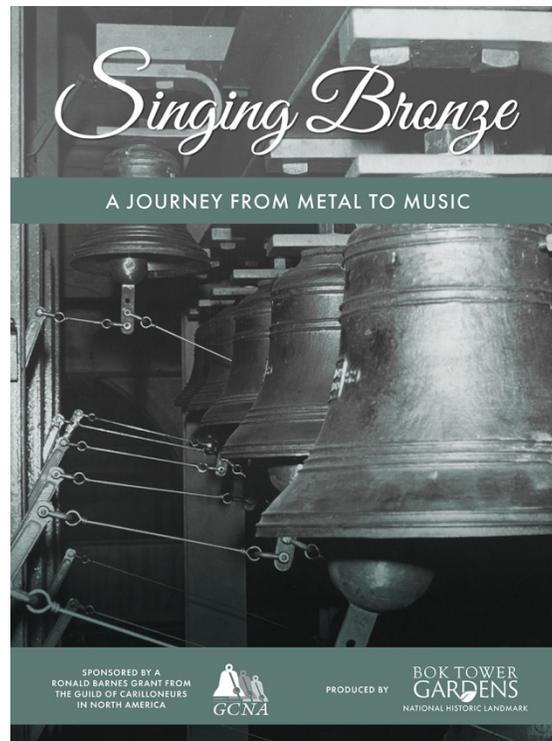


Singing Bronze

EXHIBIT INFORMATION SHEET

DESCRIPTION:

Singing Bronze features information about the process of bell founding. Photographs, infographics, and details from a variety of sources share the story of a bell being cast, from the creation of its inner core to the sounding of its sonorous overtones.



BACKGROUND:

Casting a bell is a very involved and technical process. It is one that many people do not understand and thus are less able to appreciate the hard work, craftsmanship, and artistry that go in to creating them. This exhibit seeks to educate the public-at-large about bell founding so that they may better understand and appreciate the carillon(s) and other bells their community.

TRAVELING VS PERMANENT:

There are 2 different ways by which you can bring *Singing Bronze* to your community; 1) you can borrow the **traveling** set or 2) you can have your own **permanent** set. Please read through all of the details below to determine which is right for you.

COSTS:

This exhibit is funded by a Ronald Barnes Memorial Grant from the Guild of Carillonneurs in North America (GCNA) and is provided free of charge, however there are still some costs associated with hosting the exhibit:

	Traveling	Permanent
Borrowing or Licensing Fee	\$0 courtesy of the GCNA	\$0 courtesy of the GCNA
Printing costs	Optional, template banner estimated \$85-100	Yes, estimated \$1000-1200
Hardware costs	No, included	Yes, estimated \$800-1000
Shipping costs	Yes, varies by location	No
Total costs:	\$0-100 + shipping costs	\$1800-2200

Traveling:

Hosts of the traveling exhibit are responsible for shipping costs* (including insurance) and will be required to sign a loan agreement. The host is responsible for the cost of repair or replacement should the exhibit sustain any damage. Hosts are also responsible for the cost of printing the template banner should they desire to have one for their location.

*Although efforts will be made for the exhibit to pass from one location to the next without returning to the GCNA archives, hosts must be prepared to pay shipping costs both To and From their location.

Permanent:

Those who desire to have their own permanent set of the exhibit will not be required to pay a licensing fee, but will be responsible for all other costs, including printing and hardware.

WHAT'S INCLUDED?

	Traveling	Permanent
Banners	Yes	No
Hanger bars	Yes	No
Hanging cables & hooks	Yes	No
Digital files for banners 1-11	No	Yes
Digital files for template "About your Instrument" banner	Yes	Yes
Physical Ownership	Temporary; returned to the GCNA Archives after borrowing period is concluded	Permanent; yours to keep
Rights	No	No

DIMENSIONS:

11-12 banners

Hanger bar width: 38"

Total: 35 - 38 linear ft

#	Title	Dimensions	Notes
1	Singing Bronze	36" w x 48" h	Title banner
2	What is a Carillon?	36" w x 48" h	
3	Core & Cope	36" w x 48" h	
4	The Method: English vs. False Bell	36" w x 48" h	
5	Inscription & Decoration	36" w x 48" h	
6	Metal	36" w x 48" h	
7	The Art of Casting	36" w x 48" h	
8	Tuning	36" w x 48" h	
9	Installation	36" w x 48" h	
10	Keyboards & Playing	36" w x 48" h	
11	Carillons Around the World	36" w x 48" h	
12	Template: About your instrument	36" w x 48" h	Optional Provided with artwork only**

**Artwork for the template banner will be provided for you to fill in and create a banner about your own instrument. The artwork will be provided as a fillable PDF or as an Adobe InDesign file. The cost of printing the template banner is always the responsibility of the host (whether traveling or permanent).

Banners are made of canvas and are hung by means of metal rod supports with eye-loops and cables with hooks. We strongly encourage hosts to use the hanging system as it is very easy to install and uninstall, and is easily adjustable. You are not permitted to use nails or puncture the banners in any way. Installation and packing instructions will be provided.

The spacing and/or grouping of the panels can be adjusted to fit your venue, but it is recommended that panels remain in their proper order.

Those who are interested in a permanent set will be provided with the digital files, printing guidelines to ensure the banners look as intended, and recommendations for appropriate hardware. No manipulation or editing of the files is permitted, with the exception of the template "About Your Instrument" banner.

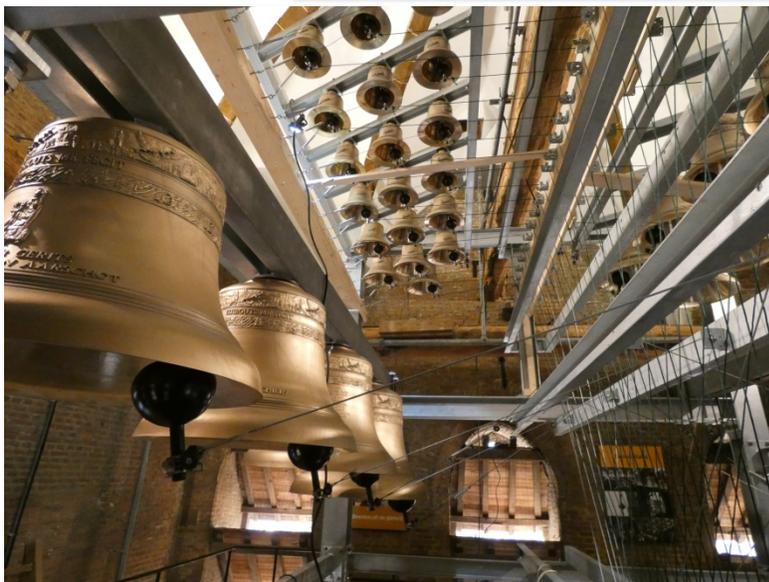
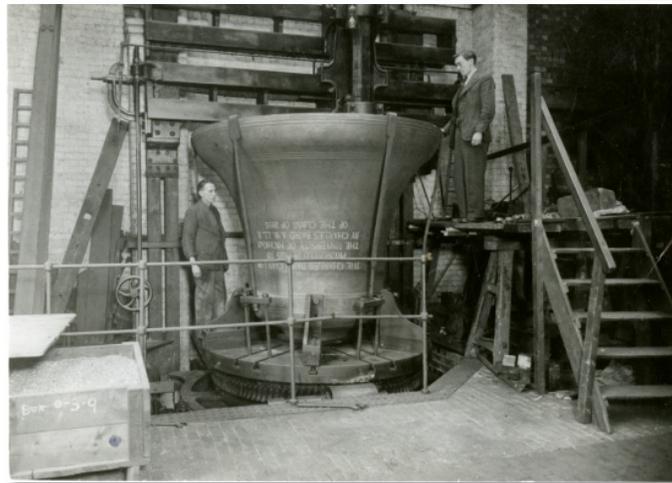
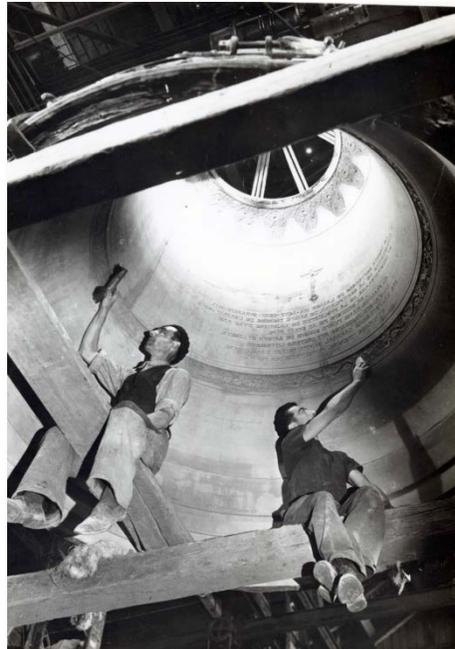
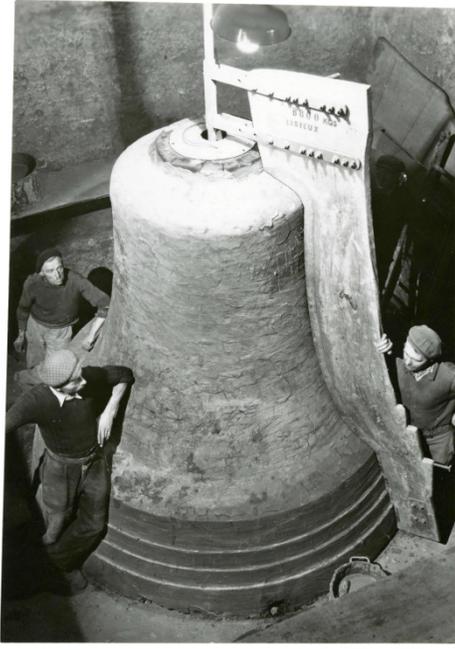
LOCATION CONSIDERATIONS:

The ideal location to display the exhibit may or may not be within your institution itself. For example: if your instrument is housed in a church and the church members are familiar with and supportive of the carillon, you might consider coordinating with another location, such as the local public library, to display the exhibit. Choose a location that will broaden the audience and increase awareness and appreciation of your instrument. The host is responsible for coordinating with the location and arranging the installation and removal of the exhibit. Please have permission of the location and approved dates selected prior to submitting the exhibit request form.

Possible locations to display the exhibit in your community:

- At your institution
- Public library
- Community center
- City Hall
- Local history center
- Visitors center/Travel information center

SAMPLING OF IMAGES:





Metal

COMPOSITION OF BRONZE

Bells are cast from bronze, which is an alloy composed mainly of copper and tin.

DEFINITION
Alloy: a mixture of metals

Component	Percentage
Copper (Cu)	79%
Tin (Sn)	19%
Impurities/Trace Elements	2%

Sometimes the metal from an old bell is reused. The old bell is broken into pieces, melted down, and combined with fresh bronze to make a new bell. In this way, a bell that may have been cracked or broken can live on in a new bell.

Pieces of a broken bell originally cast in 1805 by Paul Revere. It fell victim to a fire and was recast in 1866 by Henry Hooper. After falling victim to a second fire in 2000, it was recast again in 2005 by Meeks & Watson Bell Foundry (Cincinnati, OH). Credit: Meeks, Watson & Company

FUN FACT
It would take the copper content of 580,600 pennies* to make a 100 pound bell.
* Post-1982 pennies.

Bronze being loaded into furnace.
John Taylor Bell Foundry (Loughborough, England)

THE Art of Casting

The core and cope are then sealed together for the casting. Depending on the foundry and the size of the bell, the mold will either be buried in the ground or placed in a secure container called a flask.

The bronze is heated to around 2000° F (1100° C) and then poured into the mold. The molten bronze fills up the space between the core and the cope to create the bell.

Inner and outer molds after being sealed together.
Whitechapel Bell Foundry (London, England).
Credit: Geoff Manough/BLDGLOG

Molten bronze being poured to cast a bell.
Credit: John Taylor Bell Foundry

FUN FACT
The molten bronze is stirred to release any gasses trapped in the metal, ensuring that there will be no air pockets in the bell. Some foundries use a willow branch for this process because the salicylic acid in the wood helps release the gas.

After the metal has cooled, the mold can be unearthened to see if the casting has been successful. To remove the bell, the core and cope are smashed into pieces. Although they cannot be reused, the brick and loam from the broken core and cope can be recycled to make new molds.

DEFINITION
Bourdon: the largest (and lowest) bell in any set of bells

Bok Tower Gardens' bourdon bell, being unearthened after casting. Credit: John Taylor Bell Foundry