TIMBER FRAMING

JOURNAL OF THE TIMBER FRAMERS GUILD

Number 45, September 1997

Kimberley Reagan

'97 Design Exhibition

Ken Rower

Eastern Conference

TIMBER FRAMING
INCORPORATING TIMBER FRAMERS NEWS

Number 45 September 1997

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Published Quarterly

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Subscription $20.00 Annually
Or by Membership in the Guild

ISSN 1061-9860

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BOOKS

Timber Solutions

Timber Solutions Manual, by David W. Duquette, P.E. Argulus Publishing, New York, 1997. 7 in. x 9 in., 368 pp., 460 illustrations. Softbound, $49.95. Available from the publisher (212-410-4212).

THE average textbook for structural timber design follows a standard formula for organization and content. At the outset, such a text will contain a chapter on loads, a chapter on structural analysis methods and a chapter on properties of wood. Then, one component per chapter, the authors of these texts present the requisite behavior theories, specification provisions, design methods and example problems for beams, columns, beam-columns, shearwalls, etc. Contrary to texts for other engineering materials (steel and concrete in particular), timber design textbooks generally do not burden themselves, or their readers, with excessive amounts of mathematical theory. Instead, the focus tends toward the practical, with an emphasis on the rationale behind the specification provisions and completeness in making design checks. Nevertheless, the *formula* for organization and content is still followed.

Such a formula for textbooks is not necessarily a bad thing. Students of engineering design (the largest consumer group for such books) are accustomed to the formula and have learned to work with it. That is, their instructor covers the material from front to back: theory—specification provisions—design methods—examples—homework assignment. Students accept this. Then they work according to the reward system. They start with the homework assignment. Then, if necessary, they work backwards from examples to theory, but only so far as required to get the homework done. With this approach, students earn the maximum homework credit in the minimum study time. With sufficient repetition in problem solving, students generally acquire a satisfactory understanding of fundamental principles.

Now it appears that someone has finally responded to how students want to learn, rather than how they are taught. David W. Duquette, a registered professional engineer, has produced a learn-by-example book containing more than 150 structural analysis and design problems related to timber engineering. No theory, no derivation of specification provisions, no flowcharts of generic design methods, just problems and solutions. The intent of the author is to supplement existing textbooks and manuals with a wide variety of practical solutions to problems found in the classroom and in the design office. The author has generated problems that are comparable in form to those found on the PE and SE examinations. The 1991 *National Design Standard* is the reference design specification; seismic provisions are based on the 1994 *Uniform Building Code.* The book is organized into nine chapters: Structural Behavior and Design Loads; Design of Beams; Combined Bending and Axial Loading; Horizontal Diaphragm Design; Shearwall Design; Timber Connections with Nails; Timber Connections with Bolts and Lag Screws; Horizontal Diaphragm to Shearwall Connections and Subdiaphragms and Continuity; Advanced Topics, including built-up members, composite action and repair of fire-damaged members.

In each chapter, the problems and their solutions are developed by the author in a logical manner and are organized in order of increasing complexity. The author's approach is engaging; he is reader-oriented with his first- and second-person prose style. The author has done his best to educate the reader in the details of timber design, without the tedium found in many textbooks. The problems and solutions are interspersed with useful suggestions and rules of thumb for design practice to help the new engineer develop reliable designs based on good judgment. Simple techniques for organizing calculations for completeness and accuracy are given. The author's own judgment is discussed and explained throughout the examples, yet his approach is not heavy handed. He recognizes that different engineers can have different philosophies and preferences, many of which can be equally valid.

References to design specification equations and building code provisions are liberal. Although the specification and code provisions are not developed (derived) by the author, their use is explained. In a lighter vein, each problem solution is concluded with an aphorism or witticism whose source might be anyone from Churchill to Yoda. No particular philosophy is espoused, just food for thought and a smile or two. "Never put off till tomorrow what you can do the day after tomorrow" (Mark Twain); "Life is like a dogsled team—if you ain't the lead dog, the scenery never changes" (Lewis Grizzard); "Even if you're on the right track, you'll get run over if you just sit there" (Will Rogers).

TIMBER FRAMING, Journal of the Timber Framers Guild of North America, reports on the work of the Guild and its members, and appears quarterly, in March, June, September and December. TIMBER FRAMING is written by its readers and welcomes interesting articles by experienced and novice writers alike. Contributions are paid for upon publication at the rate of $125 per published page. ♻

In spite of its own appealing content and style, use of a good text in timber design along with *Timber Solutions Manual* remains essential. This book is not a quick lesson in timber design for the do-it-yourselfer. Instead, it is a legitimate supplement to existing texts; it requires that the reader have a background in structural analysis and design theory. Traditional timber design textbooks, to which this book would make a nice companion, include the following:

Breyer, D. E., 1993. *Design of Wood Structures*, Third Edition. New York: McGraw-Hill. ISBN 0-07-007678-2.

Faherty, K. F. and Williamson, T. G., 1995. *Wood Engineering and Construction Handbook*, Second Edition. New York: McGraw-Hill. ISBN 0-07-019911-6.

Stalnaker, J. J. and Harris, E. C., 1997. *Structural Design in Wood*, Second Edition. New York: Chapman & Hall. ISBN 0-412-10631-0.

Desirable in addition, and indispensable for the structural timber designer, would be a copy of the *National Design Specification for Wood Construction (NDS)*, published 1991 by the American Forest & Paper Association (1111 19th Street NW, 7th Floor, Washington, DC 20036).—Dick Schmidt

Richard Schmidt (schmidt@uwyo.edu) teaches engineering at the University of Wyoming at Laramie and has been systematically studying and testing timber frame joinery.

Joint-Busting at Amherst

The 1997 Eastern Conference in June at the University of Massachusetts, Amherst, saw the return of joint-busting after an absence of many years. Professor Schmidt supervised the operation. Graduate assistant Rob McKay ran the test rig, which included the ability to project graphical, real-time test results onto a convenient wall in the seminar room.

FIVE joints were tested. Four were constructed (following the rules of the competition) using 6x6 green Eastern white pine timbers donated by W. D. Cowls, Inc. One joint was constructed of kiln-dried red oak supplied by Greg Thaxton of Sunset Structures. Joints were pinned with 1-in. diameter, turned red oak pegs supplied by Scott Northcott.

A description of the joints and the test results follow in the order that the joints were tested. Plots of load versus deflection for all five joints are shown in the figure. The maximum load for each joint is indicated. Initial stiffness of each joint is taken as the slope of the load-deflection curve for a load of about 1,000 lb.

Number 1. Cut by Ben Brungraber and Jonathan Orpin, who earned the Pounds Per Minute Award, created and awarded by Ben to his team for cutting the strongest of the pine joints in less than 30 minutes. They also earned the Casual Attitude Award for laying out and cutting their joint with only found items and a minimal amount of planning. This was a conventional mortise and tenon joint with a tenon approximately 2 in. thick, 6 in. wide and 6 in. long. Pegs were staggered slightly. The joint failed by peg shear at a load of 6,450 lb. The initial stiffness of the joint was 271,000 lb/in.

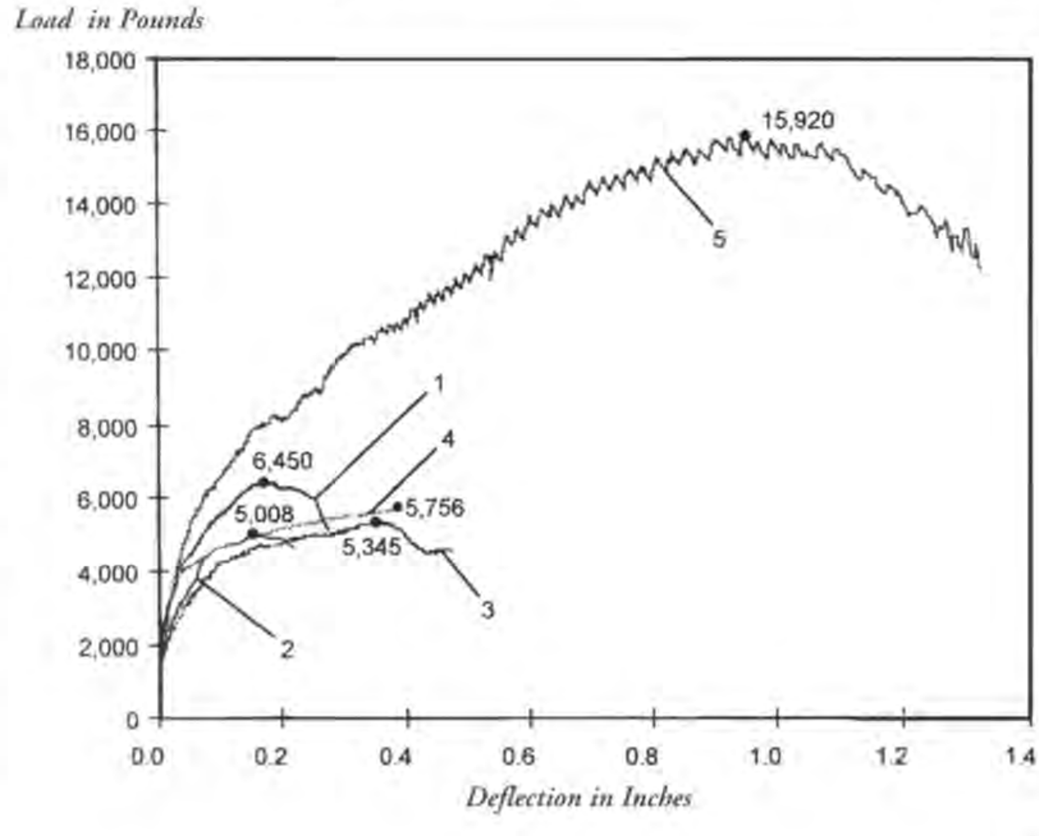
Number 2. Cut by Michael Martin, his first timber-frame joint ever, for which he won the Good Sport Award. He had sat in on Will Beemer's square-rule layout presentation and decided to try his hand. Michael reasoned that a twin tenon would allow the pegs to carry twice the load as a single tenon. Unfortunately, he was not quite sure where to place the pegs to optimize strength between mortise splitting and tenon relish failure. His pegs were a bit too close to the shoulder and his joint failed by mortise splitting at 5,008 lb. The initial stiffness was 163,000 lb/in.

Number 3. Cut by the Hardwick Post and Beam team, including Todd Wilson, Dave Post, and John Flamand, this was a double-lap joint. One through-peg was placed in the center of the lap. The other peg was cut into four short keys, each of which was driven into a joint line. This was a very tough joint in that it endured about .375 in. of deflection before it failed at a load of 5,345 lb. Failure was by rolling shear of the keys and direct shear of the through-peg. Initial stiffness was 298,000 lb/in; this was the stiffest of the five joints tested.

Number 4. Also cut by the Hardwick Post and Beam team, their second offering was a wedged half-dovetail. Unfortunately, their wedge was not hardwood and it failed in compression perpendicular to the grain at a load of 5,756 lb. This joint was also quite tough as it resisted a deflection of almost 0.4 in. before failure. Initial stiffness was 290,000 lb/in. For their efforts, the Hardwick team received the Stretch the Rules Award for their creative use of pegs.

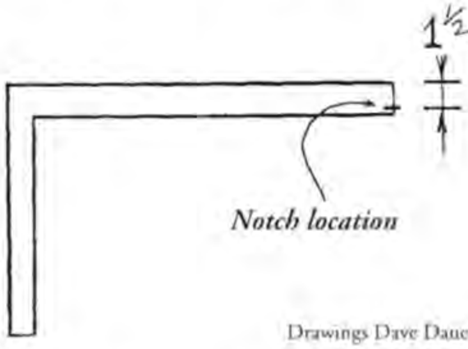
Number 5. Cut by a team from Blue Ridge Timberwrights, including Larry Tueller, Jimmy Vest, Scott Page, Lee Johnson, Don Downs and "Schwartze," who was on loan from toolmakers Mafell. Their joint was a keyed half-dovetail made from kiln-dried red oak, for which they earned the Complete Disregard for the Rules Award. This joint carried a maximum load of 15,920 lb. and finally failed by compression perpendicular to the grain of the key and the dovetail, long after the two pegs failed in direct shear. It also survived an impressive 0.9 in. of deflection before reaching its maximum capacity. Initial stiffness was 211,000 lb/in. The saw-tooth character of the load-deflection curve for this joint is due to the slip-and-catch nature of its behavior as the load climbed above 10,000 lb.

—Dick Schmidt



Square Rule Methods

TOOLS needed: two framing squares, tape measure, ruler, calculator (or lots of paper), ink line or chalk line. Modify one framing square by filing a v-notch at the far end of the 2-in. blade, precisely 1½ in. from the outer edge, as shown above. This notch corresponds to the 1½-in. graduation at the opposite extremity of the square, on the outside edge

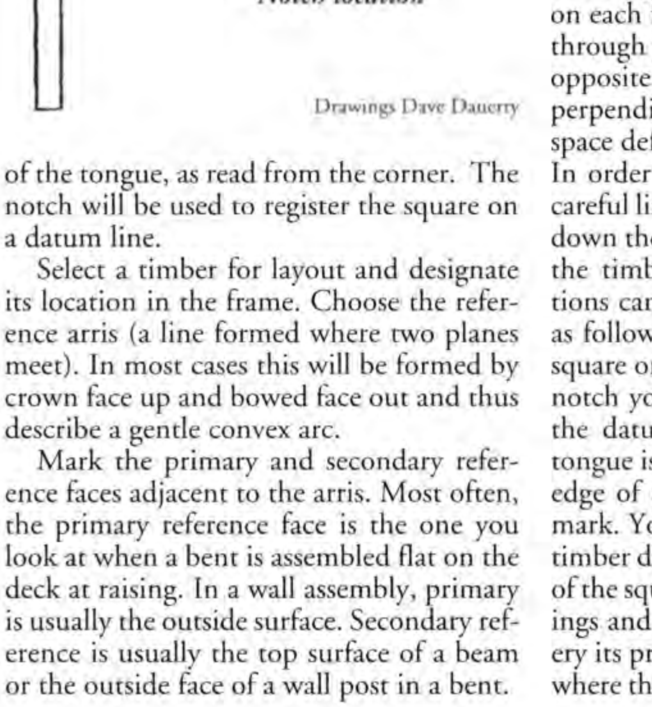


Drawings Dave Dauerty

of the tongue, as read from the corner. The notch will be used to register the square on a datum line.

Select a timber for layout and designate its location in the frame. Choose the reference arris (a line formed where two planes meet). In most cases this will be formed by crown face up and bowed face out and thus describe a gentle convex arc.

Mark the primary and secondary reference faces adjacent to the arris. Most often, the primary reference face is the one you look at when a bent is assembled flat on the deck at raising. In a wall assembly, primary is usually the outside surface. Secondary reference is usually the top surface of a beam or the outside face of a wall post in a bent.



Mark for the end cuts of the timber, primary face up. Lay the framing squares at the end lines of the timber with the blade (the wider leg) on the primary face and the tongue on or near the secondary, as shown above. Sight across the top edges of the squares to check for wind (twist) in the timber. Adjust for wind by trenching the timber to bring the squares level with each other. *Do not trench the arris corner.* You may have to trench the secondary to be able to register one square or the other on the arris. With squares in parallel to each other and both registered on the arris, you can establish datum lines.

Make a mark precisely 1½ in. from the arris corner on primary and secondary faces. Using a ruler, measure precisely 1½ in. from the blade of each square down the face adjacent to primary and opposite secondary. On the underside of the timber measure precisely 1½ in. from the tongue of each square across the face adjacent to secondary and opposite primary.

Using your ink or chalk line, snap a line on each face of the timber from end to end through your datum points. These lines on opposite faces establish two planes at the perpendicular. Two perpendicular planes in space define a Cartesian coordinate system. In order to lay out joinery on the timber, careful linear measurements should be made down the datum line on the primary face of the timber. Monuments for joinery locations can be transferred around the timber as follows. Register your modified framing square on the datum line on primary so the notch you filed in the blade is centered on the datum line, the 1½-in. mark on the tongue is on the datum line and the outside edge of the tongue is on your monument mark. You can measure across the width of timber directly from the scale on the tongue of the square for placing tenon cheeks, housings and mortises. This will give your joinery its proper location in space regardless of where the surface of the timber is. To square around the timber, square across the primary, secondary and non-reference adjacent to primary, then connect across the face opposite primary.

One basic tenet of square rule layout is that housings are used to reduce the timber to an ideal size. For most non-load bearing joints, minimal housing is required. I tend to use ½-in. reductions from nominal size. This means that to join an 8x8 post to an 8x8 wall plate, I would use a 7½-in. dimension at both halves of the joint. For the plate, I would register my square on the datum line, then make marks at 7½ in. from the theoretical top of the plate on each side. The actual measurement would be 6 in. from datum. The housing in the underside of the plate would measure 7½ in. from reference side of the bent.

The top of the post would be laid out similarly by registering my square on datum on secondary and non-reference adjacent to primary and measuring 7½ in. from theoretical face (6 in. from datum). The shoulder of the tenon would be 7½ in. from the theoretical top of the post. The non-reference side of the post would then be cut back to fit the housing at 7½ in. For joinery bearing weight in shear, 1-in. and deeper housings may be more appropriate (Fig. 1).

Layout of braces is purely by standard measurements. For discussion, assume that braces are required measuring 36 in. along the horizontal and vertical legs. To lay out the brace housings on the plate, measure 35½ in. from the reference face of the post housing. To place the brace housing on the non-reference side of the post, measure 43½ in. from the reference side of the housing. These housings on the plate should be laid out to a depth of 7½ in. from theoretical top of plate. This makes the housings ½ in. deep in theory.

To lay out a post for the same 36-in. braces, measure 36 in. from the shoulder of the post. The brace on the primary side of the post would be housed to a depth of ½ in. from theoretical surface. The brace on the non-reference face of the post would be housed to a depth 7½ in. from theoretical reference. This leaves 7 in. of wood between braces at the post and leaves all brace ends housed.

To lay out braces, first find brace length by trigonometry or on your calculator or framing square. The brace length for 36 in. legs is 50.91. We would like to have a ½-in. nosing (or slightly greater, but no smaller) on the brace to fit the ½-in. housings in the plate and post. By solving for the triangle with a ½-in. hypotenuse, we find that the nosing line and the shoulder line must cross .35355 in. from the face of the brace (Fig. 2). For ease of measurement, I use ⅜ (.375), which makes for a nosing slightly fatter than ½ in. (For further ease of measurement, certain brace legs yield easy-to-work-with overall lengths. For instance, a 35-in. leg yields a 49½-in. length.)

Using two squares as winding sticks, lay out datum points on brace stock ⅜ in. from primary on each side and 1½ in. from arris on bottom and top. These are laid out at end points of the brace after accounting for wind as before. Snap lines on all four faces. Lay out the brace length on primary and square around each end. On secondary and the face opposite secondary, lay out 45-degree pitches crossing at the point defined by datum and its intersection with the length

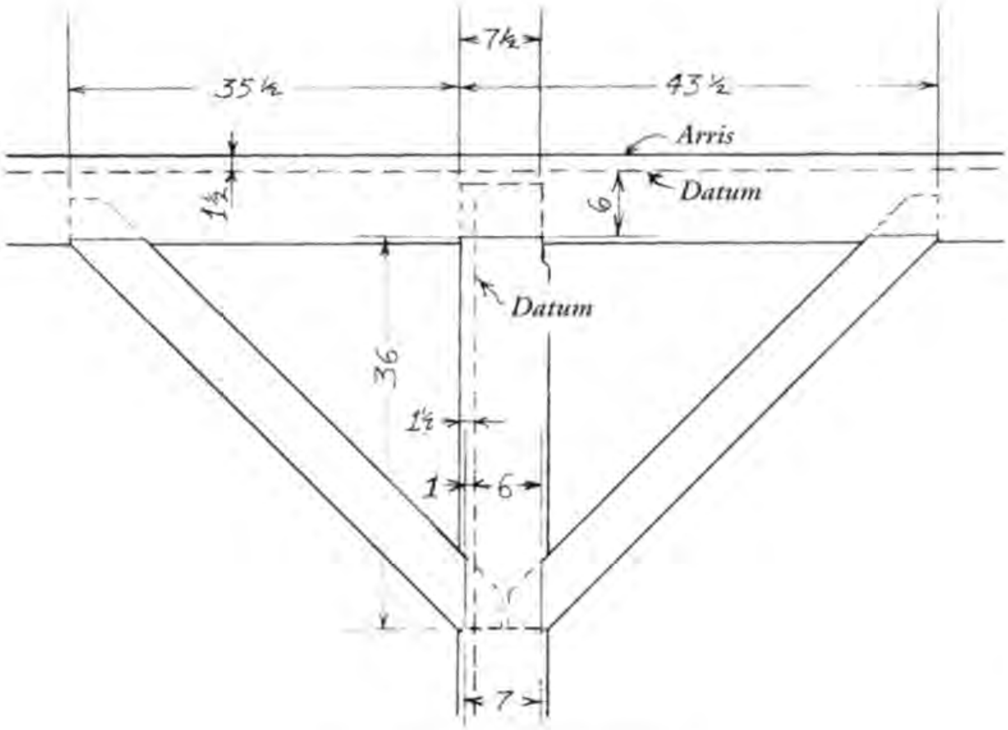
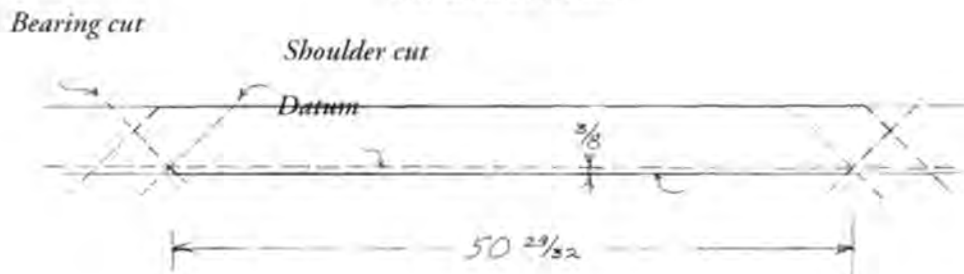


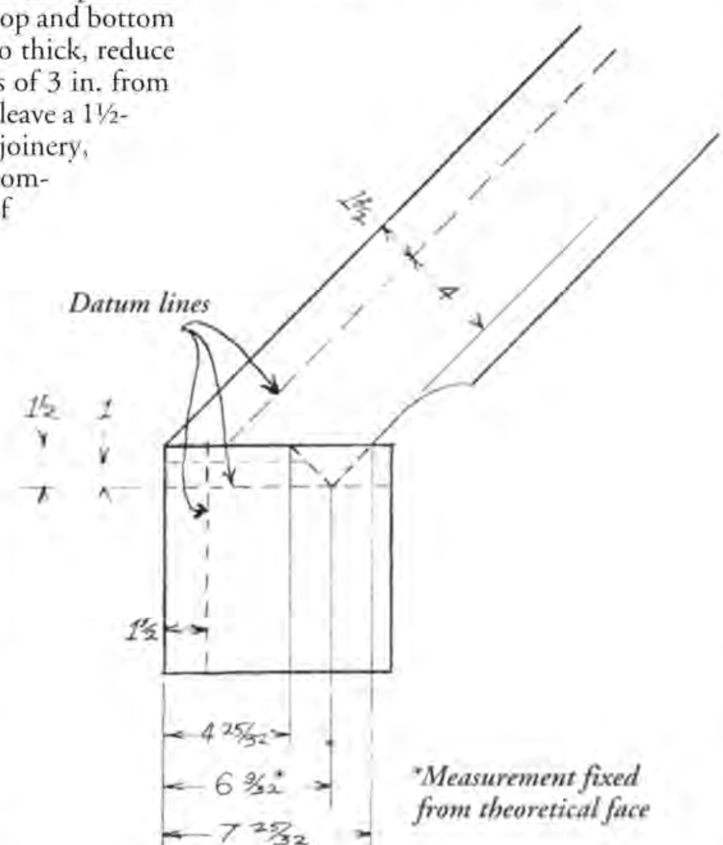
FIG. 1. SHOWING USE OF HOUSINGS

FIG. 2. BRACE LAYOUT



marking. Connect the lines across the top and bottom surfaces of the brace, point to point. Do not square across top and bottom faces. If the brace stock is too thick, reduce the tenon area to a thickness of 3 in. from theoretical face. (This would leave a 1½-in. thick tenon.) For roof joinery, we call on some simple geometry. Suppose a 12-pitch roof with a 20-ft. span outside-to-outside on wall plates. The 4x6 rafters sit in birdsmouths and peak in simple, plumb-cut butt joints. By solving the triangles we find that the overall length point-to-point for a rafter is just under 170⅞ in. By the same reasoning, the distance along datum line from plumb to seat is just under 167⅞. In solving by triangles for the birdsmouth in a perfect theoretical timber, we can find the measurements from theoretical face of timber for the bearing cut intersecting surface, the centerline of the birdsmouth and the backcut intersecting surface (Fig. 3).

FIG. 3. RAFTER TO PLATE CONNECTION



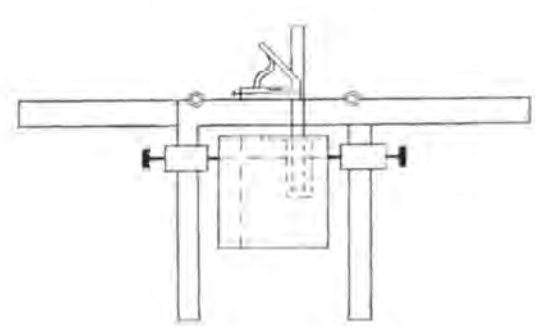
To adjust the layout in case of severe crown in the plate, measure the actual distance from arris corner to datum line on outside face. Use this number for rise (or run, since the pitch is 12) of the triangle to solve for the measurement from the centerline of the birdsmouth to where the cut will surface on the timber.

The same geometric solution of pitch and length along datum can be applied to place any joinery in the frame. One must be careful, however, to use proper values for rise, run and known distances. In pitches other than 12, it is easy to transpose rise and run figures and thereby make ill-fitting joinery.

THE last great challenge in square rule is how to ensure that joinery is perpendicular or parallel to reference and at the proper depth. To do so, you must establish a line or plane parallel to the datum plane in question and a measurable distance from it. Measurement perpendicular to this established line or plane will determine proper depth and orientation.

The simplest way to establish a line or plane parallel to a datum plane is to lay a framing square on edge across the timber, then shim under the square to bring it parallel to the datum plane. With a combination square you can then measure the offsets from datum as well as check the orientation of the joinery. Remember that measurements are taken from the datum plane, not the surface of the timber.

Alternatively, a jig can be built as in the drawing below, using stair gauge fixtures to clamp together two framing squares and attached hardwood blocks with captive nuts and pointed all-thread rods to register in the edges of the datum plane. This jig transfers the datum plane off the timber and provides a way to take measurements and check joints for square.



Square rule joinery allows many approaches. The methods described here will give good results on almost any converted timber—sawn, hewn, twisted or bowed.

—DAVID DAUERTY

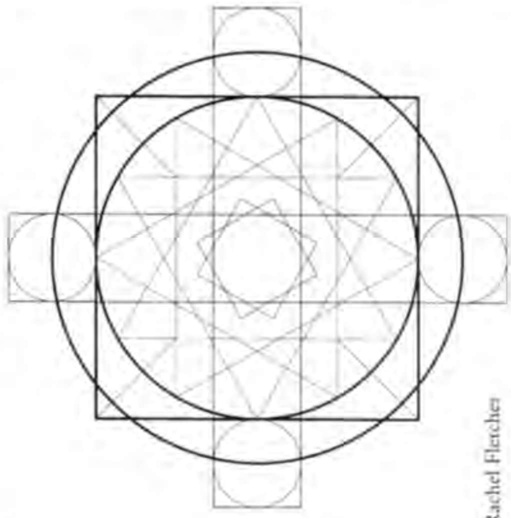
Dave Dauerty operates To the Line Timber Frames in Constantia, New York, and specializes in hewn work.

Amherst Conference

PULLED together by the usual host of visible and invisible hands, but even closer to the event than usual, the Guild's 13th Eastern Conference June 20-22 at UMass Amherst disappointed none of the 300 attendants with its range of presentations, roundtables and demonstrations. An exceptionally full trade show, and, for Guild eastern conferences, exceptionally good food, added to the pleasures, and commentator Willem Lange's after-dinner observations of New England life Saturday night had most diners cheered by laughter and prepared for the surprisingly successful auction that followed. Out of doors, test-firings of the visiting Lexington Bellifortis, the new trébuchet built jointly by the Guild and Virginia Military Institute, and a unique candle-lit solstice mandala, laid out in a field by geometer and stage designer Rachel Fletcher, connected the conference firmly to the physical world.

The conference proper was preceded by a day of Timber Frame Business Council meetings. The Council has gathered force this year, with membership now at 72 companies, and continues to declare its ideals in corporation-speak (though there can be home truths, too, when council members speak in person—see Jeff Arvin's remarks on page 11). The Council's affairs are run by a management consultancy, Steven Winter Associates, in Washington, D.C., which provides an executive director for the Council, Cynthia Gardstein, by profession neither framer nor businessperson, but rather professional executive director. Such is the abstraction of life above a certain level of organization. The Council is paying to get done things that the Guild with its multiplicity of interests and its mostly volunteer forces was unable to achieve systematically. Dick Schmidt's pegging and joinery test program at Wyoming promises to lead somewhere useful, and the Council's almost-ready survey of Guild (and other) framers might yield a truer picture of the trade (which the Council characteristically insists on calling an industry) than the guesses we have been living with for a dozen years. The long and fairly friendly ideological struggle in the Guild between believers in the ascendancy of the individual and believers in the supremacy of business has been solved by sending the combatants to separate corners of the ring, though we are all evidently still in the same ring—in some cases, we are the same person.

Rachel Fletcher's solstice mandala, a geometrically elaborated 75-ft. circle laid out in an unpromising and remarkably desolate field at an inconvenient distance from the University conference center, turned out to be magical once night fell on June 21. Hundreds of candles set in short stands followed the lines of the mandala, providing gentle direction for those who strolled about and a peacefully mesmerizing display for



Rachel Fletcher

the many more who settled at the perimeter. A respectful silence, and for a time the single, clear notes of a hand bell, perfected the summer night, and the group firmly resisted urgings to sing or otherwise demonstrate in any kind of unison.

Willem Lange's accounts of New England life (his own, chiefly, though he was quick to point out that it began outside of New England) referred often to the amusements rural New Englanders, bound to an austere landscape and a short summer, devise for themselves. "Does this road go through?" asked the blue-haired lady, leaning out of the window of a car so long that as Lange stood next to the front wheel, he had to strain to see her. "Go through? Go through what?" Lange replied. Still polite, the lady tried again: "I mean, does this road go anywhere?" Lange considered this question and finally replied: "Well, I've lived on it for 35 years and it hasn't gone anywhere yet." The lady had strength for one more utterance. "We want to get to Hanover!" she said brightly. This time Lange replied without a pause: "That's a damned good idea!" Such an approach is not limited to roadside encounters, Lange demonstrated. It is likewise a wonderful revenge on telemarketers.

The trébuchet, a reduced-scale version of a famous medieval siege machine (the new one has a mere 23-ft. throwing arm, the original had an arm 66 ft. long), was dismantled by the cadets at Virginia Military Institute who had, with Guild help, built it in April (see TF 44), then trucked to Amherst courtesy of the Murus Company in Pennsylvania. (The trucker stayed for the conference and enjoyed himself.) Several test-firings down the long, empty firing range brought no surprises. The treb continues to fling 100-pound missiles 200 yards and more. The weapon now sports sturdy iron dogs and ratchets to fix the winch (photo on facing page) made by Lexington, Virginia, blacksmith Lee Sauter, which allow more convenient cocking of the arm. There are hopes that the treb will go to Europe at some point for a fling-off with the few other machines of its sort that have been built there in recent years.

The trade show, administered this year by Denny Hambruch of Mafell, offered its usual panoply of panel makers, tool makers and specialty wood suppliers, one astonishing Canadian woodcarving service, Wood Spirits of Dorchester, Ontario (basswood dragon, below), two building software developers (one German, one Swiss) and not one but two German makers of computer-controlled timber-cutting machinery. The last would certainly be capable of transforming American framing from a trade into an industry if companies here were willing to make the capital investment (in six figures) and accept the characteristic joinery of the tooling (facing page, at left). The food at the trade show, introduced last year and again supplied (like the customary drink, courtesy of the exhibitors) was quite a good idea, with a civilizing influence.

Outdoor demonstrations of layout, hewing, riving and sawing took place in or near

the valuable shade of a group of young trees and against the ironic background of the University Conference Center and Hotel, a concrete edifice of the usual sort that no one had a good word for. A trio from Plimoth Plantation, the 17th-century living museum on the Massachusetts coast 100 miles east, came to hew logs, split out siding and saw boards out of hewn logs. Michael Burrey hewed and rived; Stuart Bolton and Preston Woodburn, shown in the photo at right above, manned the timber saw on a trestle (thus "topsawyer" and "pitman"). Meanwhile, Jack Sobon (at right) donned a straw hat to explicate scribe rule layout.

Joint-busting returned to the eastern conference after a seven-year absence (photo, bottom right). Fittingly enough, former buster-master Ben Brungraber, along with veteran Jonathan Orpin, handily cut a test joint that performed very well (see Dick Schmidt's report, page 3). Ben's machine was defeated at RPI (Troy 1990) by oak joints that sustained 20,000 pounds before his hydraulic machine's hoses yielded. Larry Tueller, who built one of those earlier joints, was on hand again, and with fellow Blue Ridgers built another oak joint that gained the highest values in the new contest. However, the latter-day joint busting is in a different spirit, with science and uniformity of test examples more at issue than the question of defeating the machine.

All presentations at this conference took place in the basement of the university conference center, aptly compared by Janice Wormington to a dungeon, although dungeons typically offer some natural light high up. But the general good cheer of the presenters and their audiences overruled the grim surroundings, which were at least cool. There was plenty of history, in the form of barn lore from Peter Sinclair, Greg Huber and Richard Babcock, and scholarly presentations from Yale's Abbott Cummings (ever dapper in his customary three-piece suit) and Ed Hood of Sturbridge Village to the south. Not least, retired Middlebury ethnologist Horace Beck, a worldly and skeptical septuagenarian, essayed the connections between Puritanism and shipbuilding and their effects upon New England art and architecture, suggesting that the virtue of spareness in New England houses, ships and furniture is no accident and is to be contrasted with the virtue of amplitude in (for example) German settlement areas.

Photos Ken Rower

The seminar called Geometry for Builders, given by Rachel Fletcher, Ed Levin and Boston architect Henry MacLean, perhaps should have been included in the group of presentations called the Timber Frame Track, lately a regular feature of both eastern and western conferences. Geometric drawing, once the head and heart of architectural design but now largely displaced by the arbitrary parallel rule and perhaps computer software, continues to offer inbuilt order and satisfying relationships for the design of buildings, to counter the chaotic effects of buildings designed from the inside out. The growing use by Guild framers of computers as drawing machines was taken up in a roundtable led by CAD veteran Paul Freeman and timber-frame architect Randall Walter (see page 12), as the trade continues to evolve with the times.

—Ken Rower

1997 Design Exhibition

WHAT had been in past years a design competition became, at Amherst, a design exhibition, thus relieving its organizer (who has plenty enough to do) the task of choosing judges, and its judges the task of distinguishing between good design work and good presentation, or between extravagant work and modest work in the same category, or between fish and fowl—not to mention the responsibility of supplying rational, defensible reasons for their choices. There has always been a single People's Choice award, from straight balloting of all (including passers-by) who happen to see the exhibition. This year, organizer Nancy Wilkins set three categories, historical, non-residential and residential, and let the people decide. No harm seems to have come of the new arrangement. —KEN ROWER

Garland Mill Timberframes

Above and below, views of the Wetlands Study gazebo at the Whitefield, New Hampshire, elementary school, winner of People's Choice award in the non-residential category. A 21-ft. septagon with observation cupola, and made up of seven half-bents fitted to rings, the structure was designed and built by "an ever-changing number of 12- and 13-year-olds" under the supervision of six Guild instructors: Rene Cournoyer, Peter Hoffmann, Curtis Milton, Rick Moyer, Harry Southworth and Tom Southworth. Gross floor area, about 300 sq.ft. Budget, "wicked cheap, about $2,500."

People's Choice, Non-Residential

People's Choice, Historical

Nancy Grove

Above, flying in the new 44-ton, 46-ft.-diameter dome for St. George's Anglican church, Halifax, Nova Scotia. Built in 1801, the church suffered a devastating fire in 1994, but parts of the timber frame below the dome survived. Acorn Timber Frames of Hantsport, N.S., managed to find (right in the province) the 90 curved timbers, not to mention an 11x14 46 ft. long, required for the reconstruction of the dome. At right above, the dome in flames. At right, the 12-spoke dome frame seen from beneath, and at right below, the frame before application of covering.

Photos Kimberley Reagan

People's Choice, Residential

Blue Ridge Timberwrights

This large Virginia residence was designed by architect J. Edward Feher to suggest a barn (the main body of the house), a silo (center) and a stable (left). The round-head window sits under a timber-framed dormer; the smaller dormers are made of panels. Timber frame design was a collaboration between builders from Blue Ridge Timberwrights (Christiansburg, Virginia) and frame designer Ed Levin of Hanover, New Hampshire.

Reflections on the Business Council

TEN years ago, after election to the TFG board of directors, I traveled to Portsmouth, New Hampshire, for a weekend-long meeting, my first, with my new colleagues. My instructions were to meet Rudy Christian and Cyndy Gardner at the Boston airport and together we'd travel on to Portsmouth. Rudy arrived first and met my plane, which was right on time, but Cyndy's was delayed. In the ensuing two hours, a time during which I rarely spoke, a legendary relationship was born. From the beginning, Rudy and I were oil and water. Although we had hardly met, and may not have had even a passing conversation before, in my memory at least Rudy filled the entire time with an exhaustive dissection of my philosophy of life and timber framing concluding, in a dismissive tone, that I was a capitalist.

That hurt. Even though I was a relative newcomer to the Guild, and just a big galoot from the Midwest, I figured I was as hip as the next guy. I'd read all the right books. My hair (when I had it) had been the right length. I'd dropped out of the right colleges, then dropped back in to complete degrees that would never be used. In short, I felt I came to timber framing with the right credentials and for all the right reasons. Under those circumstances, being branded a capitalist was nearly too painful to bear. Fortunately, time heals; I recovered from the wounds. Rudy and I shared four years as TFG directors and many a discussion since. Today, I'm of the firm belief that our differences are not nearly as great as they once were. In fact, there is at least one thing on which we can certainly agree—I am a capitalist.

I love the rigor of capitalism. Like timber framing, you can't fake it. I love the discipline of a marketplace that demands that we provide real value and service to our customers. I love it that business is arguably the most powerful social force of our time, or as my eloquent friend Joel McCarty says, "Business is the crucible where ideals are tested and annealed by the fires of pragmatism." I love it that our businesses are the vehicles by which we serve our communities and ourselves; how we put our money where our mouths are; how we walk our talk.

I am not, however, blind to the legacy of a capitalism that exploits people and resources. I am not unaware that capitalistic business can accrue short-term profits without regard for long-term consequences. But the practice of business is not restricted to authoritarian, paternalistic, exploitative models. You don't have to look far in current business literature to find examples of companies that are financially healthy and are managed for "multiple bottom lines," that strive for responsible use of resources, value individuality and thrive on creativity. Similarly, and not surprisingly for an avowed capitalist, I am also a fan of profit. Profit is required for growth and growth is required for life. Profitable companies can provide healthy working conditions, living wages and good benefits. Profitable companies can create opportunities for personal growth. Profitable companies can invest in innovation of product and process that keep a company and an industry vital and relevant. Profitable companies are the ones that endure and continue to serve their customers and communities.

But most of all, I love the diverse talents required by our businesses, ranging from the broadest of visionaries to those capable of consistently executing the details which make the vision real, and this is the first challenge (and the first strength) of business. Getting one person out of bed every day to do the right thing is hard enough. Getting a group of people focused on common objectives requires leadership, communication and nitty-gritty, day-in, day-out work—but the power of a focused group with commonly held purpose and values is awesome. Witness the bridge in Guelph and two houses in Hanover, Pennsylvania. The power is awesome when created by an individual business.

THE power could be incredibly so when created by an entire industry. And this is exactly what the Timber Frame Business Council offers timber framing, because the values at the heart of timber framing are exactly those required to transform the home-building industry.

I believe that by committing to high standards of professional conduct as outlined in the TFBC's "Principles of Practice," we can build the reputation of our industry on value, integrity and accountability, and insist on changes to the fragmented, antagonistic, finger-pointing model of home construction that John Abrams has described as the "bankrupt relay race approach."

I believe that by collectively investing in research and development we can improve the products and services we offer, increase value to our customers and reduce the cost of our homes. I believe that by working to remove institutional obstacles to timber frame home ownership, which range from building codes to financing to material supply, we can further reduce expense and make timber framing accessible to a wider range of people and purposes.

Achieving change is difficult. It requires vision, reflection, courage, commitment and persistence. We cannot fear change. We must be willing to confront our shortcomings. We have much to gain. As Yogi Berra said, "If you do what you've always done, you're gonna get what you always got."

Frankly, at times, I'm afraid that we're gonna get what we always got—that timber framing and its practitioners will remain a small collection of curious and crusty relics of the past that briefly appeared on the screen in the latter 20th century and then disappeared again. I'm discouraged that our industry appears reluctant to embrace the challenges of increased service to our community and relevance to our times. I'm frustrated by our reluctance to accept that by working as effective groups of people in individual companies and as a group of companies in a collective industry we can achieve far more, far faster than we can as isolated individuals and companies—especially when the precedent is right under our nose! The small group of practicing timber framers reintroduced craftsmanship to homebuilding and changed the way houses are built. I firmly believe we can go much further. I believe that by working collectively we can truly revolutionize the way homes are built and, consequently, the way that people live on this planet.

In my mind, where few things are clear, this is: at the heart of commerce is a promise of an exchange of value between you and your customer; a business is nothing more than the structure or the vehicle by which you deliver on that promise; and success is the measure of how well you deliver on your promise. Our deeds are the manifestation of our values. Our businesses are truly living, creative, powerful entities. How we use that power is the key. We have the right values. We need to continually improve the way we walk our talk. If this has been our foundation year, the coming year is the time to build on that foundation. —JEFF ARVIN

Jeff Arvin is president of the Timber Frame Business Council and past president of the Timber Framers Guild. These remarks were excerpted from his address to the Council at the Guild's 13th Eastern Conference in June at Amherst, Massachusetts. Sponsored by the Guild and affiliated with it, the Business Council was formed after years of discussion and false starts, and chartered in 1996 at Annapolis, Maryland, with its own board of directors, independent membership and financial structure. Copies of "Principles of Practice" and "A Client's Guide" may be requested from the Council at 202-783-1100.

Timber Frame Nerds?

IN June a score of people gathered at the Eastern Conference in Amherst to discuss computer use by Guild members. In this mixed group of newbies and nerds, the general consensus was, "Let's get something started that addresses the use of computers specifically in the business of timber framing." We felt the best thing was to make a list of useful services that the Guild might sponsor, organize or attract.

Workshops. Most of us consider the Guild an educational organization, so naturally we are looking for the Guild to be involved in our computer education where it relates specifically to timber framing. To be sure, there are dozens of potential workshops that could be offered. Here are a few: Software Training (CAD, spreadsheets, database, financial), Task-oriented Training (creating stick drawings with CAD, using a spreadsheet to estimate materials), Methods (file-management, plotting and printing, backup procedures), Lessons from the School of Hard Knocks (mistakes we've made), Computing 101 (where to begin, buying and choosing hardware and software, introduction to terminology and WHOA, the wondrous hoard of acronyms).

CAD Apprenticeship Program. Such would be best addressed and devised by a team of computer aficionados and some experienced apprenticeship organizers. A software apprenticeship program may be easier to implement than traditional programs, because support and training can be facilitated by the Internet and software programs that allow a remote operator to take control of your PC over the phone line.

CAD Shoot-out. Individual guild members could compete in some CAD frame drawing exercise to earn bragging rights as the fastest timber framer propeller head for the year. Perhaps more useful is the suggestion that vendors be invited to compete head to head. (This could get bloody!) One attractive benefit of this kind of exercise is the opportunity to learn by watching others work.

Survey of Guild Computer/CAD Use. Survey what hardware, software, and outside computer services Guild members use, and for what tasks. Perhaps some of us would be willing to provide reviews and tips or warnings about products we have experience with. The results would be very helpful to someone considering getting a particular product or service. This might be the first step toward the development of an entirely new Guild service that might include tools or business utilities.

CAD Design Display. "How do you *(enter task here)* with your system?" For instance someone might use detailed frame elevations for their shop work, while others create stick drawings. Admittedly, there are as many ways to draw a timber frame as there are designers. But, speaking from experience, it is very helpful to see techniques others have used to make their drawings more "readable" and therefore better at communicating the design and achieving the final goal of a high-quality home that meets client expectations.

Digital Communication and the Design Process. Can we use computers to improve communication among client, builder, banker, candlestick maker and so on? This topic might cover how to use the Internet for collaborative computing such as a simultaneous walk-through of a virtual 3D timber frame with clients three states away. Other topics could include drawing conversion between CAD systems, reduced scale drawings for fax transmission, use of e-mail.

Detail Library. Since so many situations call for custom details, it might be helpful to see what others have found worked (or didn't), and at least provide a good jumping-off point. Print and electronic libraries should include a printed TFG book of typical details, a web site and a CD-ROM. If past attempts at standard joinery documentation have foundered on the standards issue, still a library could contain user-submitted suggestions and it could be made clear that none of the drawings or notes had been, or would be, reviewed or recommended by the Guild. Drawings would be submitted for the inspection of individual designers. As a matter of fact, rather than decreeing "Here is the Guild standard Panel/Deck/Sill Detail," there might be six user details for that condition. A designer could review any and all, and use all, some or none. Any liability should fall on the designer's judgment in applying the proper solutions to individual building and site conditions.

Guild Computer Conference. With the number of questions people have and their obviously lively interest in the subject, it was only half-jokingly suggested that we could usefully hold a Timber Framer's Computer Conference. This would also be a good forum for "shoot-outs" and a way to entice vendors to come and ply their wares. It may be worth considering weekend seminars similar to TTRAG's.

Guild Chat Site. An Internet chat site is a forum that allows many people to "talk" to each other in a virtual meeting. (The Guild's web site at *www.tfguild.org* has just added a chat site and bulletin board.) Other people logged on to the chat site can see your message and respond to it. Conversations ensue. Organized chat sites frequently announce topics to be discussed at a particular time, or guest "speakers" with whom other members are invited to come and ask questions and discuss the topic at hand. It's also possible to submit files of pictures, drawings, texts, spreadsheets, etc.

Drawing Management and Standards. If you already use CAD, you know how important it is to standardize drawing features such as layers, text styles, dimension styles, title blocks, symbols and more. If you are considering CAD, one of the best things an experienced CAD operator can offer is advice on establishing drawing standards. There are many different CAD systems in use throughout the Guild, and therefore one company's set of standards may not apply to another's. However, in principle, the methods are the same. A very lively discussion could ensue regarding the "right" way to set up drawings.

The Future. This subject cannot be avoided in today's information revolution. Today, most CAD operators can draw on a computer using a combination of mouse, keyboard and voice control. But many of us find this interface restrictive. What we really want to do is to reach through the monitor's glass to pick up that beam and put it in place. This capability is not so far off, in the form of virtual reality.

Many of us have already experienced virtual reality in arcade-like gaming systems. Immersive virtual reality is a system in which you wear a headset (or shutter glasses). The headset provides each eye a unique perspective, producing true stereoscopic vision. When that's combined with stereo sound, your brain accepts the illusion and you are immersed in an electronic three-dimensional environment of sight and sound.

This would become the CAD operator's input device. (Years ago, hackers interfaced Nintendo Power Gloves with their PCs to replace the mouse.) We are not very far away from raising a virtual frame. No more stretch and move commands. Just magnify yourself, pick up a 1x1x1 unit of Virtual Oak, spread your hands, stretch it to the length you need and drop it into place. Now shrink yourself to hummingbird size and fly through the frame, or toggle the wind and gravity buttons and observe the result. Or see what happens when that brace is removed . . . oh no! Where's that Undo command?

—PAUL FREEMAN AND RANDALL WALTER

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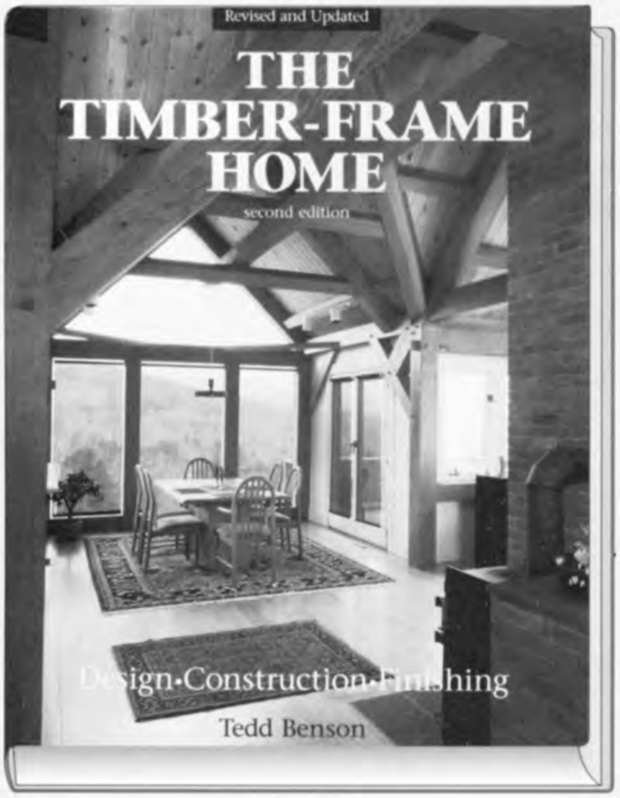

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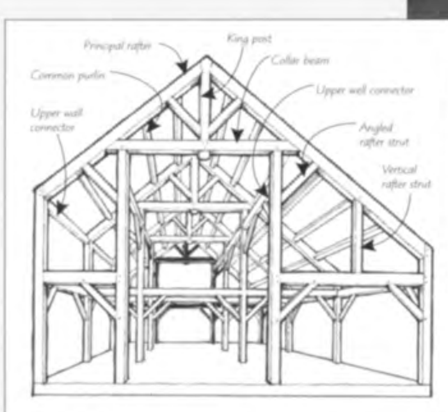

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