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## Ring masters The Boston Globe

### Think all church bellringers are created equal? To join this crew, it helps to be a rocket scientist.

By Janice O'Leary, Globe Correspondent | December 24, 2006

Bing never crooned about these bells.

They aren't silver. Made of bronze, they don't jingle. And no Quasimodos lurk in the recesses of their towers.

And Bing Crosby wouldn't know what to make of the people who come to play them. They don't exactly produce Christmas carols like the ones he used to know.

You'll see them at the Old North Church and the Church of the Advent on Beacon Hill. For most, it's a trip across the river: They're usually MIT students or grads. They come, always in groups, to grasp the dangling ropes and pull for all they're worth. But that's precisely where the "White Christmas" imagery breaks down.

The members of the MIT Guild of Bellringers are practitioners of what is called "change ringing." They strive to follow a pattern of notes called a method, instead of a sequence of notes forming a song. Rather than reading a sheet music score, bellringers memorize diagrams, rectangular blocks of numbers that dictate the order in which to ring the bells. There is no recognizable tune.

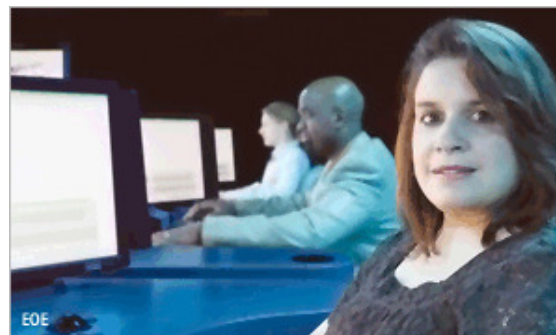
At first the bells emit a dissonant, slightly out-of-tune, metallic clang. After a few rounds, they begin to sound more musical, and you feel as though you've been transported to a European piazza on a Sunday morning.

Bellringing might seem an unlikely team sport for engineers and math wizards, but Cally Perry, the ringing master at the Church of the Advent, said they go hand in hand.

"Bellringing attracts computer people because they are one of those groups that love beautiful patterns and have an ability to recognize patterns," said Perry. "That's what makes people who love computers love bellringing."

Each of the eight bells at Old North and the Church of the Advent are numbered, beginning with the lightest bell, the treble, number one, and progressing to the heaviest, the tenor, at number eight. At Old North, the treble weighs about 500 pounds and the tenor nearly 1,400. Each also rings a particular note: The treble is tuned to an F, as is the tenor, but in a lower octave. They are among the few change bells in Massachusetts. Because the patterns are rung in an orderly sequence of numbers, said MIT sophomore and Old North ringing master Mish Madsen, it's a good fit for the mathematically minded. Ringers don't necessarily have to be musicians, but "it helps to be

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used to thinking about numbers, and it's useful to talk about bells in terms of number theory and permutations," she said.

For instance, you may need to calculate the possible number of changes depending on the number of bells. With six bells, you have 720 changes, or 720 lines to diagram. With seven bells, there are 5,040 changes, which makes up more than a peal. A peal is 5,000 rings without a break and takes three hours to do -- "a marathon for bellringers," said Danielle Morse, the tower captain at Advent.

"Ringing is music that's unlike any other kind of music," Perry said. "There's an inevitability to it." And it's more intellectual engagement than holiday entertainment.

Playing a tune on a conventional church bell is called "chiming" and happens when a hammer hits the outside of a bell.

But in change ringing, the bells are mounted on enormous wheels that are affixed into a square wooden frame. When a ringer pulls the rope two floors below, he or she is pulling on the wheel, not the clapper, moving the bell in a 360-degree arc, from noon to noon, with each pull. The bell sounds at the 9 o'clock position, when the clapper catches up with the bell. Only one bell sounds at a time.

"Striking a tower bell is very difficult," Perry said. "You pull, wait, and then when your hands on the rope reach your nose, the bell sounds. It's . . . like playing the drums by standing 30 feet away and throwing a softball at it.

"Imagine doing jumping jacks, counting to eight, and you care that your hands are out straight on three," she said. "You can consciously fit in when you're supposed to ring like that, or you can look around and find the person you're ringing after, but you have to find a different person every ring."

This is how Madsen learned to ring bells -- through ropesighting. Instead of memorizing the entire method or playing by ear, she locates the person she'll follow each time and when that person's rope reaches a certain point, she tugs on hers. Often the ringing master will call the next line in the diagram, signaling the bells to swap places in the sequence.

On a recent Sunday morning at Old North Church, the sun poured into the bell tower and the guild members rang hunts -- the treble "hunts" diagonally on the diagram from front to back -- on the very bells that Paul Revere used to ring.

One person pulled at each of the eight ropes, in what first looked like a random order with random timing, but soon a descending scale was discernible. The 3-foot-thick brick walls actually swayed, as they are built to, with the vibrations of the bells.

Morse, an MIT alumna, led the first round, shouting "5 to 3," then "5 to 2," and finally "5 to treble." She was calling the bells to change places, which is where change ringing gets its name.

The eight change ringing bells at Old North Church are the oldest in North America, said Morse, and were cast in 1744 by Abel Rudhall in Gloucester, England. They came to the North End in 1745 after serving as a ship's ballast on their trans-Atlantic journey. In 1750, Paul Revere signed a contract to ring them. Twenty-five years later, he arranged for the church sexton to hang lanterns as a signal to other patriots about the movement of British troops before he and William Dawes set off on their famous midnight ride.

"Knowing that he went up the same narrow stairs . . . that is really, really cool for me," said Madsen, who grew up in Newton. "It makes this a very authentic experience."

The bells at the Church of the Advent were cast in 1900 at the Whitechapel Bell Foundry in London, the same place that cast the Liberty Bell in 1752.

"They are tuned in E flat," said Perry, "just the right key for Tchaikovsky's 1812

Overture . So on the Fourth of July, they ring to accompany the Boston Pops on the Esplanade. They mike us and swap us in."

For 70 years , the Advent bells lay nearly dormant because its Beacon Hill neighbors complained of the noise. In 1971 they were rediscovered and rang in the New Year in 1972 . Since then the church tower has been soundproofed so efficiently that the bells can hardly be heard just a block away.

On New Year's Eve and July Fourth, the MIT guild rings a special technique to celebrate, which Madsen was practicing that recent Sunday at Old North -- they "fire" the bells.

Firing is the only time all the bells ring at once, and it sounds like hands banging on a piano. "First we have to raise the bells," Morse said. "Get them all so they are at the top of their arc."

Because of the varied weights of the bells, balancing them upside down poses a challenge. Once the bells are set up, however, the guild members pause. They then all pull at the same time, and the bells sound simultaneously, a treat for both the ringers and listeners.

Next Sunday, as revelers raise their glasses, listen for the guild to fire off a toast to the year ahead.

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