hand is less perpendicular to the strings. You may need to re-seat the guitar on the body if the student is trying to hold the neck up with the left-hand.</p> <p>-The lower left bout of the guitar is resting on the top of the chair forcing the guitar neck to be too high. Have the student slide forward and seat the guitar lower on the body.</p> <p>-The knuckles (MCP) joints are too extended or in-line with the metacarpal bones in the back of the hand (crabbing). This forces the upward motion of the fingers resulting in less downward displacement of the string. Adjust the wrist higher from the face of the guitar. You may need to adjust the arm forward (toward the 1<sup>st</sup> string, too. Be sure that there is a little wrist arch.</p> <p>-Some teachers believe that loudness is created by the speed of the knuckle (MCP) joint moving the finger-tip and nail across the string (Berg, pg. 15). Ask for a “twitchier” firing from the knuckle (MCP)</p>

	<p>joint. Be sure that the student doesn't increase the effort beyond what is necessary.</p>
<p><b>Unfocused attack</b> defn., there is little definition at the front of the envelope and volume is low.</p>	<p>-The guitar neck is too low and the right-hand fingers are too parallel to the strings. Raise the neck by adjusting the foot-stool higher. You may need to adjust the guitar on the student's body.</p> <p>-The left shoulder is too low, forcing the neck angle lower. Correct the student's posture so that the shoulders are level.</p> <p>-The wrist is bent to the left. This common problem occurs when the student drops and flexes the wrist for a thumb stroke. You may need to hold their wrist in place while they rediscover the default position.</p> <p>-The nails are too short.</p>
<p><b>Slow Speed</b> defn., the student is unable to achieve open string quadruplets at 120 bpm while alternating any combination of "i,m,a".</p> <p>There are many causes of slow velocity. It is likely that ALL of the items to the right need to be correct. Remember, speed happens in the absence of resistance.</p>	<p>-tip joints are over extending. This could be weakness in the tip joint (unlikely) or because of the Quadridge Phenomenon (likely). The Quadridge Phenomenon appears when "c", "a", or "m" are extended beyond a finger to the left (palm down). Coach the student to bring the extended finger into an arc with the other fingers. If this fails, use a LOOSE rubber band around "a-c" and treat them as one, sympathetic stroke (Urshalmi, pg. 89).</p> <p>-the student is "muscling" with the extensor and flexor digitorum profundis. Reposition the hand to allow for the lumbricals to develop the relaxing portion of the stroke (Glise, pg.17).</p> <p>-The fingers are splayed (Duncan, pg.36). The muscles that splay the fingers (palmar and dorsal interossei) assist in flexion of the mid-joint. Have the student do some block chords with the finger tips touching or overlapping.</p> <p>-The hand looks great but is slow; the fingers are rigid. There are agonist and antagonist muscles activated, often caused by tension filled tip joints. There is great effort but little mechanical work. Shake the hand loose before every note so that a more relaxed feeling is experienced.</p> <p>-The student is trying to play from the tip-joints. The tip joints (DIP) flex after the mid-joints (PIP), so initiating the stroke from the DIP joint is counter to the natural flexion of the fingers. This is also why the tip joints are incapable of ballistic motion. Re-set the hand so that the free stroke begins with the PIP flexed beyond the mid-range point.</p>

-The hand looks fine, has little or no dysfunctional tension, but is slow. The student is in a transition stage. They have discontinued relying on the profundis muscle group in the forearm, but have yet to refine the effortless mechanism of ballistic muscle contraction with instant muscle relaxation of the lumbricals (Berg, pg.13). Have the student “ballistically twitch” the fingers, accessing the fast-twitch muscle fibers in the lumbricals.

-The student trained to leave the fingers on the next lowest string during a previous rest-stroke study. The student is also likely holding tension in the tip joints. Use a release exercise (like the one found in the Drill essay). You may need to shake the hand out between strokes to loosen the tip joints. Adjust the tip joints to the flexion side of the midrange position (Berg, pg.15).

-Follow through is too deep into the palm. The student hasn't adjusted the follow through from their earlier studies. The flexors muscles may be exerting continuous control for too long through the flexing motion. Ballistic twitches without alternation is the remedy.

-The knuckle (MCP) is not the initiator of the stroke. The knuckle (MCP) accesses the lumbrical muscles while the middle (PIP) and tip (DIP) only use the flexor and extensor digitorum profundis and superficialis muscles in the forearm (Glise, pg.17), along with some help from the interossei in the hand. Sometimes awareness is a remedy. If unsuccessful, try a “straighter” finger rest-stroke practice followed by an acute awareness of the ballistic actions of the knuckle (MCP) during free-stroke.

-The finger is traveling beyond its midrange return point. The extensor muscle is firing. A release exercise is in order, but be sure the student is feeling the weight of gravity returning the finger to the ready position. The return is also aided by the inelasticity of the tendon upon which the lumbrical is attached.

Some teachers coach the student to practice reverse (or rasqueado) rest-strokes for strengthening. I feel this is not an immediate concern since we are not engaging the extensor muscles to play free-strokes.

-the student has not internalized that the impulse to play is the same as the impulse to return. *“The impulse that causes the finger to release the string and set it in vibration is the same that brings the*

	<p><i>finger back again to playing position.” -Pepe Romero (Berg, pg.39)</i></p> <p>-The student has not spent enough time practicing slowly. It takes some time for the extensor and flexor digitorum profundis muscles to relinquish command of the fingers to the ballistic twitch of the lumbricals. They also need to play slowly enough to rid the tip joints (DIP) of dysfunctional tension.</p> <p>-The covert motor routine is too slow. The student isn't hearing the music in their head any faster than they can play the segment. Have the student sing it with you faster than they are playing. Then have them sing as they play.</p>
<p><b>Uneven timing</b> defn., repeated notes and speed bursts are rhythmically chaotic</p>	<p>-nails lengths are too uneven.</p> <p>-the release of the finger is mistimed. The knuckle (MCP) should release first. Slow practice and awareness are necessary.</p> <p>-The strings are not seated in the subungle (the space between the nail and the fingertip) in such a way that they result in equal tone and attack. The seating will likely need to be at a different angle for each finger. A fix might be planting “p-i-m-a” in the default position and practice tugging the strings back and forth (Byzantine, pg.16) to get a kinetic memory of where these are to be found.</p> <p>-Try making the alternation “m-i” instead of “i-m”. The middle finger is stronger than the index and can create a louder downbeat by moving faster at the knuckle (MCP) joint. Hopefully, this will even out the downbeats, at least.</p> <p>-The fingers are too slow to recover from the stroke. Some schools teach that the “m-a-c” fingers should be held in the palm and should extend together in one impulse. While there is some merit to this assertion, it can cause some unevenness in recovery speeds since the fingers are playing at different times but releasing at the same time, creating unevenness in tension durations for each finger. Retrain the fingers to release at the instant they sound the string.</p> <p>-The fingers may be “stuck” on the strings from earlier instruction on thumb technique. Have the student become aware of “parking” the fingers above the strings.</p> <p>-There can be some involuntary flexing of the fingers when the thumb plays. This issue will not likely need your intervention and should resolve</p>

	<p>itself quickly.</p> <p>-It's sometimes difficult to determine what is out of time. Weave a polish cloth between the strings and the face of the guitar and listen for inexact attack-points. If they are good, then the problem is not a rhythmic one, but often one of unequal tone.</p> <p>-"a-m-i" is a natural "tapping on the table" mechanic and should come fairly easily. "i-m-a" is not and may need extra attention on your part. When using a "p-i-m-a" full-plant, watch for fingers involuntarily lifting from the strings.</p> <p>-Check for uneven string height. This can be caused by bridge or by chords which are in the higher positions that also use open strings. The planing section in Villa-Lobos' Etude no. 1 is a prime example.</p> <p>-Tip (DIP) joint collapse can cause synchronicity issues. Have the student momentarily firm the tip-joints at the moment of attack.</p>
<p><b>Hyper extended Basal segment</b> defn., the joint of the thumb at the wrist is involuntarily extended.</p>	<p>-arguably our most stubborn problem. The basal joint (the middle joint) of the thumb is involuntarily and permanently flexed. Many teachers make the mistake of pointing to the wrong joint –the middle. It's the joint nearest the wrist that is involuntarily extending. This adds significant dysfunctional tension to the hand. Simple awareness over time has worked, -somewhat.</p> <p>-Also try "spinning hitchhiker" thumb; it at least draws the students' attention to the problem. This works by simply fatiguing the adductor muscle, and it finally just gives up. Be sure to tell the student that this is a temporary fix.</p> <p>-Massage may work as well.</p>
<p><b>Inadvertently striking the next lowest string.</b></p>	<p>-The middle joint (PIP) is not flexing enough.</p> <p>-The knuckle (MCP) is not placed over the target string, but is in the "Flat Hand" rest-stroke position. Adjust the hand forward (toward the 1<sup>st</sup> string) and check to see if the middle joint (PIP) is flexed just to the palm side of its midrange position.</p>
<p><b>Bouncy hand</b> defn., the right-hand is bobbing away from the strings.</p>	<p>-The fingers are extending after the flexion. Hold your fingertip a ¼ inch above the back of the student's hand and have them play some block chords. Tell them they owe you \$100 for each time they touch your fingertip. Have the student follow through into a fist. They will usually "crab", but it gets the point across.</p>

	<p>-The improper flexion of the tip joints (DIP) causes an involuntary extension of the knuckle (MCP) joint (Berg, pg.14). Have the student be aware that there is a momentary firmness of the tip joint ONLY, and not an active flexion.</p>
<p><b>Missing or uneven Notes in block chords</b></p>	<p>-The offending finger is not following through. Follow through to a fist for a week or so.</p> <p>-The tip (DIP) joint is extending to its collapsing point. Individual finger work is necessary. Check for the Quadridge Phenomenon.</p>
<p><b>Rocking</b> defn., the hand is rocking toward the floor or back to the shoulder.</p>	<p>-One finger-nail is too long.</p> <p>-The student is confusing the “Flat Hand” rest-stroke position with the “Open Hand” free-stroke position.</p> <p>-The student is using the basal segment of the thumb (the one closest to the wrist) for the p-stroke, causing a momentary “thumb-under” position. Assign a slow block chord “chorale” type piece that will isolate a thumb stroke now and then. Brouwer Etude #2 is an excellent choice.</p>