

GENERAL

Access to the church is by a flight of steps up from the road and then by a sloping path and two further steps up to the south porch. There are three steps down from the porch to the nave floor which is stone flagged and level back to the tower where two steps lead up to the tower floor. The door from the porch to the nave measures some 41" wide and thus any of the bells would easily pass through if required. There is a high churchyard wall to the west of the church with only a very narrow path between the two and thus unfortunately it would not be possible to use the tower west door should any of the bells ever have to be brought out.

The church possesses a two-stage tower situated conventionally at the west end of the building. The tower has no buttresses. There is a stair turret in the thickness of the south-west corner which provides access to the intermediate chamber only. There are no clock dials and the tower does not appear to have the benefit of any lightning conductor.

The ground floor area of the tower serves as a ringing chamber as well as having fixed cupboards for general storage. The chamber is some 25' tall and as such is much too high to allow safe and comfortable rope handling. There is a central hatchway framed in the ceiling through which it is presumed any of the bells could pass if required. There is a west window with a door beneath some 48" wide and with five steps up to the doorway. The east tower arch is filled by a glazed timber screen incorporating a central door measuring some 31 3/8" wide and thus not wide enough for the bells to pass through. The available floor area is effectively reduced by substantial fitted cupboards on the north and south sides and also by the bottom step to the west door, the step spanning the full width of the tower. There is an Ellacombe chiming frame fixed to the south wall from where any of the four bells may be sounded. A door in the south-west corner leads to the stair turret.

The intermediate chamber is about 7' 6" tall and is lit by a wired window on the east side. A ladder in the south-west corner leads up to the bellchamber above.

The bellchamber is about 11' tall to the eaves with a low pyramidal roof above. There are adequate lifting points available within the roof structure from which lifting tackle might be suspended if required. There are sound openings to all four sides, all close louvered but entirely without any wire netting. A platform above the tenor bell provides access to a hatchway out onto the tower roof.

We could see no signs of any structural distress which might be attributed to the ringing of bells. One matter about which we were seriously concerned was the security and safety or otherwise of the intermediate chamber floor. We cannot recommend too strongly that the condition of the supporting joists to this floor be carefully inspected especially where they enter or are in contact with the walls.

BELLS

The church possesses a ring of four bells the details of which are as follows:

bell	diameter	weight	note	date	founder
Tenor	38 3/4"	10cwt	G	1637	Thomas Pennington II, Exeter
Third	35"	7 1/2cwt	A#	c.1450 I.T., Exeter	
Second	32 1/2"	6 1/4cwt	C	1904	Mears & Stainbank, Whitechapel
Treble	31 5/8"	6 1/2cwt	C#	c.1430	Robert Norton, Exeter

The three older bells were all originally made with canons or supporting loops and second made with Doncaster canons, all of which have subsequently been removed. The second bell was made with a centre hole for an independent crown staple. The three older bells were all originally made with cast-in crown staples, the crown staple being the part from which the clapper hangs. These staples have since been cut away and centre holes drilled for independent crown staples, the badly corroded stumps of the original staple still remaining in the crown of the treble bell. It should be noted that cast-in crown staples and their remains are by far the most common cause of old bells becoming cracked. The staple is of wrought iron while the bell is of bronze and cracks are caused by a combination of differential expansion between the two metals and corrosion and consequent expansion of the wrought iron staple.

The tenor and treble have been eighth-turned and the remaining two bells quarter-turned, all in order to bring new faces to the blows of their clappers. Wear at the present strike points is below 1% of total thickness, 10% being generally accepted as the wise maximum.

The tenor and third bells have no tuning marks. The second bell has been machine-tuned at its soundbow. The treble has been extremely heavily chip-skirted or had its lip largely removed as a result of which the bell is now a very strange shape. The frequencies of the principal and main partial tones are as follows all expressed to the nearest half-hertz:

bell	hum	fundamental	third	fifth	nominal
Tenor	213.5	381.5	478	625	798.5
Third	239	440.5	554.5	757	926
Second	295.5	509	641.5	853.5	1045
Treble	284	557	675.5	868.5	1114.5

Consideration of the nominal or principal notes shows that they are wildly out of alignment, in particular the tenor is extremely flat, and as such the notes of the four bells do not form the lower four notes of a major scale as is traditional. Closer analysis of the various partial tones or harmonics shows that they are mostly wild, it being these partial tones which control the tonal quality and timbre of any individual bell. Tonally the tenor and third are quite poor, the second fair at best and the treble extremely poor. It is interesting to note that the harmonics to

the treble are perhaps the closest to correct alignment of any of the bells though the way in which the lip of the bell has been so badly butchered in the past has encouraged the production of a number of other extraneous harmonics which explain the unfortunate sound the bell produces.

The tenor bell has two visible cracks in its crown running from the original crown staple position, it being likely that these cracks are longstanding. Until such time as the bell is completely dismantled the full extent of any cracks will not be clear. The remaining three bells all seem to be sound though only complete dismantling would allow a proper examination to be made.

The third and treble bells are listed by the Council for the Care of Churches as being worthy of preservation.

FRAME

The bellframe to the three larger bells consist of sills, curved braces, very tall corner posts and long frameheads, all mortised and pegged and with some tie-rods having subsequently been fitted. The frame is supported by four oak joists spanning the tower north-south which rest on shallow offsets to the tower walls. An additional frameside has been added at some time on the east of the original three-bell frame and standing entirely in the window reveal, with a further section of framehead installed across the east end of the third pit in order to carry a fourth bell. The original three-bell frame has every appearance of being medieval in date although it is difficult to be any more precise. The age of the section added on the east side is also not certain though is likely to be C17th and thus probably coeval with the tenor bell.

The western-most foundation joist and the sills above it have almost entirely rotted away due partly to having been in contact with the damp walls but also because of their exposure to driving entering through the sound opening. Although the decay in this area is severe it is fortunately not such as to affect the basic stability or safety of the bellframe as a whole provided the bells are not swung. The frameside which was added on the east side is extremely badly decayed and suffering from death-watch beetle infestation and as such is now in extremely poor condition. The condition of this frameside is now such that any attempt to swing the treble bell might lead to its collapse.

The bellframe is generally loose in its joints and can be freely swayed from side to side in a north-south direction within the limits imposed by the timbers which are set across the tall corner posts and the ends of which are close to the tower walls.

The original three-bell frame is of considerable interest and importance due to its antiquity, there being almost no other frames of this age surviving in Devon. It has been said that the bellframe at Hennock is the oldest surviving in Devon and although any certainty in such a matter is difficult that could certainly be the case.

FITTINGS

Most of the ringing fittings date from 1989/90 when the bells were restored by Arthur Fidler, a local bellhanger who has recently retired. The headstocks are of cast-iron with steel

gudgeons set in true alignment, all running in double row self-aligning ball bearing races housed in cast-iron plumber blocks. The tenor wheel appears to be a second-hand item, those to the other bells having been re-rimmed. The pulleys consist of nylon sheaves running upon ball bearing races all housed in timber boxes. None of the bells has a stay or slider mechanism although there is ample evidence that stays and sliders were originally fitted. The clappers are of malleable iron and hang from independent crown staples.

All the headstocks are in excellent condition. Measurement and subsequent calculation has shown that the hanging radii are reasonably well graded.

All the gudgeons seem sound and tight. Without complete dismantling it is not possible to comment in detail about the condition of the internal bearing components although bearing in mind their age no problems are expected.

The three smaller wheels were relatively crudely re-rimmed and one of the solings to the third wheel is far from circular, though overall the wheels are sound enough.

All the pulleys are in good order.

All the clappers are in good order.

All the bellropes are in good order.

RECOMMENDATIONS

BELLS

The fact that the bells are so badly out of tune is most unfortunate. In considering the tuning of the bells it is perhaps worth noting at this point that bells do not go out of tune to any extent, it is simply that the bells at Hennock were never in tune with each other in the first place. There is a natural presumption against tuning any listed bell, the third and treble being so listed. The fact that the treble has been so brutally tuned by skirting in the past is unfortunate.

We have looked in considerable detail at the tuning figures for this ring of bells and recommend that the medieval third bell be left untuned and the other three bells be tuned to bring them into line with it. This solution leaves the better of the two medieval bells untuned, whilst tuning of the treble would be expected to bring about something of a transformation in its tonal qualities thus undoing some of the damage done in the past. Overall this solution seems to us the best possible way forward and would leave the four bells in a proper pitch relationship whilst at the same time allowing tonal improvements to the three bells to be tuned.

Until such time as it has been dismantled the full extent of the cracks to the crown of the tenor bell cannot be ascertained with any certainty. It is entirely possible that the cracks can merely be noted and left as they are, although it is also possible that repair by specialist welding will prove necessary.

FRAME

The condition of the part of the bellframe which supports the treble bell is in our view not now in good enough condition to support the dynamic loads which would be imposed if the bell were to be swung. We therefore strongly recommend that no further attempt should be made to swing the treble bell. There is no reason why the chiming hammer cannot be used in the very short term. However the part of the bellframe in question is now in such poor condition that it is fast approaching the time when the bell will need to be removed from it for reasons of safety.

If the bells are never to be swung again the decayed area on the west side at sill/foundation level need not be a serious cause for concern. If the bells are to be swung, however, action will need to be taken to stabilise the frame where decay has set in.

If the bells are only to be chimed in the future and thus not swung at all we believe that replacement of the east treble frameside would suffice to leave all safe and useable in the medium/long term. This would be a shame as the bells were always intended to be sounded by swinging, in fact there is every sign that the bells were once rung full circle, and there is no doubt that a bell being swung sounds incomparably finer than one hung for stationary chiming.

If the bells are to be capable of swing-chiming or full circle ringing the only sensible way forward is to rehang them in a completely new bellframe. Because of the considerable antiquity and historical importance of the present bellframe it is highly unlikely that a faculty would be granted for its removal. Measurement and subsequent calculation has shown that there is just sufficient space in the intermediate chamber to install the bells there in a new bellframe, either for swing-chiming or traditional full circle ringing. With the bells rehung in a new bellframe in the intermediate chamber the existing bellframe could remain in-situ and therefore retained for posterity. We enclose a drawing which illustrates the layout we propose, from which it can be seen that our design leaves sufficient space inside the doorway for a ladder up to the present bellchamber. In order that the sound of the bells at their new lower level can be heard clearly outside the church it will be necessary to remove the existing bellchamber floor. Fortunately the bellchamber floor is of no great age, much of it having apparently been replaced when the bells were last attended to less than fifteen years ago.

FITTINGS

If the bells are to remain static there is nothing which needs to be done. If, however, the bells are to be rehung in a new bellframe lower in the tower measurement has shown that unfortunately two of the headstocks would need to be replaced and two heavily modified. The likely need for replacement gear is especially unfortunate given that much of it is less than fifteen years old. We have taken detailed measurements but have to conclude that replacement is entirely unavoidable.

CONCLUSION

The fact that a partial restoration of the bells was undertaken in such recent years makes it all the more unfortunate that extensive works are now required if the bells are to continue to serve the parish well. With the bells retuned and rehung in a new bellframe with new fittings the parish would finally be provided with an installation in excellent order and capable of serving well for many years to come.

I trust that the above report is of interest and assistance. If there is anything further we can do to help do please let us know.

Andrew Nicholson

Managing Director

25th September, 2001.

