Scene Shop Essentials

When planning to set the stage, here's what you need to set the shop.

Is your professional theatre company, civic theatre, or academic theatre department considering a new scene shop? Is it time to upgrade from a closet full of random tools to a more professional operation? Investing in the best theatre scene shop equipment you can afford will enhance production quality, encourage safe operations and maximize the contributions made by technical staff in the creative process. We talked to experienced theatre technicians and managers for helpful advice about choosing essential equipment and luxury items.

Scene Building

Troy Brizius, faculty technical director at North Carolina School of the Arts, advises that it is important to remember that the tools and equipment needed for building scenery often differ from what is needed for fine woodworking. He also suggests that the materials most commonly used by the theatre company should be considered during scene shop planning. Do the designs often call for metalwork, or will flats and lumber platforms be more common? The best equipment purchases for your new shop will depend on the type of construction materials most often used. Brizius also strongly recommends a new shop be arranged to allow easy handling of construction material for delivery and storage. He advises, "Hopefully, solutions will be devised to limit the amount of double-handling or backtracking in the shop," he advises. When arranging stationary tool locations, consider traffic patterns, deliveries and the size and shape of materials likely to be handled in each work area.

Loren Schreiber, director of technology at San Diego State University’s School of Theatre, Film and Television, reminds us that dust removal is a necessary component of scene shop planning. Workplace air quality, tool maintenance and finished product quality all will be improved by a central dust collection system. Master carpenter J.E. Johnson at the Performing Arts Center, University of Texas, Austin, recommends having a central system custom-designed for your shop space if your budget allows. Although individual dust-removal equipment installed at each woodworking tool station is better than no dust collection at all, Johnson has found that the do-it-yourself solutions are much less efficient. Johnson also believes a portable dust collector is often unused when "it’s marooned in the corner of the shop behind the elephant sculpture and the castle portcullis.” Johnson also reminds us to consider buying in bulk when purchasing consumable shop materials such as drill bits and blades for reciprocating saws and jigsaws. When planning your shop floor, arrange for adequate storage space for fasteners and other hardware and consumables in convenient cabinets or drawers.

Portable and Powerful

Despite modern advances in stagecraft technology, a well-planned scene shop will always include traditional hand tools. You should always avoid poorly manufactured items, but middle-of-the-road choices are usually adequate for general stagecraft use and can be more cost-effective when tools are inevitably lost or damaged beyond repair. Spare no expense, however, when selecting quality measurement and layout tools directly impacting the precision of your work. Choose specific tools you will frequently use over the packages including equipment the shop will never need. For example, scenery construction very often requires 1/4-inch, 1/8-inch and 1/16-inch socket wrenches, but rarely calls for other sizes. For secure storage, plan for lockable cabinets or a tool cage when arranging your new shop space. Many shop supervisors encourage hand tools or mark each tool with fluorescent paint to help track ownership, especially in multi-use facilities. Labeled storage shelves or pegboards with tool outlines drawn in their storage locations (a "shadow board") can help you inventory tools at a glance.

Cordless drills are an absolute must for faster installation and efficient drilling, and NCSA’s Troy Brizius notes that choosing a consistent size and model allows convenient battery sharing and uninterrupted recharging during work. He also suggests that 14.4-volt models such as the Bosch 1/2-Inch Brute Tough offer adequate strength for most scenery applications in an easy-to-handle size. A corded 1/4-inch hammer drill with a side handle also should be available for steel drilling and other heavy-duty applications.

A scene shop needs at least two types of electric hand saws; a good-quality 7/8-inch circular saw for straight cuts, such as the Skil worm-drive model Loren Schreiber recommends, and a construction-grade scrolling jigsaw for curved cuts and detail work. Schreiber also advises that a shop needs other necessary finishing tools, including oscillating palm Sanders, belt Sanders and a handheld router for flush-trimming sheet goods to frames. A router table, although a luxury item for some budgets, opens up possibilities for creating custom molding and other decorative items.
Experts suggest a commercial-grade air compressor to power your pneumatic tools, which should include ½-inch to 1½-inch capacity narrow-crown staplers and 1-inch to 2½-inch capacity wide-crown staplers and pneumatic brad nailers. Maximize efficient use of your pneumatic tools by purchasing enough hoses and hose connectors to cover the entire shop workspace.

**Buy for the Future**

Stationary power tools are the most costly individual items for a new shop or upgrade, but this is one area where the extra expense will be rewarded many times over by product quality and performance. For example, your table saw should be a durable contractor-grade model with a 10-inch blade and five-horsepower motor. J. E. Johnson in Austin prefers the SawStop brand table saw because it has been carefully engineered for safety with a revolutionary brake mechanism that instantly engages when nonconstruction material approaches the blade. If you are not replacing your current table saw, your work may be enhanced by at least adding a top quality saw fence. The Biesemeyer T-square Commercial Saw Fence is especially well respected by many theatre technicians.

For crosscutting board lumber, options include radial arm saws and compound sliding mitre saws. Some scenery technicians prefer the versatile sliding compound mitre saw because a radial arm saw requires careful maintenance of its right-angle alignment for safety and precision. Many sliding compound mitre saws will cut lumber up to 12 inches wide, with the added benefits of horizontal and vertical angle cuts made simultaneously if necessary. Other stationary power tools considered essential by the experts include a 14-inch or 20-inch bandsaw, a variable-speed drill press and a bench-mounted belt sander.

For welding, a 200-amp MIG welder is standard equipment and should be operated with well-maintained welding helmets, heavy gloves and welding jackets to ensure safety. Some shops find flux-core welders are less costly to operate and eliminate the need to deal with gas canisters, but they create more splatter requiring cleanup and might, therefore, be less efficient.

Your scene shop planning should also include resources for new equipment instruction, and even experienced personnel will benefit from regular refresher training. “The most important thing a well-equipped shop must have is a well-trained staff,” says Associate Professor Shan Ayers of Bere College in Kentucky. “All of the best equipment in the world will not mean a thing if no one can use it safely.” In addition to ensuring continued safety and smooth operations, staff training results in better time management and less waste from incorrect tool use.

**And a Little Extra**

Not every new shop is established under tight budget guidelines, and luxury items can make the work of creating scenery more productive. For example, a panel saw is a convenient alternative to cross-cutting sheet lumber with a circular saw, if your shop has space for an additional stationary lumber cutting tool. In the metalworking area, a self-lubricating cold saw will provide a much better finish on steel cuts and will operate more smoothly and quietly than an abrasive saw. Loren Schreiber advises that a CNC router may be the most valuable “nonessential” item to consider. CNC (for “computer numerical control”) routers such as the ShopBOT models can create intricate identical scenery.

A tech welds in the San Diego State scene shop.
Feature

pieces in a fraction of the time a carpenter would require with handheld power tools. You may discover your luxury items can become necessities, as improved scene shop quality directly influences the complexity and artistic impact of scenic designs created by your theatre company.

The professionals named in this article contributed to the following list of scene shop essentials. We’ve put it online at www.stage-directions.com/esceneshopessentials so you can print out a copy for your own use. Also, feel free to add your own essentials to the list in the comments on that page.

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SHOP TOOLS

Hand Tools
- 26' tape measures
- 100' tape measure
- Carpenter square
- Combination square with 45 and 90 degrees
- Snap chalkline
- 4' level
- Small torpedo level
- Claw hammers
- Phillips and flat screwdriver sets
- Hex key (Allen wrench) set
- Nut driver set
- Socket wrench set with extra socket wrench ratchet handles
- Extra 7/16", 1/2" and 9/16" sockets (regular and deep sizes)
- Adjustable wrenches
- Channel lock wrench
- Combination wrench set
- Large and small pliers, including needle nose pliers
- Locking pliers ("Vice-Grips")
- Diagonal cutters
- Locking gripping pliers of various sizes
- Wood and metal file sets
- Wood chisel, cold chisel and punch sets
- Mat knives
- Drill index with drill bits up to 1/4"
- Paddle drill bit set with sizes from 1/8" to 1/2"
- Industrial staple gun
- Flashlights
- Hand saws
- Bar clamps, 5' and 9' sizes
- Large and small C-clamps
- Wire brushes

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Stationary Power Tools
- 5-horsepower table saw
- 14” or larger band saw
- Sliding compound mitre saw
- Variable speed drill press
- Bench-mounted belt sander

Handheld Power Tools
- 14-volt cordless drills with dual batteries and chargers
- Circular saw
- Reciprocating saw
- Routers
- Heavy-duty corded hammer drill with side handle
- Scrolling jigsaws
- Oscillating palm sanders
- 3” belt sander
- Air compressor, hoses and fittings
- Narrow-crown and wide-crown pneumatic staplers
- Pneumatic brad nailers

Miscellaneous Necessities
- MIG welder (200 amp)
- 14” abrasive saw for metal cutting
- Bench vises
- Industrial first-aid kit
- Face shields or safety goggles
- Adjustable-height roller stands
- 6’ and 12’ folding ladders
- Push broom and whisk brooms
- Small bench broom
- Dustpans
- Rolling mop bucket and mop
- Wet/dry vacuum
- 50-gallon trash barrels
- Moveable 4x6 work tables
- Hardware cabinets with drawers
- Storage racks for sheet and board lumber and linear steel
- Lockable tool storage cabinets or closet
- Dust-collection system

Valuable Luxuries
- Steel-cutting cold saw and rolling runoff tables
- Router table with fence
- Vertical panel saw
- CNC router

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