NEAR Speakers Take to the Sea Aboard Presidential Yacht

U.S.S. POTOMAC
Docked in Oakland, CA

The Challenge

- Must withstand salt air, rain, and wind
- Provide lifelike sound for safety announcements and music during historical cruises and at dockside for a 165-foot long vessel with a beam of 25-1/4 feet, weighing 376 gross tons and capable of cruising at 10 to 13 knots
- Facilitate clear communication to ship's crew so they can react quickly in case of an emergency at sea
- Meet Coast Guard Specifications and Certification

The Solution

From 1932 to 1945, the United States faced enormous challenges — the Great Depression and World War II. The President during this era, Franklin D. Roosevelt, also faced some personal health challenges. For this reason, he often preferred living and working on board a 165-foot long ship called the *U.S.S. Potomac*. Originally, it had been built in 1934 as the Coast Guard cutter, *Electra*. Some of his fondness for this ship resulted from his love for the sea and Navy tradition. According to historical documents, he felt safe in this vessel since it is constructed of steel rather than wood, which could burn. The *U.S.S. Potomac* is sometimes referred to as FDR's "floating White House."

After FDR's death in April 1945, the *U.S.S. Potomac's* status declined precipitously. The Port of Oakland bought the all-steel vessel for $15,000 from the U.S. Customs Office in 1980. The Port of Oakland led a cooperative effort with labor, maritime corporations and dedicated volunteers to complete a $5 million restoration. The Association for the Preservation of the Presidential Yacht Potomac now operates this National Historic Landmark as an active memorial to FDR and the momentous times through which he led our nation.

As with all federal projects, safety is important. For this reason and because lectures and entertainment held aboard the ship require effective sound systems, the Association decided to install a sound system that would meet the following needs: stand up to salt air, rain, and wind; keep within budget and have supervised volunteers install the system; and meet stringent Coast Guard certification and inspection standards. In addition to dockside tours, cruises are offered from May through October as well as 30 special event cruises held throughout the year. "Visitors celebrate weddings, birthdays, anniversaries and hold fundraisers and banquets aboard the *U.S.S. Potomac*," explained Ms. Marti Burchell, Executive Director of the Association for the Preservation of the Presidential Yacht Potomac. Thus, the sound system must serve the *U.S.S. Potomac* well, like a reliable shipmate, during the spring, summer, and fall.

"Craig Newton, Ship Keeper for the *U.S.S. Potomac* and some technically oriented volunteers selected the Bogen audio system because they felt it would provide long-lasting, high-quality sound," said Marti Burchell. The Preservation Association knew it was time for a sound system overhaul when the ship's original system deteriorated to the point at which it was difficult to hear the historical narrations. In addition, the ship's crew sometimes plays big band music to create a nostalgic environment, reminiscent of the FDR era. "The older audio system couldn't do justice to the pleasant, high-energy big band sound," said Ms. Burchell.

System Components

Realizing that unique products and design would be needed to meet special challenges such as salt air and outdoor operation, it was decided that a combination of 22 NEAR A-Series Loudspeakers (A2T, A6T, A8T), 1 Bogen M-Class Power Amplifier (M600), and 1 Bogen Power Vector Mixer (VMIX) would permit effective communication. These components also provided a benefit in that crew members could themselves install and connect the audio system elements — a true advantage for a nonprofit organization.

BOGEN

The Bogen M-Class Power Amplifier (M600) and Bogen Power Vector Mixer (VMIX), which are linked together, power the NEAR A-Series Loudspeakers (A2T, A6T, A8T). The cassette player and microphone simply feed into the Bogen Power Vector Mixer (VMIX).

The Results

"The sound system we had in the past had been a constant source of concern, as announcements, narratives, and music were marginal at best and at worst could not be deciphered at all. This was particularly critical with regard to safety announcements," according to Burchell.

"Since we have put in the new Bogen system, the sound quality is so superior. The narrations during historical cruises, student cruises, and special events are now clear and easy to understand. Also, the '40s Big Band music on our cruises is now most enjoyable for all of our visitors," said Burchell.

Product Highlights

Speakers

The 22 NEAR® A-Series Loudspeakers (A2T, A6T and A8T) used on the decks withstand harsh weather conditions including rain, wind, sun and salt air without affecting audio clarity and intelligibility. "This was a number one concern the Bogen speakers would have to address," noted Burchell.

The Bogen loudspeakers easily met the challenge, in part, due to the following technologies. Metal Diaphragm Technology (MDT™) uses metal-alloy drivers rather than paper or plastic for stability even after long periods. MDT is lightweight, strong, and produces natural sound, great phase response, musical accuracy, and fine detail of sound with ultra-low distortion. Patented Magnetic Liquid Suspension (MLS™) technology relies on the speaker's magnetic field to center the voice coil in the magnet gap. Furthermore, proprietary Ferrofluid® seals the magnet gap and voice coil against moisture and corrosion. This special fluid also heatsinks the voice coil to the magnet for greater power handling capacity.

The *U.S.S. Potomac* required speakers that would work outdoors and in all kinds of weather while providing natural sound with low distortion. NEAR speakers were the ideal choice because they are completely weatherproof. The fully-sealed cabinet allows the speakers to be used reliably indoors or outdoors despite exposure to heat or cold, dry or wet conditions. The speakers have a rugged and durable construction including UV-inhibited mineral-filled polypropylene enclosure, powder-coated mounting brackets, compounded rubber cone surrounds, high-temperature adhesives, and brass, stainless steel, and gold-plated corrosion-resistant mounting hardware.

On interior areas of the *U.S.S. Potomac*, the installation crew also selected NEAR A-Series Speakers. They serve well in the ship's wheelhouse, radio room, crew quarters, and chief petty officer's quarters. NEAR A-Series speakers enable the ship's 10,000 to 12,000 annual visitors to enjoy the big band sounds. In other interior areas such as the crew and president's galleys, forward and aft saloons, and guest quarters, NEAR A-Series Speakers were also selected for their reliability and clear sound for announcements.

The speakers were tapped as follows:

- the A2T speakers in the radio room, President's galley, crew galley, guest quarters, and forward and aft saloons @ 1.25W
- the A2T speakers in the officers' quarters @ 8W
- the A2T speakers on the port and starboard weather deck and under the bridge wing @ 16W
- the A6T speakers on the upper deck port and starboard, and at the fantail @ 32W
- the A8T speakers aft of the wheelhouse, behind the stack, and in the bow @ 64W

Amplifiers

Located in the radio room, the Bogen M-Class Power Amplifier (M600) provides amplification for a CD player, cassette player, and microphone, powering all the speakers in a 70-volt single zone system. A Bogen Power Vector Mixer (VMIX) mixes the CD player, cassette player, and microphone. Since the M-Class Power Amplifier is only 3.5 inches high, it fits well into shipboard rooms which typically have limited space availability. The rugged M-Class Power Amplifier (M600) is well suited for this application. Voltage stabilization, massive power toroid and heat sinks, clip limiters, and over-current and thermal protection circuits make the M600 ready for reliable service.

Installation

Association members had met Phil Simpson, Bogen Regional Sales Manager, Telco Channel, California, at a trade show. After he demonstrated the Bogen audio equipment, their interest grew until Burchell, Newton, and five of the technically oriented volunteers made their decision that Bogen products would be suitable for their needs. After consulting with Simpson about wiring, Newton and five crew members had to re-wire some areas and installed the NEAR A-Series speakers during off times two days a week when not performing other maintenance duties over a six-week period. Given that the ship is made of steel, re-wiring involved a great deal of pulling and reinstalling shielded, 2-conductor, 18 gauge wire.

The crew also mounted speakers in the prow, behind the wheelhouse, on the aft stack, near the stern, on the front of the pilot house, three on both the port and starboard sides, in the engine room, on the fantail, and at the main deck ladder. “The distance of the speakers from the decks ranges from 3 feet at the prow to 15 at the aft smoke stack,” according to Burchell. However, most speakers are 7 feet from the deck since ship design doesn’t allow for high ceilings.

The Bogen Power Vector Mixer (VMIX) is set so that announcements from the wheelhouse override narration or background music.

While some ships pose a challenge for audio systems due to high levels of vibration, there was only one area on the *U.S.S. Potomac* with a slight amount of vibration. Nonetheless, the volunteers used stainless steel fasteners and the ruggedly designed NEAR A-Series speaker brackets to ensure secure mounting of speakers throughout the ship. During the last phase of installation, Newton and the volunteers adjusted the audio system to ensure the sound levels would fall within the range of permitting clear pages and music, without being too loud as to offend sensitive eardrums.

Equipment List

- 15 NEAR A-Series Outdoor Loudspeakers, White (A2T)
- 4 NEAR A-Series Outdoor Loudspeakers, White (A6T)
- 3 NEAR A-Series Outdoor Loudspeakers, White (A8T)
- 1 Bogen M-Class Amplifier (M600) with Balanced Input Module (BAL2S)
- 1 Bogen Power Vector Mixer (VMIX)
- 1 Bogen MIC Input Module (MIC1S)
- 1 Bogen MIC Input Module (MIC1X)
- 1 Bogen Telephone Input Module (TEL1S)
- 1 Bogen Mono AUX Input Module (MAX1R)

Key Products

A2T
NEAR A-Series Loudspeakers

A6T
NEAR A-Series Loudspeakers

A8T
NEAR A-Series Loudspeakers

M600
Bogen M-Class Power Amplifier

VMIX
Bogen Power Vector Mixer

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