



**TOM'S TORSION
BOX WORKBENCH**



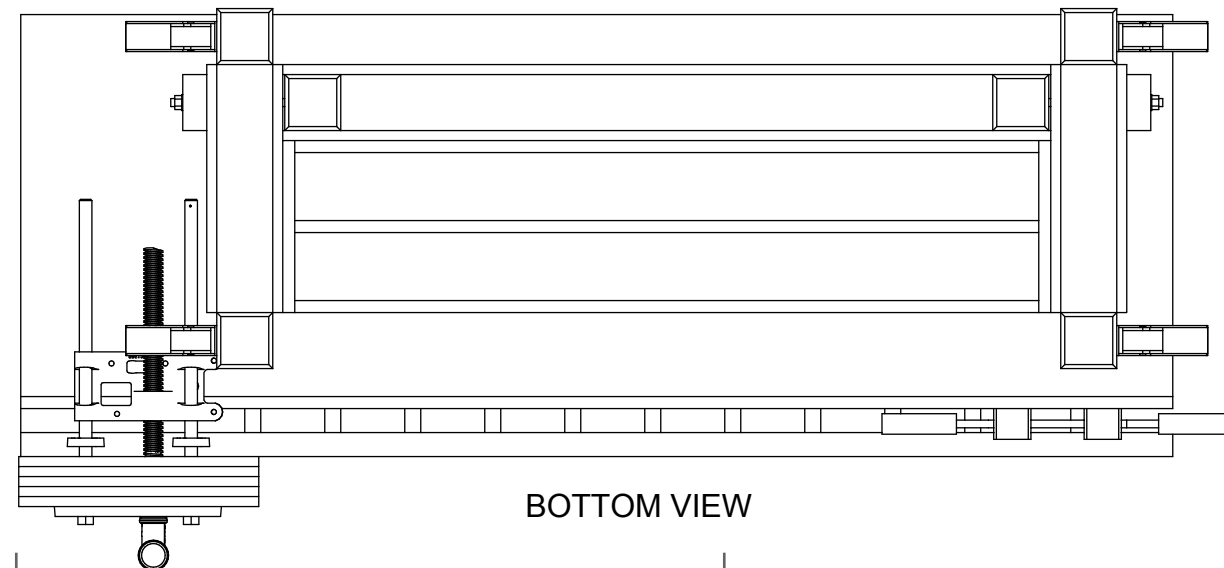
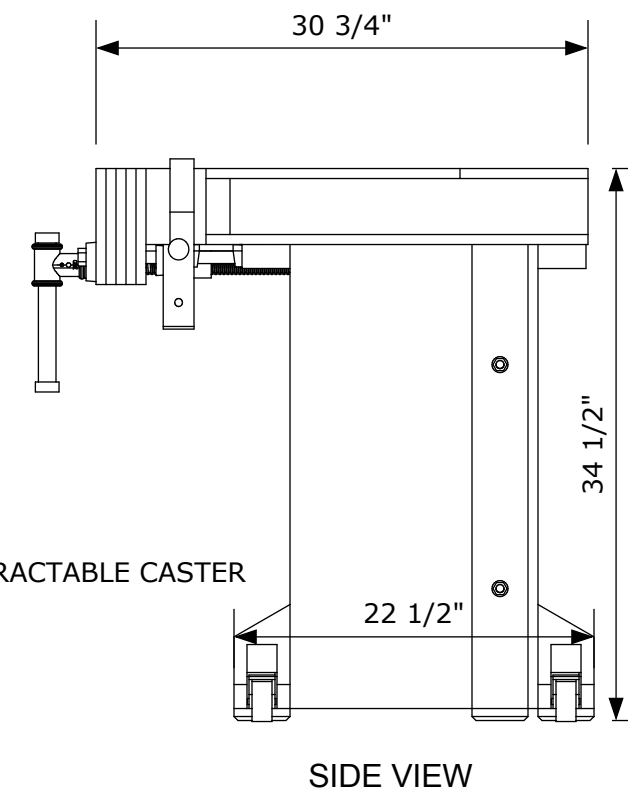
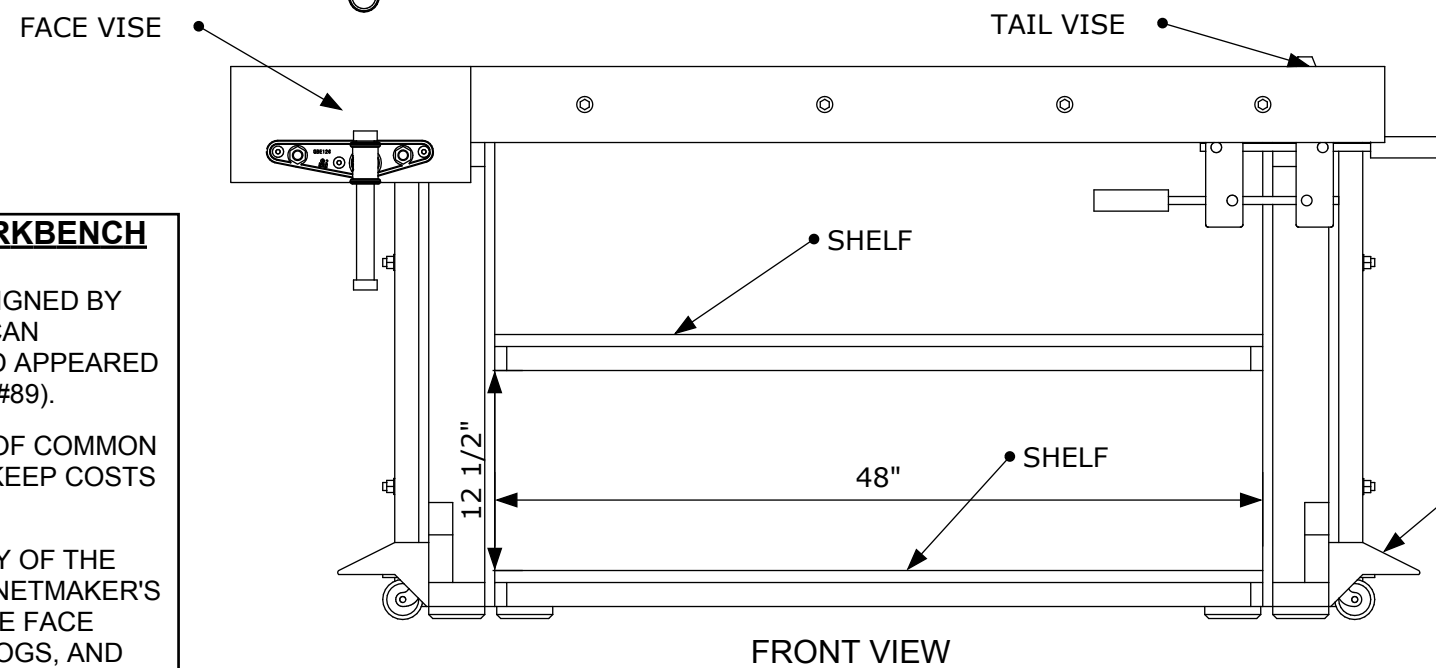
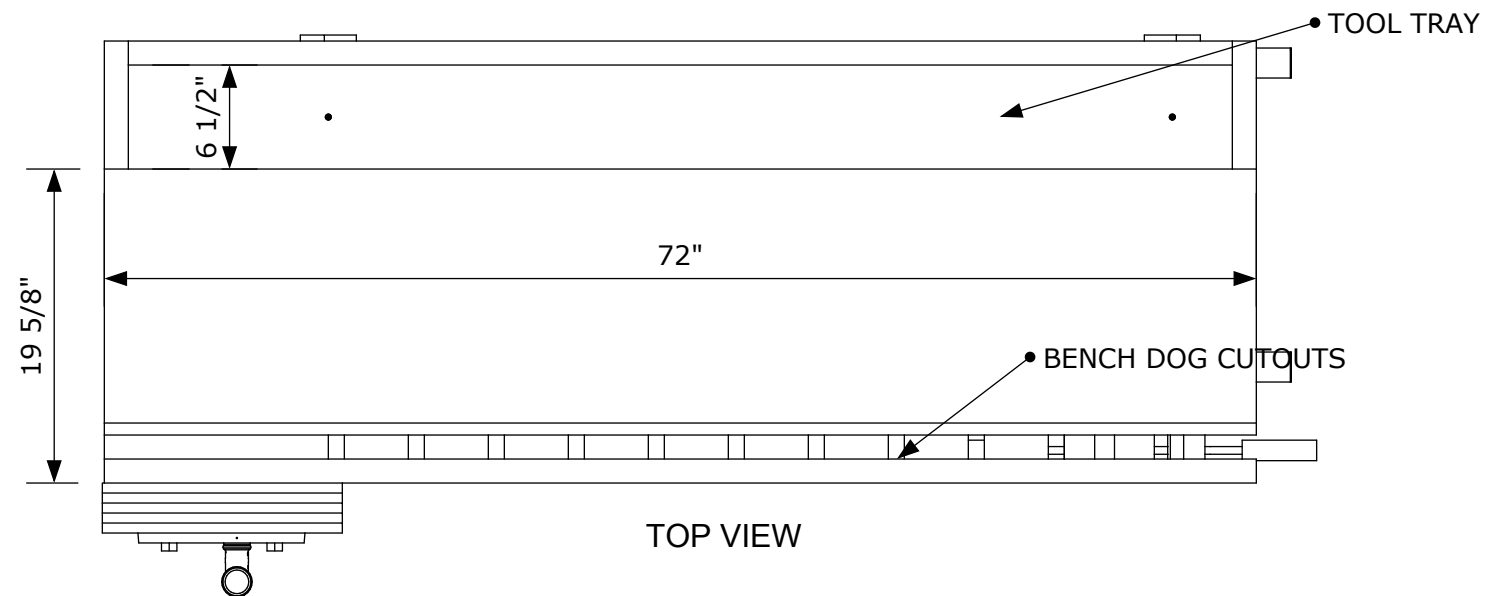
FSB INDUSTRIES

*"Making the most
of our Enterprise"*

DRAWN BY: FRANK C. BORIK DATE: 5/10/2015

REVISED BY: FRANK C. BORIK DATE: 5/10/2015

APPROVED BY: FRANK C. BORIK DATE: 5/10/2015



TOM'S TORSION BOX WORKBENCH

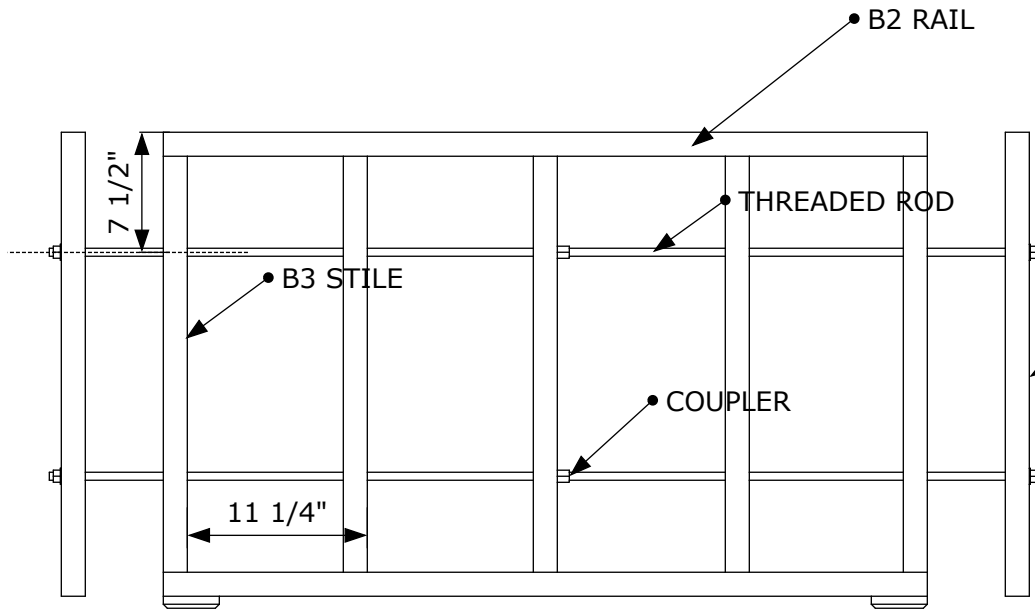
1. THIS WORKBENCH WAS DESIGNED BY TOM CASPAR FOR THE AMERICAN WOODWORKER MAGAZINE AND APPEARED IN THE OCTOBER, 2001 ISSUE (#89).
2. THIS WORKBENCH IS MADE OF COMMON LUMBERYARD MATERIALS TO KEEP COSTS TO A MINIMUM.
3. THIS WORKBENCH HAS MANY OF THE FEATURES OF A MASTER CABINETMAKER'S WORKBENCH SUCH AS A LARGE FACE VISE, TAIL VISE WITH BENCH DOGS, AND HEAVY, STABLE CONSTRUCTION DUE TO THE TORSION BOX DESIGN.

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| <p>SH-03 1 OF 5</p> | | |
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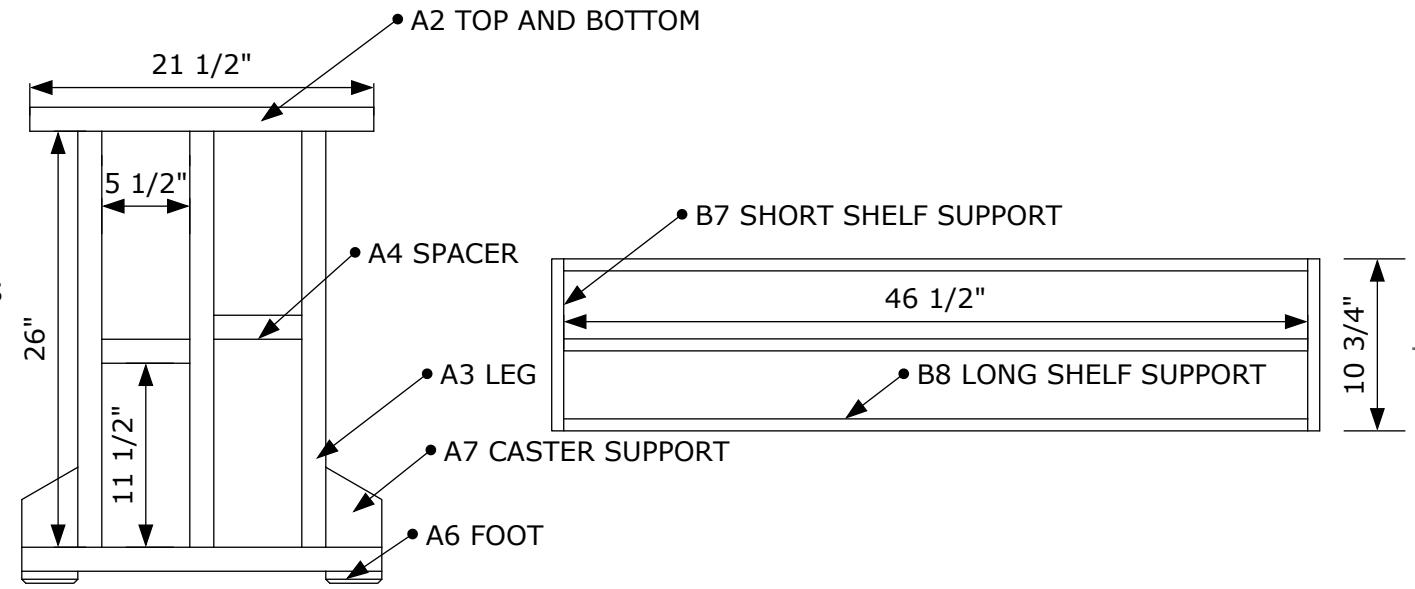
VIEWS AND FEATURES
SCALE 1:12 (1" = 1')

TOM'S TORSION BOX WORKBENCH



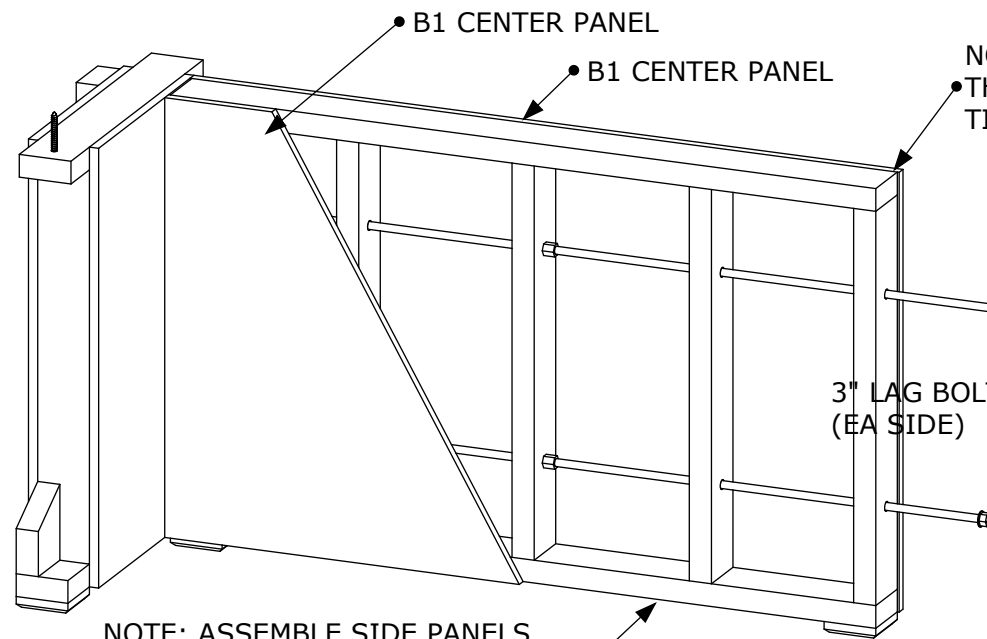


BACK STRUCTURE



SIDE STRUCTURE

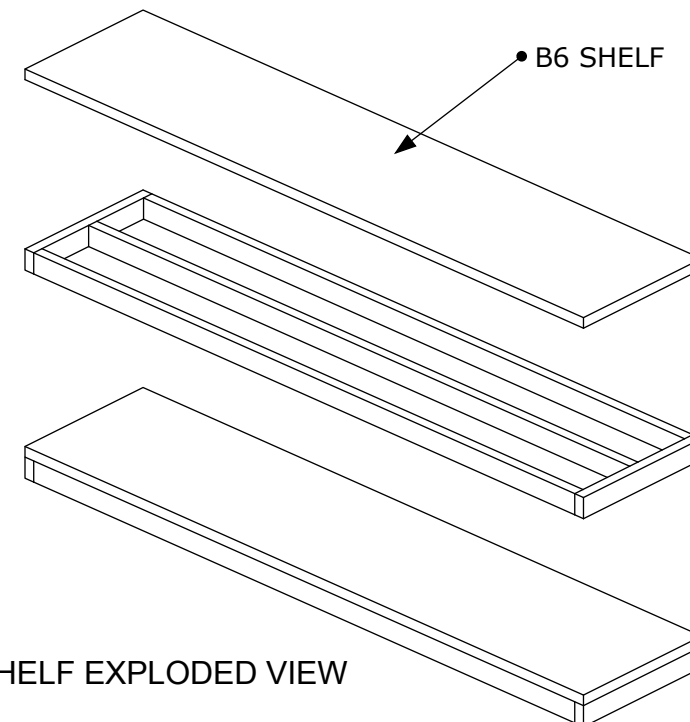
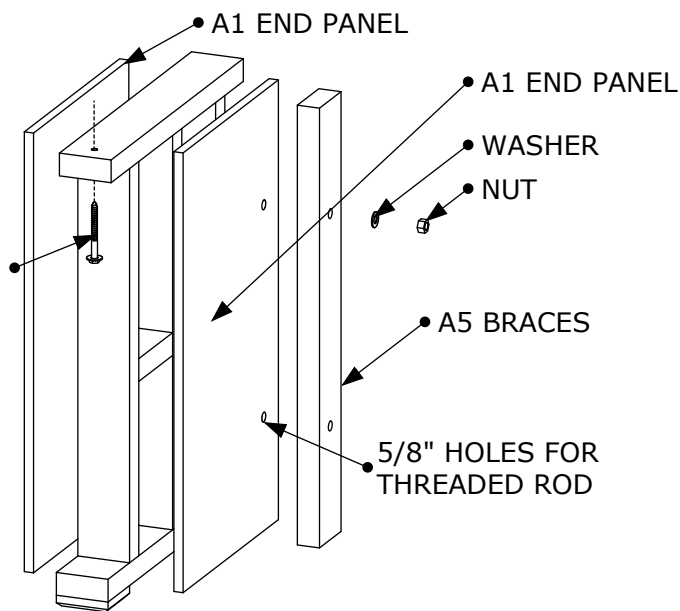
SHELF STRUCTURE



NOTE: ASSEMBLE SIDE PANELS AND CENTER PANEL FRAME, THEN CUT THREADED RODS TO FIT

BACK-SIDE EXPLODED VIEW

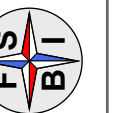
NOTE: PANEL IS 1/8" LONGER THAN FRAME TO ENSURE A TIGHT FIT WITH THE SIDES



SHELF EXPLODED VIEW

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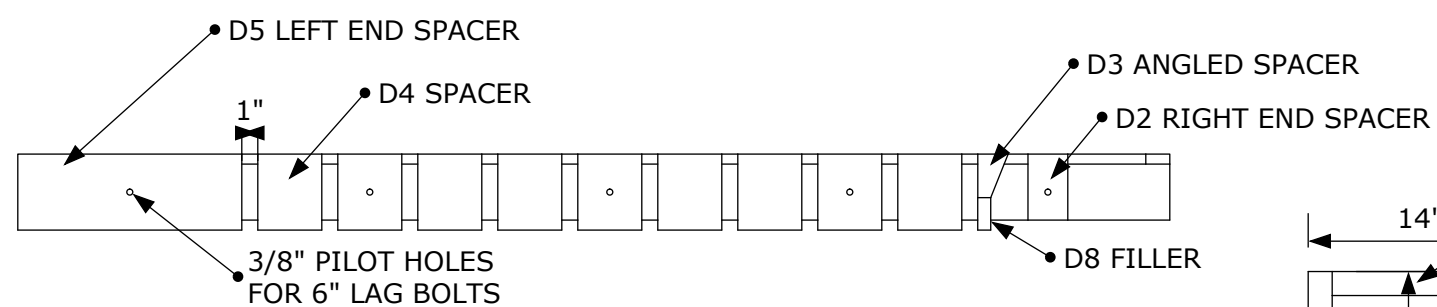
SIDE, BACK,
SHELF DETAILS
SCALE 1:12 (1" = 1')



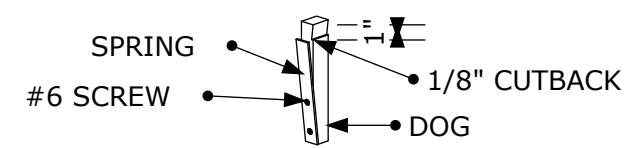
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**TOP AND FRONT
ASSY DETAILS**
SCALE 1:12 (1" = 1')

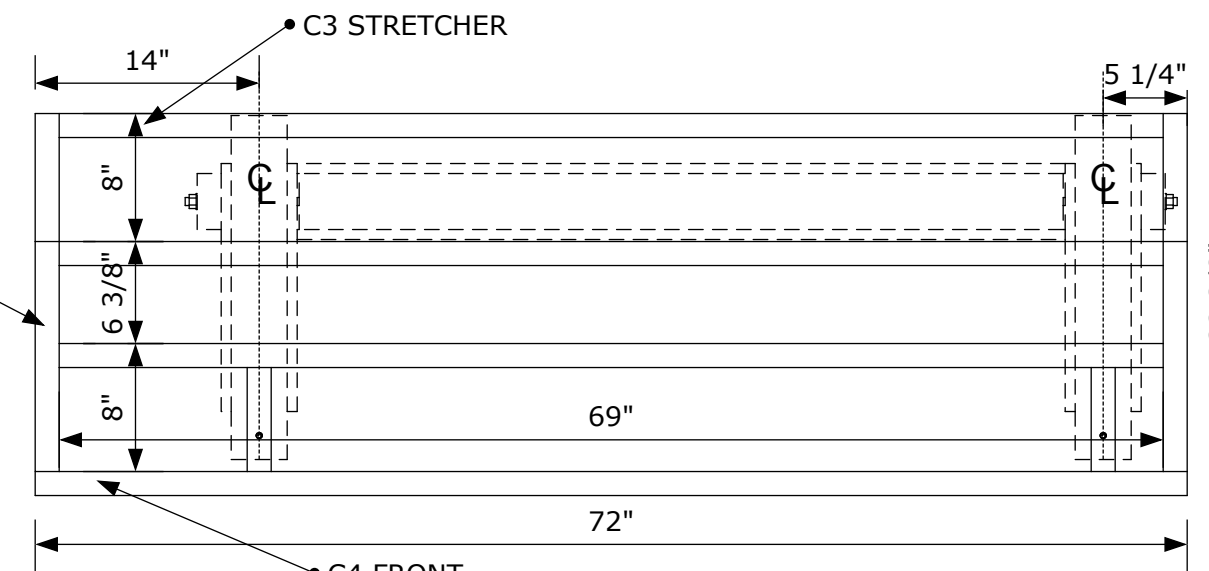
**TOM'S TORSION
BOX WORKBENCH**



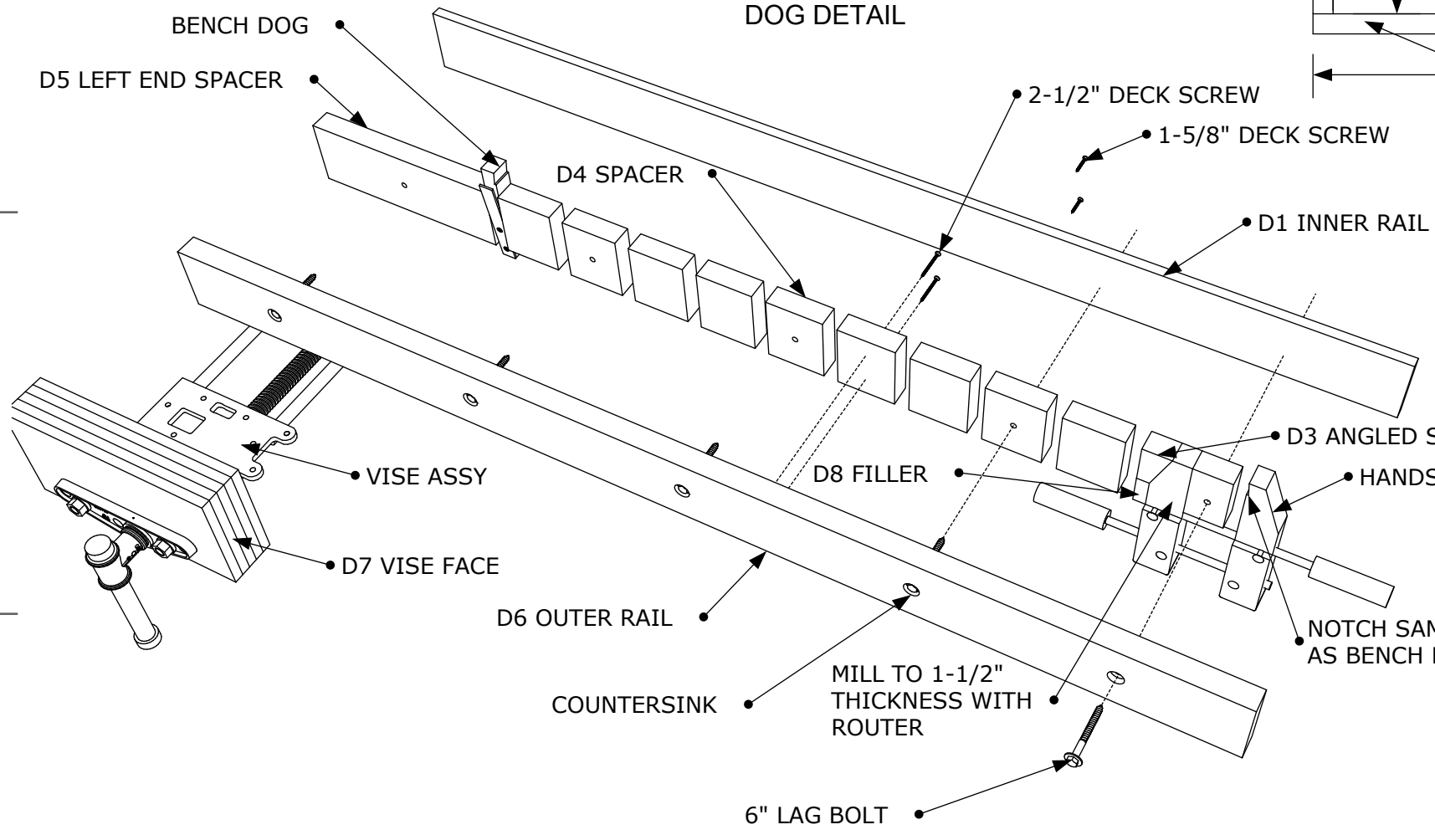
SPACER DETAIL



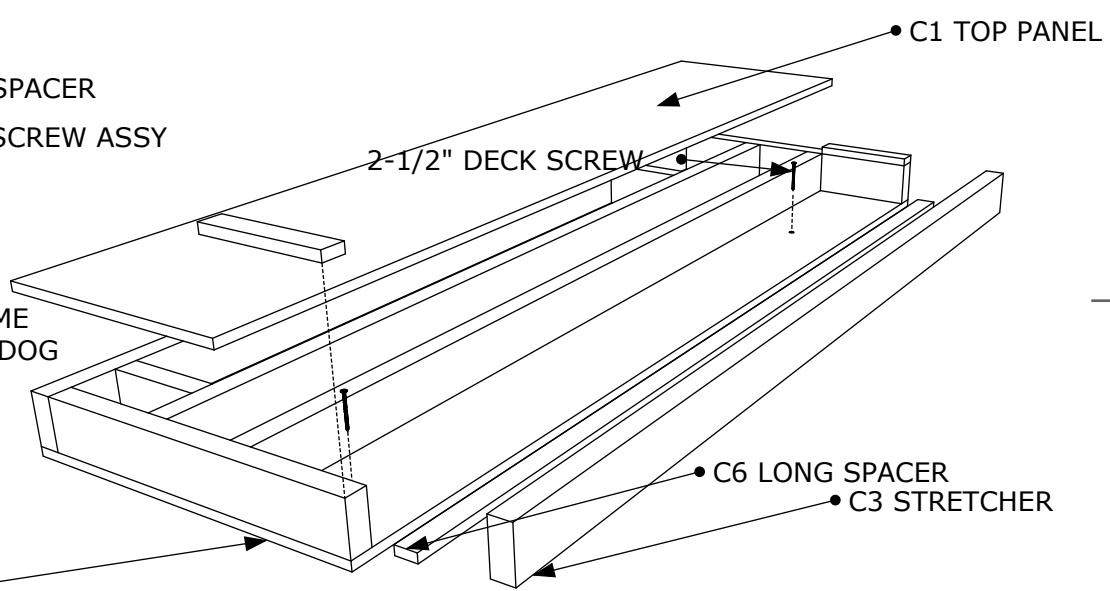
DOG DETAIL



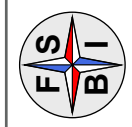
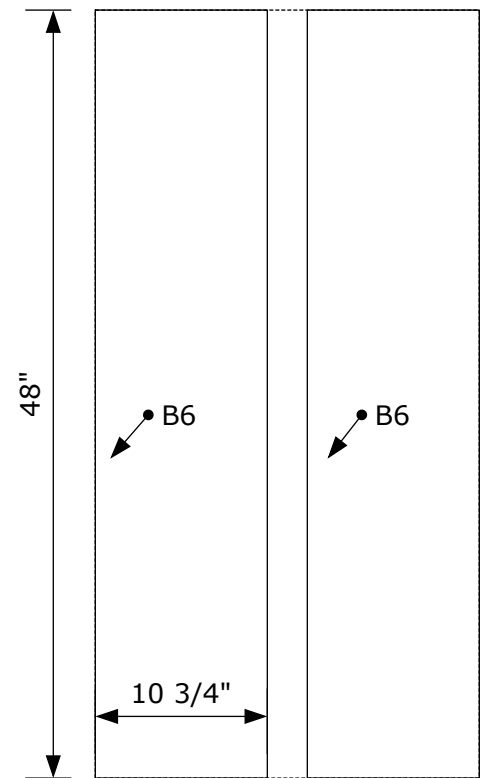
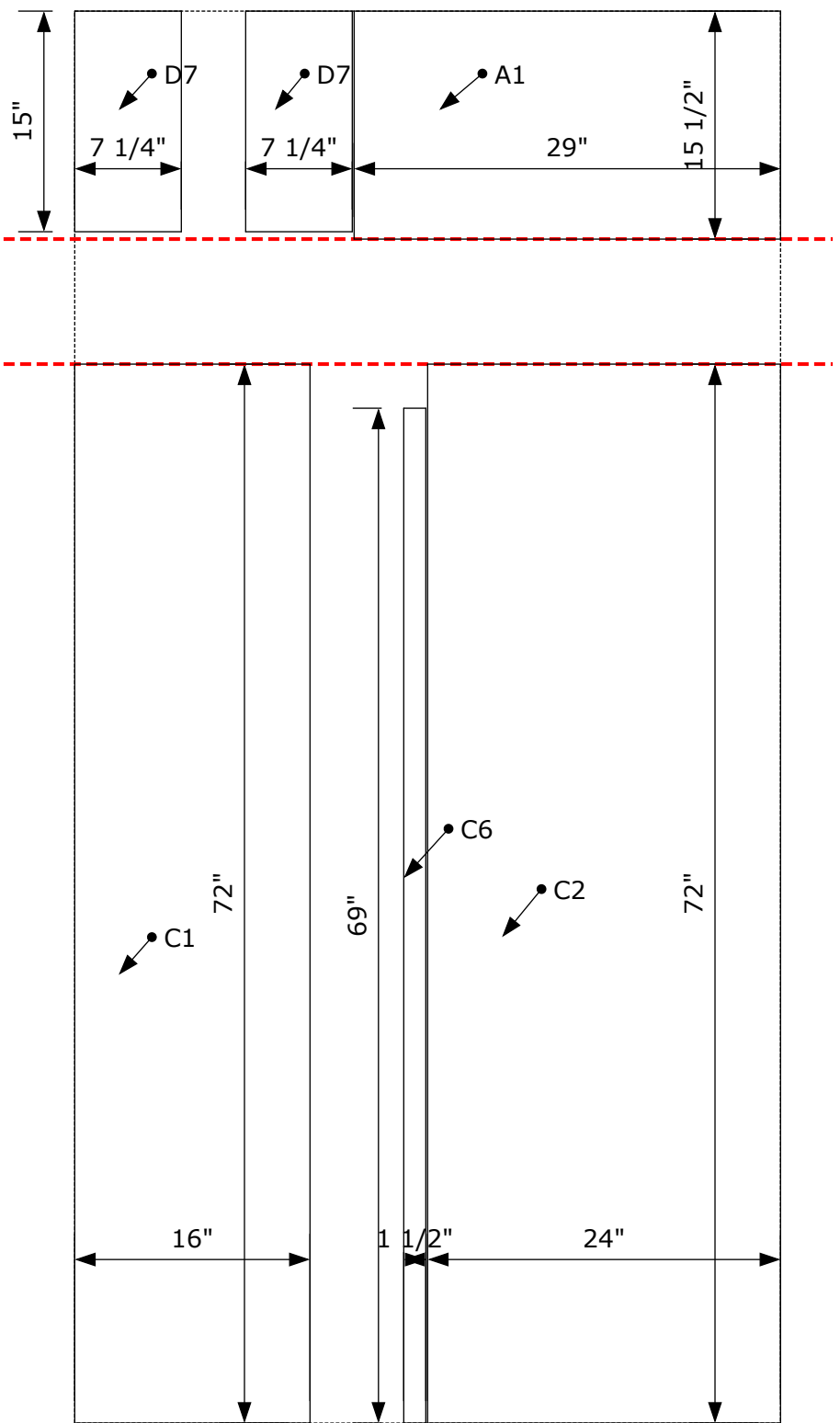
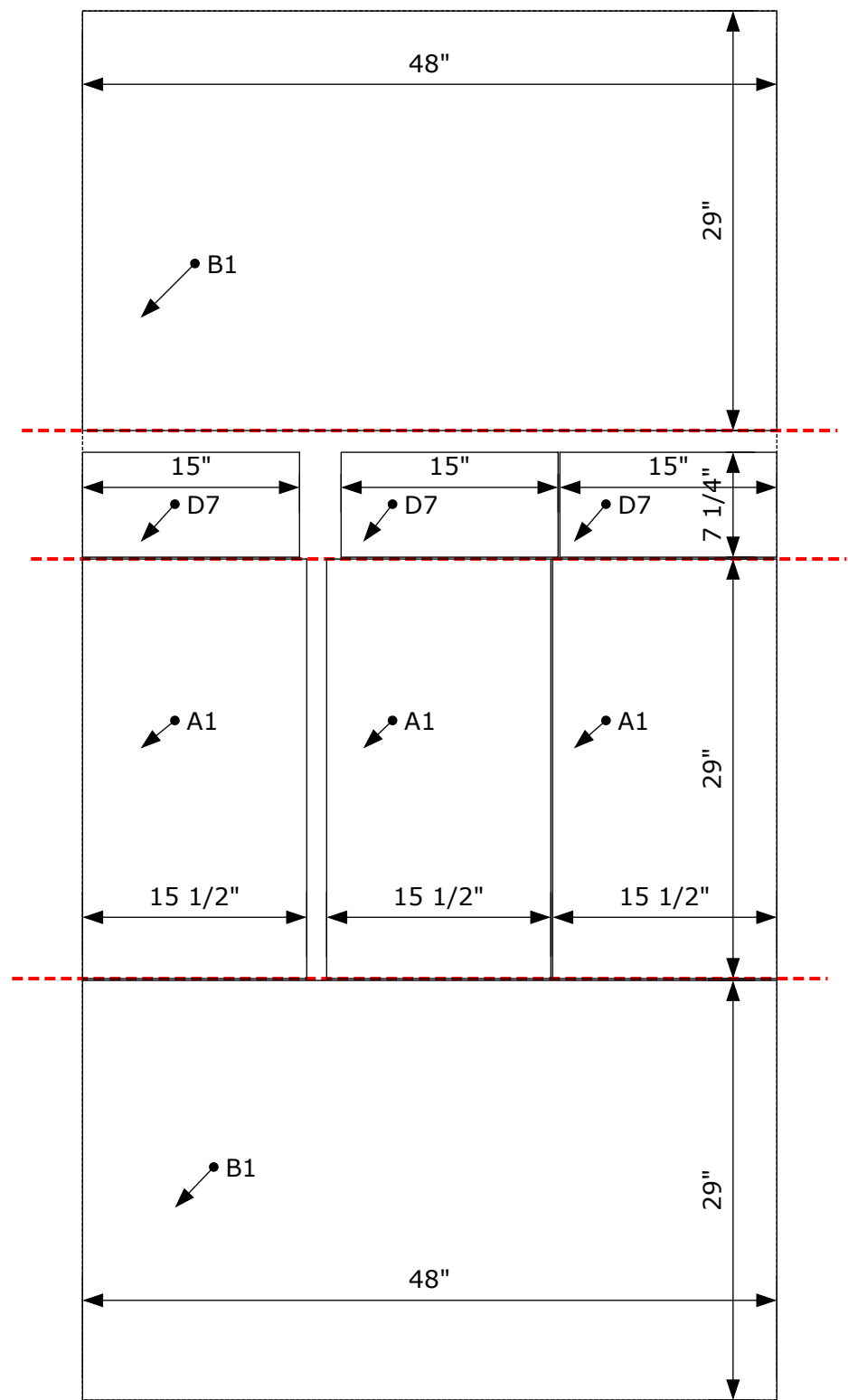
TOP STRUCTURE



FRONT ASSEMBLY EXPLODED VIEW



TOP EXPLODED VIEW (FROM BACK)



**TOM'S TORSION
BOX WORKBENCH**

**PANEL CUT
LAYOUT**
SCALE 1:12 (1" = 1')

| # | REVISION | DATE |
|---|----------|---------|
| 0 | ORIGINAL | 5/10/15 |
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| WORKBENCH CUTTING LIST | | | | |
|--------------------------|--------------------|------|--------------|---------------|
| PART | NAME | QTY | MATERIAL | WxL |
| ENDS | | | | |
| A1 | PANELS | 4 | 5/8" PLYWOOD | 15-1/2 x 29 |
| A2 | TOP AND BOTTOM | 4 | 2x4 | 23-1/2 |
| A3 | LEGS | 6 | 2x4 | 26 |
| A4 | SPACERS | 4 | 2x4 | 5-1/2 |
| A5 | BRACES | 2 | 2x4 | 29 |
| A6 | FEET | 4 | 1x6 | 3-1/2 x 3-1/2 |
| A7 | CASTER SUPPORTS | 4 | 2x4 | 5 |
| CENTER | | | | |
| B1 | PANELS | 2 | 5/8" PLYWOOD | 29x48 |
| B2 | RAILS | 2 | 2x4 | 47-3/4 |
| B3 | STILES | 5 | 2x4 | 26 |
| B4 | FEET | 2 | 1x6 | 3-1/2 x 3-1/2 |
| B5 | THREADED ROD | 4 | 1/2" DIA | 31 |
| B6 | SHELVES | 2 | 3/4" STOCK | 10-3/4 x 48 |
| B7 | SHORT SHELF SUPPOR | 4 | 1x2 | 10-3/4 |
| B8 | LONG SHELF SUPPORT | 6 | 1x2 | 46-1/2 |
| TOP | | | | |
| C1 | TOP PANEL | 1 | 5/8" PLYWOOD | 16 x 72 |
| C2 | BOTTOM PANEL | 1 | 5/8" PLYWOOD | 24 x 72 |
| C3 | STRETCHERS | 3 | 2x4 | 69 |
| C4 | FRONT | 1 | 2x4 | 72 |
| C5 | ENDS | 2 | 2x4 | 22-3/8 |
| C6 | LONG SPACER | 1 | 5/8" PLYWOOD | 1-1/2 x 69 |
| C7 | SHORT SPACERS | 2 | 1x6 | 1-1/2 x 8 |
| C8 | MOUNTING BLOCKS | 2 | 2x4 | |
| FRONT | | | | |
| D1 | INNER RAIL | 1 | 1x6 | 72 |
| D2 | RIGHT END SPACER | 1 | 2x6 | 4-7/8 x 2-1/2 |
| D3 | ANGLED SPACER | 1 | 2x6 | 2-3/4 x 2-3/8 |
| D4 | SPACERS | 9 | 2x6 | 4-7/8 x 4 |
| D5 | LEFT END SPACER | 1 | 2x6 | 4-7/8 x 14 |
| D6 | OUTER RAIL | 1 | 2x6 | 72 |
| D7 | WISE FACE | 5 | 5/8" PLYWOOD | 7-1/4 x 15 |
| D8 | FILLER | 1 | 1x6 | 1-1/4 x 2 |
| DOG | | | | |
| E1 | BODY | 1 | 2x4 | 1 x 1-3/8 x 8 |
| E2 | SPRING | 1 | HARDWOOD | 1/8 x 1 x 7 |
| BILL OF MATERIALS | | | | |
| MATERIAL | DESCRIPTION | QTY | | |
| 5/8" PLYWOOD | FIR A-B | 2 | | |
| 2x4 | KD 8' | 10 | | |
| 1x6 | KD 8' | 2 | | |
| 2x6 | KD 8' | 2 | | |
| 3/4" PLYWOOD | 1/4 SHEET (2x4) | 1 | | |
| 1x2 | 8' | 4 | | |
| HARDWOOD STRIP | 1"x8"x1/8" | 1 | | |
| DECK SCREWS | 1-5/8" | 3 LB | | |
| DECK SCREWS | 2-1/2" | 1 LB | | |
| FINISH NAILS | 8d | 1 LB | | |
| 1/2" THREADED ROD | 36" | 4 | | |
| COUPLERS | 1/2" | 2 | | |
| NUTS | 1/2" | 4 | | |
| WASHERS | 1/2" | 8 | | |
| LAG SCREWS | 3/8" x 3" | 2 | | |
| LAG SCREWS | 3/8" x 6" | 5 | | |
| WASHERS | 3/8" | 7 | | |
| WOOD SCREWS | #6X1/2" | 2 | | |
| WOOD SCREWS | #14X2-1/2" | 8 | | |
| FLAT BLACK PAINT | QT. | 1 | | |
| HARDWOOD PLUGS | 3/8" | 50 | | |
| YELLOW GLUE | 16 OZ BOTTLE | 2 | | |
| 9" QUICK RELEASE VISE | ROCKLER | 1 | | |
| 12" HANDSCREW CLAMP | ROCKLER | 1 | | |
| CASTERS, RETRACTABLE | ROCKLER | 4 | | |
| ROLLER, FOAM | DISPOSABLE | 1 | | |

INSTRUCTIONS:

- CUT PLYWOOD PANELS USING THE RED CUTLINES TO MAKE THE INITIAL CUTS.
- CUT 2x4 STOCK PER THE CUT LIST. USE THE STRAIGHTEST STOCK FOR PARTS A3, B2, C3, AND C4.
- DRILL 9/32" PILOT HOLES THROUGH ALL SIDE PANELS (A1), CENTER PANELS (B1), AND TOP AND BOTTOM PANEL (C1 AND C2). MARK CENTERLINE OF EACH FRAME MEMBER ONTO THE PLYWOOD AND DRILL THE PILOT HOLES AT A 6" TO 8" SPACING. WORK CAN BE SPEEDED UP BY CLAMPING SIMILAR PIECES TOGETHER (A1, B1, AND C1 - C2). THE HOLES IN THE TOP PANEL (C1) ARE COUNTERSUNK BY 1/4" TO ACCEPT WOOD PLUGS.
- ASSEMBLE THE SIDES BY USING 8d FINISH NAILS TO TACK THE FRAME TOGETHER. ALIGN THE FRAME TO ONE SIDE PANEL AND SCREW IN 3-4 PLACES TO SECURE THE FRAME. FLIP THE FRAME OVER AND ALIGN THE OTHER SIDE PANEL, SECURING WITH 3-4 1-5/8" DECK SCREWS. BACK THE SCREWS OUT AND LEAVE 1/4" EXPOSED ON THE BOTTOM TO SERVE AS ALIGNMENT PINS. REMOVE THE SIDE APPLY GLUE TO ALL FRAME MEMBERS. SCREW THE SIDE PANEL SECURLEY TO THE FRAME. FLIP THE FRAME OVER AND REPEAT WITH THE OTHER SIDE PANEL.
- BORE 5/8" HOLES THROUGH SIDE ASSEMBLIES, BRACES (A5), AND CENTER STILES (B3). ASSEMBLE CENTER PANEL FRAME WITH 8d FINISH NAILS AND TEMPORARILY ATTACH ONE CENTER PANEL (B1) WITH SEVERAL 1-5/8" DECK SCREWS, ENSURING THE ENDS OF THE PANEL EXTEND 1/8" BEYOND THE END STILES. FIT 2 OF THE THREADED RODS WITH 2 WASHERS AND A NUT, LEAVING 1/4" OF THREAD EXPOSED ON TOP OF THE NUT. ASSEMBLE THE SIDES, BRACES AND CENTER PANEL AND INSERT THE THREADED RODS WITH THE NUT AND WASHER ASSEMBLIES, ONE INTO EACH LINE OF HOLES. INSERT THE OTHER THREADED RODS FROM THE OTHER SIDE AND JOIN WITH COUPLERS TO THE OTHER RODS. INSTALL WASHERS AND NUTS AND TIGHTEN BY HAND. MARK THE EXCESS RODS 1/4" FROM THE TOP OF THE NUT AND CUT WITH A HACKSAW. UNSCREW THE RODS FROM THE COUPLERS AND COAT THE INSIDE OF THE COUPLER THREADS WITH THREADLOCKER. REASSEMBLE THE RODS WITH THE COUPLERS AND REMOVE THE NUTS AND WASHERS. REMOVE THE SIDES AND BRACES AND LAY THE CENTER ASSEMBLY FLAT.
- FINISH THE ASSEMBLY OF THE CENTER PANEL IN THE SAME MANNER AS THE SIDES IN STEP 4. ENSURE THAT THE ENDS OF THE CENTER PANELS OVERHANG THE END STILES BY 1/8" ON EACH SIDE. THE THREADED ROD ASSEMBLIES WILL REMAIN IN THE CENTER PANEL DURING ASSEMBLY.
- IF DESIRED, PAINT THE SURFACES AND EDGES OF SIDE AND CENTER PANELS WITH FLAT BLACK PAINT.
- ASSEMBLE THE SIDES, BRACES, AND CENTER PANEL AND SECURE TIGHTLY WITH 2 WASHERS AND 1 NUT ON EACH THREADED ROD.
- INSTALL THE CASTER SUPPORTS (A7) AT EACH LOCATION INDICATED IN THE PLANS WITH THREE 2-1/2" DECK SCREWS. TURN THE BASE ASSEMBLY UPSIDE DOWN AND ATTACH THE FEET AS SHOWN WITH GLUE AND 1-5/8" DECK SCREWS. CUT A 1/4" CHAMFER ON EACH FOOT WITH A ROUTER, IF DESIRED. INSTALL THE RETRACTABLE CASTERS PER THE MANUFACTURERS DIRECTIONS USING THE INCLUDED HARDWARE.
- ASSEMBLE THE SHELVES (B6, B7, B8) IN A MANNER SIMILAR TO THE SIDES IN STEP 4. TURN THE BASE ASSEMBLY ON THE BACK AND LOCATE THE POSITIONS OF THE SHELVES AS DESIRED. INSTALL THE SHELVES USING 2-1/2" DECK SCREWS INTO FRAME MEMBERS ON THE SIDES AND BACK.
- ASSEMBLE THE TOP ASSEMBLY IN A MANNER SIMILAR TO THE SIDE ASSEMBLIES IN STEP 4 WITH THE EXCEPTION OF INSTALLING THE BACK STRETCHER (C3). ENSURE THAT THE FRONT EDGES OF THE TOP AND BOTTOM PANELS (C1 AND C2) EXTEND 1/8" BEYOND THE FRONT (C4). GLUE THE LONG SPACER (C6) ON THE TOP OF THE BOTTOM PANEL AND APPLY GLUE TO THE TOP OF THE LONG SPACER. PLACE THE BACK STRETCHER (C3) ON TOP OF THE LONG SPACER AND SECURE THE BACK STRETCHER TO THE ENDS USING TWO 2-1/2" DECK SCREWS ON EACH END. GLUE AND SCREW THE SHORT SPACERS (C7) AS SHOWN. TURN THE TOP OVER AND SECURE THE BOTTOM TO THE LONG SPACER AND BACK STRETCHER WITH 2-1/2" DECK SCREWS. PLACE HARDWOOD PLUGS INTO THE COUNTERSINKS ON THE BENCH TOP, SECURING EACH WITH A DROP OF GLUE, AND TAP IN WITH A HAMMER.
- TURN THE BASE ASSEMBLY RIGHT-SIDE UP AND RAISE THE CASTERS TO ALLOW THE BASE ASSEMBLY TO REST ON THE FLOOR. PLACE THE TOP ASSEMBLY ONTO THE BASE ASSEMBLY AND LOCATE PER THE PLANS. SECURE THE TOP TO THE BASE USING TWO 1-5/8" DECK SCREWS THROUGH THE TOP OF THE TOOL TRAY. LOCATE THE POSITIONS OF THE LAG SCREWS IN THE FRONT AND DRILL 1" COUNTERSINKS. DRILL 1/4" PILOT HOLES AND INSTALL THE 3"x3/8" LAG SCREWS USING WASHERS.
- GLUE THE VISE FACES (D7) INTO A LAMINATED BLOCK USING CLAMPS AS NECESSARY. WHEN DRY, TRIM THE SIDES SQUARE WITH A TABLE SAW. DISASSEMBLE THE BACK PLATE FROM THE VISE AND USING IT AS A TEMPLATE, BORE 7/8" HOLES TO ACCOMMODATE THE RODS FOR THE VISE.
- MILL THE 2x6 AND 1x6 STOCK TO 4-3/4" WITH A TABLE SAW. NOTE: MILL THE 2x6 STOCK IN TWO PASSES TO OBTAIN SQUARE EDGES. SAVE THE STRAIGHTEST 2x6 FOR THE OUTER RAIL (D6) AND CUT THE OTHER INTO PIECES D1 THRU D5 PER THE MATERIAL LIST.
- FABRICATE THE DOG ASSEMBLY USING SCRAP 2x6 THAT WAS PREVIOUSLY MILLED.
- ASSEMBLE THE FRONT SPACERS. ALIGN THE LEFT END SPACER (D5) WITH THE END OF THE OUTER RAIL (D6) AND ATTACH WITH GLUE AND 2-1/2" DECK SCREWS ON TOP AND BOTTOM. ATTACH SPACERS (D4) USING GLUE AND SCREWS USING THE DOG AS AN ALIGNMENT GUIDE. CLAMP THE RIGHT END SPACER (D2) BETWEEN THE JAWS OF THE HANDSCREW CLAMP. ALIGNING THE TOP OF THE SPACER 1/8" BELOW THE TOP OF THE CLAMP. CUT THE ANGLED SPACER (D3) AND FILLER (D8) TO FIT THE OUTER JAW OF THE HANDSCREW CLAMP. ATTACH THE ANGLED SPACER (D3), FILLER (D8), AND RIGHT SPACER (D2) TO THE OUTER RAIL WITH GLUE AND SCREWS. NOTE: THE RIGHT SPACER WILL STILL BE CLAMPED BY THE HANDSCREW TO ASSIST ALIGNMENT.
- MILL THE SURFACE OF THE HANDSCREW JAWS WITH A ROUTER TO A THICKNESS OF 1-1/2" WHERE THE JAWS WILL BE COVERED UP BY THE FRONT ASSEMBLY. CUT 1/8" OFF THE TOP OF ONE OF THE JAWS, AND CUT A NOTCH IN THE TOP OF THE INSIDE OF THE OTHER JAW TO MIRROR THE NOTCH IN THE BENCH DOG. MOUNT THE SHORTENED JAW IN BETWEEN THE RIGHT SPACER (D2) AND THE ANGLE SPACER-FILLER ASSEMBLY (D3, D8) WITH GLUE AND SCREWS.
- ATTACH THE INNER RAIL (D1) TO THE FRONT ASSEMBLY WITH GLUE AND 1-5/8" DECK SCREWS, SANDWICHING THE SPACERS AND HANDSCREW ASSEMBLY IN BETWEEN.
- CLAMP THE FRONT ASSEMBLY TO THE FRONT OF THE BENCH TOP AND DRILL 1" COUNTERSINKS FOR THE LAG SCREW HEADS AND WASHERS. DRILL 1/4" PILOT HOLES FOR THE LAG SCREWS ALL THE WAY INTO THE FRONT OF THE TOP ASSEMBLY. SECURLEY ATTACH THE FRONT WITH 3/8" BY 6" LAG SCREWS AND WASHERS. USE A BELT SANDER TO SAND THE ENTIRE TOP AND FRONT ASSEMBLY FLAT, INCLUDING THE PLUGS SO ALL SURFACES ARE FLUSH.
- USING THE BOTTOM VISE FACE AS A TEMPLATE, LOCATE AND DRILL PILOT HOLES UNDERNEATH THE LEFT FRONT OF THE BENCH. REASSEMBLE THE VISE, INCLUDING THE VISE FACE ASSEMBLY. ATTACH THE VISE TO THE BENCH WITH #14X2-1/2" WOOD SCREWS. TIGHTEN THE VISE TO CLAMP THE VISE FACE AGAINST THE BENCH TOP AND ALIGN. DRILL PILOT HOLES INTO THE VISE FACE AND SECURE WITH #14X2-1/2" WOOD SCREWS.
- HAVE A BEER AND ADMIRE YOUR WORK.

SH-03
5 OF 5

DATE
5/10/15

REVISION

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**CUT LIST, BOM,
INSTRUCTIONS**
NOT TO SCALE

**TOM'S TORSION
BOX WORKBENCH**

