SOUNDTEMPO PUTT

User Manual

Introduction

SoundTempo Putt™ is an advanced Golf Training App that teaches putting rhythm, tempo and speed control through the use of audio tones. In addition, it calculates the required backswing length in inches/cm to roll a golf ball a specified distance based on green speed and your personal **CoreTempo™**. Your **CoreTempo™** is the core rhythmic timing of your golf swing. Specifically, the timing of the downswing to impact timing multiplied by 2 and expressed in beats per minute. For example, if your downswing to impact timing is 333msec, your **CoreTempo™** would be 90 beats per minute (bpm).

Metronomes

For years, Metronomes have been used to provide timing cues for putting practice. Typically, for an actual putting stroke, i.e., **Putt mode**, the "tick" represents takeaway and the "tock" Indicates impact. When the Metronome is used for rhythmic training, i.e., **Rhythm mode**, each "tick" and "tock" indicates the top of the backswing and the top of the followthrough. If a golfer wants to practice with a **Rhythm mode** **CoreTempo™** timing of 90 bpm, the Metronome would be set to 90bpm and the golfer would swing the putter back and forth in sync with the "tick" and "tock" sounds. But what should the Metronome be set to when used for **Putt Mode** given a personal **CoreTempo™** of 90bpm? The answer would be **60bpm**. Why 60bpm? The 60bpm setting provides a "one second from takeaway to impact" timing which has the same downswing timing as 90bpm in **Rhythm mode**. Likewise, a **CoreTempo™** of 112bpm, (Tiger Woods' tempo), would require a Metronome setting of 75bpm for **Putt mode.** This can be confusing. **SoundTempo Putt™** automatically accounts for the difference in **Putt mode** and **Rhythm mode**. All you need to do is select your CoreTempo™ in bpm and choose **Putt mode** or **Rhythm mode** and the **SoundTempo Putt™** App will automatically generate a custom tone that takes mode into account. Instead of just providing a "tick" and a "tock", **SoundTempo Putt™** provides a continuous tone during the backswing and the downswing with a distinct impact "chirp" playing at the precise instant when impact should occur.

Two modes of operation allow a golfer to learn the overall back and forth rhythm of the putting stroke as well as the allocation of backswing and downswing timing for a putting stroke.

 Listening to **SoundTempo Putt**™ tones while putting ingrains the stroke into the golfer's mind and greatly aids in the development of a smooth and consistent putting stroke.

Many devices used by Instructors today **analyze** a golfer's putting stroke. In contrast, **SoundTempo Putt**™ **shows you** and **helps you feel** what a well-timed putting stroke is like through audio.

It will also show you and help you feel what the ideal acceleration profile should be during the putting stroke.

The Theory and Research behind SoundTempo Putt™

The concepts that drive the **SoundTempo Putt**™ App and the TempoStik™ have emerged from over 20 years of research and collaboration between World Renowned Putting Coach Phil Kenyon and Golf Development Engineer Dean McConnell. Their kinematic analysis of 1000s of players has enabled them to establish the common patterns highly skilled putters acquire and in particular related to the Tempo and Rhythm acceleration Profile of the Putting Stroke. To understand more and get the best out of your **SoundTempo Putt**™ App, it is important to understand the key concepts behind it.

What is Tempo and Rhythm?

Many golf experts have differing definitions of tempo, rhythm and timing. Many say that tempo is the time from the start of the backswing to impact in seconds. Using this definition of tempo, two golfers with identical "tempos" of 1.2 seconds could have very different backswing and downswing to impact times. A swing with a slow backswing followed by a very fast downswing is very different from a swing that may be quick back and then slow down although both could have the same backswing to impact time.

For putting, many use a Metronome to specify the tempo based on takeaway to impact timing expressed in beats per minute. Since the two beats signify takeaway and impact, there is no beat for the top of the backswing. So, two golfers could follow the same "tempo" yet, have different backswing and downswing timings.

Definition: Tempo and Rhythm

Tempo therefore relates to the overall length of time of the stroke OR the time one of its component parts take.

Tempo of backswing 700ms, tempo of downswing 333ms, overall tempo 1.033secs*.* The backswing can a have a tempo and the downswing can have a tempo.

Some technology companies (swing and putting analysis products), however define tempo as the ratio of backswing time to downswing to impact time. So, in the example, if the backswing was 0.7 seconds back and 0.333 seconds from the top of backswing to impact they would say the tempo was 2.1. We, however, call this *ratio of backswing time divided by the downswing to impact time* as the **Backswing Rhythm**.

We define a putting stroke with two numbers: **CoreTempo™** and **Backswing Rhythm**. So, a golfer with a backswing time of 700msec and a downswing to impact time of 333msec would have a Putting Stroke timing definition of: **90bpm/2.1.**
Using this convention simplifies putting. Whether using Rhythm mode or Putt mode, tempo in bpm is the same number. In Putt mode, the Rhythm ratio describes the amount of time spent in the backswing phase. In Rhythm mode, the BS Rhythm ratio is always 2.0.

Extensive Data Collection:Establishing Patterns of Elite Players

Using the SAM Puttlab® data over the past 20 years, the developers of SoundTempo Putt™ have been able to analyze and establish the typical Timing, Rhythm and acceleration profiles that elite players use.

Based on 1000s of sets of data typically elite putters will have an **overall tempo** between 800ms to 1200ms and a rhythm that falls between 1.9 to 2.5. The term CoreTempo^{TM} refers to the downswing to impact time of the golfer's "swing".

This *core tempo* will range from 266ms to 400ms across elite players. Furthermore, Based on research by Dxp Tech, CoreTempo^{TM} is essentially constant for all clubs in the bag. That is why it's called "CoreTempo"; it defines a golfer's core, fundamental downswing timing that is unique to the individual golfer.

For the majority of golfers, CoreTempo™ is constant for each club.

For example, if a golfer's CoreTempo™ is 90bpm, the downswing to impact time for the golfer's wedge, 7 iron, 5 iron, Driver and putter will be close to 333ms. However, the backswing time may vary (Backswing Rhythm), typically rising as the club length increases (with a corresponding backswing length increase) but the downswing to impact time stays constant.

One thing we have also established is that elite golfers typically use this **same tempo and rhythm for putts of all length**. The timing and rhythm do not change much from a short putt to a long putt. What happens is that the golfer swings longer or shorter in that time frame which, as a consequence, produces more club head speed. The phenomena can be appreciated through the Gravitational law of isochrony. This law states that pendulum swings of different lengths will always take the same time. The only time a golfer's backswing rhythm ratio may increase is for a very long putt; a putt requiring a large force that causes the wrists to load creating a two-lever pendulum. However, even for a very long putt, the downswing to impact time should not vary by much.

Velocity/Acceleration/Deceleration

To achieve different swing lengths in the same time (tempo), the acceleration profile must change. The club must accelerate more for longer strokes and accelerate less for shorter strokes.

This acceleration/deceleration in turn controls the velocity the club is travelling at which in term control the distance the ball travels.

As we can see Tempo, Rhythm, Swing length and Acceleration all interact to have a direct effect on club head speed. SoundTempo Putt™ will help you train all of these variables.

Through the developers research they have established what a model acceleration/deceleration profile looks like and have been able to program SoundTempo Putt™ to, regardless of your own person rhythm and tempo, produces an optimum acceleration profile to help train world class speed control.

So, as we can see, there are many different definitions of rhythm and tempo in the Golf Industry. However, we define them though, its commonly appreciated that good Tempo and rhythm will help you control your acceleration profile and club head speed.

Definitions Revisited

For the purpose or understanding or working with the SoundTempo Putt™ it's important we define the terms as we see them:

Tempo:

Relates to the time of a particular segment or whole of the putting stroke

CoreTempo^{TM}:

Relates to the time of the downswing to impact segment of the putting stroke

Rhythm:

Relates to the relationship between different segments of the putting. The relationship between the backswing and the downswing

Swing Length: The length the club travels in the backswing

Law of Isochrony: All strokes of different lengths take the same time

Working with SoundTempo Putt™

As we have described when it comes to an actual putt, there is a backswing and a downswing time. This timing can vary from player to player. The Rhythm of this backswing and downswing time can also vary slightly from player to player but what is critical is the consistency of this Rhythm and Timing and how it works to control your acceleration profile

It is also important that the Tempo and Rhythm remains constant regardless of the length of the putt. It's the actual length of swing that will vary to control the speed but the player's tempo and rhythm will generally and stay the same.

Entering Your Tempo and Rhythm with SoundTempo Putt™

The backswing time can range from 1.7 times the downswing to impact (DSI) time to 2.5 times the DSI. They can also range in terms of time itself not just the ratio.

However, in SoundTempo Putt™ Instead of expressing putting tempo as a backswing time in milliseconds and a downswing to impact time in milliseconds, SoundTempo Putt™ has developed a simpler definition.

There are two key numbers we need to understand to use the SoundTempo Putt™ effectively:

1. **BPM (tempo) number**

This represents the CoreTempo™ of the player which is based on the downswing to impact time (DSI). To work out the BPM use the formula:

30 divided by the DSI = BPM For example, if your downswing time is 0.333 secs then divide 30 by 0.333 this will give you 90bpm. 90bpm which would be the setting to replicate the a DSI of 0.333 secs

2. **Backswing Rhythm**

Next, you need to set the BSswing Rhythm. This is the backswing time divided by the DSI. A typical Backswing Rhythm seen my many of the best putters is 2.1. While a typical CoreTempo™ would be 0.333 seconds.

For a CoreTempo™ of 90bpm and a 2.0 Backswing Rhythm ratio the backswing time would be (.333 seconds * 2.0) = .666 seconds.

"90bpm/2.0" notation would fully describe a putting stroke in terms of its tempo and rhythm. In particular, these values are very commonly found but not exclusive to good putters.
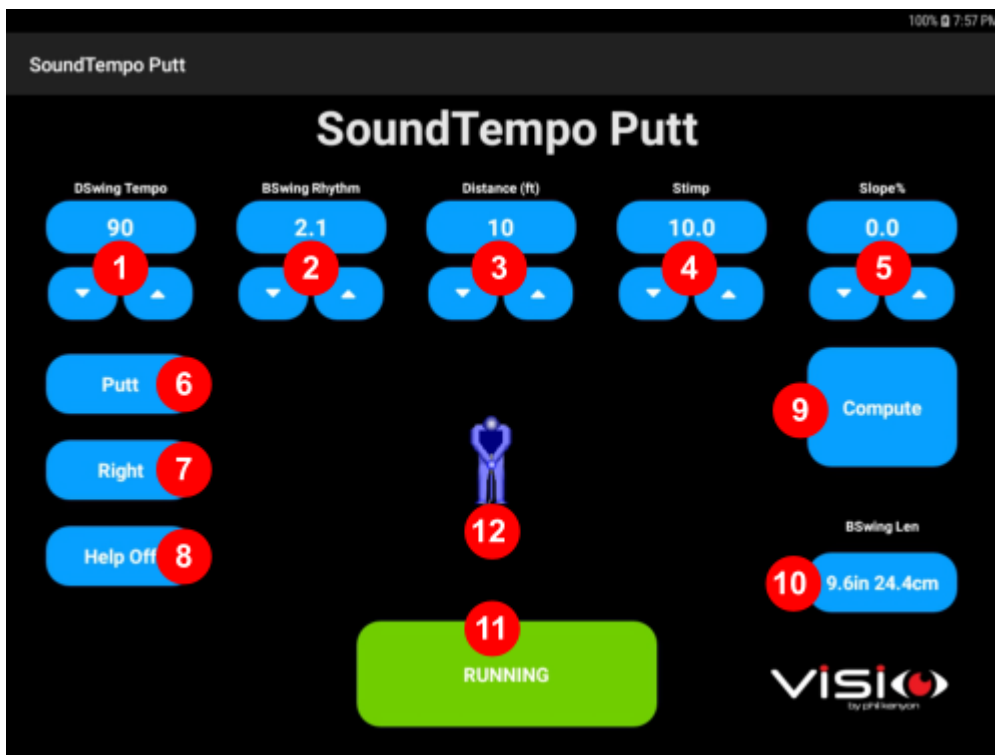
Setting Parameters

Figure 1 SoundTempo Putt™ App Screen

Looking at Figure 2, we see the SoundTempo Putt™ App functions:

1. Downswing Tempo setting buttons
2. Backswing Rhythm setting buttons
3. Distance (ft) setting buttons
4. Green Speed setting (Stimp) buttons
5. Green Slope setting (% grade) buttons
6. Putting Stroke or Rhythm Swing mode setting button
7. Left or Right-handed button
8. Help On/Off

9. Compute button (press when red), calculates backswing length
10. Backswing Length in inches and cm based on parameters
11. Stop/Run button, cannot make changes while Running (green)
12. "Roboputt" animation shows how the stroke is made when in Run mode

DS Tempo (1):

To enter Tempo, press the Tempo up/down buttons until the desired tempo is reached. Tempo has a range of 72 to 130 bpm.

BSwing Rhythm Ratio (2):

To enter Backswing Rhythm Ratio, press the Backswing Rhythm Ratio up/down Buttons until the desired rhythm ratio is reached. Backswing Rhythm Ratio has a range of 1.7 to 2.5.

Distance (3):

To enter desired putt Distance in feet, press the Distance up/down buttons until The desired distance is reached. Distance has a range of 1 to 60 feet in 1 ft increments.

Stimp (4):

To enter Stimp in feet, press the Stimp up/down buttons until the desired speed is reached. Stimp has a range of 5.0 to 16.0 in 1/2 ft increments.

Slope Percentage (5):

To enter slope, press the Slope up/down pushbutton until the desired slope is reached. The slope percent is defined as the ratio of the rise/run expressed in percentage. For example, a positive slope of 0.01 ft rise for every 1 foot of run would be a +1% slope grade. A downward slope is negative. If you specify a negative slope and too fast of a green speed, it is possible that the ball won't be able to stop. If so, the SoundTempo Putt™ App will notify you with a message telling you to lower the slope and/or slow the green speed.

Putt/Rhythm Mode (6):

Putt/Rhythm toggles between Putt and Rhythm modes. When the Putt/Rhythm button shows Rhythm Mode, pressing the button toggles to Putt Mode and vice versa.

Putt Mode

Putt Mode, as the name implies, executes a putting stroke based on the Selected Tempo, Backswing Rhythm Ratio, Distance, Stimp, and Slope parameters. The LED sequence will start from the setup position.

Rhythm Mode

Pressing the Putt/Rhythm button while Putt Mode is showing, toggles the Putting stroke mode to Rhythm Mode.

Rhythm Mode executes a series of 10 sets of putting swings from the top of the backswing to the top of the followthrough and then back. This is a continuous motion back and forth.

Note: changing Putt/Rhythm mode can only be accomplished while SoundTempo Putt™ has been stopped (RUNNING/STOPPED button showing "STOPPED").

Upon changing Putt/Rhythm mode, the Compute Backswing button (showing red) must be pressed to update parameters and compute the backswing length.

Left/Right (7)
The Left/Right button toggles between Left/Right. If the Left/Right button shows Right, then the sound file indicates a left to right backswing and a right to left downswing. If the Right/Left button shows Left, the sound file indicates a right to left backswing and a left to right downswing when using headphones. The Roboputt animation also shows Right/Left-handed orientation based on the Left/Right button.

Help On/Off (8)

Help Off, when pressed, activates Help which provides a description of each pushbutton and label. Press Help On to go back to the normal screen.

Compute (9)

The Compute button (when Red), computes the backswing length required to roll The ball the desired distance selected using Stimp, Slope, and Tempo. It also generates the SoundTempo Putt^{TM} tone. When SoundTempo Putt™ is in Stopped mode and any parameter changes (Tempo, Rhythm, Stimp, Slope, or Distance), the Compute button will change to red. Red indicates the button needs to be pressed.

Backswing Length (10)

The result of a Compute button computation is the backswing length. The Backswing length sets up the resulting peak velocity of the downswing and the distance the ball will roll after impact. Backswing Length is shown in inches and centimeters (cm).

Run/Stop (11)

After the backswing length has been computed and the Compute button is blue And not red, press the Run/Stop button to start the SoundTempo Putt™ sequence Whether in Putt or in Rhythm mode. When the SoundTempo Putt™ is running, the Run/Stop button will be green and the label of the button will show "RUNNING".   Pressing RUNNING stops the SoundTempo Putt™, changes the Run/Stop button to STOPPED, and allows changes to parameters to be made. A green buttons indicate Go while a Red Compute button require pressing action.

Roboputt (12)

The Roboputt animation provides a guide to what an ideal putting stroke looks like. It is right-handed or left-handed based on the Left/Right button setting.

How to Use the SoundTempo Putt™ app

First, make sure Putt/Rhythm is set to Putt. Now, set the DS Tempo to 90 bpm, BS Rhythm to 2.0, Distance to 10 ft, Stimp to 10 and Slope to 0. Select Right hand or Left Hand as it will affect the orientation of the stereo audio and Roboputt. The Compute button should be red indicating parameter changes have been made and a new computation is required. Press Compute. Notice that the Backswing Length has changed and the Compute button color is blue. Now, press Run. Listen to the audio while watching the Roboputt animation. Roboputt shows you how to putt using the audio prompts and tones. Each putt sequence consists of a pre-shot "beep", "bop", and the putting stroke tone. The fundamental timing between the pre-shot cues is takeaway to impact. The takeaway to impact time is dependent on the selection of DS Tempo and BS Rhythm ratio. As you change the tempo and the backswing rhythm ratio, SoundTempo Putt™ automatically adjusts the takeaway to impact timing between the pre-shot beeps.

We recommend listening to SoundTempo Putt™ tones through ear buds or headphones. The stereo tones fade/rise from one side to the other during the putting stroke. Headphones provide a more immersive experience than the speaker within a phone or tablet can provide and allow a golfer to better hear the nuances of the rising/lowering pitch of the tones. A subtle beep provides a cue at the top of the backswing that signals the start of the downswing. An impact chirp plays at exactly the instant when impact of the putter with the ball occurs. A pause at the end of the stroke provides time to hold the finish before beginning another stroke sequence.

Finding your tempo

We recommend starting with 90 bpm and 2.0 BS Rhythm and going up or down in regard to DS Tempo as you search for the most comfortable timing. You may want to find a putting Instructor with a SAM Puttlab® system who can determine your downswing to impact timing. Use the following formula to find your CoreTempo™:

CoreTempo™(bpm) = 30/(downswing to impact time in seconds)

Example: let's say your average downswing to impact time for 10 putts is 356 milliseconds. Your CT would be: 30/.356 = **84 bpm**. Your Backswing Rhythm ratio can also be determined by SAM Puttlab®.

Another method of finding your CoreTempo™ is to use Rhythm mode. Set the Putt/Rhythm button to Rhythm and adjust the DS Tempo until you feel comfortable. Each time you press Run, SoundTempo Putt™ will execute 10 cycles of "back and forth" Rhythm tones. After each set of 10 is complete, adjust DS Tempo, Compute, and press Run again. After finding a tempo you like, go back to Putt mode and then try putting at the tempo you found in Rhythm mode. You may want to adjust BS Rhythm up starting at 2.0 until you can impact the ball in sync with the impact chirp.

A common fault for the club golfer is to have a backswing that is too slow and then As a consequence, the downswing gets too quick to try and generate speed. These Rhythm ratios can typically be higher. Therefore, starting with 2.0 ratio can often be a good principle to follow.

Putt Mode:
- Select Putt/Rhythm to Putt while status is STOPPED
- Select DS Tempo
- Select BS Rhythm
- Press RUN…
- Start with short putts (which require short backswings)
- Practice putting following the tones
- Strike the ball in sync with the impact chirp
- Increase backswing length (by increasing distance)

You will learn how to strike the ball at the proper point in time while keeping the downswing to impact time constant regardless of putt length.

Rhythm Mode:

- Select Putt/Rhythm to Rhythm while status is STOPPED
- Select DS Rhythm (BS Rhythm is auto set to 2.0)
- Press RUN
- Start with short swings
- Practice swinging back and forth feeling rhythm following the tones
- Increase backswing length (by increasing distance)

Overall, you will learn how to keep the same rhythm and tempo regardless of putt length.