

# Simulators

## Introduction

The Editor promised a comparative review of simulator software. Twenty years ago, there was only one source of simulators - the late Peter Cummins, who invented the concept, used to build them. Now there are many alternative products, some doing considerably more than the original simulators.

This review includes products that are capable of performing the function of a basic ringing simulator. They can be used to enable a ringer on the end of a rope to feel and control a 'bell' as normal, and to hear the co-ordinated sound of both the bell being rung and all the others, in rounds or changes. To provide this experience requires a (real) rope and wheel and the (real or simulated) mass of a bell, together with the logic to simulate the appropriate sounds at the right times - the simulator. The aim has been to include as many products as possible that meet this criterion. The review excludes products that only simulate some other aspect of the ringing experience, eg listening tutors, bell and rope animators, non interactive ringing machines and bell recordings.

My main focus in this review is on the use of a simulator as a training tool. Simulations can be used in other ways of course, for example as demonstrators, or to explore the simulation process itself, but these are considered secondary for this review.

Two additional popular uses of simulators have emerged in recent years, as well as the basic function described above, and they are both covered explicitly, namely:

- Dispensing with the physical act of ringing, and 'ringing' by pressing keys, to train the mental skills of method ringing in real-time.
- Dispensing with the logic that rings the other bells, and using the simulator as a form of electronic sound control for normal group ringing.

The first of these two uses applies mainly to a different (and in fact larger) market, namely people who buy software-only products for private use on their own computers, where the total investment is considerably less than when acquiring a simulator for use in the tower.

Table 1 shows the products considered in the main review.

Table 1

| Product                   | Price | Supplied on | Runs on        |
|---------------------------|-------|-------------|----------------|
| Abel for Windows (v3.3.0) | £25   | CD          | Windows PC     |
| BelTower (v8.15 / v8.25)  | £40   | CD          | Windows PC     |
| RingLeader                | £650  | Hardware    | Self contained |
| !Stringing                | £10   | Floppy      | RISC-OS PC     |
| (*BELLS)                  |       | ROM chip    | BBC -B         |
| (ABEL)                    |       | Floppy      | DOS PC         |
| [RingingMaster]           | £45   | CD          | Windows PC     |

The two products shown in (...) are not currently advertised, though many are already in use, and both suppliers are still active supplying other products. The DOS version of ABEL has minimal mention in the review, since it has been superseded by the Windows version. \*BELLS is included in the basic review, because it provides some useful points of comparison.

[Ringing Master] is mentioned because its author is in the process of adding a basic ringing simulator facility to what is already a well established program in its own right. It is not currently available as a simulator, and is not therefore included in the main review.

A few Cummins simulators are still in use, but they have not been manufactured for many years, and so are not included in the review.

Two of the products, Abel for Windows and BelTower, are far more complex than the rest, and offer a wider range of facilities. Following the main review these extra facilities that they offer are compared. The versions reviewed are shown in brackets. BelTower v8.15 was supplied for review, but a clarification question later revealed that it had progressed to v8.25. I used that to check the points where I had raised questions about the previous version, but did not attempt an exhaustive exploration for any other changes. A minor upgrade to Abel is also imminent, but has not been reviewed.

## Simulators compared

This section compares the products in Table 1, and their ability to perform the basic functions of a simulator.

### Hardware

Apart from RingLeader, which comes in a small purpose-built box with controls and display built in, the other products are all software that relies on the use of a general-purpose computer. \*BELLS is the oldest and runs on the BBC-B computer. It is supplied on a memory chip that plugs permanently into the machine. All the other products are supplied on disc. The original ABEL ran on DOS PCs, and has been superseded by Abel for Windows, which requires a more recent PC running at least Windows 95. BelTower also runs on a Windows PC with similar requirements. !Stringing runs on any RISC-OS computer.

### Price

All the software products are relatively cheap when compared with commercial PC software, or with the cost of the computer and other hardware that you needed to use it as a simulator (or for example with the price of a new bell rope). RingLeader is a complete self-contained hardware product with built-in software. At £650 it costs considerably more than the software-only products, but it would be more realistic to compare it with the cost of the software + computer.

All simulators require sensors to detect the movement of the bell (or dumbbell) being rung. The most common sensor in use is the Bagley optical sensor, which together with power supply, leads, interface box, connectors, etc costs £75. If you want to fit sensors to more than one bell, multi-sensor kits are available (from £353 for 6 bells up to £539 for 12 bells). Other types of sensor have been used, and some people have constructed their own.

### Timing

Accurate timing is fundamental to a simulator. All of the simulators are capable of achieving this, but when software-only products can be used with a range of different machines, then their performance can be influenced by the hardware on which they run. This is not a problem for \*BELLS, because although it is software, it runs on a single machine. In general for software, the more powerful the hardware, the less the likelihood of problems, but a computer to be left in the tower, is likely to be an older, less capable model, so this might be a consideration. With early DOS simulators the machine could limit the maximum speed at which it would run. With the more complex products (Abel for Windows and BelTower) machine problems are subtler and less predictable.

There is a section in the BelTower help file on timing problems telling you that 'over-stretching your processor' can cause uneven striking. It suggests various things that you can do to reduce the problems, the most severe of which is 'Disable Bell Sounds'. You certainly won't hear any timing errors with the sound turned off, but then a simulator that you can't hear doesn't meet the basic requirement.

In fact, providing I left them alone, neither BelTower nor Abel seemed to have problems on the Dell Inspiron 4000 with Windows 98 that I used for testing. Things were different if I used the controls though, with occasional glitches (more with BelTower than Abel) when I moved the pointer over the buttons. This is a Windows problem - the 'tool tips' I think - maybe they can be turned off, but I don't know how and nor will most users. The effect probably reduces with a more powerful computer. You can avoid using the soft buttons in both programs if you learn the appropriate function keys.

Using BelTower's built in display of striking error, I noticed that the position of the bells it was ringing sometimes appeared to move very slightly. This looks disconcerting, but the size of the effect (2-3%) is smaller than you would be able to hear, so not worth worrying about. Doing the same exercise with Abel showed nothing visible. Both BelTower and Abel can show errors smaller than what a good ear can detect.

### Sound

Sound is the main (or only) output of a simulator. If you use a software product, then you are reliant on the sound capability of the computer on which it runs. This is often of limited volume, which need not be a problem in a reasonably quiet ringing room, especially if the hardware can be perched on a chair in front of the student (\*BELLS or PC products running on a laptop). If you use a desktop machine in a fixed location, then you might need external power speakers. RingLeader is both portable and has a built in amplifier.

The sound from different products varies quite a lot. \*BELLS uses a synthetic beep, which doesn't sound like a real bell, but is perfectly adequate for training purposes, and in a few situations can even make it easier to hear the striking. Most simulators use some sort of 'real bell' sound. Which of these you find aesthetically pleasing is probably down to personal choice. Most simulators let you raise or lower the note. Low might be more resonant, but higher is often easier to hear, which should be the main criterion when using a simulator.

## What they can do

Table 2 shows a few key facts about each product.

Table 2: Comparison of main functions

| Product    | Ring with real bell | Ring from keyboard | Ring all bells | Review striking | Bells  | Methods built in | New methods |
|------------|---------------------|--------------------|----------------|-----------------|--------|------------------|-------------|
| Abel       | Y                   | Y                  | Y              | Y               | 3 - 22 | 126              | Y           |
| BelTower   | Y                   | Y                  | Y              | Y               | 3 - 16 | 171              | Y           |
| RingLeader | Y                   | -                  | Y              | -               | 5 - 12 | 176              | -           |
| !Stringing | Y                   | Y                  | -              | -               | 3 - 12 | 133              | Y           |
| (*Bells)   | Y                   | -                  | -              | -               | 5 - 12 | 176              | -           |

## Flexibility

Any training aid needs to be easy to use, and flexible enough to fit in with your training needs. If you are a tutor, the training tool should not get in the way of how you train your pupil, particularly in the early stages.

A traditional problem with simulators has been getting the pupil and the machine to start in time with each other. A nervous pupil needs time to settle down with the bell itself before being pitched into rounds, so it is useful to let the pupil start first and then bring in the other bells.

Abel offers an auto-start feature. The ringer starts, and after a couple of whole pulls the machine joins in at the right speed and with the bells in the right place. This simplifies things providing that the ringer is reasonably confident. Hesitancy in the first few strokes can cause the machine to ring very slowly, or even to come in at the wrong stroke, so always wait a few blows for a nervous pupil to settle down first, and then turn on auto-start. RingLeader provides a slightly simpler auto start, so that the simulator comes in at the correct time to fit in with the ringer, but at the preset speed (which you will normally have set to suit the bells anyway). BelTower doesn't have an auto-start, but if you start it and pause it, and then let the ringer settle down to a comfortable speed, when you un-pause it, it rings at the ringer's speed. You have to press the buttons at the right times though, since it carries on where it left off in the row.

If a pupil has difficulty with the speed, it is very handy being able to adjust it up or down a little while ringing. If a pupil gets significantly out of place (rather than just being a little erratic) it can be handy to be able to pause for a fraction of a second and then continue the other bells, to make them fit in with the pupil, rather than having to talk the pupil through a lengthy adjustment during which the striking is confused. Stopping and starting for a second or less requires a simple easy control - ideally a push-push control on the same key.

BelTower has a mode where it will stop and wait for late blows, or pull in over close blows. This would provide a degree of speed adjustment with a steady ringer, and would ensure that the place moved to fit in with an unsteady ringer. I have not tried using it in the tower, but I would be concerned that it would remove the stable rhythm that a simulator ought to provide.

One feature I find particularly annoying as an instructor is when the software won't let me be in control. For example, if a pupil is having difficulty, I want to call stand on what I can see will be a good blow, with the ringer in enough control to stand the bell. I also like to let more confident pupils call stand for themselves when they are ready to stop. That is easy if the machine stops on completion of the whole pull when you press the button, as the simpler simulators do. Abel and BelTower don't do that, because they include a simulated voice, which calls stand at the end of the first whole pull, and then stops the ringing a whole pull after that. The voice is useful if you are ringing on your own, and you want to enter a touch that the machine will call for you, but for normal use it needs turning off, which both let you do but neither does what I would expect. BelTower just does an instantaneous stop and Abel still adds the extra whole pull delay while showing 'Stand' on the screen. It can also do an instantaneous stop. An instantaneous stop does the job, but means that the instructor has to press the button at exactly the right moment after stand is called, or have a messy finish.

Some instructors like to start a beginner ringing with simplified sound, gradually building up to full rounds - say only 2 and 3 audible at first, then 2, 3 and 4, and so on (to a six-bell rhythm) with the beginner ringing the 3rd. That requires selectively silencing some of the bells and then bringing them back in. RingLeader and Abel both let you turn each bell sound on and off during the ringing. You can make bells silent with BelTower, by allocating them as additional 'ringers' bells that are not used, but you can't do it during the ringing, because using any of the menus stops BelTower ringing.

Finally, if the default settings when the program first runs are different from what you normally need, it is handy not to have to change them every time. When I left the program, both Abel and the updated version of BelTower automatically saved the changes that I had made. The others don't save any settings.

Table 3 shows a summary of these flexibility factors. 'Y' means it does it. A comment in (...) means it is achieved with some limitation. '(Y)' means you have to change something from the standard settings in order to do it.

Table 3: Comparison of flexibility and control

| Product     | Ringer start first | Start on demand | Pause / continue | Auto-start | Change speed while ringing | Stand on demand | Silence some bells  | Settings saved |
|-------------|--------------------|-----------------|------------------|------------|----------------------------|-----------------|---------------------|----------------|
| Abel        | Y                  | Y               | Y                | Y          | Y                          | (Instant)       | Y                   | Y              |
| BelTower    | (Y)                | (Y)             | Different keys   | -          | Y                          | (Instant)       | (While not ringing) | Y              |
| Ring Leader | Y                  | Y               | Y                | Y          | Y                          | Y               | Y                   | -              |
| !Stringing  | -                  | Y               | Y                | -          | Y                          | (Instant)       | -                   | -              |
| (*BELLS)    | Y                  | Y               | Y                | -          | Y                          | Y               | -                   | -              |

## Efficiency

A good simulator should do what is needed with the minimum fuss and complication. In a training session, you want to focus on the student, not the computer, so ideally the simulator should add as little distraction and delay as possible. One well used practical measure is how many keystrokes (key presses or mouse clicks) that you need to perform frequently repeated tasks (see Table 4).

Table 4 keystrokes needed for common operations.

| Product    | Set ringing options <sup>1</sup> | Set same again   | Different method <sup>2</sup> | Different stage <sup>3</sup> | Different bell rung |
|------------|----------------------------------|------------------|-------------------------------|------------------------------|---------------------|
| Abel       | 0-5                              | 0                | 1                             | 1-5 <sup>4</sup>             | 1                   |
| BelTower   | 1-10                             | 0                | 4                             | 4-6 <sup>5</sup>             | 5                   |
| RingLeader | 4/5                              | 1-5 <sup>6</sup> | 4/5                           | 4/5                          | 4/5                 |
| !Stringing | 11                               | 11               | 11                            | 11                           | 11                  |
| (*BELLS)   | 4-5 <sup>7</sup>                 | 1-5 <sup>8</sup> | 5                             | 5                            | 5                   |

## Other factors

Several other factors might influence your choice of simulator. For example in an open ringing room, you probably need to be able to unplug and carry the equipment away with you. That is easy with RingLeader, which is a small box, or \*BELLS (which does not need a display). With any of the PC based products you would have to use a laptop machine, probably costing more than a desktop machine. In a small ringing chamber with no convenient ledges or tables, you might also be constrained to use something that can be perched on a box in the corner. If you need to minimise cost, you might be limited in what sort of computer you can obtain for nothing, which could also limit your choice.

<sup>1</sup> Typical figures. The higher is first time, but could vary depending on what you want to do. The lower figures are for subsequent times doing the same thing.

<sup>2</sup> Same stage

<sup>3</sup> Number of working bells.

<sup>4</sup> 1 for rounds, 5 for different stage method

<sup>5</sup> 4 more bells in rounds, 6 fewer bells for method.

<sup>6</sup> 1 after pause, 5 after stand.

<sup>7</sup> 5 for doubles

<sup>8</sup> 1 after pause, 5 after stand.

## The heavyweights

This section explores in more detail the two heavyweight simulator software packages that are currently available, in three broad areas:

- Advanced training facilities
- Other functions
- Ease of use

### Advanced training facilities

What makes a simulator valuable as a training aid, over and above the basic functions? How can it help to develop skills more effectively?

#### Feedback

Feedback on performance is one of the most important components of any training. In this case, performance means striking. A basic simulator provides more feedback than live ringing, because the ringer knows that any audible imperfections are self-caused. A significant advance in recent simulators is to provide objective review of striking after the ringing has concluded. Not only is one's brain freed of the immediate pressures of ringing the bell, but seeing any patterns of when errors develop, whether they are wide or close, at hand or back, at lead or lie, hunting up or down, etc, is extremely useful. It helps to understand why the striking was good or bad, and therefore what to do about it. It can do for striking what the video camera does so well for bellhandling, by showing things that one might not have been aware of while ringing. Both products provide this facility, but in different ways.

With Abel, at any time you can open a display showing the position of every blow in the previous touch. This is simple and easy to use.

BelTower requires a bit more effort. You have to remember to press 'record' (which also starts the ringing automatically) instead of 'start'. It also has a maximum limit on the number of rows it records, so it would be sensible to put in a large number and save it to avoid losing the end of a touch.

The two error displays are similar, but Abel marks where you should have struck as well as where you did. Abel tells you overall error at both handstroke and backstroke as a percentage, and also shows you whether overall errors tended to be early or late, which is useful for detecting any biases in ringing style. BelTower shows 'faults' for each row and total 'faults'. It does not give hand-back or early-late indication. BelTower also lets you listen to what has been recorded.

Both Abel and BelTower show a one line version of the error display during the ringing, so the instructor can see the size of errors being made by the student, as well as hear them.

#### Odd struck bells

Odd-struck bells (and odd-struck ringers) are facts of life, and being able to cope with them is a necessary skill. Any simulator helps to develop this ability because it forces the ringer to focus on the sound produced, and to rely much more on ringing rhythmically. Being able to switch a bell from odd struck to not odd struck would be a very useful training feature, but so far no simulator has offered it. Both Abel and BelTower provide the ability to introduce various sorts of wrong striking (but not making the bell being rung odd struck). This facility can be used to demonstrate what varying degrees of bad striking sound like.

Making the other bells strike badly in various ways can also be used to give the trainee a 'bumpy ride' but whether that is worth doing with a simulator if you have real ringers available is open to question.

### Other functions

#### Voice calls

I mentioned voice calls above as getting in the tutor's way. If you want to ring a long touch on your own, and have the machine call it for you, this is obviously a very useful feature. Both Abel and BelTower provide a repertoire of built in calls, and you can add your own as well.

#### Changes display

Ringing with a simulator, you should not be looking at the screen, but it can be helpful for the instructor to be able to see what is going on, especially if the ringer gets lost. Using the software on your own from the keyboard for method practice, the display can also be very useful if you go wrong, to help put yourself right. Both products show the rows being generated in real time as they are rung, and scrolling up the screen. By default, the Treble is red and the bell you are ringing is blue, but you can change this, and specify colours for up to 4 other bells in Abel or 2 in BelTower.

Next to each row BelTower displays the number of the place you should be in and the place you actually rang in.

This relates to an alternative way of using it (from a keyboard) by entering the correct place number of your bell in each row, rather than pressing a key at the right time for it to strike in the row.

The timing of the numbers in BelTower can be confusing unless you remember to select the appropriate option. By default it displays each number when the bell pulls off. So what you read does not tie in with what you hear, nor does it align with the striking display above it, which does show each blow as it strikes. This is an option you can turn off.

### **Rope display**

Both products show visual representations of ropes (or handbells), but they are quite different, and reflect what seem to be different underlying design philosophies.

Abel shows rope symbols in a circle. During ringing, the symbols alternate between a sally and a tail end, to show whether each bell is at hand or backstroke. This can be useful when setting up, or if your student gets onto the wrong stroke (and therefore will have difficulty fitting with the open handstroke rhythm). It can also be useful to anyone 'ringing' from the keyboard, where a careless extra press can do what would be physically impossible in the tower.

BelTower has a much more ambitious visual simulation with full animation of ringers as well as ropes. Quite a lot of effort has obviously gone into this. The movement is fairly realistic, and there are all sorts of options including how much of your own rope to show, where the other ringers stand and even the colours of their clothes and the sallies. Less realistic is that if you stop ringing your bell, the rope keeps moving, even though the sound has stopped. From a training perspective, I am concerned to see that so much emphasis in the rest of the simulation seems to be geared to the visual element. For example using the keyboard to ring, the default is to watch the ropes and press the key when you think your bell should pull off, rather than listening and striking in the correct place. Likewise as noted above, the default is for the numbers in the changes window to appear when the rope would have pulled off rather than when the bell sounds. This appears to be counter to the motivation behind twenty five years promoting the use of simulators.

Both products can display handbells instead of ropes, and here too, BelTower animates the movement, whereas Abel simply flips from hand to back. Abel offers the option 'without handles (better for ropesight)', and it is indeed easier to see what is happening. I suspect though that it is not just the absence of handles (which you don't see in real life anyway) but the fact that the bells face you, rather than being sideways on as they are in the handle version (and also in BelTower).

### **Methods**

All simulators come with a ready stock of built in methods - more than most people are likely to need. Abel lists them alphabetically, while BelTower lists things like Plain Hunt and Plain Bob first. It can sort them alphabetically too. BelTower has more built in methods than Abel (171 compared to 126) with a wider choice on lower numbers. Above Major, Abel has slightly more than BelTower. The most conspicuous absence I spotted (BelTower) was Little Bob Maximus, which is a useful method for developing a 12 bell change ringing rhythm - it is very simple, but includes plenty of dodging, and it is short. I suspect it is more likely to be rung than Slinky Differential Little Treble Place, which is included.

With both products it is easy to enter other methods. With Abel you just type in the place notation - in the official CC format, but also allowing for common variations. BelTower's method editor gives you a choice of ways to enter a new method. You can put in the place notation (with one element on each line, rather than just typing it in) or you can type in the actual rows for a lead of the method in full, which generates the place notation for you, or you can enter it 'by blue line'. You don't actually draw the line, but use left, right and down keys to drive individual bell numbers step by step to follow a path through the space where you would type the rows. You can even alternate between this and typing. If you want to remind yourself what the method looks like, BelTower will draw the blue line, starting with your bell, with the Treble line in red. Abel will show you the figures of a plain course, with your bell shown blue and the Treble shown red.

### **Compositions**

An instructor can insert calls during the ringing by pressing the appropriate buttons on either simulator. If you are close enough to the machine, and confident enough to press a key with your spare hand while ringing (or 'ringing' from the keyboard) you can put in your own calls. Both products come with a few compositions built in - single method and spliced. As with methods, the way they each present these is slightly different. BelTower's method choosing window shows what compositions are available for the method you have selected from the method list. Abel works the other way round. It has a composition selector always present above the method list, which shows all compositions available, eg Plain Course (the default), Plain Bob 120, Kent TB 144, Cambridge & Ipswich 720. Selecting another composition removes any methods that it doesn't use from the method list.

Both products allow you to enter your own composition. I correctly guessed how to do this with Abel and had to look at the help file for BelTower. I did not explore this area in great detail, because the further you get away from the core simulator, the less it is relevant to make direct comparisons. BelTower includes considerably more here,

including facilities to prove a composition and print out information on musical rows that it contains. There are other products against which these facilities could be compared (including Ringing Master) but I am not familiar with them.

### **Help**

Both products provide detailed help files. BelTower has the nice feature of opening Help when you first load the software, which might make you look at it before rather than after you get into difficulty, which is what most software users do. I found I needed to use BelTower's help much more than Abel's.

### **Audio tracks**

Included on the Abel CD are some audio tracks of ringing (generated by Abel).

### **Ease of use**

Both products are fairly complex, but both do a reasonably good job of trying to make the complexity manageable. My overall impressions are a combination of many small factors, so I will pick out a few points of comparison.

**Method selection** - When I first ran Abel it looked intuitive. The panel at the left shows selectors for number of bells, method, composition, peal speed and start row. But when I tried to select 6 bells I couldn't (I even typed in 6 but it changed back to 8) and only 8 surprise methods were listed. I puzzled over this for a while, hunting the menus for inspiration. Eventually I had to stop thinking ringing, and think computers instead. The correct action is to select 'Open' from the 'File' menu, which offers a list of files called 10bell, 11bell, 12bell, etc, which gave me a full choice of methods. Once through that hoop, I preferred having the methods permanently visible so that you can just select them. BelTower is the opposite. When I first ran it, it automatically presented me with the option to select the number of bells, with a list of methods for each. That was easy, but I found it less convenient having to use the menu and go back to the selection panel every time I wanted to change a method.

**Speed control** - This is direct in Abel - just nudge the peal time up or down by a minute, or type in a new value. BelTower speed is not visible. You can set it as an option, but the units are arbitrary - the same number gives a different speed depending on how many bells are ringing. It was easy to change while ringing though, with the up or down key (but don't hold the key too long or you might get more speed change than you intended).

**Choosing which bell to ring** - With BelTower, you have to select this in the options page, but with Abel you just click on the bell you want in the rope circle and it moves round to your position. (Despite this simplicity, with multiple bells connected, I have seen other people tie themselves in knots trying to get the intended physical bell to strike the intended simulated bell during courses.)

**Key commands** - Mouse pointers are good for learning how to do things, but being able to use a key can be more reliable when your main concentration is on what the student is doing. Both BelTower and Abel provide keys as alternatives for most common actions. These are mainly function keys (F1, F2, ...) with or without 'shift' or 'control', and a few others like 'Escape', so you need to do some learning. BelTower prompts you for the key to start, but not for any others. Abel helpfully uses the same key for pause and resume, but BelTower uses different ones.

## **Conclusion**

Conducting this review has been an interesting exercise. I spent a lot of time digging and experimenting with the more complex products - probably more than many of their owners do - and I have learnt quite a lot about them that I did not previously know. Since I installed my own simulator many years ago, my main encounters with a new type of simulator have been under pressure in a strange tower, when I needed to bring myself rapidly up to speed with what it could and couldn't do, so that I could get on with running the course. I have used most of the products in this way, and in recent years, I have often found that simulator owners are sometimes not aware of things that I have discovered on previous encounters.

All of the products reviewed do the basic job, and if you don't currently use a simulator in your tower, I would be happy to recommend any of them as worth using. Obviously some are more capable than others, and given the choice, you need to balance the constraints that apply to equipment in your tower, and the relative importance of the additional facilities that they offer. The quirks you can probably get to live with if you have to.

Abel for Windows presents a very useful set of facilities. It meets almost all my requirements for a simulator, and only falls short on very minor points. It is fairly complex, so you need to invest effort learning how it works, especially if you want to benefit from its extra facilities. Its timing is very robust and almost completely immune from the odd timing glitch caused by the Windows operating system.

BelTower is a more complex piece of software that aims to do considerably more than provide a ringing simulator. It meets many of my requirements for a simulator, but falls short on a few features. Overall, I found it slightly less easy to use, though in a few areas it is more intuitive than Abel. It seems more complex, partly because of the

complications introduced by the quite realistic visual simulation of ropes and ringers. Its timing is less robust than Abel, running on the same machine, but should be adequate providing you avoid using the features that cause Windows to cause glitches. BelTower's other facilities include an interesting method editor, touch editor, touch prover, etc, which would be more logically compared with other software written for that purpose. It is notable that BelTower does not describe itself as a simulator, but as 'multi-function software for bellringers'.

Do not rule out the alternatives to these two. Physically, RingLeader is a simpler, lighter box than even a Windows laptop. \*BELLS (on a BBC-B) is even simpler to use (with no screen needed) and easily portable. If you happen to have the hardware that supports them, then !Stringing (or DOS ABEL) are quite usable as basic simulators.

Which option is best for you, depends on the constraints and needs of your tower, whether you want it for use as a tutor or for personal use, and what you want to use it for. The option that I would recommend avoiding is not to have a simulator available for training in your tower (or having one and not using it).

*John Harrison - March 2004*

## **Suppliers and websites**

Please note that the review cannot cover all details of any products, and most of the suppliers contacted have indicated that they are considering future upgrades, so for fuller information, including any updates, please consult the respective web site or contact the supplier direct.

David Bagley,  
38 Ashchurch Road, Newton, Tewkesbury, GL20 8BT.  
David@ringing.demon.co.uk  
<http://www.ringing.demon.co.uk>  
[RingLeader, (\*BELLS), sensors for all simulators]

Derek Ballard,  
23 Laurel Road, Honiton, Devon, EX14 2XN.  
Derek.ballard@beltower.co.uk  
<http://www.beltower.co.uk/index.htm>  
[BelTower]

Chris Hughes,  
8 Daisy Bank, Audlem, Crew, CW3 0HD.  
Abelsim@iclway.co.uk  
<http://www.abelsim.co.uk>  
[Abel].

John Norris,  
The Birches, off Wickham Hill, Hurstpierpoint, West Sussex, N6 9NP.  
JRN@norbirch.demon.co.uk  
[!Stringing]