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APRIL/MAY 2011
ISSUE #71

CANADIAN Woodworking & HOME IMPROVEMENT

DEVELOP YOUR SKILLS • TOOL YOUR SHOP • BUILD YOUR DREAMS

Working in a SMALL SHOP Issue

- Great Storage Solutions
- A One-Car Garage "Dream Shop"
- Building a Dedicated Shop
- How to Build Big Things in a Small Space

8 REAL-LIFE SHOPS
Big, Small, Impossible – How to Make It Work

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Take advantage this spring!

Buy one of these great tools for your shop and we'll put money in your pocket. $40 back by mail to be exact. Purchases must be made between March 1st and June 30th 2011 to qualify.
There has never been a better time to outfit your shop.

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20" PLANER
• Industrial 3 HP (220V) motor

KC-385FX
15" PLANER
• Industrial 3 HP motor (220V) motor

KC-1433FXR
14" WOOD BANDSAW WITH RESAW GUIDE
• Powerful 10 amp. motor

KC-26DS
26" x 12" DUAL DRUM SANDER
• Industrial 3 HP (220V) motor

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KC-26FXT/150/5052 (Left Tilt)
KC-26FXT/130/DELUXE (Left Tilt)
10" EXTREME CABINET SAWS WITH RIVING KNIFE BLADE GUARD SYSTEM
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KC-10JCS/J52 (Left Tilt)
10" CABINET SAWS WITH RIVING KNIFE BLADE GUARD SYSTEM
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6" WOODWORKING JOINTER
• Industrial 1 1/2 HP motor

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COVER STORY

Cover photo by:Rob Brown

editor's letter

rbrown@canadianwoodworking.com

I've been looking forward to putting this issue together since my first day as the editor of *Canadian Woodworking & Home Improvement Magazine.* "Dream Shops" are nice to look at and read about, but once you finish reading the article (and wipe the drool from your chin), you quickly realize you don't have 3000 sq ft. of empty space to transform your dreams into reality. This issue is dedicated to covering what most woodworkers are faced with on a daily basis: working wood in a small shop.

Where there's a will to have shop space, there's always a way to eek it out. Some of the shops I saw were so impossibly small they seemed useless, but the owners had found a way to make them work. For the last 10 years I've worked in a number of shops – all around 400 sq ft. Many woodworkers would call the space I have luxurious but because I make my living building studio furniture I have different requirements than most. Compared to other professional woodworkers' spaces, my shop is downright tiny, but with a lot of planning and practical thinking I rarely find myself wishing I could push the walls further apart to gain some real estate. As it turns out, space is relative. If you have a spot for everything and put everything in its place, you often discover you have more space than you thought.

To help you discover your own extra space, we brought together a collection of small and unique shops to show you how far some people will go to create an area where they can practice the craft they enjoy. Also covered are articles on working in a one-car garage, specific storage solutions, finishing techniques and more; topics that anyone who spends time wishing they had more space is sure to enjoy.

At the end of the day, all of us want a shop to call our own; a place where we can work on projects, improve our homes and create pieces we will have for the rest of our lives. I hope this issue helps you make even more use of your small shop … or convinces you to set one up.

Rob Brown

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CANADIAN Woodworking & HOME IMPROVEMENT
DEVELOP YOUR SKILLS • TOOL YOUR SHOP • BUILD YOUR DREAMS

Issue #71

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CRAFTEX CX-SERIES

BUILT TO MEET THE GROWING DEMANDS OF SERIOUS WOODWORKERS

10" Cabinet Table Saw with Riving Knife

- 3HP, 220V, Single Phase, Leeson Motor
- Quick release riving knife

- Table size - 27" x 40
- Cast Iron Trunnions
- Powder coated paint

Introductory Price Extended!

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Model CX200 - Reg. $1799.00

Sliding Table Attachment for Table Saws

- Add this unit to your existing table saw!
- Will fit any table saw with 27" deep cast iron table
- Max. Table Travel - 55"
- Max. Cross Cut Length - 48"

Introductory Price Extended!

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Model CX200S - Reg. $649.00

The Ultimate 14" Band Saw

- 2 HP, 220V, 1 PH, TEFC Motor
- 3 Speeds (1430, 2300, 3250 FPM)
- 13" Depth of cut
- Quick release blade tension
- Precision rip fence & mitre gauge included
- Cast iron wheels
- One piece body
- Magnetic switch
- Powder coated paint

$959

Model CX100 - Reg. $1099.00

10" Cabinet Table Saw with Extension Table

- 3HP, 220V, Single Phase, Leeson Motor
- Quick release riving knife

- Table size - 27" x 73 3/4" (with extension table)
- Cast Iron Trunnions
- Powder coated paint

Introductory Price Extended!

$1599

Model CX201 - Reg. $1899.00

Cast Iron Router Table Attachment for Table Saws

- Add the ultimate router table to your table saw!
- Table size - 27" x 20"
- Fence Length: 23-1/2"
- Table insert size: 4"

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$399

Model CX200R - Reg. $479.00

15" Heavy Duty Planer

- 3HP, 220V, 1PH, TEFC Motor
- Solid cast iron wings
- Cutterhead: 3 H.S.S Knives
- Integrated mobile base
- Powder coated paint

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Model CX15 - Reg. $1339.00

8" Parallelogram Jointer

- Powerful 3HP, 220V, 1PH, TEFC Motor
- 4 H.S.S Knife Cutterhead
- Precision Ground Cast Iron Bed
- Integrated mobile base

- Powder coated paint

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2 HP Dust Collector with Canister Filter

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- Noise Level: 74 dB
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- Steel duct arm for improved efficiency
- Canister made from spun bond polyester

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Model CX400 - Reg. $599.00

Heavy Duty Deluxe Wood Shaper

- 3HP, 220V, 1 Ph, Leeson Motor
- Table size: 31" x 29"
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- 2 Spindle Speeds: 7100 & 11000 RPM
- Includes 2 Spindle Sizes: 3/4" & 1"
- Powder coated paint

Introductory Price Extended!

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- 100% Canadian owned & operated
- Parts & service you can count on
- All machines are CSA/Certified
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readers' letters

Canadian Woodworking in Ukraine

From an email to forum administrator Bill MacDonald…

I am an amateur woodcrafter from Ukraine, former USSR. I read your forum as an unregistered guest. I like it. I read some issues of *Canadian Woodworking* magazine as well. It's great! Unfortunately I can't subscribe to it in my country due to our postal service. No government restrictions I think, just business. Of course, things are changing for the better. Some internet shops from US and Canada started working with orders from Ukraine. And PayPal started working with our cards too. This summer my friend successfully ordered some tools from US. Looking at him I am going to order some books from Amazon. And you gave me a great idea to try subscribing to some magazines directly from the publisher, not through our Post. *Canadian Woodworking* magazine should be one of them.

Best regards,
Andrey

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NEW SUBSCRIBER

Jamie C.
Uxbridge, ON
has won a Mobile Dust Extractor from Festool.

LOYAL SUBSCRIBER

Mark M.
Welland, ON
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woodworkers' gallery

Midi Lathe Stand and Storage

by Gary Zimmel

This is Gary Zimmel's latest addition to his shop – a lathe stand. He's aiming to have his entire shop filled with black cherry storage and fixtures so he can enjoy spending every minute he spends working in it. "I spend a lot of time in my weekend shop so it might as well look really good," says Gary. With hand-cut dovetailed drawers and half-lap joints on the cabinet frame it looks fantastic and is very strong. It also serves him well functionally, securing his lathe on top of the cabinet and providing him with storage inside. Gary even designed a shallow area on the side of the cabinet where he can store many of his turning tools. "The metal stand I had was never stable enough and I wanted to have all the accessories for my small lathe close at hand," Gary mentions, regarding his reasoning for building this cabinet.

Show your work to the world!
Visit **canadianwoodworking.com** and join our forum!

Correction

The propane cylinder shown in the Hot Pipe Bent Salad Tongs article (Feb/March 2011) is made to be stored and used in an upright position. To use the illustrated technique safely orient the pipe in a vertical position, so the propane cylinder can remain upright.

Coming Events

For more woodworking events: www.CanadianWoodworking.com
List your club and event FREE.

Made of Wood Juried Show & Sale
April 23 to May 15
Businesses along Main Street
Erin, ON
www.madeofwoodshow.com

WOOD 11 Saskatchewan Woodworkers Guild Annual Show
May 28 to June 5
The Galleria
Innovation Place
Saskatoon, SK
www.saskwoodguild.ca

Northern Alberta Woodcarvers Association's Spring Competition and Show
April 16 - 17
Duggan Community Hall
Edmonton, AB
www.nawca.ca

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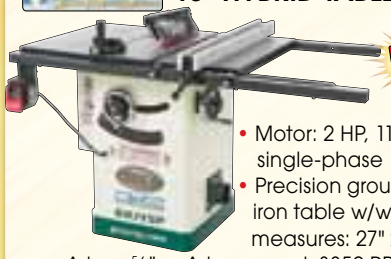
10" HYBRID TABLE SAW



New!

- Motor: 2 HP, 110V/220V, single-phase
- Precision ground cast iron table w/wings measures: 27" x 40"
- Arbor: 5/8" • Arbor speed: 3850 RPM
- Capacity: 3 1/8" @ 90°, 2 3/16" @ 45°
- Rip capacity: 30" R, 12" L
- Quick change riving knife
- Cast iron trunnions
- Approx. shipping weight: 354 lbs.

BEAUTIFUL WHITE COLOR!

INCLUDES BOTH REGULAR & DADO BLADE INSERTS

G0715P INTRODUCTORY PRICE $765.00

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10" CABINET TABLE SAWS *with Riving Knife*

3 HP LEESON® MOTOR!

- Motor: 3 HP, 220V, single-phase
- Table size with extension: G0690 -27" x 40", G0691 - 27" x 74 3/4"
- Arbor: 5/8 • Arbor speed: 4300 RPM
- Max. rip capacity: G0690 - 29 1/2", G0691 - 50"
- Max. depth of cut: 3 1/8" @ 90°, 2 3/16" @ 45°
- Approx. shipping weight: G0690-542 lbs. G0691-572 lbs.

INCLUDES 10" CARBIDE TIPPED BLADE

G0690 ONLY $1295.00

Product Reviews & Awards ONLINE grizzly.com

WITH EXTENSION RAILS

G0691 ONLY $1395.00

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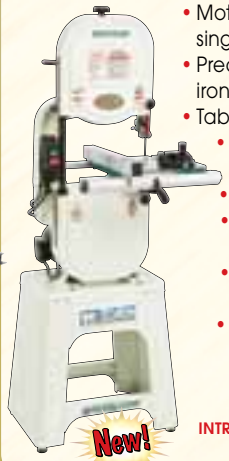
ULTIMATE 14" BANDSAW



New!

- Motor: 1 HP, 110V/220V, single-phase, TEFC
- Precision ground cast iron table size: 14" sq.
- Table tilt: 10° L, 45° R
- Cutting capacity/ throat: 13 1/2"
- Max. cutting height: 6"
- Blade size: 92 1/2" - 93 1/2" L (1/8" - 3/4" W)
- Blade speeds: 1500 & 3200 FPM
- Approx. shipping weight: 196 lbs.

G0555P INTRODUCTORY PRICE $425.00

Product Reviews & Awards ONLINE grizzly.com

$69 shipping ANYWHERE IN LOWER 48 STATES

8" JOINTERS

- Motor: 3 HP, 220V, single-phase, TEFC
- Precision ground cast iron table size: 9" x 72 1/2"
- Max. depth of cut: 1/8"
- Max. rabbeting depth: 1/2"
- Cutterhead dia.: 3"
- Cutterhead speed: 5000 RPM
- Cuts per minute: 20,000
- Approx. shipping weight: 500 lbs.

New!

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CHOOSE EITHER 4 HSS KNIVES OR SPIRAL CUTTERHEAD MODEL

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WITH SPIRAL CUTTERHEAD

G0656PX INTRODUCTORY PRICE $1075.00

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8" x 76" JOINTERS

- Motor: 3 HP, 220V, single-phase, TEFC
- Precision ground cast iron table
- Cutterhead dia.: 3 3/16"
- Cutterhead speed: 5350 RPM
- Max. rabbeting depth: 1/2"
- Max. depth of cut: 3/8"
- Approx. shipping weight: 597 lbs.

PARALLELOGRAM TABLE ADJUSTMENT

G0490 ONLY $945.00

FREE SAFETY PUSH BLOCKS

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15" PLANERS

New!

- Motor: 3 HP, 220V, single-phase
- Precision ground cast iron table size: 15" x 20"
- Min. stock thickness: 3/16"
- Min. stock length: 8"
- Max. cutting depth: 1/8"
- Feed rate: 16 FPM & 30 FPM
- Cutterhead speed: 5000 RPM
- Approx. shipping weight: 660 lbs.

BUILT-IN MOBILE BASE

CHOOSE EITHER 3 KNIFE OR SPIRAL CUTTERHEAD MODEL

G0453P INTRODUCTORY PRICE $995.00

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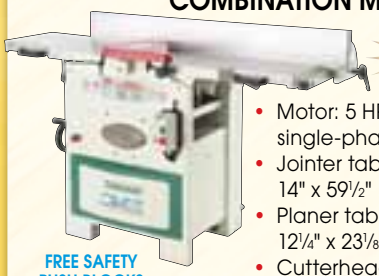
WITH SPIRAL CUTTERHEAD

G0453PX INTRODUCTORY PRICE $1475.00

12" JOINTER/PLANER COMBINATION MACHINE



New!

- Motor: 5 HP, 220V, single-phase
- Jointer table size: 14" x 59 1/2"
- Planer table size: 12 1/4" x 23 1/8"
- Cutterhead speed: 5034 RPM
- Max. planer cutting height: 8"
- Approx. shipping weight: 734 lbs.

FREE SAFETY PUSH BLOCKS

CARBIDE INSERT SPIRAL CUTTERHEAD!

G0634XP INTRODUCTORY PRICE $2195.00

$139 shipping ANYWHERE IN LOWER 48 STATES

15" DISC SANDER *with Stand*

New!

- Motor: 1 1/2 HP, 220V, single-phase, 1720 RPM
- Cast iron sanding disc size: 15"
- Cast iron table size: 12" x 20"
- Table tilt: 0 - 45°
- Floor to table height: 37 5/8"
- Dust port: 2 1/2"
- Approx. shipping weight: 232 lbs.

INCLUDES MITER GAUGE

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CYCLONE DUST COLLECTOR

New!

- Motor: 1 1/2 HP, 110/220V, single-phase, TEFC, 3450 RPM
- Air suction capacity: 775 CFM
- Static pressure at rated CFM: 1.08"
- Intake port: 6" w/included 5" optional port
- Impeller: 13 1/2"
- Height: 68 1/2"
- Built-in remote control switch
- Approx. shipping weight: 210 lbs.

PLEATED FILTER IS PROTECTED BY A STEEL CAGE

FULLY MOBILE WITH BUILT-IN CASTERS

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product news

Grex **18-Gauge Nailer**

The 18-gauge brad nailer is the jack-of-all-trades of the pneumatic fastening world. It has the right combination of strength and finesse to get the vast majority of jobs assembled properly. Now Grex has added elements of functionality, class and durability to the group with their newly unveiled "Green Buddy," which makes this shop workhorse feel more like an agile stallion. With extras like a non-marring rubber tip, an auto-trigger lockout to prevent empty firing and a patented integrated-safety feature that allows the user to fire nails at virtually any angle, you almost forget about all the basics that this shop mainstay flawlessly provides. As the name implies, I don't think you will be hard pressed to make friends with this newcomer. www.grexusa.com

shoptested

Varathane **Aerosol Spray Finish**

I use a number of different finishes to protect and enhance the custom furniture I make. Usually I apply a finish by hand, wiping it on with a clean cloth or brushing it on with a quality natural brush. Sometimes the project I'm finishing is small and has many different angles and surfaces, making it tricky and time consuming to wipe or brush a finish on properly. That's when a fully-fledged spray system would come in handy, yet for a smaller project they're too time consuming to set up beforehand and clean afterwards. After searching for a better option, I picked up these aerosol spray cans from Varathane to see if they would fill in where my brush left off. They come ready to spray and there's no clean up, making finishing a project a lot faster and easier. And to tell you the truth, when the finish dries, it looks much smoother than when applied by hand. Available in satin, semi-gloss and gloss, these cans apply a very durable finish that will stand up to decades of use. Although it's possible to finish a large project like a dining table or armoire, I think the best use for this handy product is on small to medium sized projects. Even if you apply a few coats of this finish by brush on a larger piece (it's also available in half pints, quarts and gallons – all non-sprayable) then apply the final coat by aerosol spray can, I think you'll like what you see. You may even look forward to the finishing process!
www.rustoleum.ca

Canadian Woodworking & Home Improvement Hires New Fulfillment Company

To enable *Canadian Woodworking* to continue its growth, we have recently hired a fulfillment company out of Dartmouth NS.

Because of this transition, you may have noticed that our recent invoices displayed our corporate name (Sawdust Media Inc.) instead of our magazine name.

Don't worry, we are still the same company/management as before (ie since 1999) – we have just brought on a fulfillment company to handle our growing number of calls, letters, emails, and mail-outs – which will leave us more time (and energy) to focus on bringing you the best in woodworking projects, techniques, and tool reviews!

Paul & Linda Fulcher

How Do You Create Endless Cabinet Door Making Possibilities?

Profile Shown:
Round Over
(#99-760)

Patented design allows for multiple rail & stile project combinations

With Freud's New Premier Adjustable Rail & Stile System

Now with Freud's new, patented Premier Adjustable Rail and Stile router bit system, you are able to build any style of cabinet door in a wide range of door thicknesses and sizes! This extremely easy-to-use solution gives you unlimited creative freedom, and solves the long-standing limitations of existing frame and panel door construction.

This one of a kind solution allows you to create extended tenons for extra door joint strength, adjust groove width for different panel thicknesses and choose from a variety of material thicknesses for your stiles and rails (5/8" to 1-1/4"). Optional add-on cutters increase your bits' capabilities even more, allowing you to create glass panel and double sided profile doors.

Four profiles are available; **Round Over** (#99-760), **Ogee** (#99-761), **Round Over Bead** (#99-763), and **Bevel** (#99-764).

Standard stub tenons in regular 3/4" stock

Extended tenons for strong joints in larger doors

Glass & screen panel capability

Double Sided Profiles in thick stock

Another Industry 1st By Freud

freud®
www.freud.ca

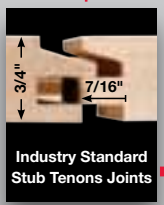
To find more information, please go to:
www.freudtools.com/PremierRailandStile

Others

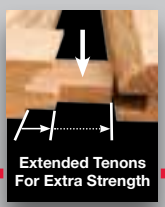
Industry Standard Stub Tenons Joints

vs

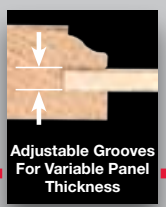
Freud's New Premier Rail & Stile System



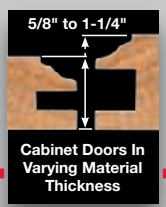
Industry Standard Stub Tenons Joints +



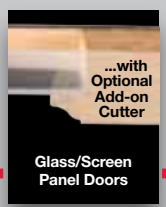
Extended Tenons For Extra Strength +



Adjustable Grooves For Variable Panel Thickness +



Cabinet Doors In Varying Material Thickness +



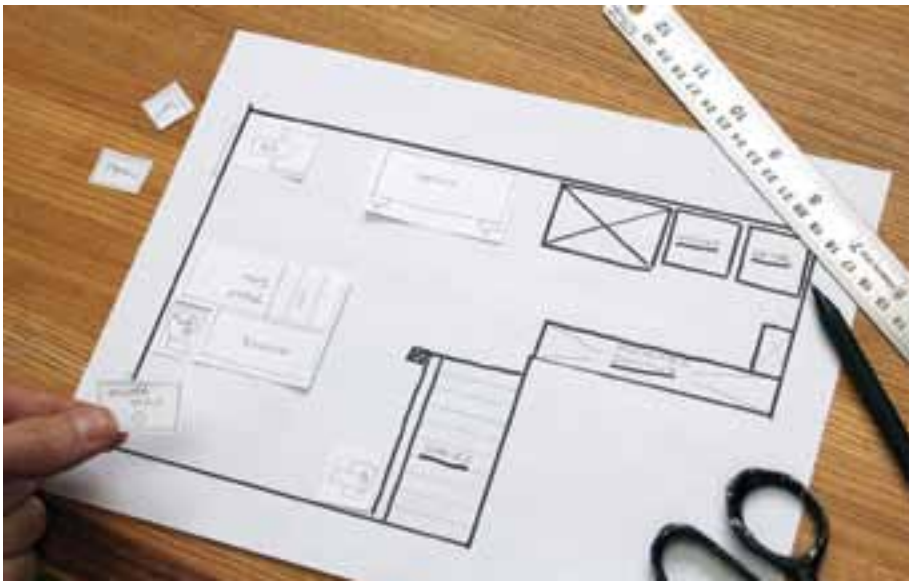
Glass/Screen Panel Doors +

Double Sided Profile Doors

Thinking of Building a DEDICATED SHOP?

With so many things to consider, it's easy to become overwhelmed. Building contractor Matt Dunkin answers some of the most important questions to ask before you break ground.

Photos by: Matt Dunkin Lead photo: Bruce McMahon



2-D Layout – By making scaled drawings of all your equipment and storage, then drawing a floor plan, you can move the objects around the space with ease. This will help you determine how much space you require to house everything. (Photo by Rob Brown)

BY MATT DUNKIN

The dream of a dedicated home shop is a common one among woodworkers. Whether you currently borrow shop space, work in your driveway or side yard, or compete for a corner of your basement with Christmas decorations or your furnace, you may be ready to build your own space that will allow you the freedom of more room and time, and will also keep dust, fumes, and noise under control.

Every design/build situation will be unique but there are a series of considerations that you will face in the design and construction phases of your project. Let's walk through the process and discuss the questions that you will need to ask yourself and others as you approach this project.

What will you build in your shop? How much space will you need?

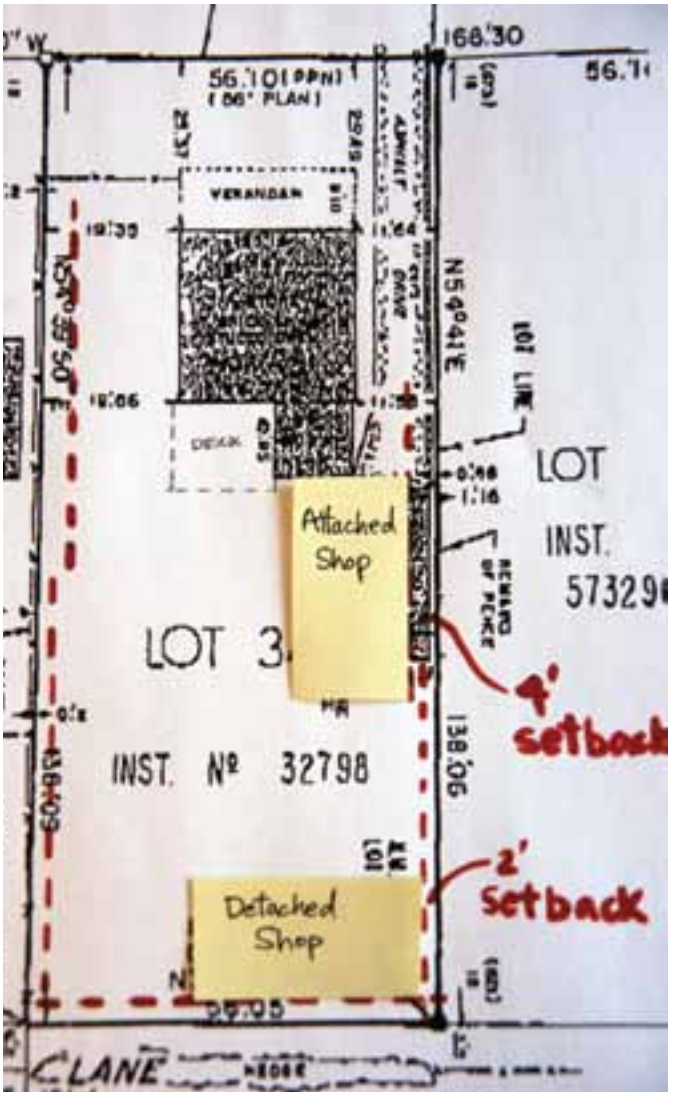
Your sense of space and how to use it will be slightly different depending on the focus of your craft. If you are building furniture with hand tools, you will be able to make do with less space (under 300 sq ft.) than if you're using mainly power tools and building sets of cabinets (over 400 sq ft.). Some 3D modelling with a program like Sketch-Up or some 2D layouts on graph paper with scaled cutouts can allow you to experiment with arranging your space and how much of it you will need. You should include not only the tools, benches and storage that you currently possess but also enough room to tackle new types of projects and new tools that you anticipate needing down the road. When you think you have a layout that works, test it out by mentally working through a range of different projects you might tackle and the needs you will have for material storage, assembly and finishing. Then revise as necessary; this process will allow you to hone in on a general square footage and layout ideas that will set you up to move forward.

Will you attach your shop to your house with an addition or locate it in an outbuilding?

There are benefits to either approach. Sharing a common wall with your house can require some careful soundproofing but can reduce heat loss and exterior finishing costs like siding. A shop located in an addition is more likely to be allowed to have living space or storage space above it, and it may be easier to make use of the existing plumbing and electrical and heating systems of your home to service your shop space. Another advantage of an addition is not having to run to an outbuilding in minus-30-degree weather or a summer downpour.

Another Story? – To gain access to a second floor the simplest option may be a ladder, as they are small and easy to make or purchase. The downside is that it can be tough to haul heavy objects up them. This foldaway ladder is secured to the ceiling with two eyehooks then lowered when needed. (Photos by John Spitters)

Survey Says ...
A survey is a good place to start when selecting a specific location for a new building. The Post-It notes show two options where shops may be appropriate.



Alternately, a detached shop can often be located closer to your property line and offers you a bit more freedom in terms of the type of foundation you can use. It may give you a sense of welcome separation from your home and open up yard space or allow a deck on the back of your house that would otherwise be lost behind your shop. In an urban setting, if you would like to have a wood stove in your shop you may find it more challenging to find an insurance carrier that allows one in an outbuilding. Also, outbuildings can be subject to more stringent height regulations than additions.

One floor or more?

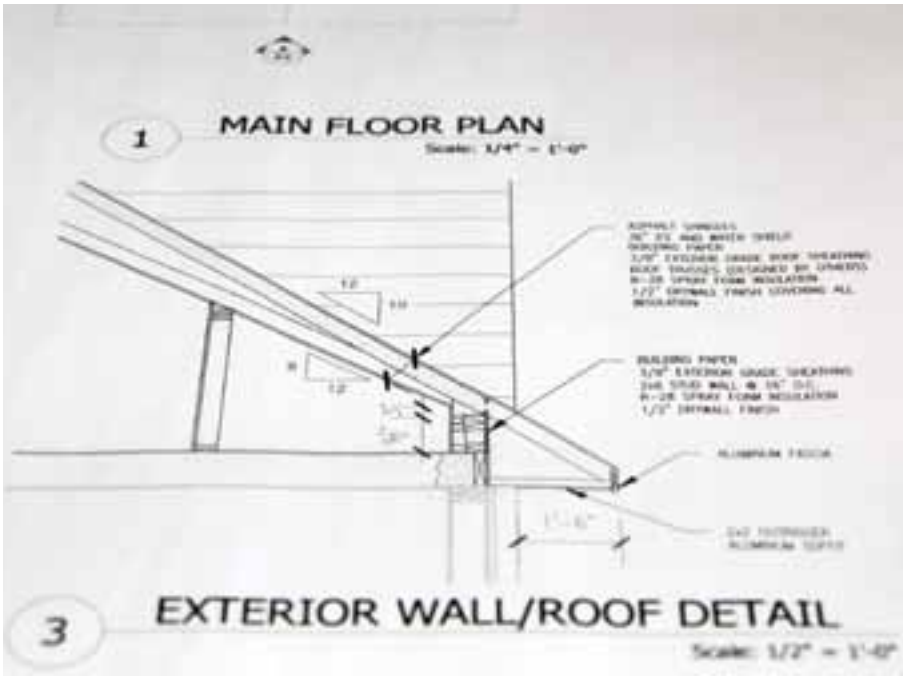
Let's face it, one of the most significant costs of your shop will be its foundation. While you're at it, what about adding space above your shop? There may be regulations preventing you from building living space above your shop if it is in an urban setting or in an outbuilding, but there may be some flexibility depending on where you live. It is in the municipality's interests to encourage infill housing that uses existing infrastructure. At a minimum, think about including attic trusses to create some space above your shop for drying lumber or storing equipment. Access could be from simple pull-down attic stairs or from the exterior if you don't want to lose floor space to a stair or ladder. If you're creating an addition to your house, you may be able to add a couple of rooms you've always wanted, such as a family room, office or in-law suite.

What is the zoning of your property?

If you want to run a business operated by yourself and more than one employee, you may run into zoning issues if your location is zoned for residential use only. It's common for municipalities to allow and encourage home-based businesses but there will likely be a maximum area that you will be permitted to add for business purposes. If you try to build a shop that will contribute noise and traffic (from employees or deliveries) to an urban neighbourhood, you run the risk of running into opposition from neighbours concerned by the impact your shop will have. Your municipality will have planners with whom you should consult as you begin to define the possibilities that your property will allow.

Do you have room to add a shop?

This is a fundamental question. A good place to start is with a survey of your property. Most municipalities have a



Proper Drawings – Drawings are required to show you will comply with the building codes in your area.

maximum percentage of your lot that you can build on and standard setbacks from your property lines that you will need to adhere to without needing to request special permission to build. On a photocopy of your survey you can draw in what your local setbacks are in order to define the location within which you will be permitted to build. In a best-case scenario, you will have the space to build without compromising too much on space or location; otherwise, you may need to request a minor variance, which would allow you to circumvent an obstacle such as a setback.

Minor variances are applications to your municipality to suspend a particular by-law to allow your project to proceed, based on common sense or precedents set by other buildings in your area. If your municipal committee of adjustment denies permission because a neighbour voices concern over the development, you would have to appeal the decision to the municipal board of your particular province. In that case, you may be better off looking for another piece of property with an existing structure that you could renovate, more relaxed zoning regulations, a larger lot, or more congenial neighbours.

Don't Overlook the Floor – Anti-fatigue mats can be cut and placed around all the machines in your shop, leaving a more comfortable work area.

What drawings do I need to apply for a building permit? Can I prepare them myself?

Gone are the days when you could apply for a building permit based on a sketch on the back of a cigarette package. In provinces like Ontario, design work must be undertaken by an insured designer registered under the provincial building code or by the owner of the property. You can do the drawings as the owner if you can demonstrate effectively through your drawings that your structure will comply with the technical requirements of the building code in a clear and concise way. You will be required to submit detailed drawings, including the following:

Site plan – an oriented aerial view of your property and the surrounding streets, with details of setbacks from property lines of existing and proposed buildings, separations between buildings, etc.

Floor plan – again, an overhead view of each floor of the proposed structure and, if it is attached to a house, the floor plan for the house will also need to be detailed with rooms sized and labelled. Doors and window sizes, plumbing fixtures and finishing details, as well as the placement of partition walls, are to be included.

Structural drawings and cross sections – these will be comprised of foundation details, cross-sections of the structure, floor, wall and roof framing details, stairs, locations of posts and footings.

Building elevations – elevations are views from each exterior face of your structure and will detail exterior finishes such as roofing or siding, window placement, roof slope and venting, as well as the overall heights of your structure from ground level to roof peak.

Demolition plan – if you are altering an existing structure, you will likely

Simple or Complex? – While you may want to think long term and add plumbing for future expansion, plumbing can also be very low-tech. (Photo by Rob Brown)

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need to demonstrate what is currently present and how it will be altered. This would apply for moving windows or doors, changing the uses of rooms and removing or adding walls.

How do I figure out what the design and permit costs will be?

If you choose to hire a draftsperson or architect, they may charge you based on the square footage of the area you are proposing, by an hourly rate for their time or as a percentage of the cost of the structure. Costs of building permits will be a percentage of the estimated cost of the structure you are proposing (e.g., $15 permit fee per $1000 or 1.5 percent), or a cost-per-square foot depending on your municipality (e.g., $1.20 per square foot). Design work and permits will both differ depending on the part of the country in which you will be building, so ask the questions as you move ahead. One of the costs that is often overlooked in planning is the increase in annual property tax you will pay once your improved property has been reassessed.

What is the role of the building department once I begin building?

After a permit has been issued, the building inspector will want to be notified at various points during your build in order to do a site visit, walk around and inspect the details to make sure that they meet code requirements. These inspections are commonly at the point where excavation work is complete, when the foundation is completed but before back-filling, when framing and all structural work has been done, after the installation of the insulation and vapour barrier, and then a final inspection after everything is complete. You may need to have a separate plumbing inspector if you're adding or changing plumbing fixtures, and electrical work will need to be inspected by the appropriate electrical inspector (in Ontario, the Electrical Safety Authority). In my experience, inspectors appreciate good work, a clean, safe site, and are willing to work with homeowners and builders to make sure that the work will meet code and will endure.

What are my options for foundations for my shop?

The frost generated by Canadian winters wreak havoc on structures through their foundations. According to code conventional foundations and footings must rest below the reach of frost on undisturbed soil (in most provinces, this is safely considered to be 4 ft. below ground level or grade), bear directly on bedrock, or be frost-protected. A shallow foundation may be possible in your area in an outbuilding if you can get an engineer to design and stamp plans for insulating the area directly beside your shallow foundation wall so that frost will not form beneath the footing area and cause damage. A slab-on-grade foundation for an outbuilding is another option that will need to be designed by an engineer so that the concrete slab will structurally bear the weight of the shop structure you build above it.

If your shop will be attached to your house or another structure, it will likely need to match its foundation, tying the two

structures together so that one does not structurally stress the other if they shift differently. That may dictate a poured concrete or concrete block foundation. Regardless of your foundation type, a cold concrete floor will sap energy away from the rest of the structure if you are not careful, so think about how to insulate it well before you build.

Do you need plumbing in your shop?

This will be a personal matter, depending on whether it will be helpful for finishing or sharpening. However, it is a good idea to look beyond your current use of this space to the next owner. Would it be beneficial to add plumbing hookups so that the shop could someday be an apartment, or an art studio, or an extension to your house? It could add to the resale value of your house to be able to create as flexible an area as possible by roughing in a bathroom and even a kitchenette area if you can. If this is done when wall cavities are open or before the slab is poured, your forethought could pay dividends but not cost much up front.

How many windows and doors should there be?

You may want a garage door if you will need to access your shop with large workpieces or tools, or if you or future owners will ever want to use the space to park a vehicle. Garage doors are notoriously drafty, however, so if you think you can live without one you will probably be warmer. Instead, you could opt for out-swinging double doors. In a small shop you can, at a pinch, rip longer lengths of lumber by feeding the material out of either a strategically placed door or window.

The number of windows, as well as their sizing and placement, depends on your orientation, view, desire for ventilation, and needs for daylight and solar gain. Orienting more of your windows towards the south side of your shop and placing them high enough that they are shaded by the eaves in summer, but allow lower-angle winter light to come in, will increase your ability to get free light and heat from the sun. If your goal is to take advantage of passive solar opportunities, make sure that you carefully research the type of glass that is in your windows and look for something with a high solar heat gain coefficient. Higher windows generally allow for benches and tools beneath them, and relatively windowless north walls may be a place to arrange wood storage or mechanicals.

What are my options for a shop floor?

The standard option for a shop floor is a concrete slab. You're probably not going to go to the trouble of creating a basement beneath your shop, although it is possible. The

weight of most woodworking machines suggests that a concrete floor is the most solid and durable substrate available. It has the potential to be used as thermal mass to store heat from your heating system or from the sun, but it can be tiring and hard on your body to be standing on concrete all the time. You can add a vapour barrier, 2x4 sleepers and a wooden floor above the concrete to ease the tendency of the floor to strain your feet and back, or you can add anti-fatigue mats in key areas where you'll be standing for longer periods.

Do you need to upgrade your electrical service?

Depending on your situation, you may need to upgrade to 200 amp electrical service in order to meet the needs of your house and your shop. It may also be in your interests to add in a separate electrical service meter on your shop so that you can clearly write off electrical use for your business, or in future rent the space out and clearly separate out the utilities for billing your tenant. Generally, you don't want to skimp on the power to your shop or on the lighting you include.

How finished should the interior of a shop be?

Shops can range from functional spaces adorned with unpainted wallboard to beautifully finished, painted, and trimmed-out spaces. Ultimately, I think it depends on your budget and how important your surroundings are to your mindset as you're working, or to your clients' if they will be viewing your shop. If finishing your shop will improve the quality of the work that you will produce, thereby relaxing or inspiring you, or showcase for your clients the quality of the work of which you are capable, it may be a worthwhile investment. A more finished space may also allow for activities like parties or even a weekly poker game (as long as drinks stay off the tools).

How can I budget for the build?

My advice here is to make a detailed list of what the various parts of the build will be (drawings, permits, foundation, framing, electrical, etc.) and decide what you would like to do yourself and what you will need to hire others to do. Get quotes on the work that you would like to hire out and estimate the materials you will need to do your portion. You may want to factor in your time into the cost as well, especially if you will be passing up other income to work on the project. At some lumberyards, you will be able to give detailed drawings to an estimator on staff who will do a material takeoff list for you of what you'll need and what it will cost. When all the numbers come in, you can put together a budget and plan for an overrun allowance of around 15 percent. If you keep track of the materials and subcontract costs as you go, you can stay on track and make decisions as you go about the latter stages of the project without regretting it later. If it is challenging to obtain funding for a complete build, you may want to stage the build so that initially the frame goes up and the exterior is finished, and then you finish the interior work as you have time or as funds become available.

What is the value of a shop?

Shops have value on many different levels. There is the satisfaction of having a place to create and work on projects that is hard to quantify, but definitely improves your quality of life. There is the value to your small business of having space in which to work wood and thereby generate income. There is the dollar value of the build itself, which will be a considerable investment and, finally, there is the resale value of your property after you've added your shop. Before you go too far, though, it's worth asking a local real-estate agent about the potential return on your investment in your area; generally shops won't add significantly to the value of your property, so it's worth thinking carefully about what else the space could be used for if you were to sell. The decision about whether it is worth it to build is a matter of balancing all these factors: projected sales balanced against the cost; the cost of building is balanced against what it will be worth when you sell. Woodworking can be a creative outlet, can give you a sense of mastery, and even be a way to give back to your community by donating beautiful pieces to local charities for fundraising auctions, or creating pieces that future generations will inherit. Ultimately, the value of a shop might come down to the emotional and social returns that it will pay you and the people around you for years to come.

MATT DUNKIN
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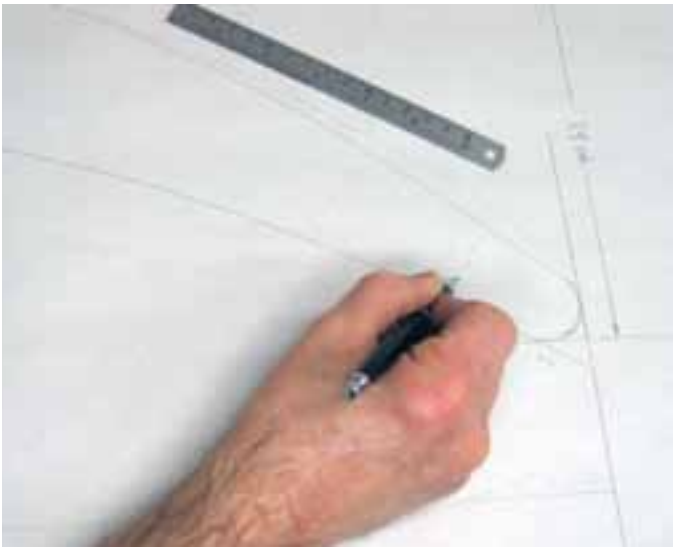
Building BIG THINGS in a Small Space

Just because you have a small space to create doesn't necessarily limit you to small projects. There are many things that can be done to push those walls apart from each other and get the most from your space.

Photos by: Marty Schlosser

Subcomponents – Break large pieces down to separate components.



Better Safe Than Sorry – Full-scale drawings help resolve production problems as well as show you how large parts will be and if you are going to have trouble getting parts upstairs.

BY MARTY SCHLOSSER

As a boy growing up in a small prairie town, I had the privilege of working with an elderly craftsman from the "old country". Mr. Germscheid was a jack-of-all-trades who amazed me with his ability to create large pieces of furniture and cabinetry in a relatively small shop. Over the years, most of my shops have also been, well, size-challenged. However, like Mr. Germscheid, by using imagination and some common sense I've successfully made several large pieces of furniture. Let me share some of what I've learned about having big things come out of a small shop, from my mentors and through the school of hard knocks.

Think BIG!

The first thing needed to succeed is the proper mindset. Don't let yourself be intimidated into passing up the opportunity to tackle something huge in your home workshop. Most large pieces of furniture and cabinetry can be broken down into sub-components, each small enough to be worked on individually and assembled outside the shop. As long as you are realistic and plan carefully before starting out, even the smallest of shops should be able to handle large projects.

Okay, so you've drawn up a full-scale plan, from which you have determined the size of each sub-assembly. The next thing you need to do is confirm whether those sub-assemblies can possibly get out of your shop. After you've referred to the scaled plans you made (you did make accurate scaled plans, right?), check to see if there may be any difficulties in getting all of them out of your shop. Don't assume that just because the largest one will make it that they all will, as oddly-shaped pieces have a way of making life difficult for you when it comes time to extract them. If this check indicates there may be challenges, go ahead and make yourself a full scale mock-up using cardboard and 1x3 strapping, fastened together with hot melt glue, staples and duct tape. Because it's light, and therefore maneuverable, you should be

Alternate Work Areas – Garages or outbuildings can double as extra space for tasks like finishing, assembly or temporary storage.

Fast Fix – Extend your bench top with a piece of MDF.

Extra Support – You can also use sawhorses as a temporary base to support sheet stock.

able to readily confirm not only if the piece can make it successfully out of the shop, but the best orientation of the piece as you wind your way out. Knowing you won't have to fret about getting all of the soon-to-be completed sub-assemblies out of your shop, you need to look at any challenges associated with bringing the raw materials in. In most cases, with your circular or jig saw you can reduce the size of even the largest oversized plywood panels and other sheet goods and long pieces of lumber to manageable sizes before bringing them into your shop, either through its front entry door or a window. Don't be worried about your hand-held saw's inherent inaccuracy on any sheet goods you needed to reduce in size. If you retain at least one factory outside edge on each, it doesn't usually matter if that saw cut edge is no longer perfectly straight. Why, even if you have to lose that factory edge, by allowing yourself a bit more material on the cut side you should be able to recut it on your shop's more accurate tools or by using a known straight edge to guide your saw. I'm also here to tell you that your dream project's not down the tubes just because your plan shows that some sub-assemblies are too large to be worked on in your shop. Think outside the box, or in this case, outside the shop. Is there some other area of the house, say, the garage, or an outbuilding, which can be pressed into service as a workspace? What about renting space at an associate's place or commercial space if need be? Necessity is indeed the mother of invention, so don't immediately throw your hands in the air and call it quits. Hang in there.

Space, the final frontier

Try to plan a workflow that allows only those sub-assemblies into the shop, which absolutely need to be worked on at that time. If you need to have a particular sub-assembly readily available as you work on an adjacent one and don't have enough space to have it concurrently in the shop, place it in an adjoining room, a nearby garage or perhaps a close-at-hand outbuilding. Further, if you followed my advice and have a full-scale plan at hand, you could refer to it rather than having to measure directly from that other piece. Nonetheless, it's always a good idea to confirm with the actual piece before committing to a final cut. Another great use for a garage or outbuilding is to house a temporary spray booth. There are some obstacles you may need to overcome, but depending on the time of year these areas may offer that much needed extra room.

The order of construction may also need to be considered. If space is that close, then consider making a scaled, 3-D model of the piece and using it to walk yourself through the construction process. The point to emphasize here, is the need to plan and to plan carefully. Sometimes by altering the sequence of machining, you can overcome an otherwise seemingly impossible assembly challenge.

Safely storing sub-assemblies until the project is complete needs to be considered, so make sure to check this out before moving ahead.

Easy Rolling – Casters can be used in many different ways. The two castors at the end of this router table remain about $^{1}/_{8}$" off the floor until the opposite end is lifted, tilting the wheels downward and bringing the casters into contact with the ground. This keeps the router table sturdy during operation, but easily movable. (Photo by Rob Brown)

Final Assembly – Once you have the subcomponents in their final home you can assemble them for good using any metal fasteners and adhesives required.

Construction

Large pieces require large work surfaces, and because this isn't something you'll be doing often, you may need to extend the size of your bench or assembly tables. Not to worry; get yourself some full-sized ¾" plywood or MDF sheets and lay them onto the work surface. You could also use a pair of sawhorses and some sheetstock to fashion a temporary worksurface. Don't hesitate to move everything out of the way temporarily if that's what's needed to get the job done.

You may have to use some imagination when it comes to working with large components; extending side and outfeed tables on tablesaws or bandsaws are just a couple of things you may have to tackle. Having many of your machines on casters so they can be moved is another way to reconfigure the space to suit the project.

Assembly

As was the case with construction and finishing, there are times when you'll need to come up with imaginative solutions. Commercial shops usually assemble pieces on-site, so there's no reason why you can't also follow suit. By planning your assembly carefully before you even begin construction, things should move along easily.

By now you've hopefully realized that planning and imagination are the keys to success when working on large pieces. But beware: Once you've sunk your teeth into a large, complicated project and succeeded, you'll be encouraged to tackle even more challenging pieces. Don't say I didn't warn you!

MARTY SCHLOSSER
MartysWoodworking.ca

Oops –

What to do when the piece is too big...and it's in the basement

Stuck in the stairway leading out of your basement shop, trying to wedge that big dresser around those two tight bends? Here's the order in which you could proceed:

➤ Remove anything from the piece that sticks out and can be unscrewed: the top; knobs or other protruding hardware. Ensure you've removed drawers, doors, etc. Tape drawer slides closed so they will not slide open.

➤ Tape a thin blanket to the piece so it'll slide instead of having its finish (or worse) rubbed off as it gets squeezed and shoved along.

➤ Remove the door at the top (and bottom) of the stairway and hinges from the door frame.

➤ Remove the stair rails and supporting hardware.

Look carefully at your intended route, trying to envision which position the piece should be in as it winds its way upwards. Feel free to turn the piece onto its end, top, back, whatever! You can use an old blanket as a pad underneath to spin the piece on.

➤ If you're stuck partway up the staircase at a corner, you may have to consider cutting into the drywall to widen things enough. Before you do so, check the area with a stud-finder capable of detecting electrical wiring. If you sense any wiring, remove the power to that area before proceeding, then remove the gyproc as necessary.

➤ Assuming it's possible to get the piece around the bend, but not through the doorway, remove the striker plate and door stop (the flat, vertical trim running up the center of the jamb that your door closes against). Still need more room? Carefully remove the door casing (the trim that sits flat against the wall at the top and sides of the door) then the door jamb and any shims you may encounter. That should give you about a full inch on each side as well as one at the top. Still not enough? Those 2x4s you're looking at are wall studs, so before you consider removing them, have it checked by a professional to see if they're load-bearing members. If they are, they'll have to be shored up before removal. Start first on only one side, using a stud sensor capable of sensing electrical wiring, as explained previously, then remove any studs and drywall as may be necessary. Be careful as you cut the drywall, because you'll have to replace it afterwards.

Such situations can be very frustrating. However, if you follow the recommendations outlined in the main article, you should seldom find yourself in such a predicament. Remember, however, that with imagination and a bit of ingenuity, you can usually get yourself out of a tight spot. Literally.

A One-Car Garage Dream Shop

From a New Floor to Dedicated Ceiling Storage: How to Make it All Fit – And Work.

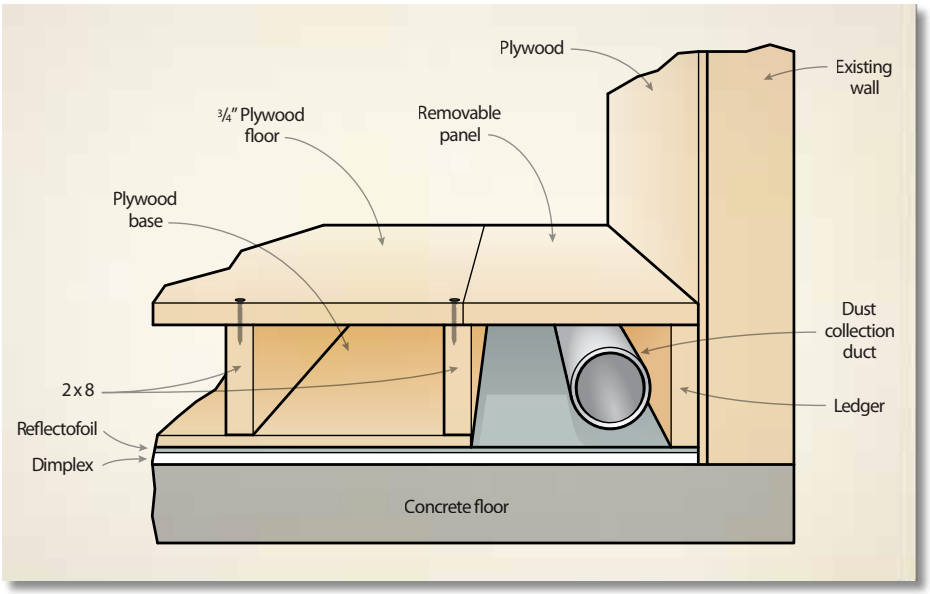
BY KEVIN DUBÉ

So you don't have a double car garage, a huge basement or an airplane hangar in your backyard for shop space and you're really thinking it's not feasible to get a decent shop set up in anything smaller. Well, with some planning and some extra work, you'd be surprised what you can accommodate in a dedicated smaller area.

I'll emphasize dedicated smaller area, as in my case I don't share any of my single-car garage space with the family chariot. Although it took a while for my wife to appreciate that the car should be kept outside in the winter to lessen the effects of rust, it's been worth the exercise to get the most use of space for my shop.

Phase 1 – The Floor

The most important element of my shop is the floor construction. Concrete is cold and hard on the body and the pour of my floor had a significant slope both side to side and lengthwise that was unacceptable for having some of the heavy machinery on mobile bases.



Photos by: Rob Brown Illustration by: James Provost

Top photos by Kevin Dubé

Retain Warmth – Dubé installed a number of layers to keep the cold weather out. First Dimplex then Reflectofoil.

Level the Ground – In order to create a level floor, each 2x6 had to be precisely cut before being attached to the base layer of plywood.

Run Your Wires – Instead of running wires, dust collection, etc. above head Dubé put it all under the plywood floor.

A Solid Floor – Plywood was placed on top after each module was fastened to the concrete floor. Plywood strips would partially overlap the 2x6s and be removable if required.

My garage had a standard height ceiling and I had issues running ducting for dust collection overhead interfering with overhead storage access. I also wanted to run electrical without having to run surface mounted conduit everywhere and I wasn't going to remove existing drywall to have it otherwise buried. The solution was to create two modules that covered most of the floor area and fix them in place. This gave me a level floor and an area below where I could bury my ducting and my electrical, solving the other issues I faced.

My garage walls had heavily dinged drywall and I wanted to be able to affix anything anywhere so I covered them in T1-11 plywood with Reflectofoil® underneath where there were exterior walls to also aid in keeping the shop warm. I also ran the belt sander over them to soften the rough burred surface a bit before installing it. The T1-11 was sturdy and ideal for affixing a level ledger board all around the shop perimeter using 2" by whatever width was needed to arrive an inch or so away from the actual concrete floor. This acts as a ledger in the non-traditional sense, in that it is what will be for most of the perimeter an actual ledge to have panels laid over top of to two "modules" that would cover the majority of the floor area that I would walk on and have my machinery on. The modules themselves are made of vertical 2" by Xs of varying lengths and widths assembled with 3/4 ply overtop, but the edge of each module extends ¾" beyond the edge of the ply to create the second ledge that panels could be laid over top of. Below these panels is where I would run my ducting and BX wiring throughout the shop.

Before fastening the modules to the floor using Tapcon screws, I wanted to help keep as much coldness away as possible and avoid any major problems should I ever have a leak or water spillage in the future from the sink I installed, so I first laid Dimplex® on the floor and also covered it with Reflectofoil tucking the edges of both under the perimeter ledger but not tucking it up completely against the wall per manufacturer's instructions. I recall that -20C cold January evening where I had laid down and butt-taped that last piece of the Reflectofoil over top of the Dimplex. Exhausted, I lay down on my floor to rest and unintentionally fell asleep only to wake up a while later, sweating profusely in my winter coat. That Reflectofoil and Dimplex combo really works!

All the joists of each module are level with the perimeter ledger but the fact that my floor slopes five inches from one end and varies two to four inches side to side posed a challenge. I had to cut a lot of bevelled and angled joists to ensure my floor would be level and that the tops of each joist would lay flat against the plywood as well. I did this by using my bandsaw, which I must say was the trickiest and maybe most critical part of getting good results overall. Basically, I would lay a joist on the floor where I wanted it, propping it up vertically to level it, chalk line both sides of the joist using the perimeter ledger as reference, then went to the bandsaw and free-hand cut along the lines as best as I could. After the first few, I got pretty good at it, although there were a few that had to be restarted or skimmed off using a belt sander.

Each module has a fastened plywood top to walk on, and a bottom sheet that would be tapconned to the floor. I also made sure each module had removable lids in the center that I can use to store scraps of lumber in. With heavy machinery rolling over top, I felt these access areas needed reinforcing, so I notched out the joist tops and installed 3/4 x 3/4 square hollow steel under the edge of the 3/4 ply to avoid deflection. Because I would be walking on top of these access lids, I was reluctant to affix any kind of pull hardware that would trip

Consistent Height – Most of the small to medium sized machinery is located along one wall. Surface heights were kept consistent, and each machine can be moved forward a few inches if necessary.

Brace for It – The router table top rests on shop made braces, allowing Dubé to reposition it with ease then clamp it in place before making a cut.

Easy Access – To have the option of running his air filter while it's located centrally, Dubé fastened it to heavy-duty drawer slides. It also makes getting at lumber stored behind the filter much easier.

Sheet Storage – Because Dubé uses mainly sheet stock, he made sure storage wasn't a problem. He raised it off the ground in order to gain easily accessible space below.

me. The lack of hardware also helps while I'm sweeping and rolling any machinery around. Instead of pulls I use a glass suction device to remove the storage access lids and the other perimeter covers. Works like a charm!

Phase 2 – Machinery Layout

The floor was no longer just a floor but was now part of the system of efficiency and space saving foundation for my shop. The next phase was placement of all the equipment, which was no easy task with the amount of equipment I wanted to use in my 11.5' x 21' space. Sadly, I am no good at CAD software and have limited drawing skills. Trying to figure out how to place everything was a struggle working with such tight tolerances. I ended up using graph paper and scaled cut-outs of the equipment and went through different configurations, keeping in mind what material infeed and outfeed requirements were needed, until I found a configuration that worked for me. I think each situation has its best solution based on what type of work you want to do primarily. In my case, I knew I wanted to make my own cabinetry and built-ins for our home, so the handling, cutting and storing of plywood was my primary focus. The lathe (which I have yet to use but will one day) and some other items that are not used regularly had to be located carefully so they would not interfere with the main function of the shop.

Some of the unique solutions I implemented were to raise all the equipment along one wall to be able to gain space below for the storage of my jointer, as well as ease of access to the panels in the floor below along the perimeter where the ducting and electrical were located. I wanted to be able to have the router table, radial arm saw and the mitre saw surfaces all at the same height for outfeed and infeed support. I also set these machines up so I could move some of them closer or further away from the wall if required. Most shop equipment is designed or built on stands around 34" high. For the router table, I fastened two triangular 2x6 brackets through the T1-11 wall siding into the studs to support my

A Place for Everything – From hardware and push sticks to clamps and glue, virtually everything has a home in this well organized shop.

Multi-Purpose Table – This rolling cabinet/surface has a lot going for it. An infeed table, tool storage and assembly area are just a few of its jobs.

Bits and Pieces – Dubé hates searching for his tools. A great example is at his drill press, where he can easily access anything he could need without having to go anywhere.

router table. The table's outer edges are laid on the brackets without fastening, allowing me to slide the table forward and back as needed. I also built a sled for my mitre saw, which slides back and forward from the wall. Below the mitre saw is my jointer on a mobile base, which I can slide out for use. On the far side of the router table, I made a foldaway for my lathe, which doubles as an outfeed surface for that row of equipment, and a desk area.

Another important storage consideration was full-sheet plywood storage. On the opposite long wall I built an above ground plywood storage rack 37" off the floor, which is also integrated into an overhead storage rack for regular lumber. A lot of lag bolts and metal angle brackets went into this and it was worth the effort to be able to enjoy more side to side space when using the table saw. Rather than use 2x4s vertically placed, as is traditionally done for storage space above our heads in the garage, I used 2x6s laid horizontally and secured them using metal fasteners to maximize the available space. I was really trying to squeeze every inch I could out of the space available and was treating the space as if it was a boat where every nook has a use and needs to be used in the best possible way.

Phase 3 – Use Every Last Bit Of Space

It was important to look beyond the conventional setup for my dust collector. I removed the standard mobile base and mounted the motor unit directly to my wall. Here it was reconfigured for better dust collection via a shorter conduit from the impeller to the collector. The collection bag was placed on a mobile base where its location can be fine-tuned. The extra work was worth it; I now had a base unit that would conveniently fit in a smaller location.

My overhead wood storage is located at both upper ends of the shop and required the central ceiling area to be clear to remove the material. This presented a dilemma while placing my JDS air filtration unit, as these units are traditionally simply hung from the ceiling with supplied hook screws and essentially stay put. Instead, I placed the unit on heavy duty drawer slides, which enabled me to temporarily push it out of the way so long boards can be handled with ease. Some of these customizations on their own may seem minimal but collectively they make the shop much more space efficient and functional. I often hear of people in similar sized shops lament about how they can't do a lot of things because of space limitations, or simply they need to move a bunch of equipment around just to use one machine. This doesn't need to happen. With proper planning and some outside-of-the-box thinking you can enjoy working in your shop with more equipment and efficiency than you would otherwise expect.

KEVIN DUBÉ

A Cozy Space for Studio Furniture

A lot can be done in a small shop if you have the right mindset. Have at look at how West Coast studio furniture maker Jason Klager deals with his friendly confines.

BY JASON KLAGER

I view the time I spend in my small shop as a relationship, realizing that compromises and creative thinking are essential for resolving daily issues and for remaining productive. With a little effort, I was able to produce an efficient space that was inviting; a place where I felt motivated and creative.

When I began designing my small space, I first needed to consider the scale and type of pieces I build and the way I like to work. From here, I was able to decide what machines were necessary to bring into the space, where I would position them and how accessible I needed them to be. Before finding a permanent home for a specific machine, I considered how I would use that machine and, in a few cases, found ways to save space. For example, since I ask my local building center to cut my plywood to specific dimensions, I was able to designate my table saw primarily for small panel work and joinery. I could then situate my table saw closer to the wall without worrying about clearances, thereby providing valuable floor space. Smaller secondary machines are kept mobile and can be moved to create different clearance areas around primary machines when needed. As well, I keep my planer on wheels so it can be centrally located when in use and then moved off to the side for storage. The use of hand tools is an essential part of my woodworking, so it was important to create a space within the shop for my bench. When setting up this area, I ensured ease of access by utilizing the wall space around the bench for storing hand tools and other bench supplies, promoting efficiency with minimal clutter.

Machine Area – Be reasonable about what machines you purchase and how you use them. Sometimes too much machinery only gets in your way.

Photos by: Jason Klager

Showcase Cabinet – "I wanted to design a cabinet on a stand that would stretch me as a woodworker," says Klager of the initial stages of design. It's made of East Indian rosewood and pearwood with imbuya marquetry. (Photo by Ingeborg Suzanne)

Rolling Carts – Very few things are as multi-purpose and handy to have around as a pair of carts; one low and one bench height cart suits Klager perfectly.

Though functioning in a small space can be difficult, it is important to keep areas of the shop open for working and storing the many parts of the piece under assembly. I am careful to bring into the shop only what is necessary for my woodworking. I find it helpful to store blades, drill bits, router bits and other machine accessories right next to or near their corresponding machines. Those who know me know that I love my wood and would prefer to have all the wood I desire on hand. In a small shop, however, it is wise to buy only what is required for your current piece, plus a little extra, so nothing is left taking up valuable space. I find it is more convenient to keep my piece on a mobile platform, allowing me to move it easily to my workspace or off to the side for safekeeping. I also make use of a mobile worktable, which can be moved from machine to machine or double as an outfeed surface for my tablesaw or bandsaw. In another corner of my shop I have a 'multi-purpose' table that I keep clear for tasks such as veneering, assembly, glue-ups and finishing.

Dressing Table – With bubinga and wenge as primary woods and pearwood, East Indian rosewood and afromosia as secondary woods, Klager consciously chose species that were distinctly contrasting but harmonious. (Photo by Jayson Hencheroff)

Over time, I have discovered that staying one step ahead is essential for remaining productive in a small shop. When beginning a new piece, I like to prepare an 'order of operations'; that is, a cut and procedures list for the upcoming piece. This list helps me manage the time I spend moving machines or setting up larger work surfaces. Understanding that my small space cannot house every machine I require, I often resort to building jigs, which increases the versatility of machines I already have. Machines that perform two or more functions, also known as combination machines, are a perfect space-saving solution when working in a small shop. A second way to reduce the number of machines is to think outside the shop by renting time on a machine in a larger shop.

The key to being productive in a small shop is conceding that you have a limited space to work in and therefore must make certain sacrifices and changes to your work habits. Every woodworker has a unique approach and style to the craft he or she enjoys. There is no fixed formula for setting up a small shop, but with patience, good organization and planning, your shop can become an inspiring and rewarding space.

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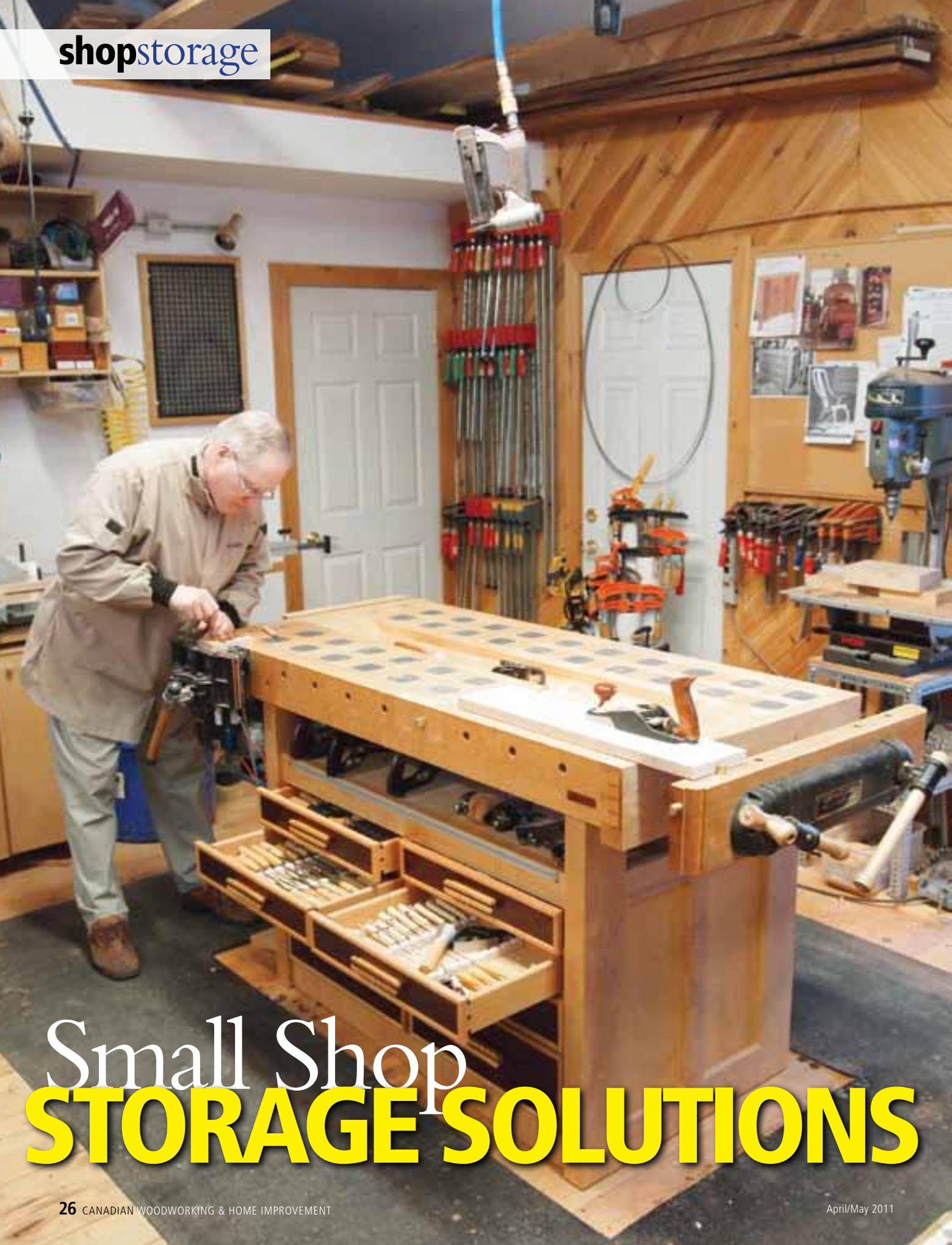

Small Shop STORAGE SOLUTIONS

One of the most important aspects of organizing a shop involves storing all the machinery, tools and supplies you will be working with. Learn a number of fundamental guidelines and tame that beast of a shop you've been working in!

BY CHRIS WONG

Last year during a seminar lunch break, I returned to the shop and heard one student say to another, "Yeah, it's really nice – you have to go see it one day."

I cut in, "What are we talking about?"

He surprised me, "Your shop, Chris."

I have a nice shop and I like it, but never thought too much about it. Later, I asked a co-worker about what might make my shop so special and he said, "It's clear that you've taken the time to organize it and think about what will work well."

My shop is about 425 square feet, roughly the size of a two-car garage. However, there is a wall running down the middle with a sliding glass door at one end that reduces the openness. It also increases my wall space. Plus, I have all my machinery on one side of the wall, so all the dust and noise stays out of the bench room. In this article, I want to share with you some of the things that make my shop such a nice place to practice my craft and give you ideas of how to make the most of the space you have.

Making Room

Though our shops never seem to be spacious enough, how you store what's inside can make the difference between a neat, organized work space and a disaster zone. The first priority is to have a good look at what's in your shop and decide how often you use it. Things that you never use have no place in a tight shop. Items that you use only rarely or are overstock should be stored on a top shelf or in another room – not on the prime, easy-access shelves. I have laid claim to a few bays of shelving in our storage room. I store all my overstock hardware in full-extension pull-outs so I can find it easily when needed. In the storage room, I also store my benchtop tools that I use less frequently. All are fairly heavy, so I make sure to store them at about waist height to make it easy on my back.

And while it would be ideal to limit our workshop to workshop stuff only, we often find things like gardening tools and general household stuff encroaching on our shop space. If it can't be helped, it's best to dedicate a corner for non-shop stuff and limit it to that area. In my shop, I have an area cordoned off with a salvaged bi-fold door which quarantines the garden tools.

Separation – If you also house garden and household items in your shop, a physical barrier is a great way to contain them, and not encroach on shared space.

Relative Location

When deciding where to locate something, I think about where all the related tools and accessories are. Keeping them close not only makes accessibility easier but it also gives me no excuse to not put them back.

One of the most-used areas of my shop is in front of the bench. I've tried to arrange all the tools I'd likely use there so they are within one step from my vise. When standing at the front vise, on my left, under the benchtop, is a pull-out tray with all my chisels, carving tools and mallet.

Behind me, I have the rest of my hand tools. The saws are cantilevered from the wall by screws against their handles while a chest of drawers contains marking and measuring tools and a plane rack holds my bench planes and scrapers.

To my right, I have my sharpening bench, drill press and charging station. The sharpening bench is equipped with a 6" metal vise and houses all my sharpening accessories. On the back of the bench is a fluorescent lamp with a magnifying lens that is shared with the drill press. All my drill bits are stored either in the drawer beneath the drill press table or in boxes hung on French cleats. To the right of the drill press, I have a shelf with a power bar that supplies power to my battery chargers. I leave them all plugged in and instead use the power bar's on/off rocker switch.

Photos by: Chris Wong Lead Photo by: Ted Robinson

Close to Home – Keep tools as close as possible to where they will usually be used. Wong stores his chisels, carving tools and mallet directly below his workbench surface (left). His planes, saws and other miscellaneous items are directly behind him when he stands at his bench (right).

In my machine shop, I store my thickness planer under the infeed table of my jointer. The feed direction of the planer is one direction and the jointer the other. This works especially well because I can joint all my boards and stack them on a cart or sawhorses; then, without reorienting them, I can feed them through the planer (after I pull it out, of course).

I have a lot of routers with different wrenches, collets and template guides. I also have a good collection of bits so I built a wheeled cabinet in which to organize them all. The wrenches, collets and template guides are housed in the top drawer; router bits and trim routers in the lower drawer; and routers sit on the bottom shelf.

Likewise, I keep all the tools nearby that are required to make adjustments to my machinery. In the center of my machine shop, I keep metric and imperial wrenches and hex keys, a machinist's square, a stepped height gauge and a multi-bit screwdriver. I try to store machine-specific accessories such as blades and wrenches within a step of the machine. My table-saw blades are stored on the wall to the left of my table-saw, but I prefer how editor Rob Brown stores his blades.

Just High Enough – This storage unit will allow wide sheet stock to pass underneath, while storing blades, wrenches, shims, etc. nearby. (Photo by Rob Brown)

Storage Floor to Ceiling and Everywhere Between

One thing I preach is to make use of the area above your head. In my shop, I've installed cabinets on the walls that start a few inches over my head and run up to the ceiling. That way they don't restrict my movements but still provide a lot of extra storage. I've also mounted a power bar to the bottom of the cabinets, which makes it really accessible and it can never be blocked. If your cabinets don't go all the way up to the ceiling, on top is a great place to store long material. For ease of accessibility, smaller items go on the lower shelves while taller items go on the higher shelves.

Larger items such as levels, framing squares, panel saws and straight edges can be a challenge to store in an organized manner. I've hung them from screws on the back of the pair of hinged doors that lead out into the yard from my machine shop. I didn't want to hang anything heavy on the doors, so this was the perfect use of the space.

Plywood and long stock can also be a challenge to store in a shop. When I had an 8' bank of cabinets in my shop, I used to slide my sheet goods in behind it. Now that they are gone, I just stand them up against the wall and use a wedge system to keep them neat and upright. Long, narrow material goes on my lumber rack beside my table saw. I also store dry lumber standing on end in one corner of my bench room.

I don't use templates very much in my work, but when I make one, I usually save it. How I store them is probably my most unusual example of storage – I screw them to the ceiling. Hey, why not? There they don't gather dust, are out of the way, and are easy to find. As long as I can get a step stool below, they are accessible.

I store most of my fasteners in plastic divider boxes. I like being able to bring a selection of them to wherever I am working and I especially like having a locking lid – something those plastic parts cabinets don't offer.

Router Storage – By having a place for all necessary routing items Wong keeps the area tidy. It's also easy for him to find anything he needs.

Drawers. Everywhere.

Drawers are really useful in a wood shop – you can't have enough. They keep out the dust and with dividers or compartments they can help organize as well. A drawer that is too deep ends up getting filled with anything that fits and becomes a junk drawer, so multiple shallow drawers are better than one deep drawer. However, drawer slides can be expensive so I make my own drawers with built-in drawer slides. In addition to saving costs, if I make multiple cabinets the same width, I can move drawers from one cabinet to another quickly and easily.

Start with ¾" plywood that is twice as wide as the depth of the cabinet and as long as one side and top/bottom. I crosscut the top and bottom off of one end and set it aside. Then, using a ½" dado stack in my table saw, I cut a series of ¼" deep dadoes across the sides. Make the spacing between them uniform so that the drawers are interchangeable. Finally, rip the sides and top/bottom in half to separate them and assemble the cabinet however you please. If you want to hang it on a wall, attach a French cleat to the back at the top and a batten of equal thickness at the bottom.

The drawers are very simple to make. First, cut the drawer bottoms from ½" plywood. Make them about 1/16" narrower than the distance between the dadoes and full length. Cut

Full Height Storage – Make use of the space above your head. Shelving units can be purchased or made.

Use Every Inch – Wong stores light items on the back of these hinged doors.

On the Ceiling – Seldom used items like template are screwed directly to the ceiling where they can easily be seen but don't take up any space.

Take Them With You – Small cases with lids provide portable storage that, when dropped, likely won't open.

French Cleats

French cleats are a simple way to hang things on walls while allowing easy repositioning. One bevelled cleat is fastened to the wall and the other is fastened to whatever you want to hang. One catches the other and gravity does the rest. French cleats are commonly cut at 45 degrees but I prefer to cut mine at around 30 degrees. This makes them easier to lift off the wall (especially way up high) without sacrificing security.

When you make French cleats, it's a good idea to ease the point. Not only does this make the edge more resilient to accidental damage, it also allows it to seat fully if there is sawdust or other debris on the wall-mounted cleat. Not that there's any of that in your shop!

strips of solid wood or plywood equal to the inside depth of the drawers you want and cross-cut them to length. I assemble the drawers with glue and nails. Note that to store a 5" tall object, you don't need a 5"-deep drawer – you just need 5" of headroom.

When I built the cabinet that houses my marking and measuring tools, I wanted to make sure each tool had its own spot and would stay fixed. I cut the drawer bottoms and used contact cement to adhere ¼" cork sheet to one side. Using an X-acto knife, I cut around each tool, then peeled the cork off the plywood with a chisel. I made the handles with hand planes, cut them to length and glued them to the fronts using a rubbed hot hide glue joint.

Another option is to cut out pieces of wood that will secure your tools at certain points and glue them to the plywood bottom, as Rob Brown has done.

Or if you want to go all the way, you can create custom-cut-out compartments for your tools and line them with a soft material such as felt. This is known as French-fitting.

Once you get your shop organized, you'll fully realize just how nice it is to be able to find and access things easily as well as have room to work! You'll soon find yourself actually putting tools back where they belong when you are done with them. Whether the shop is where you spend week days or weekends, you'll really appreciate an organized shop.

Special Cut-Outs – An exact spot for each tool, no matter how small, reduces searching. This can be accomplished many ways. Cork can be removed to leave a shallow (left), or a drawer can be fitted with wooden stops (right). (Bottom photo by Rob Brown)

CHRIS WONG
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Two-Drawer Cabinet

Whether it's for protecting our valuable tools and organizing our shop space or bringing order to a home office or kitchen, we all need a simple space to store our stuff

BY MARK SALUSBURY

Gatherers and hewers … that's what we are. From the humblest of humans to the loftiest of lords, gathering stuff for the enjoyment and needs of our daily lives separates us from other life forms. So now we need nice places to stash our stuff. Once we outgrow the cardboard boxes of our youth and the milk crates of our teens and twenties, the "hewer" in us gives us the inspiration and skills to create more attractive, personal containment, keeping our stuff orderly, safe and close at hand.

The word cabinet comes to us from the Italian word "gabinetto" for closet or chest of drawers. In any language, a cabinet is a great place to store your stuff. Cabinets can be made in all shapes and sizes, styles and configurations but the most universally useful cabinets are the simplest.

Simple is good

On the "down-side", keeping things simple keeps your materials costs down, the time required to make it down and the time involved to put your choice of finish on it down. On the "up-side", simple cabinets can be put to use doing a variety of things. They can be "open concept" versatile or customized with dividers and compartments to perform a specific task. A simple cabinet is a great foundation; it's a blank slate for expression and decoration through applied mouldings, paint, stain, glazes, and hardware or left clean and just durably varnished as I've done here.

My cabinet was made to hold my collection of hand planes in my workspace, keeping them all together in one place rather than squirreled away "wherever". However, by changing dimensions to suit, it could just as easily be made to fit the needs of a home office (records and files), entertainment area (CDs/DVDs), or mudroom (hats, gloves, dog leashes).

Design first, build second.

As with all projects, design has to be considered and a great place to begin is with a pad of graph paper and an HB pencil. From a visual standpoint, "The Golden Section" is a starting point; this ratio of 1:1.618 satisfies our sense of visual harmony but is most often tweaked to suit whatever you're making. Considerations must include the location and function of the cabinet and the dimensions of objects it will contain.

My cabinet is made to sit on a low portable cart, 28 ½" wide and 24" deep, so width and depth were established. Next, I measured the height, width and length of the stuff I wanted to put in the drawers, left a margin for expanding my collection, decided on the number of drawers I'd need and plugged all that into my thinking.

With my overall case width and depth established, I arrived at drawer widths by subtracting the thickness of the drawer sliders, clearance allowances and the thickness of the case material itself from 28 ½"; drawers then will be 26" outside, 24 ¾" inside. Sweet!

Next I turned my attention to heights. Deciding that two drawers would be fine, one for taller planes and the other for smaller tools, and

Photos by: Mark Slausbury

Simple or Specific – Though you can customize the drawers to neatly hold specific tools, there's nothing wrong with leaving things simple and flexible.

knowing that the largest item I'd be storing was my jack plane measuring 22" long x 5 ½" tall, the bigger drawer had to be at least 6" deep inside. And at over 24" inside width, I'd be able to easily access this biggest plane from its intended spot at the front of the drawer. Perfect!

I decided that drawers on the plus side of 5" and 3 ½" deep with applied face panels of 7 ½" and 5 ¼", respectively, would work well. By allowing for 1/8" clearance between the face panels and the case and the drawers themselves plus the thickness of the case material, I determined the case's overall height would be 14 ½". This would put the case's top surface at a perfect working height up from the floor once on my cart. Bonus!

From a height of 14 ½", a tad of math shows perfect "golden ratios" would have produced a cabinet 23 ½" wide (14 ½" x 1.618) and my lower drawers overall face panel height of 7 ½" would have preferred an upper drawer face a hair shy of 4 ¾" (7 ½" divided by 1.618). It was not the 5 ¼" front panel I needed, but I sure was in the visual harmony ballpark. Bliss!!

Be sure to have your drawer sliders in-hand before you begin making any cabinet so you can tweak your case and drawer dimensions to suit the sliders' requirements. Drawer sliders are available in a large selection of load ranges and lengths to suit whatever size of case you're making and the greatest weight of contents you'll be storing.

Plan the work then work the plan

The whole time I've been calculating, I've also been sketching, as accurately as possible, and now have a good picture of the size and placement of all the bits and parts I'll be working with, plus a sense of the order in the cutting/fitting/making process.

Cabinet grade plywood is the best material from which to make the case and face panels. It's dimensionally stable (won't move with seasonal changes in heat and humidity as will solid wood) and has a "good" veneer on both sides unlike lesser grades of plywood that may have ugly voids or patches. Generally, the more core plies and the thicker the face veneers the better. The case is constructed using ¾" plywood for top, bottom and sides, making sure the grain runs vertically on the sides and left to right across the top and bottom so the grain runs around the case rather than front to back, improving the appearance and allowing edging to be added with its grain direction in sympathy with that of the plywood. If you cut the sides and top from one larger piece, the grain will run continuously around the visible portion of the cabinet.

Solid edging in a similar or contrasting wood is attractive and durable, but iron-on veneer edging is also a great way to cover any exposed plywood core surfaces such as those you'll get around the case and drawer fronts.

I cut the drawer face fronts from the same plywood used for the case, allowing for the ¼" thickness of my choice of edging. For a visual treat, cut the face fronts from one solid piece of plywood so the grain will be continuous between the two panels. Ah, harmony.

Harmony Is Important … to a point – Keep the ratio of 1:1.618 in mind when designing pieces, but don't forget about function.

Edge Options – Solid wood edging on the case and drawer fronts provides durability but is harder to apply. Another option would be easy to apply iron-on veneer tape.



Choose Your Own Adventure – When selecting joinery you have many options. A lock mitre (left) is one of many ways to join the sides, top and bottom. The drawer box (middle and right) was joined with a rabbet and groove. Choose a method based on the finished look you want, the tooling you have and how much time you want to invest.

For the drawer sides, front and back I chose poplar, a medium-density hardwood, which machines and finishes well. Using solid wood for the drawers eliminates the need to apply edging and produces stronger joinery at the corners; seasonal movement isn't a consideration here. 3/8" veneer core plywood is well suited to make the drawer bottoms and the case back as it offers stiffness, strength under load and seasonal stability.

Coming together

As the owner of a "lock mitre" bit for my router table, I like to put my cases together using lock mitre joinery, but a splined mitre, biscuited mitre, double-corner rabbet joint or biscuited butt joint will work too, depending on your skill level and tooling available. In a case of this size with accurate joinery, glue and a tight fitting back panel, you'll be just fine as long as the case goes together square and plumb. For the drawers of a utility cabinet such as this, a rabbet-and-groove joint can be used to unite the drawer sides with the mating back and front components. Dovetail joints will add strength plus "eye candy" in more critical cases.

The back panel for the case is cut and trimmed for a snug fit into a rabbet cut all around the inside rear of the case before assembly. Wait to finally install the back panel after you've installed the sliders; just screw it in place for now. The drawer bottoms are slid into snug rabbets 3/8" up from the bottom of all the drawer components

With the case and drawers assembled, a coat of dewaxed shellac or thinned varnish on all interior surfaces (except where the back panel glues into its mating rabbet) will seal the interior before you go further. Let it dry overnight then lightly fine-sand to remove any fuzz. Next, the sliders are installed on the drawer sides and the mating parts marked, accurately located and applied on the inside of the cabinet case.

Now apply edging to the case and the drawer face panels using glue and brads. Trim everything flush with a keen plane and sand paper, retaining crisp edges, which you can ease once everything is fitted and before applying finish.

Face panels with drawer pulls installed are next, applied to the front of the drawers using screws through slightly oversized holes from within the drawer allowing some movement to tailor the panels placement once the drawers are installed on their sliders.

Once the back panel is glued and screwed in place and the drawers are installed and tuned to fit the case opening, it's time to play. If you want to add some decorative mouldings, stain, varnish, a glaze and more varnish or urethane for durability, now's the time to personalize your cabinets show surfaces.

Slide Selection – By using full extension slides you have easier access to items near the back of the drawer. This small project may be the perfect opportunity to try a type of slide you're not familiar with.

Add Strength – Once the slides have been installed, and the finish has been applied, glue and screw the back into place.

Cabinets are such an easy and enjoyable project; you'll want to create new cabinets for your kitchen, bathrooms, bedrooms and anywhere you want to store your stuff in style.

MARK SALUSBURY
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Photos by: Rob Brown

8 "Real Life" Shops

From basements and crawlspaces to outbuildings and apartments, there's a shop here for everyone. This collection is about as diverse as can be.

Crawlspace Shop

OWNER: Scott Harnett, Hobby Woodworker
PROJECTS: Small family projects
SHOP SIZE & LAYOUT: 10' x 7', 70 sq ft. in a crawlspace

For small business owner Scott Harnett, his interest in woodworking began while he was in Newfoundland admiring whittled objects carved by local artisans. "I wanted to try to make the same projects [wooden links and a ball in a box all carved from the same piece of wood] and the interest in wood grew from there." Years later, when Harnett became a homeowner, the previous owners had left an old workbench that was too bulky and heavy to move out of the basement.

Harnett decided to keep the workbench in the crawlspace and build a workshop around it to pursue his hobby. It's set in the midst of an area that also stores many boxes of his wife's school supplies, Christmas supplies, old toys and baby clothes. The workspace is incredibly small – 70 square feet in total - but what makes this space stand out is the headroom. The ceiling is only 4 ½' high and Harnett is over 6' tall.

For Harnett, however, the space works. He moves around his workshop while sitting on a wheelie chair, making small projects for himself and his family. Harnett has made train set pieces for his son and prepared crown moulding using his variety of basic woodworking tools, amongst other small projects.

In terms of organizing, Harnett says, "I use whatever nooks and crannies are available to me." This includes shelving made from the joist bracing and HVAC strapping. Steel I-beams are used to clamp items, such as the draped heavy nylon sheeting that surrounds his space to minimize wood dust from escaping to

Sitting down on the Job – Scott Harnett set up his hobby shop in his crawlspace because there was no other option. He sits in an office chair while he works and stores frequently used tools below his seat. (Photo by Rob Brown)

Sharing with the Car – Bruce McMahon enclosed a space for a car in his large two-car garage, then carefully set up shop in the remainder of the space. (Photo by Matt Dunkin)

other areas of the house and crawlspace. Noise isn't much of an issue in the shop because the walls of boxes muffle sound quite well.

"It's not a professional shop by any means, but it's fun to tinker in," says Harnett. "It's very solitary. It's not like you get a lot of traffic in the crawl space. It's the dog who visits me most and I've got a radio down there so I can listen to music."

By Rachel Harnett

Village Shop in Part of a Double-Car Garage

OWNER: Bruce McMahon, Teacher, Woodworker
PROJECTS: Furniture
SHOP SIZE & LAYOUT: approx. 300 sq ft. in an L-Shape

Bruce McMahon of Lakefield, Ontario has carved an economical shop out of a double-car garage on his property on the edge of the village where the lots are large. A full-time teacher and volunteer firefighter, McMahon spends time in his shop whenever he can, creating furniture for friends, pieces to donate to local fundraisers or props for historical re-enactments with his high school classes.

Because space is at a premium and most of the shop is just about 10 ft. wide, McMahon has developed efficient storage strategies for tools and materials, lining series of tools together so that feeding overlaps individual tools, and using others on wheels to provide the flexibility he needs. The shop is heated with a woodstove, which allows him to burn scraps and not heat continuously during the winter months. The downside is that periodically he needs to sand surface rust off and wax the steel surfaces of tools like his jointer. He also notices the effect of heating and cooling on the furniture and wood with which he works. He had a eureka moment when he saw the anti-fatigue

Wood Burning Fireplace – Though it doesn't work for everyone, McMahon used a fireplace to heat his shop in colder months. This method has its pros and cons but can be used safely in the right situation. (Photo by Matt Dunkin)

mats in a relative's milking barn and has outfitted his shop with the thick rubber mats sourced from a local agricultural supply store. Careful window placement allows McMahon to infeed and outfeed 16 ft. long material if he needs to. His next project hangs near his table saw – an ancient cedar-strip canoe needing restoration that will make for lovely paddles on the nearby Kawartha Lakes.

By Matt Dunkin

Urban 'Unplugged' Basement Shop

OWNER: Tom Fidgen, Furniture Maker, Writer
PROJECTS: Furniture
SHOP SIZE: 144 sq ft.
One hundred and forty-four square feet; that's 12' x 12'.

Not exactly what you'd call a 'dream shop' but three years ago I decided to make a go at building custom furniture in a small basement workspace. How was this possible? Two words: hand tools.

As it turns out, 144 sq ft. is all the room I needed to build small to mid-size pieces of furniture using only hand tools. In the middle of my work area is my workbench – that's a given. Alongside the workbench is my dedicated sharpening bench, my treadle lathe and my tool cabinet. I have two workhorses that I refer to as 'shop bents' and I also have a saw bench where I dimension all of my stock.

That's pretty much it. This is all I need to do the work I do. The key to a successful work environment is getting set up as

The Workbench is Central – In the foreground is Fidgen's dedicated sharpening bench, on the left his tool cabinet. His work bench is in the middle of the work space and against the back wall is a treadle lathe. (Photo by Tom Fidgen)

At Arm's Length – Hand-saws hang behind the work bench on the wall – proper tool storage is a must in a small workshop. (Photo by Tom Fidgen)

best as you can to suit the work that you do. That involves taking the time to set up your own shop space so that things will flow whatever size and scale you're working in and keeping things tidy along the way

Let the space define the scope of your work. If you're into building huge period armoires then maybe you should rethink a small basement shop. If you have a look at my book, *Made by Hand*, then you'll see some examples of the projects I've made in this basement wood shop. I don't think that I would have been able to pull it off with power tools. The dust and the noise would have been too much for an area this size.

Ceiling heights, lighting and assembly areas are the three things that I constantly struggled with over the past three years. I built a large traditional frame and panel door out of solid oak for a Heritage Property in Toronto last year but the door couldn't be assembled in my shop. I needed to do all of the prep work down stairs and then the final assembly happened on my dining room floor! Another source of frustration was a pair of walnut book shelves I recently made. They had through dovetails for the carcase joinery but I wasn't able to stand the planks upright in my shop because of the low ceiling height. I resorted to sawing the dovetails with the planks lying flat on the work bench instead of in a face vise held in an upright position. It was less than ideal but it worked.

That's the reality of working in a small space, sometimes you need to adapt or 'bend' a little bit. That said, it's these challenges that keep it interesting and having my quiet workshop a few steps away from my living space has worked out great for me. Maybe it'll work for you.

By Tom Fidgen

Country Detached Home Shop

OWNER: Jeff Cadence, Carpenter
PROJECTS: Furniture & Custom Cabinetry
SHOP SIZE: 1000 sq ft.

Twelve years ago, woodworker Jeff Cadence built a detached shop on his rural property near Keene, Ontario to allow him the space to operate his custom carpentry business. Since taking a job at Trent University, he doesn't use it as much as he would like, but it continues to be an inspiring place to build furniture in his spare time. He found that building in a rural setting allowed him more relaxed possibilities, including a larger shop, greater set-backs and the ability to incorporate features like a dedicated spray booth. The shop is built on a concrete slab-on-grade foundation that Cadence would insulate if he were to do it again. The space is heated by a repurposed forced-air oil furnace and he keeps the heat low during the winter months to keep things from freezing up when not in use.

A large, bright open area of the main shop has a cathedral ceiling with skylights, and clerestory windows admit indirect light. Beside the main shop area he framed in a dedicated spray room and a room that was intended to be an office for his business, although he found he preferred chatting with clients over drawings at his kitchen table, sitting on chairs that he designed and built himself. In the space above the spray room and office is a loft for drying lumber and storing materials. Cadence came across a deep map cabinet with shallow drawers being discarded from a government office and gave it a new life as a convenient dust-free storage area for hand tools and other supplies. A filter-less agricultural exhaust fan distributes ambient wood dust harmlessly out into the adjacent field, a simple technique that you can only employ in the country. A pleasant environment, Cadence's shop has been used variously over the years to produce whole kitchens, create sculptures, and as a learning environment for individuals and groups to take a foray into woodworking by tackling such projects as making paddles.

By Matt Dunkin

Dedicated Shop – Jeff Cadence built this shop on his country property Because he started from scratch he had more options to choose from in terms of layout, size and extras. (Photo by Matt Dunkin)

Dust-free Storage – By recycling this map storage cabinet Cadence has lots of area for storing smaller items. (Photo by Matt Dunkin)

The Great Outdoors – Egon Reske keeps most of his equipment and material inside (left) his basement shop … until it's warm enough to expand. In warmer weather he moves some of his machinery outside (right) and enjoys the fresh air while working on projects. (Photos by Egon Reske)

Indoor/Outdoor Shop

OWNER: Egon Reske, Retired Hobby Woodworker
PROJECTS: Furniture and Built-Ins
SHOP SIZE & LAYOUT: 200 sq ft. Indoors and a Yard Outdoors

Egon Reske's Bridgewater, Nova Scotia home – a three-storey house of 2015 sq ft. with a walk out basement on one side – is where he's set up a hobby shop. There's a 10' x 20' garage on the ground floor of his house and Reske has managed to shoehorn an incredible amount of machinery and materials into his space. It eventually reached a tipping point, and on warmer days he allows his projects and machinery to spill out onto the side yard patio, giving him a whole lot of breathing room – and fresh air. He machines furniture parts, sands surfaces, and even applies a finish under the sun. It's also a great place to mill lumber to size.

"We have a woodlot out in the country from which I cut trees and make attempts to convert them into lumber using a home built chainsaw mill," says Reske of one of his favourite tasks. "The wood is not cut to any specific dimension but rather to what I feel is the closest to Quartersawn possible. I really enjoy this aspect and could spend all my time doing it."

Indoors, his worktable is made from solid spruce lumberyard stock covered with plywood. A rack overhead holds various items of lumber large and small. As Reske says, "It's not pretty but it's strong." The King bandsaw has folding tables on both sides so longer and heavier pieces of wood can be handled. These tables are also used as work surfaces. The jointer has wheels and is easily moved outside. The radial arm saw can also be moved outside if needed, but it usually remains inside. The tablesaw's surface and his work bench are the same height for material handling purposes. He tells me it's just possible to rip a 4x8 sheet of plywood down the middle of the space or to handle a 9' long board on the bandsaw. The mitre saw is set up on another wall and can handle 12' long planks. The planer has a dedicated table with long infeed and outfeed support that it's placed on when outside. Reske adds "works well for what I use it for." It also serves him well as a work bench.

By Rob Brown

Shop on Wheels

OWNER: Matt Dunkin, Carpenter
PROJECTS: Renovations
SHOP SIZE & LAYOUT: 45 sq ft. trailer

My renovation and custom carpentry work is largely based in the homes of my clients, so my tools must be as mobile as I am. While it is not an actual "shop," the utility trailer I had custom built a few years ago allows me the freedom to arrive at a job site with a full arsenal of tools and set up a site-based temporary shop. I can transport tools, materials and cabinetry safely and securely in any weather and leave the trailer at a job site for the duration of the project, setting tools up in whatever shelter is available to me: a spare room, a garage, veranda or driveway.

Ordering a custom trailer was a bit more expensive than purchasing a stock model, but well worth it. To save my

Shop on Wheels – Matt Dunkin had a trailer custom built so he could comfortably bring all his tools with him to different jobsites. He secured everything with bungee cords, braces or straps so nothing would be damaged during transport. (Photo by Matt Dunkin)

Open Air – When Dunkin arrives at the jobsite he often ends up working outside on a lawn or patio. He keeps an eye on the weather as to avoid getting caught out in a thunderstorm. (Photo by Matt Dunkin)

An Apartment Bedroom – Phil McCurdy set up shop in a spare 8' x 8' apartment bedroom. Although unorthodox, he's organized so the space works well for him. It's a rare project that has McCurdy storing or using items in other areas of the apartment. The coffee table makes a nice sharpening bench and he even had his lathe set up in the kitchen for a short period of time. (Photos by Phil McCurdy)

beleaguered back, I stipulated that it be tall enough that I could stand fully upright inside (I'm 6' 1"). My driveway at home is tight, so I narrowed the base a bit from the standard 6' to 5' wide. And I wanted to be able to easily carry sheet goods so I made sure that the main body of the trailer was 8' long with a V-front to make it more aerodynamic and provide extra room for long material. I chose a swinging door at the back instead of the fold-down ramp option, and chose a side door for additional access. I placed my order and had to wait about six weeks for it to arrive before I could begin outfitting it. Early on I decided that I would carry fasteners and supplies in the back of my truck and leave the trailer for dedicated tool storage. A beefy hitch lock keeps me from worrying about theft.

The organization of the trailer was a fun challenge, and one I must revisit periodically as my tool needs evolve. I chose my largest tools and built around them: my folding tablesaw and shop vac are near the back of the trailer on the same side. Heavy tools are located on the floor to provide ballast and are balanced over the wheels to reduce weight on the tongue; the shelves above them house bins, toolboxes and loose tools. I left a central corridor about 2' 6" wide so that I can walk in and out and so that heavy items like several sheets of plywood can be centrally located in the trailer. I built a narrow rack for power tools on the opposite wall, and store cords and tool belts on solid hooks below. Bungee cords across the tools prone to tipping mean that they can't shift around during transport. Investing in the trailer and customizing it has paid huge dividends over the last few years in terms of my efficiency and sanity as I work – wasting time finding lost tools, and travelling home to get tools I need is thankfully rare now.

By Matt Dunkin

Double Duty Room – About the only non-woodworking item in McCurdy's shop is his clothes dryer. But you must admit … it makes a nice drill press stand! (Photo by Phil McCurdy)

Apartment Bedroom Shop

OWNER: Phil McCurdy, Hobby Woodworker & Web Designer
PROJECTS: Small Items
SHOP SIZE: 64 sq ft.

The 8' x 8' shop area that Phil McCurdy spends time in is different than most. It's on the top floor of an apartment building, in a spare bedroom. He's been accumulating tools and working on improving his finishing over the last year while he fine-tunes his layout. "Time's finally come that I can start making things with more than one piece of wood. First up will be some better storage and a bench for the shop. Limited space means I'm limited to making table-top items, not tables," says McCurdy, who is located just outside of Toronto.

Work often overflows into other areas of the apartment. The kitchen can provide more space when needed, and the coffee table in the living room makes for a comfortable place to set up for sharpening sessions. He laughs about his situation a bit. "Good thing I'm single: there's not a woman in a million that'd put up with it."

Surprisingly, noise isn't an issue. He's in the top floor end unit with the shop in the room farthest from the neighbours. He's talked to them and the only thing they've noticed is the shop vac running; though they were puzzled when they met him in the stairwell carrying in tools, machinery and lumber. The landlord's green with envy and loves to check out what's new in tools and projects every time he picks up the rent.

Machinery and tools are kept to a scale commensurate with the size of the shop. An Atlas 8" table saw (18x20" top), Delta Midi Lathe (10" diameter), Ryobi 10" drill press, 4" table-top jointer and a host of hand tools and small power tools. Arriving any day now is a Ryobi 9" bandsaw, though McCurdy admits he has no idea where it's going to go. Even the hand tools need to be carefully thought through. "I just picked up a

Veritas skew block plane instead of the plough plane because of the size issues I have."

Although nearly everything is thought out before McCurdy jumps to action, he did forget to leave room for material storage while designing his space. Stock is purchased as needed and typically limited to 2x4' unless he specifically needs something bigger. In such a case, he has it cut to size at the lumber yard before bringing it home. "Getting material in and out is no problem, as long as you don't count carrying it up a few long flights of stairs," he jokes.

Any advice for others in this situation, Phil? "Plan ahead," he quickly replies. "I did re-arrange the room once and it was a nightmare that disrupted the entire apartment. Sketch-up has been invaluable for figuring out how to make everything fit – even the little jointer had a spot planned and was measured to the half-inch before I agreed to buy it."

By Rob Brown

"Live And Work" Shop – Rob Rivison owns a two-storey building on a busy city street. He works on the main level and will eventually live on the upper level, completing the commute to work in less than a minute. After he purchased the building part of the renovations included going to great extents to separate the living and working spaces for a host of practical reasons. (Photos by Matt Dunkin)

Urban Shop in a Renovated Historic Mattress Factory

OWNER: Robin Rivison, Carpenter & General Contractor
PROJECTS: Custom Cabinetry, Built-ins
SHOP SIZE & LAYOUT: 1100 sq ft. plus storage space in full basement below

Robin Rivison of Peterborough, Ontario has been renovating a historic mattress factory, the upper floors of which were destroyed by fire in the '80s. Hoping to eventually live above the shop in the upper two floors of the building, Rivison has gone to great lengths to separate the shop from future living space by giving it a separate entrance, and soundproofing the ceiling with insulation and $^{5}/_{8}$" gypsum wall board attached to resilient channel. He chose a boiler, housed in the full basement beneath the shop that will feed radiant floor heating loops for the entire building so that dust is not making its way into the living space above.

Rivison faced challenges in getting a minor variance to establish a larger-than normal home-based wood shop in a residential urban neighbourhood because of the opposition of some neighbours concerned about noise, dust and traffic. Despite some opposition, and restrictions like not being able to include a spray booth in the shop, he has been able to create a shop that is beautiful, bright and clean and houses impressive dust collection systems, as well as finely finished details, even on shop-made brackets and benches. A large Italian combination machine takes up a central place in the shop and Rivison has constructed an impressive assembly and sanding bench with plenty of storage beneath it for supplies and clamps. He has finished and painted the walls a vibrant red, installed a variety of different lighting types, and will continue to restore the windows to the building as time and budget permit. Over the years he has developed a sense of what he wants in a shop and is intentionally building this one to be the culmination of his dreams and experience in both building and shop design.

By Matt Dunkin

Two Options for Finishing Your Next Masterpiece

If you're searching for a finish that's easy to apply, looks great and is repairable, look no further. These two finishes give you the option of either a very fine, delicate finish or a more durable, everyday finish.

BY TED BROWN

In a small shop we need to find finishing techniques that are repeatable, resilient, inexpensive to buy and apply, but will also give top quality results. This article explores the use of shellac, a great natural product that offers incredible results using a relatively easy padding technique. It also looks at a mixture of oil and varnish that increases resilience and adds a deep warm tone to your work.

The tough thing to accept in woodworking is that no finish is completely waterproof. Finishes also suffer when they come into contact with excessive heat, like that from a dinner plate or coffee mug. Therefore, it is important when considering a project to think about using the right finish for the given application. If making a piece that is seldom handled, like a showcase, then you can take advantage of the stunning beauty of a shellac finish. If you are looking at making a coffee table, you definitely cannot consider shellac but may opt for an oil and varnish mixture instead. Both finishes are simple to repair, which is a key consideration because, inevitably, the furniture will see some wear and tear. Remember when you deliver the piece to the recipient to make a nice card that explains how to take care of the finish.

Photos by: Ted Brown

Shellac Polish – It's best to buy shellac flakes then mix up enough finish when you need it. Shellac has a short shelf life after it is mixed.

Fold in the Corners – To make the "pillow" for applying shellac, start with a piece about 12" square. Fold the corners in (left) then produce a ball shape with no edges to drag (right).

I often pre-finish parts of a piece before glue-up. Both of these finishes lend themselves well to this technique. During the last dry fit, I apply wax around the joints to repel glue squeeze-out and then complete the final glue up. After final assembly, I clean the joint with either a sharp plane blade or a scraper and apply a final coat of finish to the assembled piece of furniture.

Finishing can be very complex, if you allow it. In a small shop we need finishes that are easy to apply, easy to repair, and those that don't require exhaust systems. Both of the finishes in this article are applied by hand. Dust is not an issue with either finish; the steel wool used after each application to planarize the surface also acts to remove any dust that has landed on the surface. These are good, reliable finishes that give you the choice between the delicate beauty of shellac, and the durability of oil and varnish mix. The techniques are easy to learn and master, so there is little downside to these finishes.

Keep it Going – Work with the grain and overlap each pass at least 50 percent. Be careful not to stop the pillow on the surface or a mark will be left.

Smooth with the Grain – In the later stages of the application you should cut the surface back with 0000 steel wool after each additional coat.

Shellac Polish

Shellac is a very "green" natural product that is safe to use. It is harvested in Asia, from secretions left on trees by the Kerria Iacca insect. People of Thailand, China and India harvest the resin by removing twigs and literally scraping off the larva casings and the lac resin they contain. This raw product is referred to as "sticklac". Sticklac is refined by crushing the lac, and running it through a sieve to remove debris. The lac is washed and run through another sieve to further remove debris. It is then heated and stretched, either by hand or by machine, into thin sheets. It is then broken into shellac flakes. Continuous refinement of the shellac results in products ranging from a brownish orange to a nearly clear product called "super-blonde" shellac. The latter blonde shellac is fully de-waxed using solvents. Removal of the natural wax is important for adhesion, especially if the shellac is used as a seal coat beneath another finish.

Back in 1993, I learned how to mix shellac from flakes from James Krenov. Texts will tell you that to determine the strength of the shellac in solution you need to mix it in a known "cut". A one-pound cut simply means that the mixture is equivalent to mixing one pound of shellac to one gallon of denatured alcohol. Jim had a much simpler method. You really don't need a gallon of mixed shellac on hand because mixed shellac has a limited shelf life of about six months. What Jim would do is to place a handful of flakes into a jar, perhaps ¾" of flakes in a mason jar, and then he added enough alcohol

Lustrous Finish – After the final coat, apply wax and buff the surface to a smooth sheen. Although it's not a super durable finish, it is smooth and begs to be touched. Perfect for lightly handled items.

Rub it in – Apply the oil and varnish mixture like you're rubbing it into the surface. Finish with a few passes with the grain and let it dry thoroughly.

to bring the level up to about three or four inches in height. Jim referred to the mixture as "shellac polish". If you get the mixture too rich, you will know immediately because it will be sticky when you attempt your padding application. If you get the mixture too lean, then the build rate of the finish will suffer. It is common to apply six, seven or more coats of shellac polish. It has the consistency of apple juice when mixed, and the colour (using super-blonde flakes) of light apple juice. Keep in mind that it takes about 12 hours to melt the flakes fully in alcohol. If the flakes do not dissolve, the shellac flakes may have gone past their shelf life of about two years. Adding heat by placing the jar in a warm water bath speeds up the melting process. One of the wonderful things about using shellac polish is that it changes the colour of the wood very little. It would not be accurate to call this a resilient finish, because it can be damaged by water and destroyed by alcohol. It is, however, a very fine, natural finish with a feel that is hard to match. A wax top coat is highly recommended.

Three Ingredients – Equal parts double-boiled linseed oil, Tung oil, and semi-gloss urethane varnish give you the best of all worlds.

Looks, Feels and Performs Great – Like the shellac finish, apply some wax if you wish and buff the surface clean. This is also a surface that people will not be able to keep their hands off.

Shellac Polishing or Padding Technique

The good news is that you can apply your first three coats of shellac polish in the first hour! Owing to the fact that the shellac is mixed with alcohol, the solvent evaporates very quickly, leaving the dry shellac. Once the shellac finish begins to build, you have to leave a couple of hours between coats, and then four hours or more between coats when you get over six coats of polish. Each coat melts into the previous coat, so care must be taken not to apply a sopping wet pad onto the surface or the entire coating will be broken down.

Apply the shellac sparingly with a pad or "pillow". Take a piece of clean white cotton about 12" square and fold in the corners towards the middle until you have a pillow. The rounded bottom of the pillow should be ball-shaped, with no edges to drag. Apply the wet shellac solution to the bottom of the pad and keep feeling it until it feels damp but not wet. Padding means wiping a thin layer onto the surface, but by no means should you ever see a swath of wet solution with a defined edge, similar to a paint brush stroke.

I refer to the application method as the airplane landing technique. Sweep in at a low angle of attack and land the pad on the surface about 1/3 of the way from the left edge of the

wood panel. Pass the pad lightly across the entire surface and right off the right side of the board. Reverse the direction and now land 1/3 of the way from the right side of the board, then sweep across the surface and off the left side of the panel. Overlap each stroke by at least 50 percent. Feel the pad to ensure it is damp; you will have to re-charge it with a small amount of shellac every two minutes or so.

Lay down your first three coats and then cut back the surface using oil-free 0000 steel wool. Polish with a 6x3" pad of steel wool between each successive coat of shellac. With moderate pressure, smooth the surface, with the grain direction, to flatten any raised grain and irregularities in the shellac.

After seven coats, cut the finish back with steel wool and then apply a thin coat of Clapham's furniture wax. Create a scratch pattern in the wax finish with steel wool and then buff the surface to a beautiful sheen with a clean cotton rag. To repair the finish, rub with steel wool to remove the wax and then apply another coat of shellac.

Oil and Varnish Finish

A mixture of oil and varnish gives you the advantages of each component. The oil goes deep into the wood, popping the figure while giving a warm, rich look. The urethane varnish provides resilience to the finish. Mix equal parts of double-boiled linseed oil, Tung oil, and semi-gloss urethane varnish. The choice of semi-gloss is personal; I prefer a fine sheen to a bright shine. Use latex gloves since the double-boiled linseed oil and Tung oils usually have heavy metal drying agents added. Keep the used rags in a sealed container, since linseed oil may cause heating and auto-ignition!

Apply the mixture in circles with a white cotton pad, using moderate pressure as if you are rubbing the finish into the wood. Pad off the excess finish in the direction of the grain, using the same "airplane technique" as above. It is important to ensure that you keep the film thin – do not have any pooling of liquid remaining after you spread the finish. The surface will be blotchy due to varying absorption rates; do not try to correct this by adding finish. Allow the first coat to dry overnight.

Buff the surface with steel wool in long strokes, in the direction of the grain. Apply a second coat of finish and allow a full two days, or more, for it to dry. Ensure that the finish is completely dry! If you apply your next coat over a tacky coat, the previous coat may take months to dry and your finish will remain soft.

Cut the finish back with steel wool between coats, and then again after the third and final coat. The pores will remain open on some woods, so you have to consider that when deciding whether to use a wax top coat. I use this finish for everything from my work bench, to coffee tables. To repair the finish, simply steel wool or lightly sand the damaged area, and apply another coat of finish.

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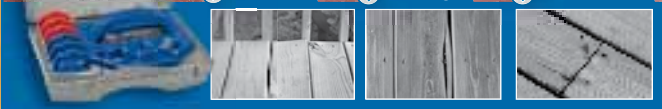

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The Workshop

BY DON WILKINSON

How many of you reading this column either have your own workshop or want to have one but you can't because your wife thinks your kids need the bedroom more than you do? Everybody put your hands up! That's what I thought.

It isn't wealth or fame or even the pursuit of the fairer sex that men want. No! The desire that lies at the heart of every man is to have their very own workshop. Preferably one like Norm Abrams has. But with a better brand of tools. Or that weird little guy with the big moustache who works in a barn and only uses his great-grandfather's tools while being filmed but probably reaches for his Makita or DeWalt when no one's looking.

It seems that a good workshop reaches somewhere deep inside every man and touches something it probably shouldn't. Possibly the spleen. But whatever it is, most men are touched by something. We seem to have this great need to build things that we can proudly present to our wives and/or significant others to be oohed and aahed over and have our bulging muscles (stomachs) gently stroked along with our egos. Who cares that we spent untold thousands of dollars on tools and equipment to make something that she could, and probably did buy at the local Wallymart for a buck-seventy-five. She'll always claim that your version is far superior and she'll cherish it forever. Or until you move and it gets 'lost.'

Most home workshops tend to be shoe-horned into whatever space is available after the greeds of the children are taken care of. Some, however, are huge expanses taking up an entire two-car garage while the cars, bikes, lawn-mower, boats and assorted kids sit under tarps in the driveway where they belong. I once had a friend with an ingenious little shop sandwiched into a left-over closet that his wife hadn't noticed quickly enough. It was a miracle of design and functionality and yet he never once managed to make anything. His wife complained that he "made too much noise" and "the light bothered her eyes." Perhaps I erred when I mentioned that if she had wanted to sleep she shouldn't have placed their bed in his workshop annex. Then she said I wasn't allowed to be his friend anymore.

But whatever the workshop, and whoever the owner, a workshop usually takes on the qualities and personalities of its owner. I say 'usually' because I have seen shops so meticulously laid out and spotless that appendectomies could be performed in them, and yet the man's car and house were so messy that his first-born had entered kindergarten before the guy ever laid eyes on the kid. Another man, who happened to be a surgeon, used my shop for several weeks and left it a complete disaster zone. Luckily for me (and others, I presume), his operating room was spotless every time I had cause to visit.

Yes, woodworking shops are personal things and mean different things to different people. For some, it is a refuge, a diversion from work or a place to hide out from the wife I mentioned (I'm going to get in trouble for this article, I just know it). For others, it is a place of peace and tranquility, which I don't understand at all, but what the heck! People are weird.

For me, my shop was a joy, a place I looked forward to entering every day. For a number of years it was a place I earned a living. And several times it was a place of intense, agonizing pain.

But most importantly, my workshop was a place where I could lovingly create things that would make my wife happy.

Before she threw them out!

DON WILKINSON
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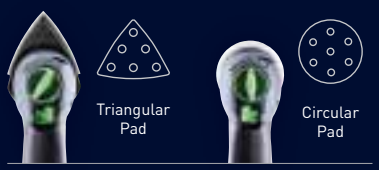

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