

# Learning with Beltower

Whether you are an existing ringer or a new ringer, these 'quick start' notes set out a learning plan and explain how to use simulator technology in **'workstation'** mode to take you from starting to ring rounds to acquiring the skills needed to plain hunt a bell to methods. Once you have mastered these basic skills, progress on to ringing methods inside can be quite rapid, and you will know enough from these notes to progress further on your own.

The latest releases of Abel, Beltower and Virtual Belfry have video clips of real ringers, so in workstation mode you can also get a realistic simulation of ringing, where the simulator rings all of the other bells, avoiding the need for a band of experienced ringers, and this technology is improving all the time.

You can also use the simulator to **'fill in'** one or more cover bells and practice call changes and Kaleidoscope exercises with a mix of real and simulated ringers. However ringing methods inside with a mix of real and simulated ringers is very difficult.

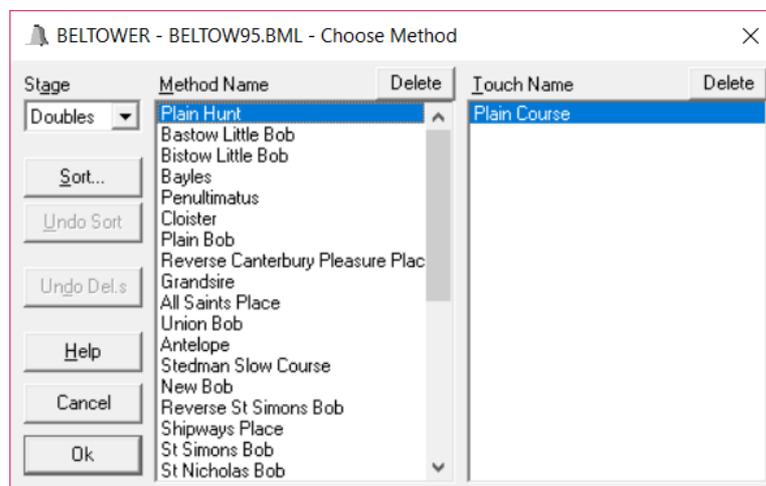
Simulators can also be used in **'silent practice'** (Free Strike) mode where all the bells are silenced and connected to the simulator, so that the simulator acts as an alternative form of sound control with no sound made outside the tower, and you can hold a practice with real ringers,

If you are an experienced ringer, ringing with a simulator, and especially by ear, is different to ringing with real ringers, who often adjust to fit round you. Therefore rather than try anything too complex to start with, it is sensible to start with some basic exercises, as set out in this booklet.

Whilst what has been written in this booklet explains how to use Beltower, the same principles apply to Abel and Virtual Belfry, and similar notes are available for those applications.

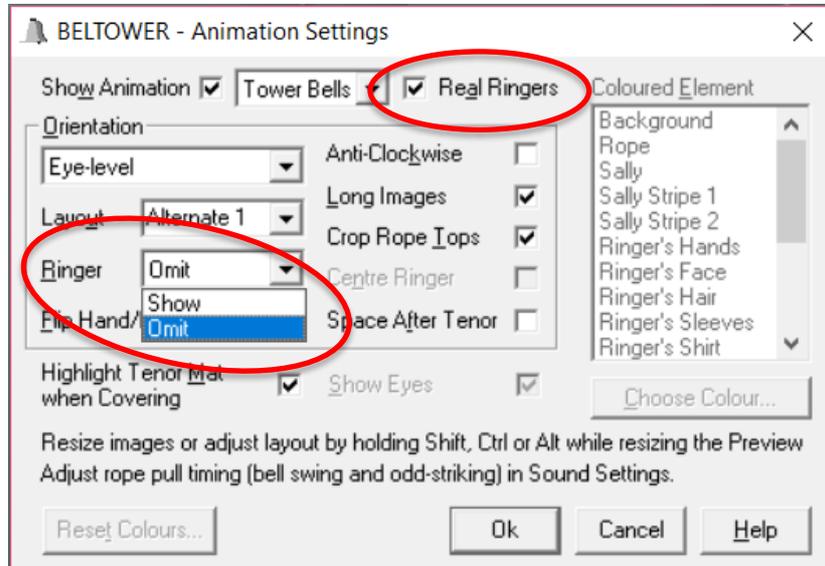
## Getting started

When you open Beltower, and have closed the tip of the day and the help window, you will be asked to choose a method. If you have never used a simulator before we suggest that you start by ringing rounds, so it does not matter which method you choose, as you are not going to 'go'.

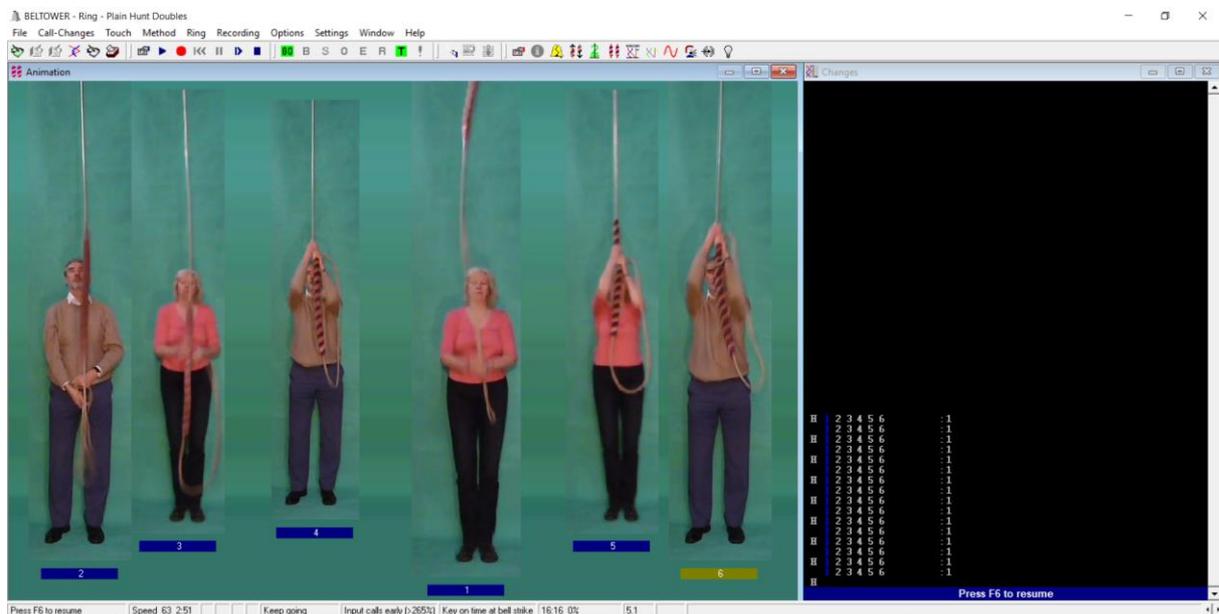


## The animation settings

Beltower has a number of choices in the 'Options' ⇒ 'Animation Settings' menu. In this booklet we concentrate on the 'Real Ringers' option:



Animation Settings window



*Real Ringers* – In this example the treble is the bell that is the 'Ringers Bell' (the one that strikes when the 'Y' key is pressed or sensor operated). The tenor is the cover bell (mat highlighted). The Ringers Bell is set to 'Show'.



*In this example the third is the bell that is the 'Ringers Bell' and it is set to 'Hide'  
 The advantage of this view is that it was the ringer of the Ringers Bell actually sees in the tower.*

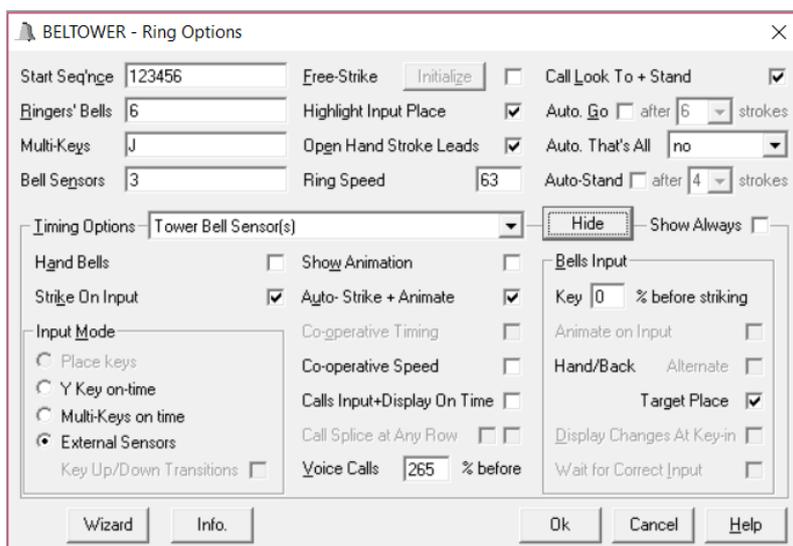
Whilst you can use 'Real Ringers' there are also animation options for hand-bells, and icons for ringers that can be used instead.

The art of bellringing is as much about the sound that comes out of the tower as watching ropes; some would say more so. Many people find that after a little while they can hear their bell and do not need to watch ropes all the time. Do practice at home, or on a simulator in the tower looking away from the screen altogether, and just rely on the sound. It's not as difficult as you might imagine!

## Ringling rounds

Beltower allows you to practice ringling any bell to rounds. Your tied bell or dumb bell will have a sensor which transmits a signal to the computer which tells Beltower when to strike. The set up varies from tower to tower, but your instructor will show you how to switch on the computer and open Beltower.

To learn to ring rounds on a simulator we suggest that you start with the tenor, as this is the easiest bell to hear. Then, once you have mastered ringling this, move to the 'inside' bells. If you have difficulty hearing six bells to start with, do start with three, four or five, and build up from there. You can even practice on eight, ten and twelve bells later!

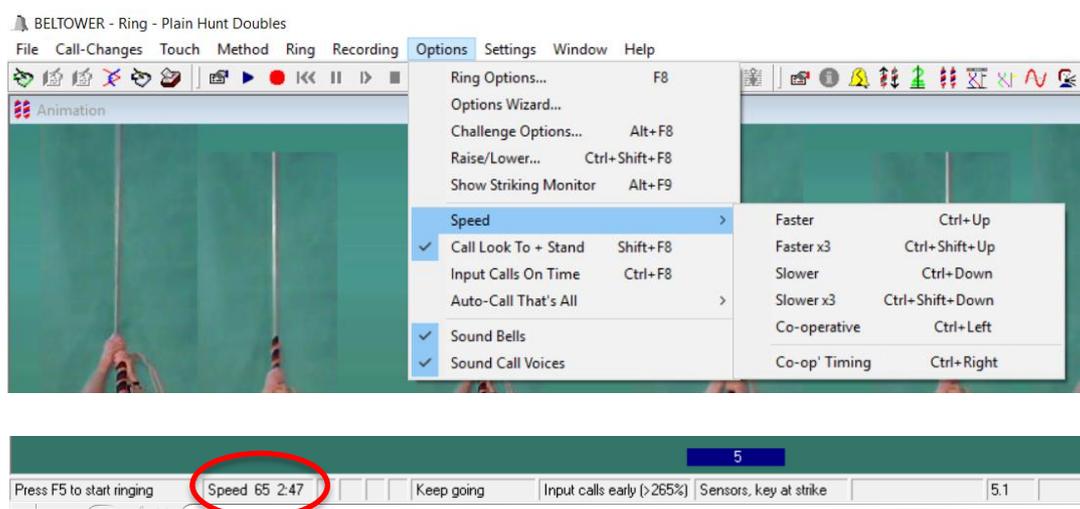


To ring a particular bell as the tenor, go to the 'Options' ⇒ 'Ring Options' window and make sure that 'External Sensors' have been selected as the input mode. You can then allocate the sensor number of the bell you are ringing (the third in the above example) and the bell you want to strike as ('Ringers Bell' in Beltower) – 6<sup>th</sup> of six in the above example. In this case, pressing the 'J' key on the keyboard will also cause the simulated bell to strike.

You can also change the simulated bell by clicking on it with your mouse. It will then move to the bottom centre of the screen.

## Ringing Speed

You should also make sure that Beltower rings at the correct speed for your ring of bells. For the average ring with a tenor of 10cwt the peal time is around 2h:47m, but on a lighter ring it might be 2h:41m and a heavier ring 3h:00m. You can adjust the speed using the **Ctrl+Up** or **Ctrl+Down** keys. The speed is indicated in the bottom left hand corner of the screen:



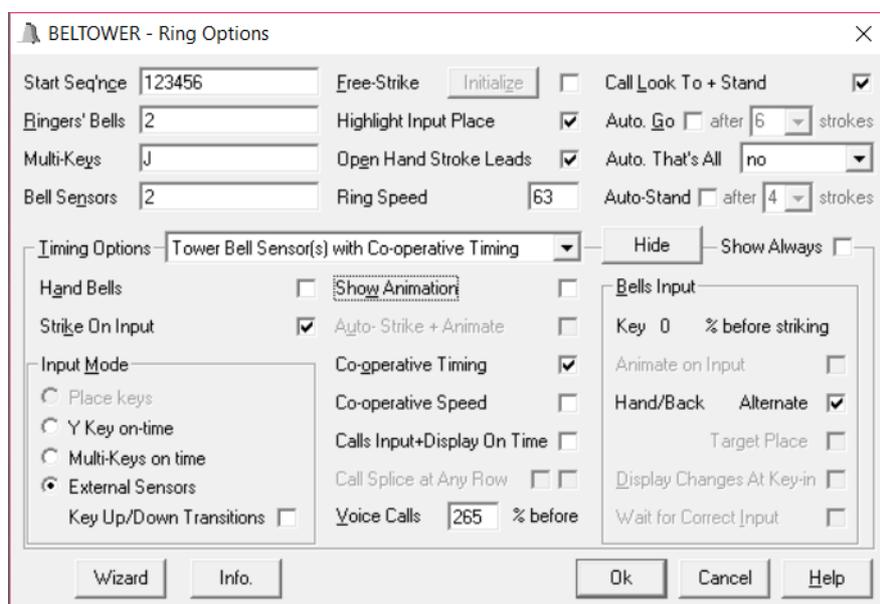
## Co-operative speed and co-operative timing

For someone who has just started learning there are two challenges:

- (a) ringing at a steady pace;
- (b) ringing at the pace set by the other ringers (or simulator).

With **Co-operative timing** selected in Ring Options, it will wait for the preceding bell(s), and if they are early, it will close the gap.

With **Co-operative speed** and co-operative timing both selected, Beltower will also ring faster or slower to match the speed of the learner's bell. Just like a band of real ringers would do.



To activate these features select an appropriate **Timing Option**, tick **Strike on Input** and select External Sensors as the **Input mode**. When active, it will show Vr-Spd in the status bar at the bottom of the screen. You can toggle CoopSpeed on/off using **Ctrl+Left** and switch off both with **Ctrl+Right**.

Of course, the object of a simulator is to teach people to ring by rhythm, so these features are only useful in the very early stages, and many people will not require them at all.

## When to pull off

If you have a footswitch, press it and the treble will immediately start to pull off at handstroke, and you can pull off just like you would on a corresponding tower bell. If you do not have a footswitch someone will need to press **F5** or click on the 'Start Ringing' button (the blue triangle in the toolbar) for you.

If you are an inexperienced user, it can be difficult getting the feel of pulling off in time. Therefore you may need your instructor to ring the hand-strokes for you to start with, till you become confident. To stop the ringing press **End** or click the blue square icon on the toolbar and you will hear Beltower call 'Stand'.

## Practice at home

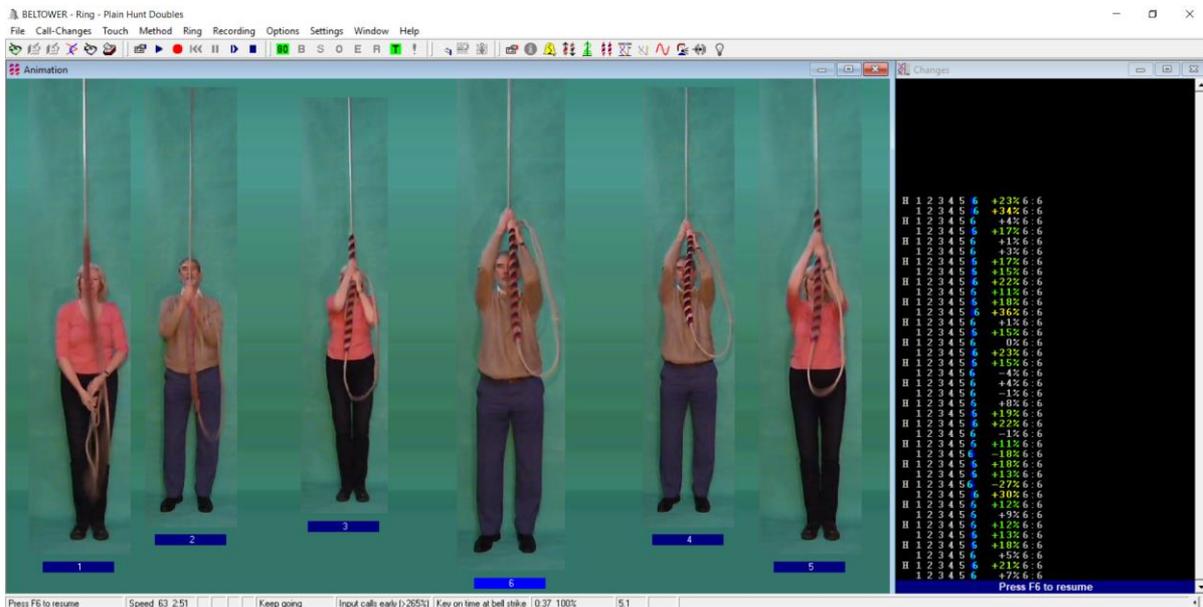
You can also practice listening and counting your place at home by pressing the **'Y' key** (you may need to check that 'Y Key on time' is selected as the 'Input Mode' in the 'Ring Options' window).

Click your mouse over whichever bell you want to ring before starting. Most people do this without watching the screen at all, just listening to the bells, and this is a great help in hearing your own bell in the tower. It also has the benefit of getting you used to the rhythm of good ringing. In fact, watching the moving ringers is a hindrance as it is very difficult to time your keystrokes with the pull, because of the time delay between the pull and the strike.

## How accurately did you strike your bell?

Beltower has two ways of showing the accuracy of your striking. In the main window to the right of the screen you will also see a display with a series of numbers. As you ring each row in addition to hearing your bell, you will be able to see how far out your bell is from its ideal position (indicated as a percentage error).

Ideally you should be aiming for an error of  $\pm 10\%$  as this is the limit of the accuracy of human hearing (as explained later in this booklet).



*Striking accuracy to the right of the main screen*

The display in the main window is relatively small, but Beltower also has a striking window which can be turned on from the 'Options' 'Show Striking Monitor' menu. This display can be maximized to fill the whole screen, or you can select 'all bells' to show how the simulated bell fits in with the others.

There is also an option to 'Beep at Strike' which makes two beeps, where the bell strikes and when it should have struck, which will cancel each other out when the simulated bell is struck on time.



## Recording a whole band

In addition to recording your ringing as a solo ringer on a simulator, or pressing the 'Y' key on the keyboard at home, if all the bells are connected to the computer with sensors and a multi-bell interface, you can record all the bells ringing together in the **'free strike'** (or silent practice) mode.

You can even analyse the accuracy of your band's ringing, for example when practicing for a striking competition. To do this you will need to install the CAS (Computer Analysis of Striking) software downloadable for free from the 12 Bell competition website:

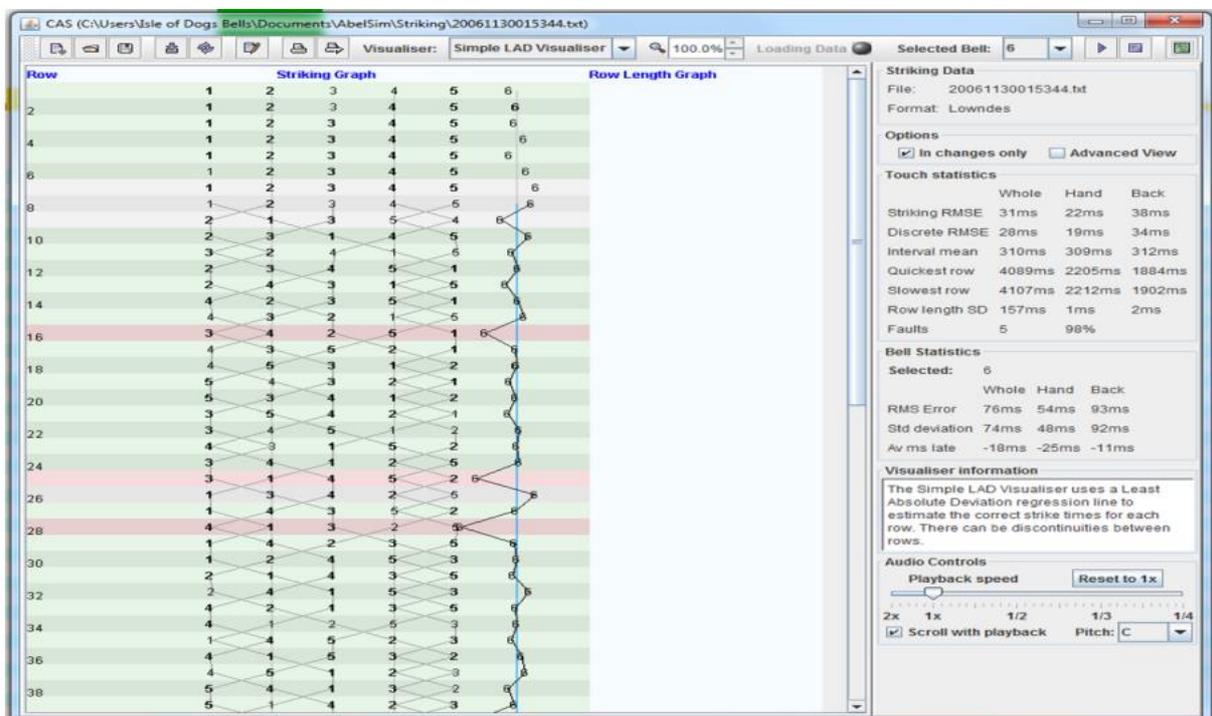
<http://www.12bell.org.uk/downloads/cas1.4.zip>

To install CAS you need to unzip and save these files to a directory on your computer. The only prerequisite is that you need Java installed, which is downloadable for free.

The number of Ringers Bells must match the Start Sequence and each bell must have the relevant sensor input configured in the Ring Options window. Beltower uses the number of strikes, as the means of identifying Hand and Back strokes, in order to correctly display the open hand stroke leads.

The **Esc** or F6 keys will stop recording in free-strike mode.

The recording can be saved in the 'File' ⇒ 'Save Recording As' window as a Lowndes .txt format file, which can be opened by the CAS software. This gives a more detailed analysis in terms of faults, and bell by bell statistics.



CAS Screenshot

## What do the error statistics mean?

A bell can be early or late (+ve or -ve) so even if the bell strikes quite randomly, the two can cancel each other out. The average error (RMS) ignores whether the rows are early or late and is a more representative indication of how variable the striking is.

In the example above the 6th has a RMS error of 76 milliseconds, so is quite variable. You can see this from the saw-tooth pattern, although the errors will tend to cancel each other out to some extent. However the software also tells us that the 6th has a tendency to strike on average 25 milliseconds early at handstroke and 11 milliseconds late at backstroke.

Ideally you should be aiming for 10% average error on a tower bell or dumb bell, and 4% by pressing the 'Y' key. A 10% error is not really noticeable when ringing with real ringers and with practice most people can hear a 5% (15-20ms) inaccuracy of one bell if the other bells are all perfect.

One row of ringing (1 2 3 4 5 6) lasts about two seconds. Therefore the gap between each bell is one third of a second = 0.333 seconds. Multiply this by 1,000 = 333 milliseconds (Less if you are ringing on higher numbers). On six bells **10% error = 33 milliseconds**.

## Standard Deviation ( $\sigma$ )

CAS also uses standard deviation as the measure of variability. This is not mathematically the same as the RMS (Root Mean Square) error. For a 'Normal' distribution 68.2% of blows will be struck within the standard deviation.

## The open handstroke lead

In much of the country\* it is a convention in ringing that a one beat pause is allowed at the end of each backstroke, before the next handstroke. [\* notable exceptions are Devon and South Yorkshire]

1 2 3 4 5 6 1 2 3 4 5 6 - 1 2 3 4 5 6 1 2 3 4 5 6 - etc

In musical terms the bar has thirteen beats, the thirteenth beat being a rest.



Once you have mastered ringing the tenor and then an 'inside bell' in rounds, practice leading on the treble. It's not an easy skill to master, and it is far easier to learn this skill on the simulator than with a real band!

## Developing your ringing skills

The skills that you need to develop before moving on to ring methods are:

- Listening to your bell and being able to distinguish it from the others
- Counting your place and knowing which place you are in.
- Controlling your bell every handstroke and backstroke and making it ring where you want it to (practice being able to set it 10 times on each stroke)
- Developing a sense of rhythm and knowing how much to hold up or cut in to move one place

## Counting your place

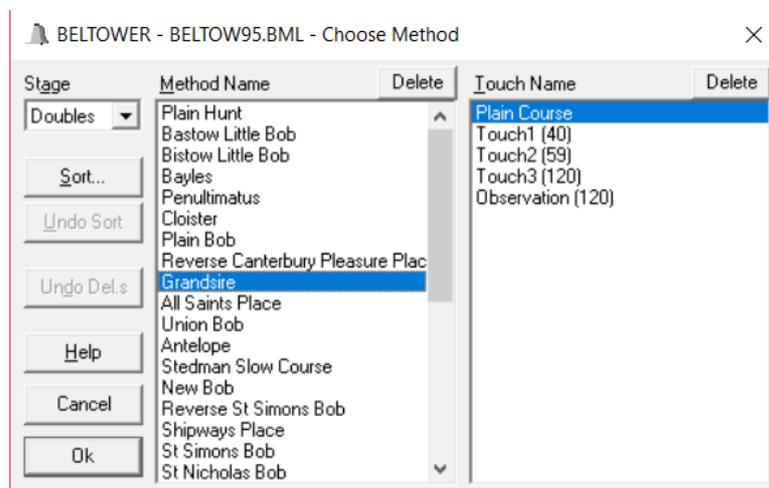
Count along in your head and emphasise your bell. It will take a lot of practice, but eventually it will become automatic and you will know instinctively which place you are ringing in.

One, **two**, three, four, five six,  
 One, **two**, three, four, five six, gap;  
 One, **two**, three, four, five six,  
 One, **two**, three, four, five six, gap;  
 etc.

## Developing listening by covering

Perhaps the easiest bell to hear in any ring or on the simulator is the tenor. As it stays still in odd bell methods you can practice developing your listening skills by ringing the tenor (6<sup>th</sup>) to a doubles method such as Grandsire or Plain Bob, without needing to worry about changing speed as well, or developing any ropesight.

To do this go 'Method' ⇔ 'Choose...' Select Doubles as the Stage and scroll down the Method Names. Then select Grandsire or Plain Bob and the length of the touch and click 'OK' To cover, make sure that you have selected the sixth bell by clicking on it, as described earlier .



## The three speeds of ringing

In change-ringing one of the basic conventions is that when you change places you usually only move up one place in a row, or down one place in a row. Of course, you can also stay still. Therefore, once you develop your control over the bell, and the feel of how hard and when you need to pull in order to wait to slow up, or cut in to speed up, you will start to develop the skill of ringing by rhythm

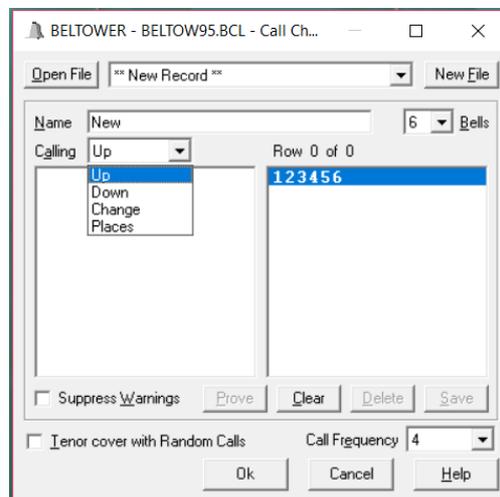
In addition, unless and until you can control the bell sufficiently accurately to move up or down one place, you will also be unable to see who you are following and develop the skill of ropesight, as you will actually be ringing at another position in the row.

On six bells, you can practice ringing at 2h:30m, 3h:00m and 3h:29m peal speed to get an idea what the three different speeds feel like.

## Changing speed at handstroke

The skill to develop first is changing speed at handstroke, because that's what you need for call changes and for your first ringing exercises. You'll later learn to change speed at backstroke too, for more advanced exercises and for method ringing. Your instructor may therefore start by practicing some simple call-changes with you, so that you only change speed occasionally

In the 'Call Changes' ⇒ 'Choose/Edit...' menu or '**F2**' shortcut there are options to call changes by the bell going up or bell going down. You can also practice ringing call changes with the conductor calling the places that change, rather bell up or by bell down.



Once set, to practice call changes, start Beltower ringing rounds, then use **Ctrl+ bell number** or point the mouse over the ringing mat of the bell which moves up or down in the row and click the mouse.

Remember that you will need to adjust the position of your hands on the sally. Higher will make the bell go quicker, letting it go up and holding it on the balance will be slower.

The call pending flag will be displayed (maybe briefly), in the Status bar, and a voice calling the change should also be heard, then, at the following hand stroke, the change will take effect.

## Changing more frequently at handstroke.

There are two pre-programmed exercises that you can use to practice changing speed at handstroke::

- **Long places** – where you move up or down one place every alternate handstroke
- **Short places** – where you move up or down one place every handstroke

	<u>1 2 3 4 5 6</u>
H	1 3 2 4 5 6
B	1 3 2 4 5 6
H	1 3 2 4 5 6
B	1 3 2 4 5 6
H	1 2 3 4 5 6
B	1 2 3 4 5 6
H	1 2 3 4 5 6
B	<u>1 2 3 4 5 6</u>

**Long places**

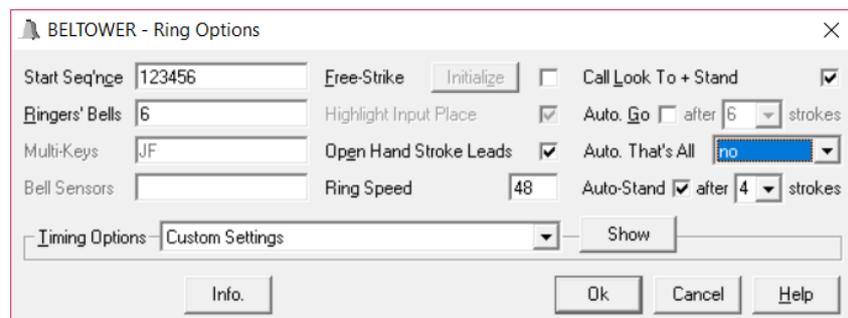
	<u>1 2 3 4 5 6</u>
H	1 3 2 4 5 6
B	1 3 2 4 5 6
H	1 2 3 4 5 6
B	<u>1 2 3 4 5 6</u>

**Short places**

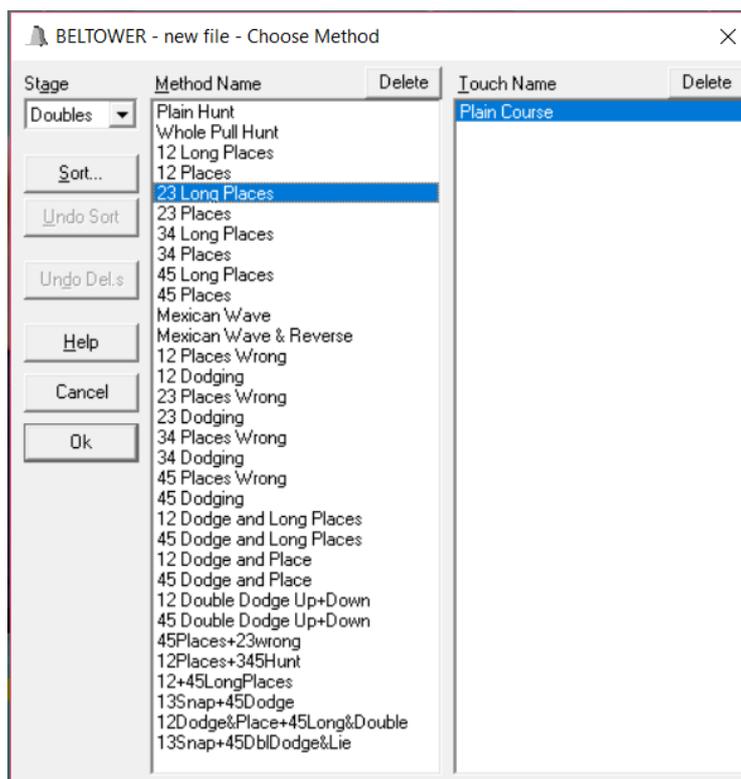
The Training and Kaleidoscope exercises can be loaded into Beltower through the File menu. It will ask if you want to switch off '**Auto That's All**' and you should click 'yes' if you want to ring the exercise continuously. If you only want to ring the exercise once then stay in rounds click 'no'

Once you have practiced the exercise a few times and are confident, you can unclick the box to practice the exercise continuously by going to the 'Options' ⇒ 'Ring Options' menu and unclicking '**Auto that's All**'.

Also make sure that '**Auto Stand**' is turned off as well, so that the bells just continue in rounds without standing; and the ringer/trainer can then press the **Space bar** or click **Go** again to repeat the method/exercise.



Once you have loaded the Training and Kaleidoscope exercises, go to the 'Method' ⇒ 'Choose Method' menu, and you will see a variety of exercises, with short places made in 1-2; 2-3; 3-4 and 4-5. Scroll down to the one you wish to practice, then click on it and click 'OK'



In the example above 2-3 Long Places has been selected.

Finally, select the bell on which you wish to practice on, as explained above.

To begin press on the footswitch (or your instructor will need press **F5** or click on the blue triangle 'Start' icon on the toolbar with the mouse) and the bells will start ringing rounds. To ring the exercise press the footswitch again (or **press the spacebar** or click on **Go** with the mouse) and you will hear a command to start next handstroke.

You can repeat this as frequently as you like, and then unclick the 'Auto That's All' option, once you are confident. Then try short places. You will change position every handstroke, alternately ringing quick and then slow hand-strokes.

### Changing speed at Backstroke

The previous exercises practice changing speed at handstroke only. However, to progress further you will need to learn how to change speed at backstroke as well. Therefore there are also the same exercises in the Training and Kaleidoscope exercises menu, but '**wrong**' (starting at backstroke)..

To ring these exercises successfully you will also need to practice adjusting the position of your hands on the tail end. An inch or two higher to speed up, and an inch or two lower to ring to the balance and slow down.

## Changing speed on both strokes

The next step is to practice changing speed at both backstroke and handstroke. By ringing the 2nd in the first of the following exercises you can practice slow hand-strokes and fast back-strokes and then by ringing the 3<sup>rd</sup> to the same exercise you can practice ringing the strokes the other way round.

	<u>1 2 3 4 5 6</u>
H	1 3 <b>2</b> 4 5 6
B	1 <b>2</b> 3 4 5 6
H	1 3 <b>2</b> 4 5 6
B	1 <b>2</b> 3 4 5 6
H	1 3 <b>2</b> 4 5 6
B	1 <b>2</b> 3 4 5 6
	etc.

**Dodging 2-3**  
(2<sup>nd</sup> dodging 'up')

	<u>1 2 3 4 5 6</u>
H	1 <b>3</b> 2 4 5 6
B	1 2 <b>3</b> 4 5 6
H	1 <b>3</b> 2 4 5 6
B	1 2 <b>3</b> 4 5 6
H	1 <b>3</b> 2 4 5 6
B	1 2 <b>3</b> 4 5 6
	etc.

**Dodging 2-3**  
(3<sup>rd</sup> dodging 'down')

## Plain hunting by rhythm – Plain hunt on three (Singles)

Once you have mastered changing speed at handstroke and backstroke, you can move on to plain hunt on three, with three bells covering. Select this form the list of Training and Kaleidoscope exercises, as before, but go up from Doubles to the Singles 'Stage'.

### Adding ropesight.

You can progress on a simulator ringing by rhythm alone, but if ringing with real ringers, you will need a degree of ropesight, However all bells differ, so ropesight is only a guide to when to pull, and really good ringing depends on listening, which is why simulators are so valuable a tool.

The moving ropes feature in Beltower can also help you develop your ropesight. However, because of the time delay this is only practical in the 'workstation' mode on a bell or dumb-bell. The problem is not a limitation in Beltower, but a limitation in people! However if you want to practice ropesight at home the Whiting Society have produced an excellent DVD with lots of examples of ringing to watch along to. There are also on-line ropesight apps – e.g. <http://www.ringbell.co.uk/toolkit/ringbell.htm>

You can also practice all of the above exercises with real ringer ringing say bells 1, 2 & 3 and the simulator covering on 4, 5 & 6.

## Bastow Doubles

In Bastow the treble rings handstroke and backstroke alternately in 1<sup>st</sup> and 2<sup>nd</sup> position, but follows a different bell (2, 3, 4 or 5 each time). Once you have reached the stage where you instinctively know how much to hold up or cut in at handstroke, you can ring the treble to Bastow and practice spotting who you are following. Don't forget, concentrate on counting your place and holding up or cutting in the right amount as your first priority. You will see what you are doing, without being able to do this first.

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
H	2	1	4	3	5	6
B	2	1	3	4	5	6
H	1	2	4	3	5	6
B	1	4	2	5	3	6
H	4	1	5	2	3	6
B	4	1	2	5	3	6
H	1	4	5	2	3	6
B	1	5	4	3	2	6
H	5	1	3	4	2	6
B	5	1	4	3	2	6
H	1	5	3	4	2	6
B	1	3	5	2	4	6
H	3	1	2	5	4	6
B	3	1	5	2	4	6
H	1	3	2	5	4	6
B	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>

**Bastow**

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
H	2	1	4	3	5	6
B	2	4	1	5	3	6
H	4	2	1	3	5	6
B	4	1	2	5	3	6
H	1	4	2	3	5	6
B	1	2	4	5	3	6
H	2	1	5	4	3	6
B	2	5	1	3	4	6
H	5	2	1	4	3	6
B	5	1	2	3	4	6
H	1	5	2	4	3	6
B	1	2	5	3	4	6
H	2	1	3	5	4	6
B	2	3	1	4	5	6
H	3	2	1	5	4	6
B	3	1	2	4	5	6
H	1	3	2	5	4	6
B	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>

**Cloister**

## Cloister Doubles

If you have mastered Plain Hunt on three and Bastow, then try ringing Cloister doubles.

In Cloister (with a Plain Bob Start) the treble and 2<sup>nd</sup> both move between 1<sup>st</sup> and 3<sup>rd</sup> place following different bells each time. This is good practice at counting a small number of places, and spotting ropes by ropesight, whether on a simulator, or with a real band.

## Plain hunting by ropesight and rhythm – Plain hunt on four (Minimus)

You can then move on to plain hunt on four.

You can also try Plain Bob Minimus, where the treble moves up and down three times, following the others in different orders. To minimise the differences in speed, ring this with two bells covering.

## Plain hunting by ropesight and rhythm – Plain hunt on five (Doubles)

You can then move on to plain hunt on five.

Once you can do this, you can try Grandsire Doubles in which the treble and second both plain hunt. If you are ringing the treble, you will always start with the 2<sup>nd</sup> at the beginning of each run up or down, so you only really have three other bells to worry about. Plain Bob doubles lasts 40 changes and the treble hunts up and down four times, the other four inside bells swapping over each time.

## Further Advice and Support

Now that you have mastered the basics, you should be able to progress on to attempting more advanced methods on your own, by going to the 'Method' 'Choose Method' window or pressing **F4**. Beltower will adjust the number of bells automatically if you choose a method on higher numbers. You just need to click on the bell you want to ring. However remember to build up to more complicated methods gradually. You should also be able to explore some of the other features in Beltower which there was not space to cover in this quick start guide.

The Association of Ringing Teachers publishes a book: Teaching with Simulators, which can be obtained by visiting their on-line shop <http://ringingteachers.org/resource-centre/shop>

ART are also producing a series of you-tube videos covering most of the exercises in these notes, and Beltower has extensive Help files..

Simulator workshops are also held in various parts of the country and can be booked by visiting the upcoming courses and workshops page <https://smartringer.org/public/daycourses/>

There is also a Ringing Simulator Users and Suppliers Facebook page, where you can communicate with other users and the software writers and hardware suppliers.

<https://www.facebook.com/groups/1441867412528870/>

We also have a network of experienced users who can help you set up and troubleshoot any problems that you may have. In the first instance contact the ART Resource Administrator:

[resourceadmin@ringingteachers.org](mailto:resourceadmin@ringingteachers.org)

## Quick Reference

Y	Manual key to ring a simulated bell
F2	Call changes menu
F4	Choose method
F5	Start Ringing
F6	Resume ringing (after pause)
F7	Start recording
F8	Brings up ring options window
Spacebar	Go a method
ESC	Pause
End	Stand
Ctrl+Up	Ring faster (increments of 2 min peal speed)
Ctrl+Dn	Ring slower
B	Bob
S	Single
R	Rounds
Alt+F9	Show striking monitor
Shift+F7	Show striking report
Ctrl+Wdws	End ringing