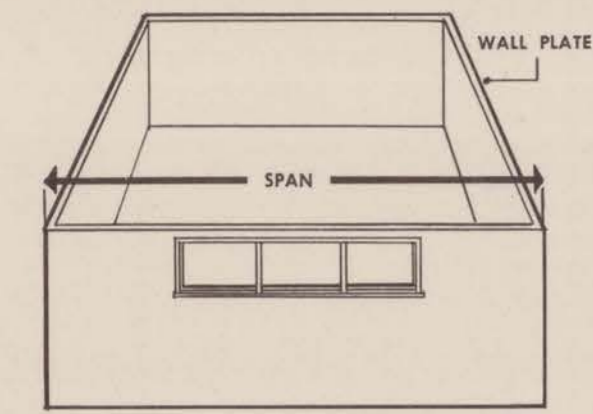


# HOW TO BUILD THE SMALL HOMES COUNCIL'S "W" TRUSS— 5/12 SLOPE, 2' ON CENTER, 20'-8" to 32'-8" SPANS

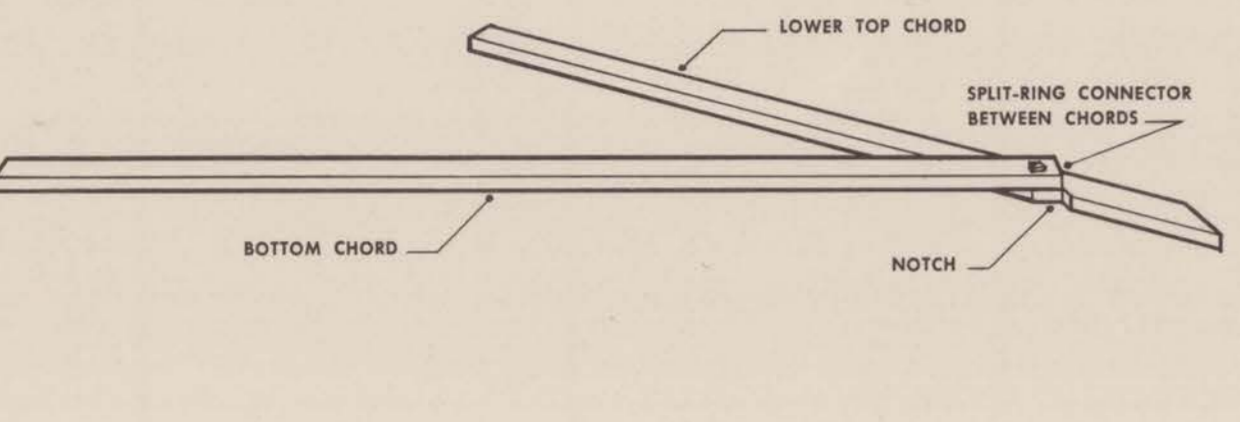
## MEMBER SIZES (TOTAL LUMBER NEEDED FOR ONE TRUSS)

NO ATTIC STORAGE		ATTIC STORAGE	
SPAN	MEMBER SIZES	SPAN	MEMBER SIZES
21'	One 2" x 4" x 14'	21'	One 2" x 4" x 14'
22'	One 2" x 4" x 14'	22'	One 2" x 4" x 14'
23'	One 2" x 4" x 14'	23'	One 2" x 4" x 14'
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31'	One 2" x 4" x 14'	31'	One 2" x 4" x 14'
32'	One 2" x 4" x 14'	32'	One 2" x 4" x 14'

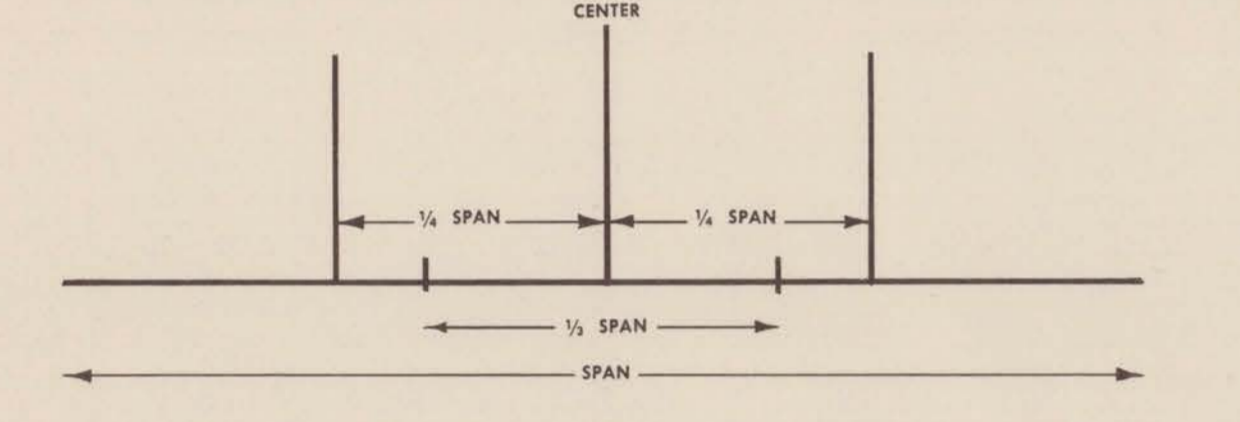
Locate the span on Member Size Table. If your span falls on a heavy dividing line, use figures to the left.



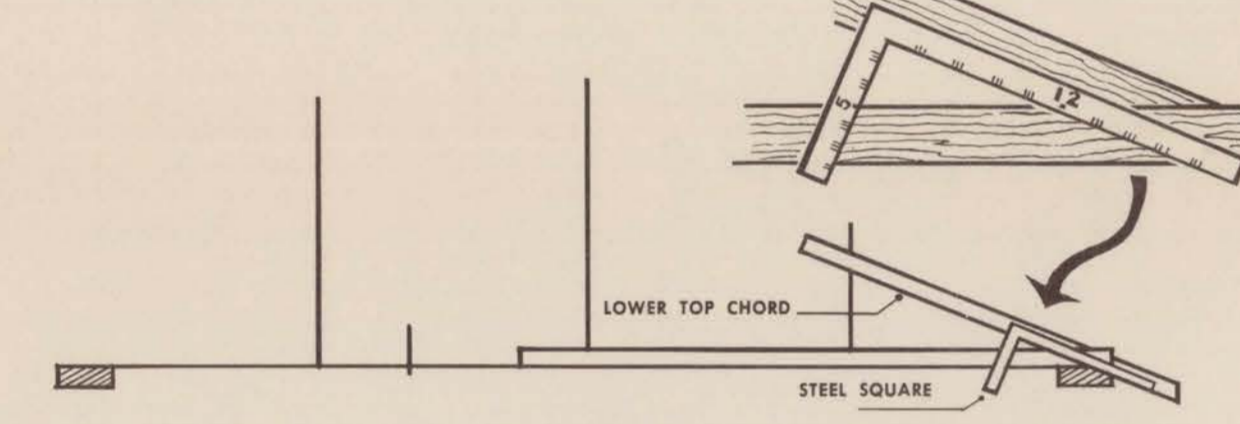
1 Determine the out-to-out dimensions of the exterior wall plates. This distance is the span.



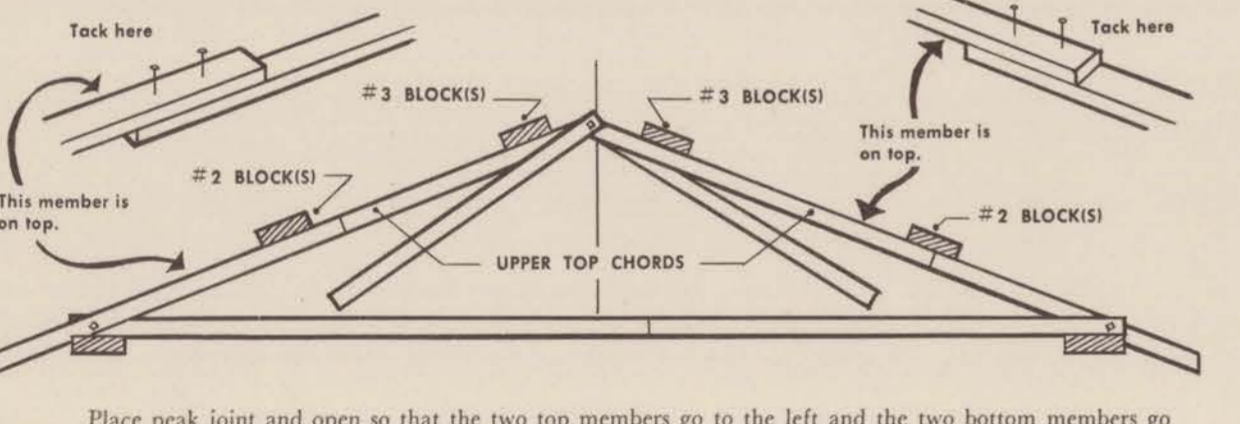
5 Make two identical heel assemblies—one for each end of the truss. Cut and drill each assembly identically. Insert split rings and bolt.



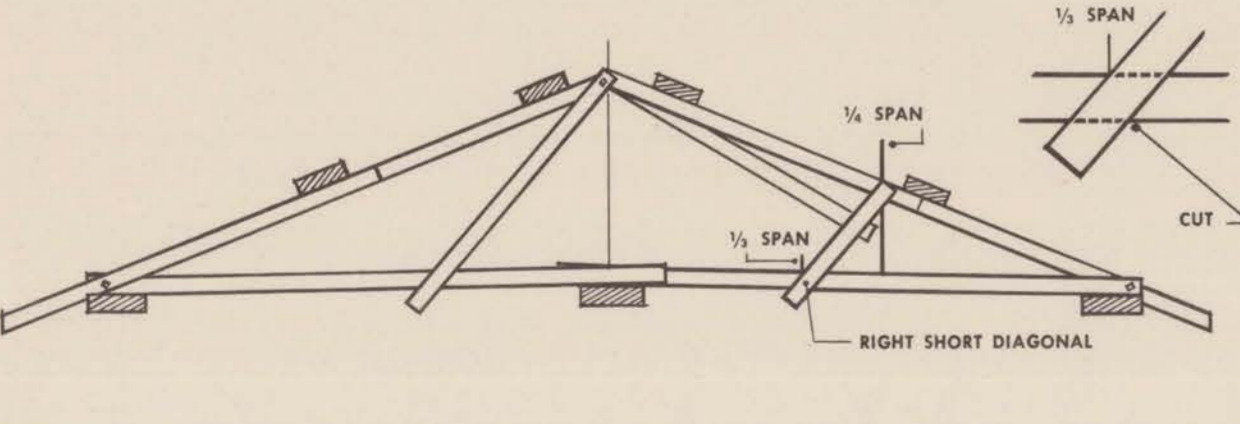
8 To construct jig on subfloor, lay out chalk line equal to span and divide as shown in above diagram.



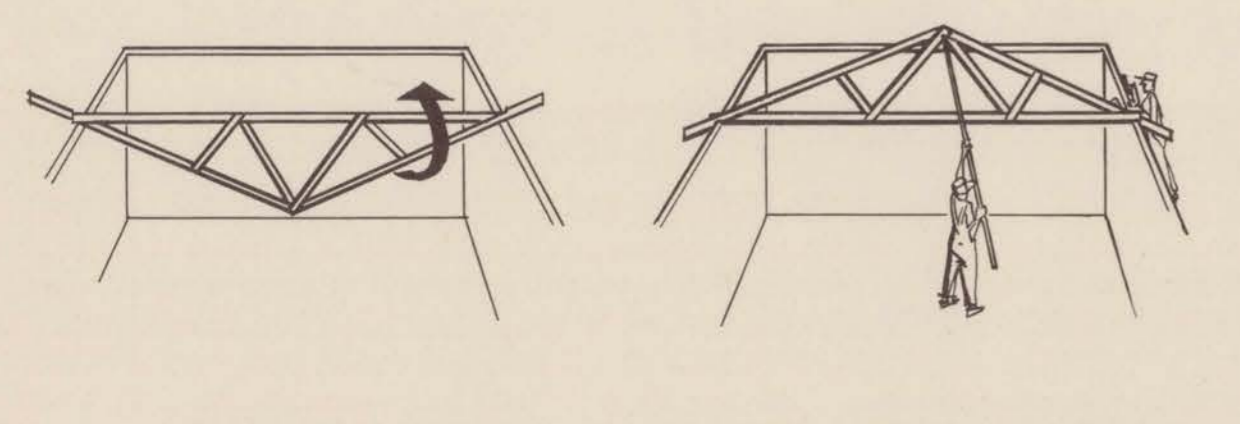
11 Move lower top chord until steel square shows a slope of 5 to 12. Tack the members together to hold slope temporarily.



14 Place peak joint and open so that the two top members go to the left and the two bottom members go to the right. Place the two upper top chords firmly against #2 and #3 blocks. Tack to hold in place temporarily.

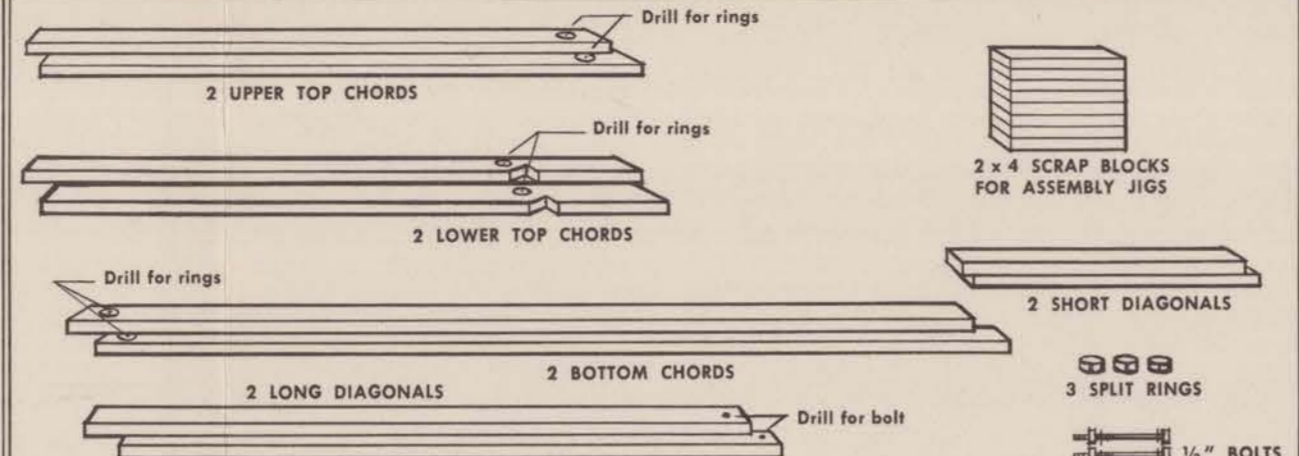


17 Lay the right short diagonal in place so that it intersects the 1/2 span point at top and the 1/2 span point at the bottom. Mark cut.

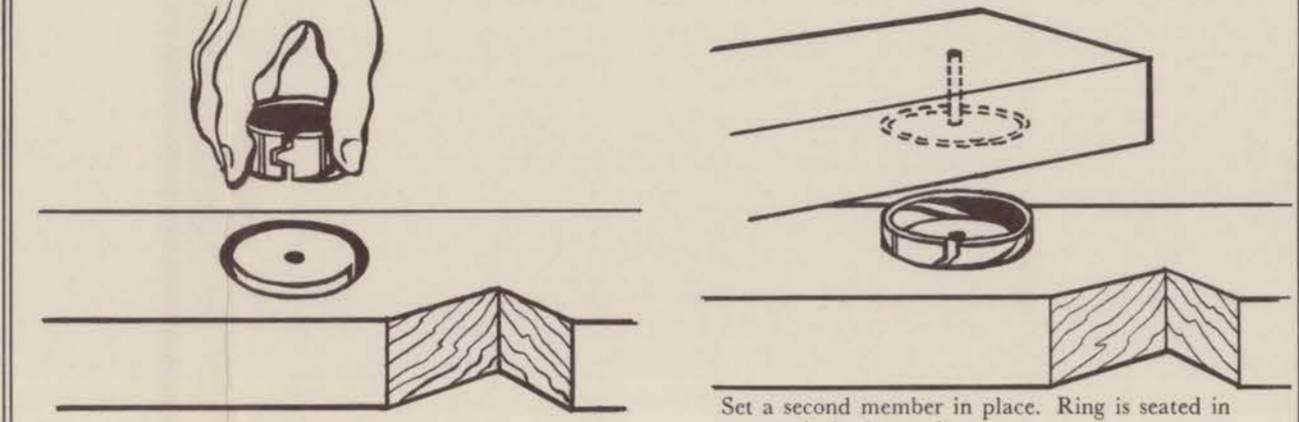


20 To erect the truss, place it in an inverted position with the ends resting on the wall plates. Use a pole to swing the truss into position.

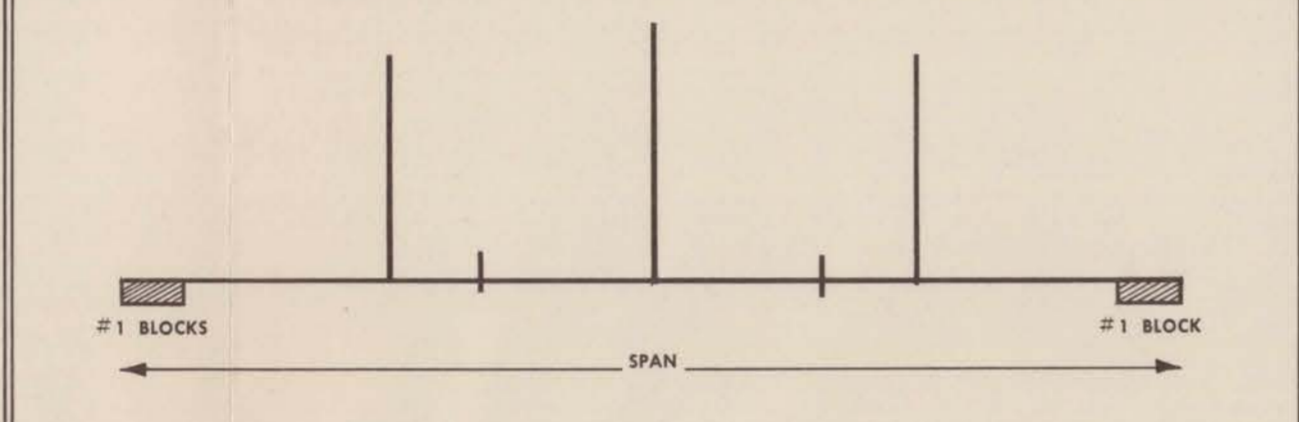
21 To space trusses, measure distances on wall plates. Place framing anchors as shown above. The spacing on right and left plates is identical. Same type of anchor is used on right and left plates.



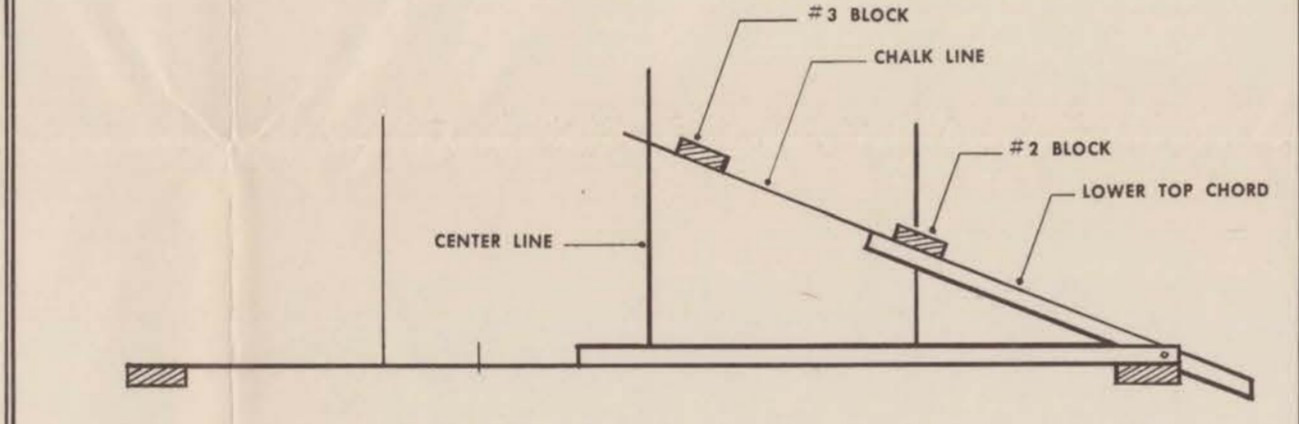
3 Consult Cutting Diagram. Cut all members necessary for one truss as shown for your span. Work from one end of the piece only. Lengths given will provide sufficient lap for the required number of nails.



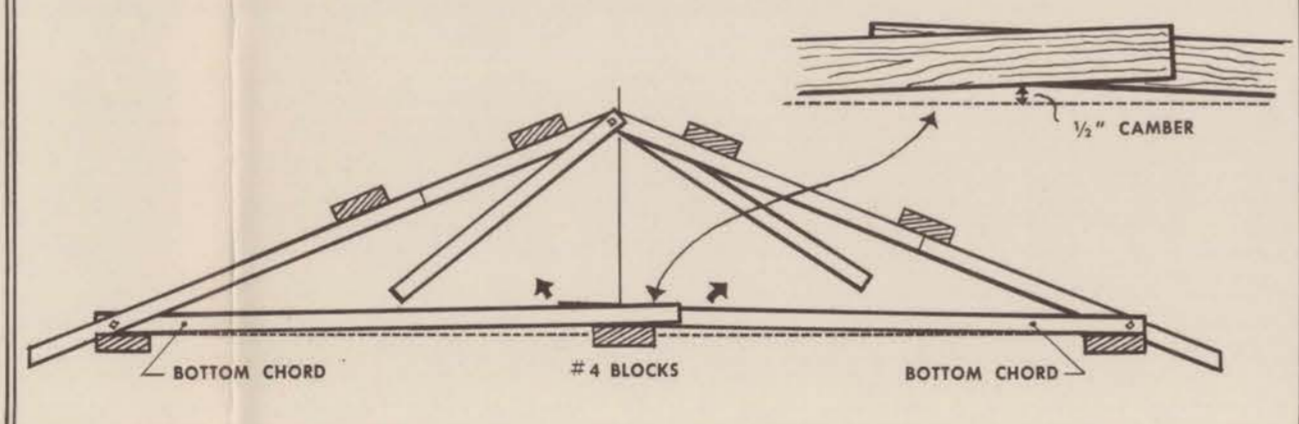
6 To install split rings, first seat ring in groove of one member. Set a second member in place. Ring is seated in grooves in both members. Insert bolt with washer at both ends. Bring nut up finger tight.



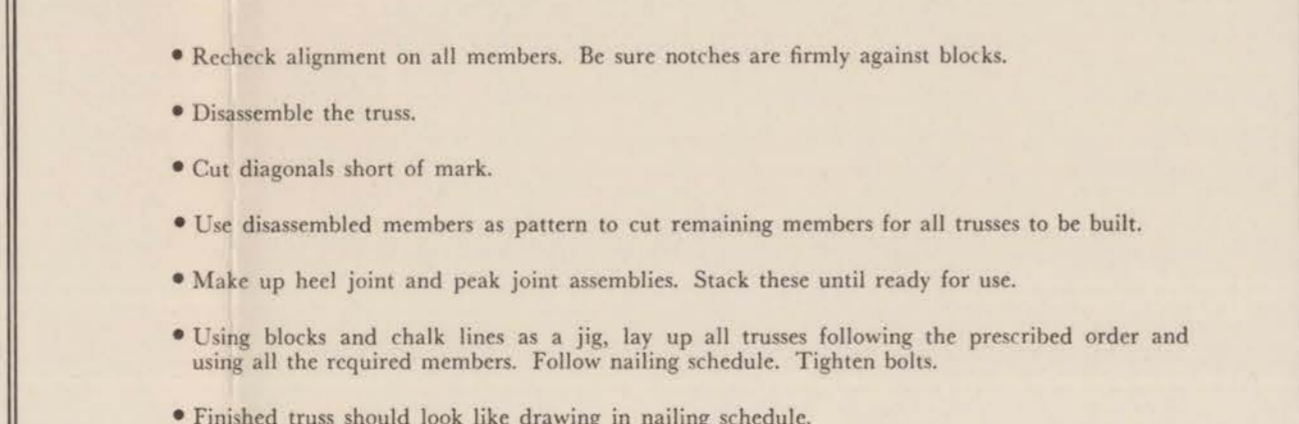
9 Nail 2 x 4 blocks so that their out-to-out dimension equals the span. These are the #1 blocks which will be part of assembly jig. Use at least two blocks on left side, one on right.



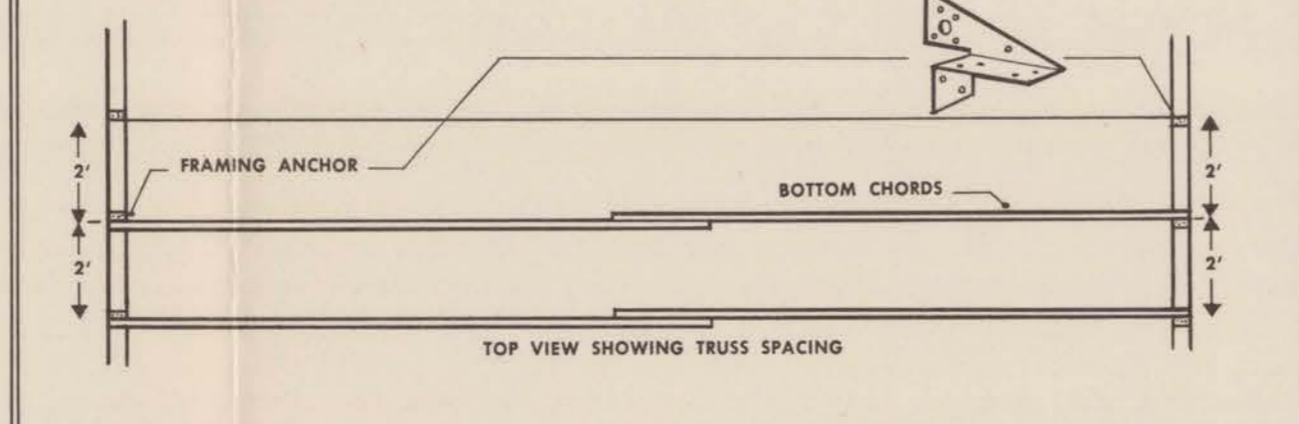
12 Run chalk line along top edge of lower top chord until it intersects center line. Nail #2 and #3 blocks as shown.



16 Swing the left long diagonal down until it intersects the 1/2 span point. Mark necessary cut.

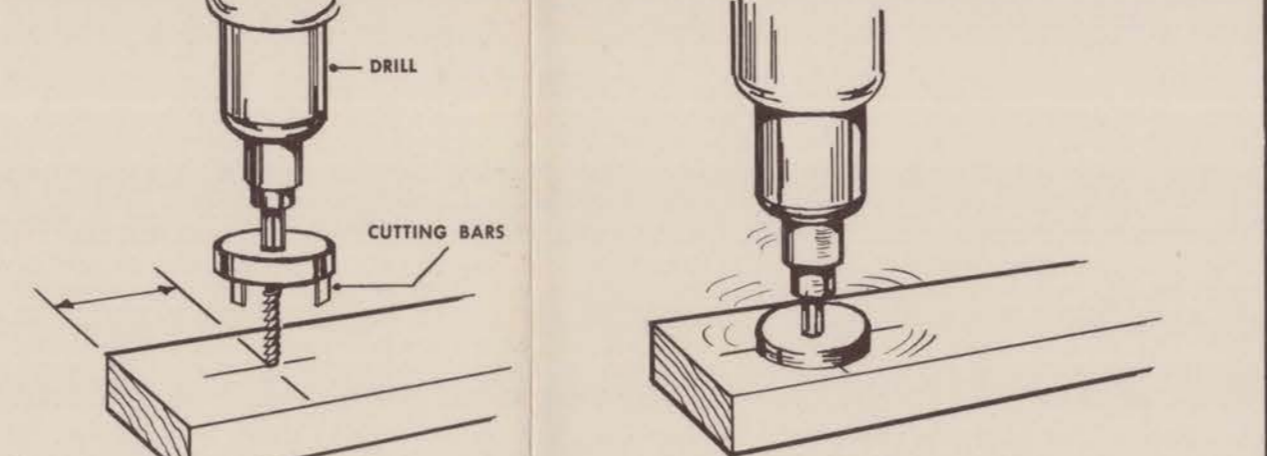


19 Assembled trusses can be carried in this manner.

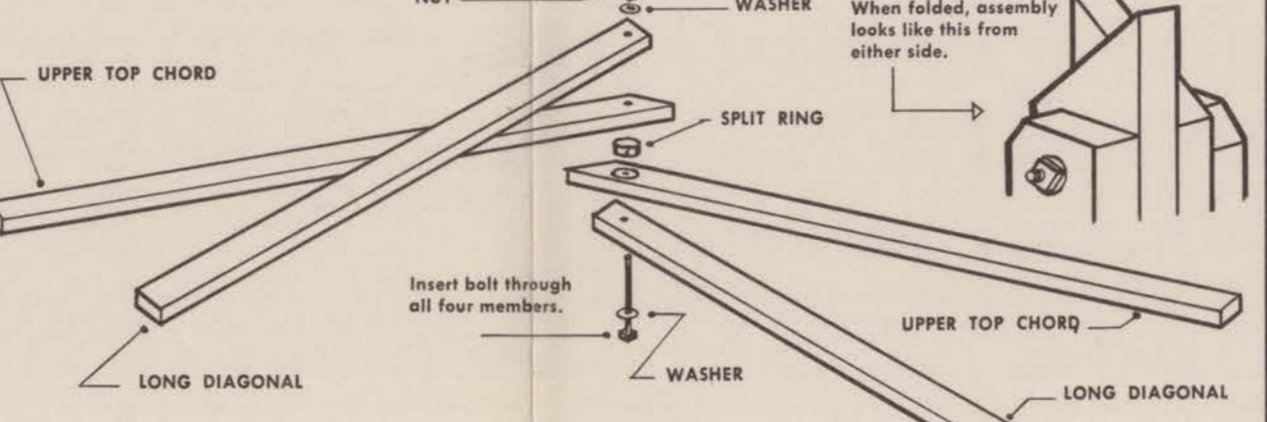


22 Nail framing anchors to bottom chord. Note that the triangular flange of anchor is directly over center of stud. Framing anchor will clear bolt as shown.

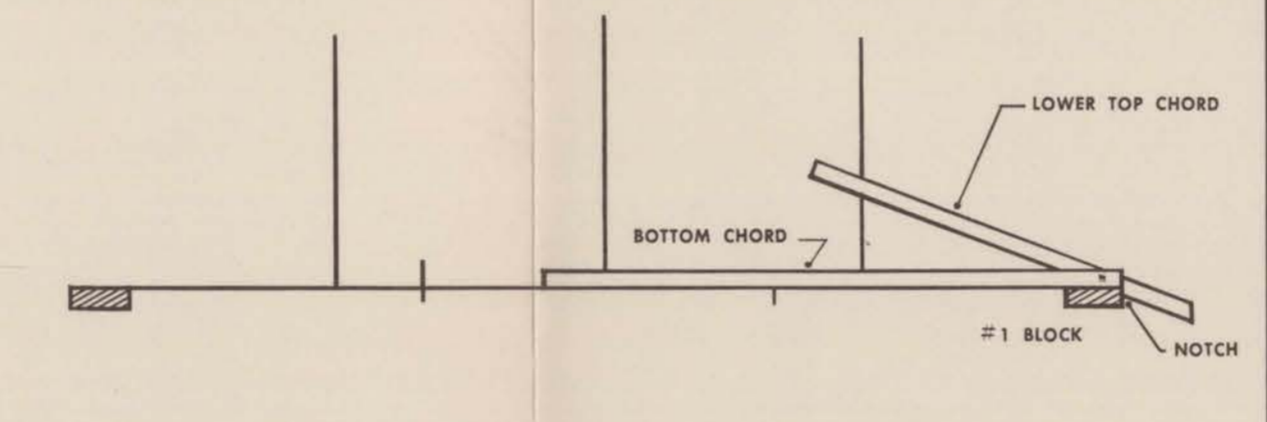
23 The bevel on the bottom chord can be left for hatchet cut. If pre-cut, bevel appears opposite notch in top chord when assembly is folded.



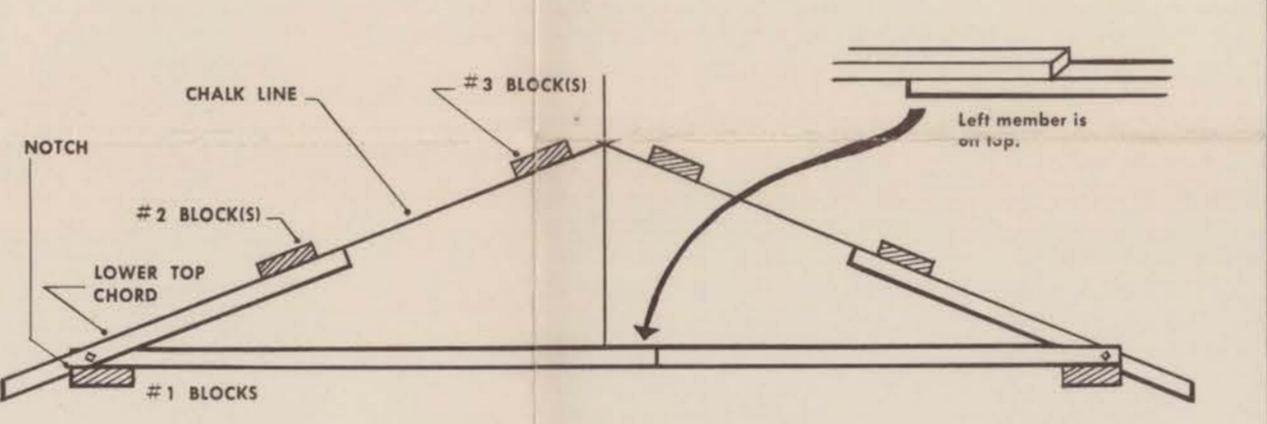
4 Drill for split-ring connectors. Drill exactly as shown in the Cutting Diagram.



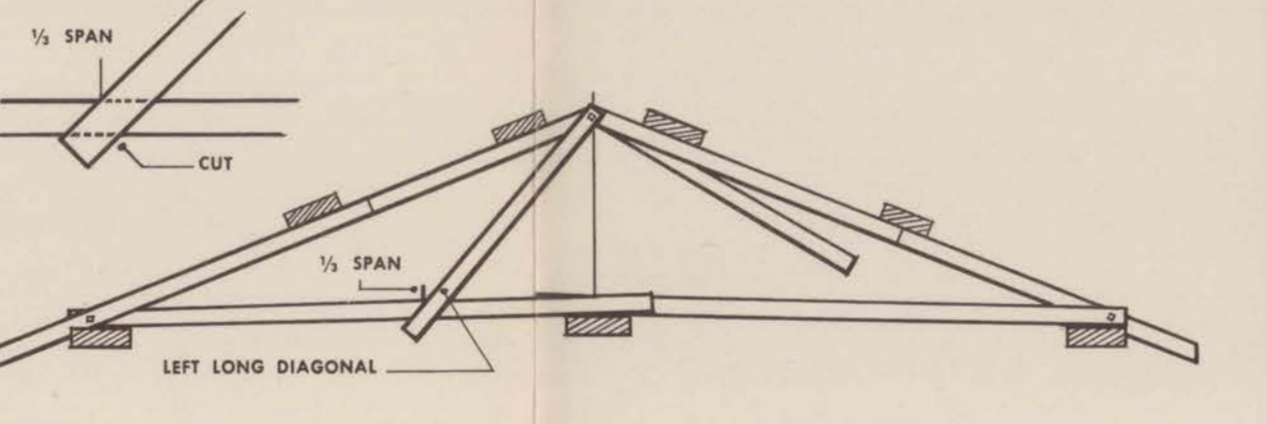
7 Make one peak joint assembly. Note correct position of bevels.



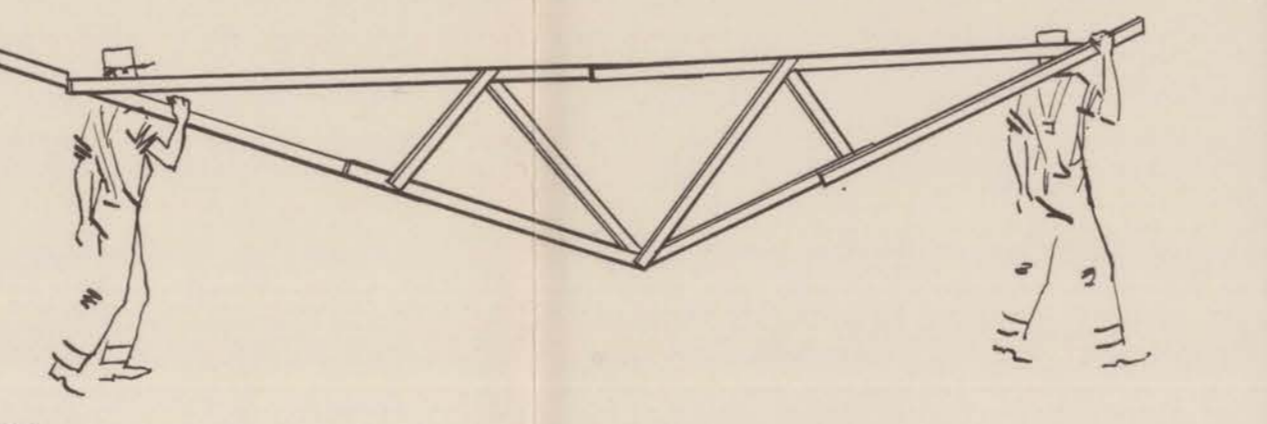
10 Set heel assembly on the right end of chalk line so that the notch in lower top chord fits against #1 block.



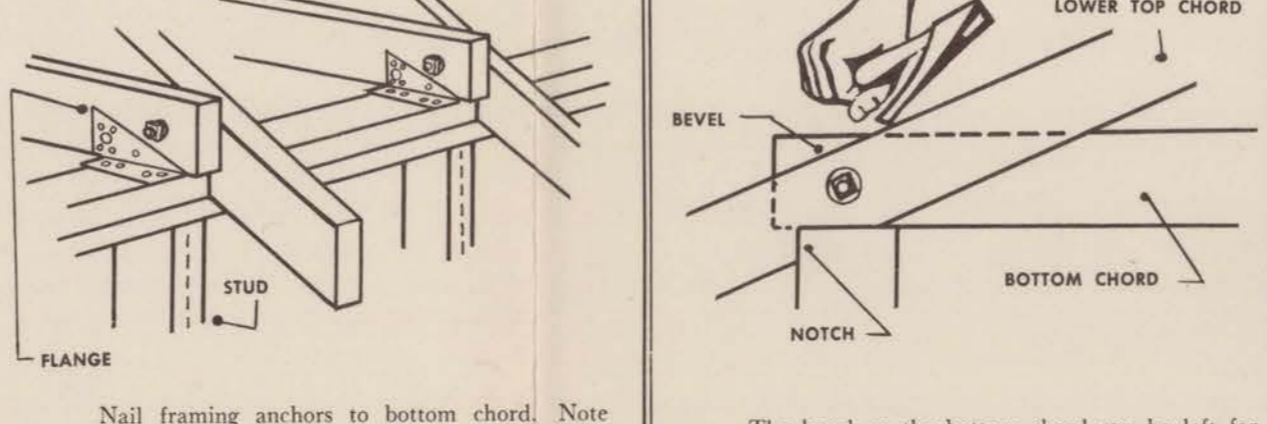
13 Nail #2 and #3 blocks on left side in the same way as for the right side. Take the other heel assembly and place it on the left end of the chalk line with the notch in the lower top chord fitted against #1 block.



16 Swing the left long diagonal down until it intersects the 1/2 span point. Mark necessary cut.



19 Assembled trusses can be carried in this manner.



22 Nail framing anchors to bottom chord. Note that the triangular flange of anchor is directly over center of stud. Framing anchor will clear bolt as shown.

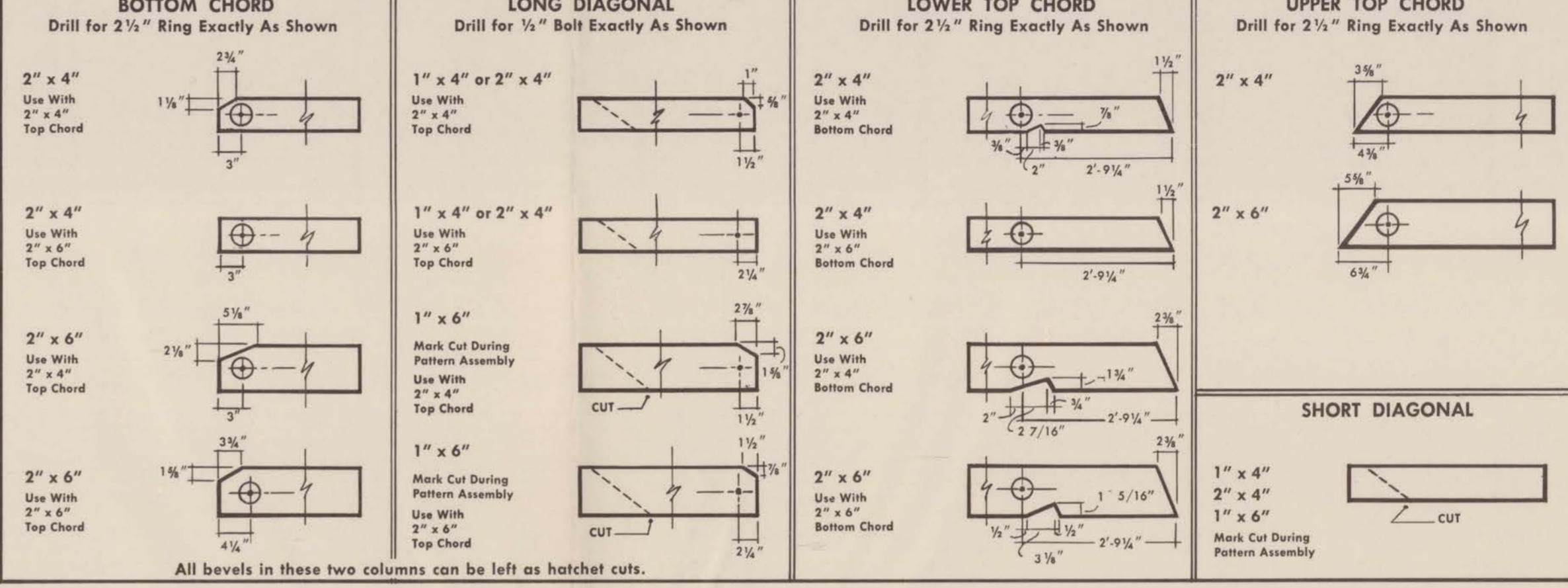
23 The bevel on the bottom chord can be left for hatchet cut. If pre-cut, bevel appears opposite notch in top chord when assembly is folded.

## MEMBER SIZES (TOTAL LUMBER NEEDED FOR ONE TRUSS)

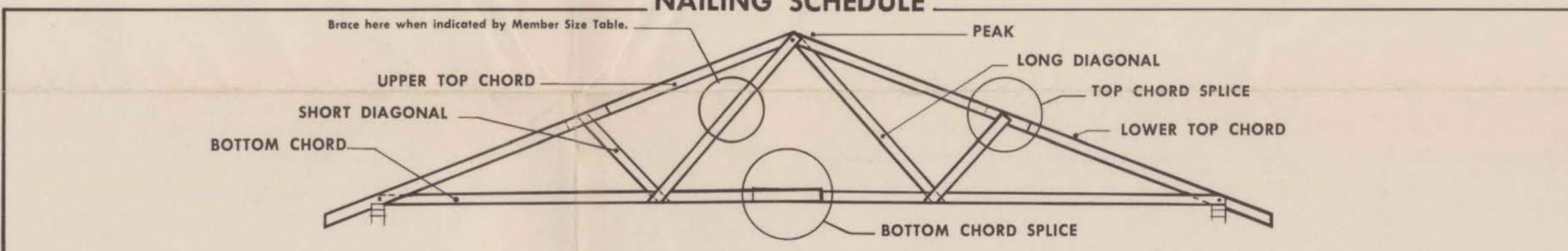
SPAN	NO ATTIC STORAGE		ATTIC STORAGE	
	MEMBER SIZES	MEMBER SIZES	MEMBER SIZES	MEMBER SIZES
21'	One 2" x 4" x 14'	One 2" x 4" x 14'	One 2" x 4" x 14'	One 2" x 4" x 14'
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26'	One 2" x 4" x 14'	One 2" x 4" x 14'	One 2" x 4" x 14'	One 2" x 4" x 14'
27'	One 2" x 4" x 14'	One 2" x 4" x 14'	One 2" x 4" x 14'	One 2" x 4" x 14'
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\* The length of these members has been computed to provide a 30" horizontal overhang. If a different overhang is desired, revise these lengths and the cutting diagrams.  
\*\* Laterally brace long diagonals at center with scabs or solid bridging.

## CUTTING DIAGRAMS



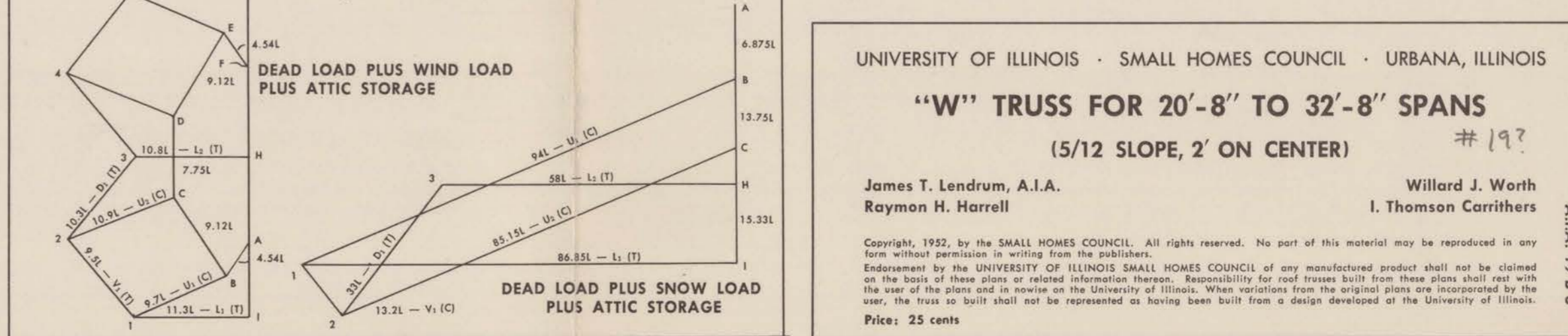
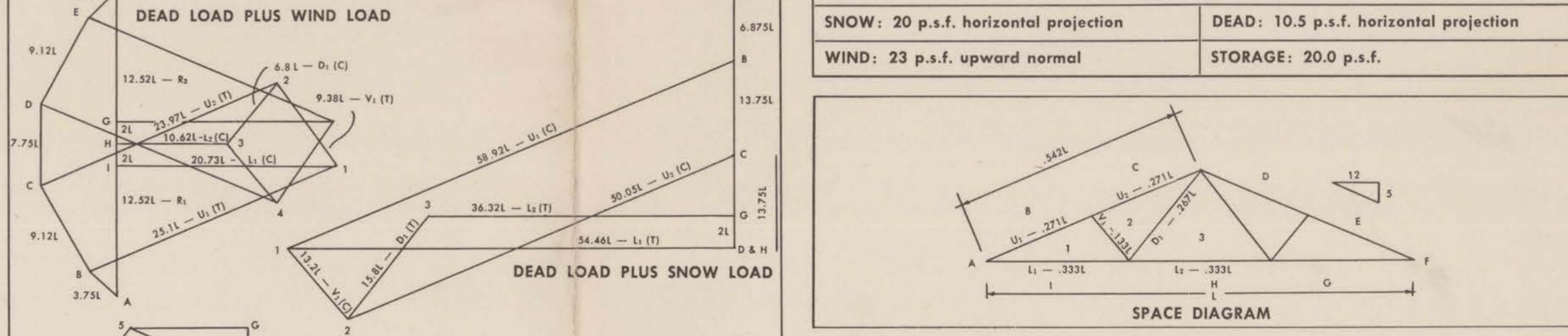
All bevels in these two columns can be left as hatchet cuts.



SPAN	TOP CHORD SPICE		SHORT DIAGONAL TO TOP & BOTTOM CHORD		LONG DIAGONAL TO PEAK & BOTTOM CHORD (PLUS BOLT)		BOTTOM CHORD SPICE	
	NO ATTIC STORAGE	ATTIC STORAGE	NO ATTIC STORAGE	ATTIC STORAGE	NO ATTIC STORAGE	ATTIC STORAGE	NO ATTIC STORAGE	ATTIC STORAGE
20'8" or less	15 - 10d	24 - 10d	4 - 8d	4 - 8d	4 - 8d	8 - 8d	10 - 10d	15 - 10d
20'9" - 22'8"	17 - 10d	26 - 10d	4 - 8d	4 - 8d	4 - 8d	9 - 8d	10 - 10d	16 - 10d
22'9" - 24'8"	18 - 10d	29 - 10d	4 - 8d	4 - 10d	5 - 8d	10 - 10d	11 - 10d	18 - 10d
24'9" - 26'8"	20 - 10d	31 - 10d	5 - 10d	4 - 10d	5 - 10d	11 - 10d	12 - 10d	19 - 10d
26'9" - 28'8"	21 - 10d	33 - 10d	5 - 10d	5 - 10d	5 - 10d	12 - 10d	13 - 10d	21 - 10d
28'9" - 30'8"	22 - 10d	36 - 10d	5 - 10d	5 - 10d	5 - 10d	13 - 10d	14 - 10d	22 - 10d
30'9" - 32'8"	24 - 10d	38 - 10d	6 - 10d	5 - 10d	6 - 10d	14 - 10d	15 - 10d	24 - 10d

For all spans, with or without attic storage, use one 2 1/2" split ring in each heel and peak joint.

## DESIGN DATA



Price: 25 cents

LOADING VALUES	
SNOW: 20 p.s.f. horizontal projection	DEAD: 10.5 p.s.f. horizontal projection
WIND: 23 p.s.f. upward normal	STORAGE: 20.0 p.s.f.

UNIVERSITY OF ILLINOIS · SMALL HOMES COUNCIL · URBANA, ILLINOIS  
**"W" TRUSS FOR 20'-8" TO 32'-8" SPANS**  
 (5/12 SLOPE, 2' ON CENTER)  
 James T. Lendrum, A.I.A. Willard J. Worth  
 Raymon H. Harrell I. Thomson Carriethers