

The Differences Between UK and US Layout Design

American railroad



American railroad model

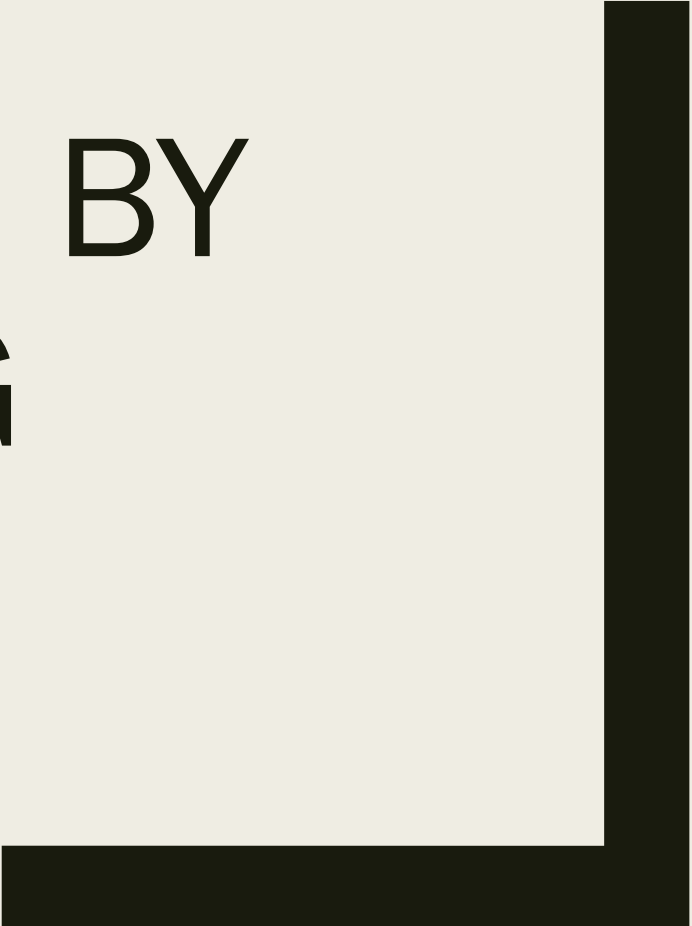


British railway



British railway model



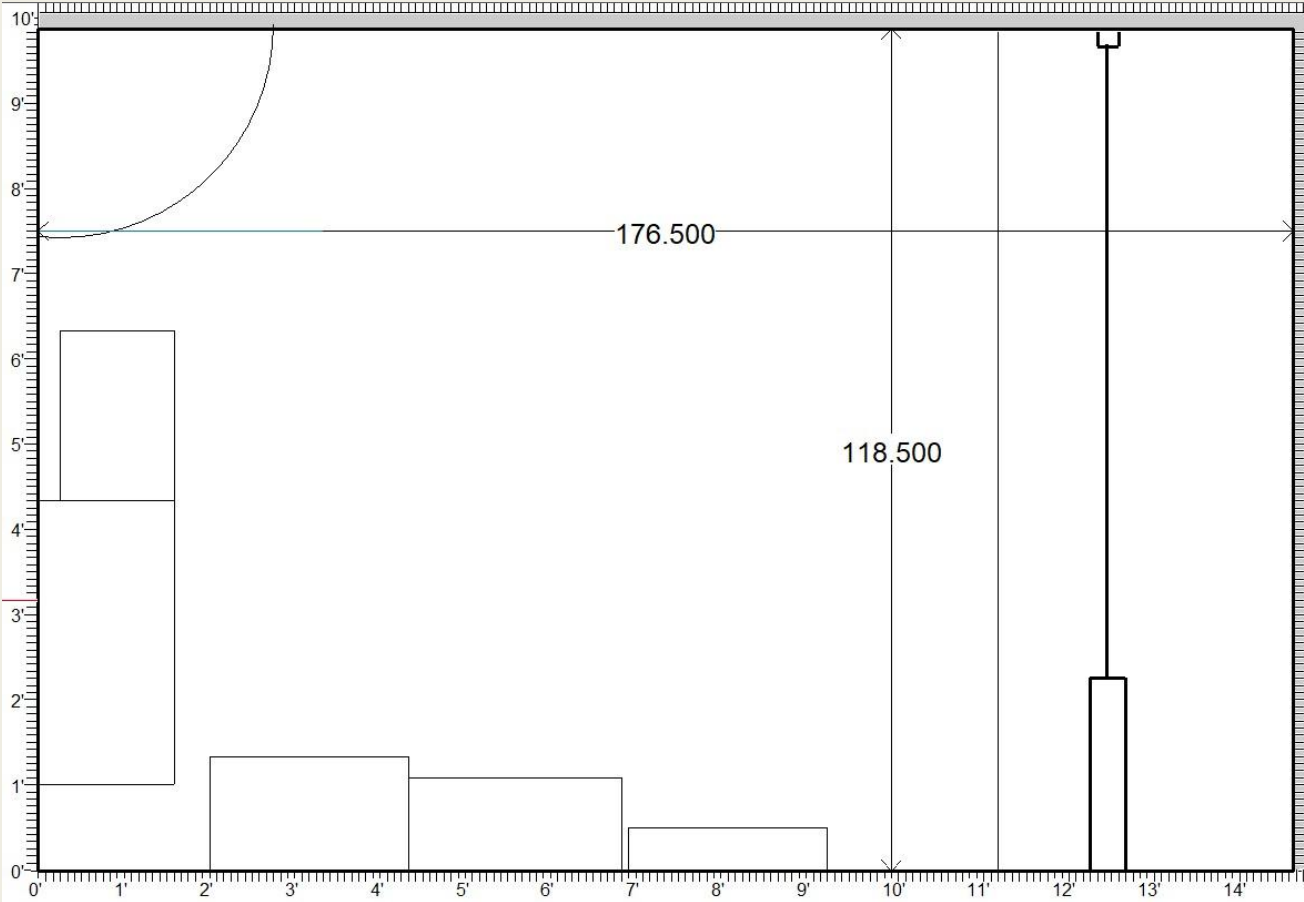


LAYOUT DESIGN BY
ARMSTRONG
SQUARES

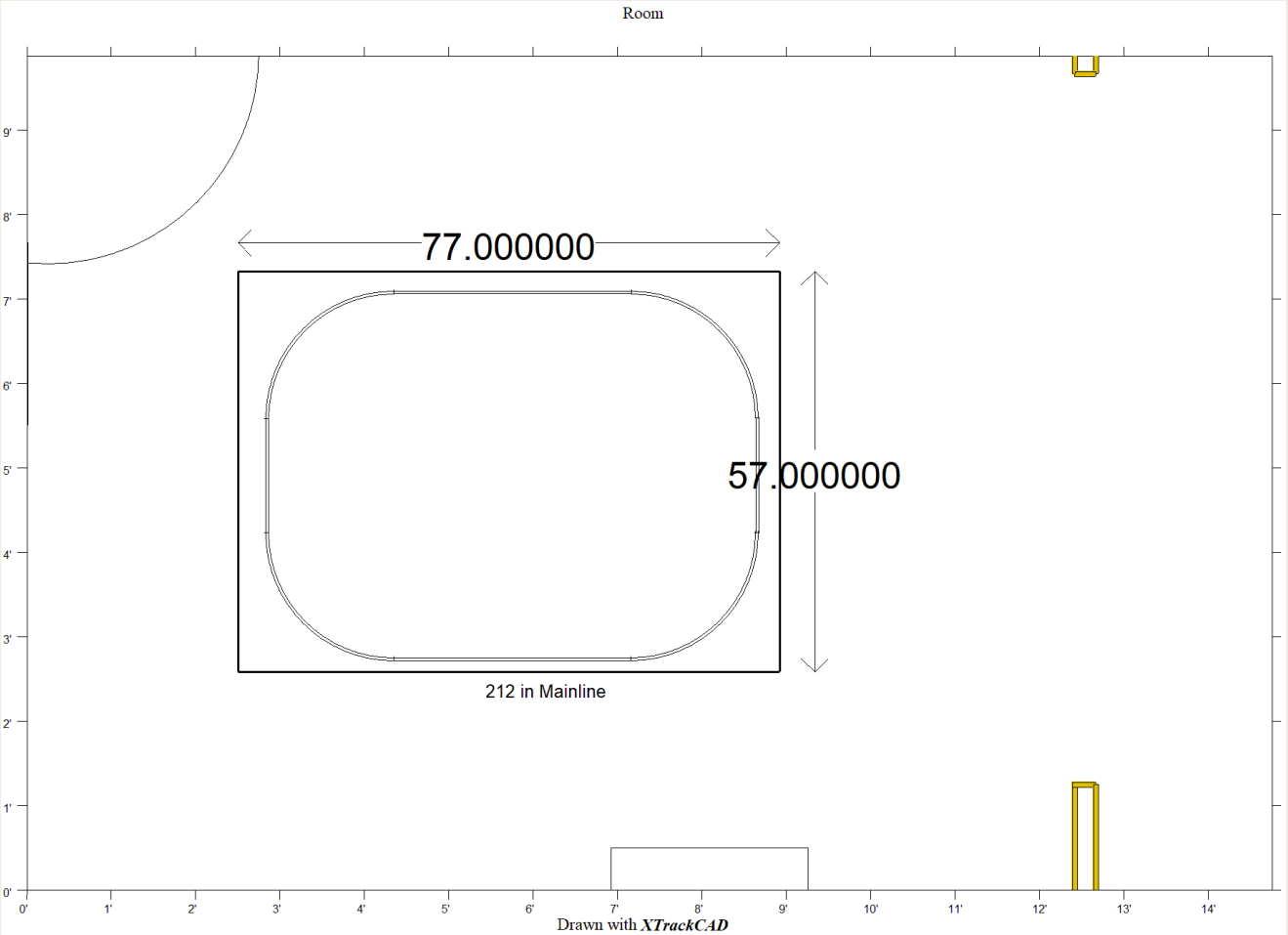
John Armstrong's Givens and Druthers

- Givens – cannot be negotiated. Examples
 - Space (room dimensions, levels, obstacles)
 - Budget (have to eat, roof over head, etc.)
 - Time (won't be on this earth forever)
 - Age (body isn't as flexible or strong as it was and getting worse)
 - Modeling skills
- Druthers – wants, but could give up. Examples
 - Modeling scale
 - Era
 - Road
 - Equipment
 - Geographic location

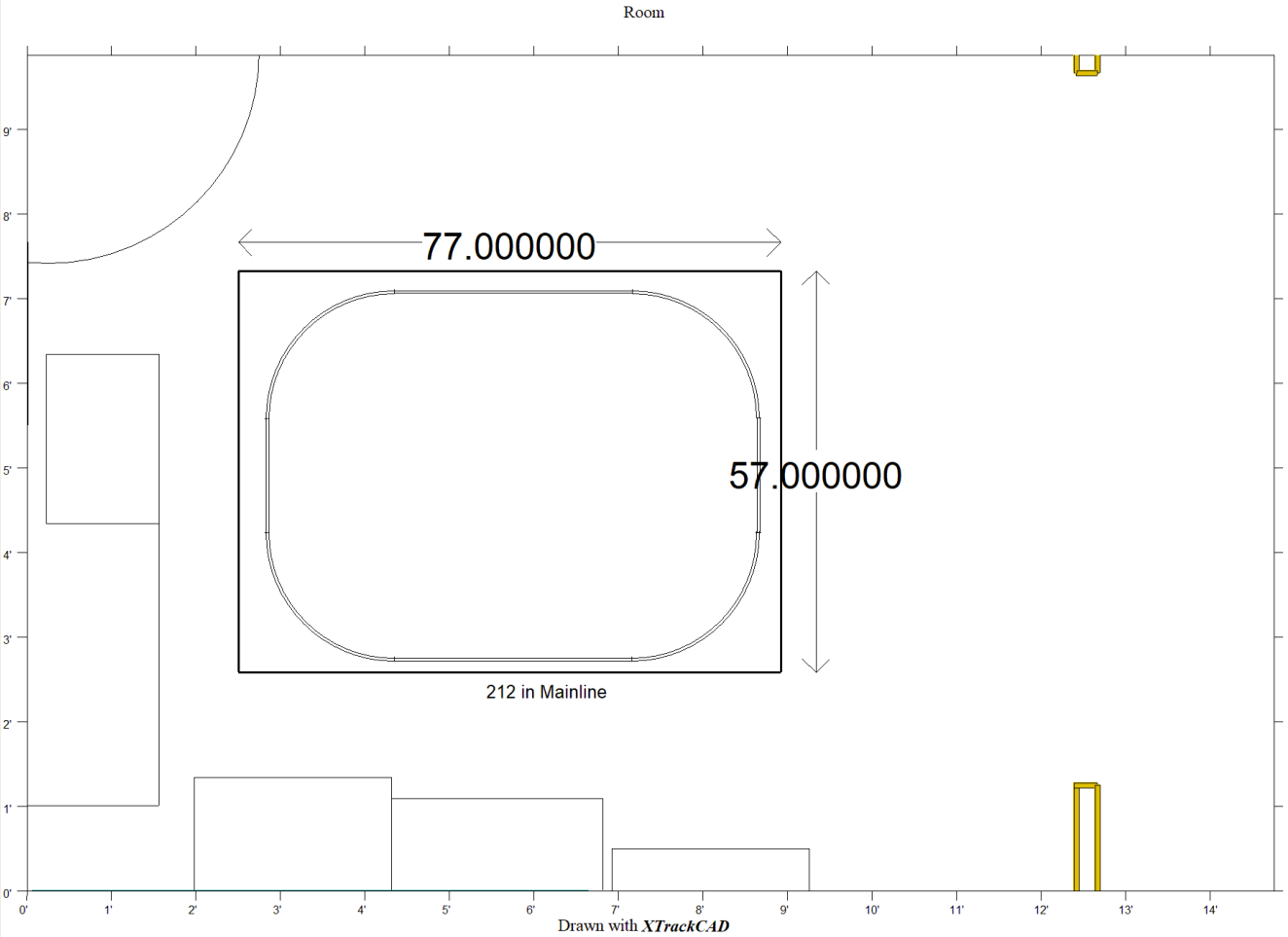
The Layout Room



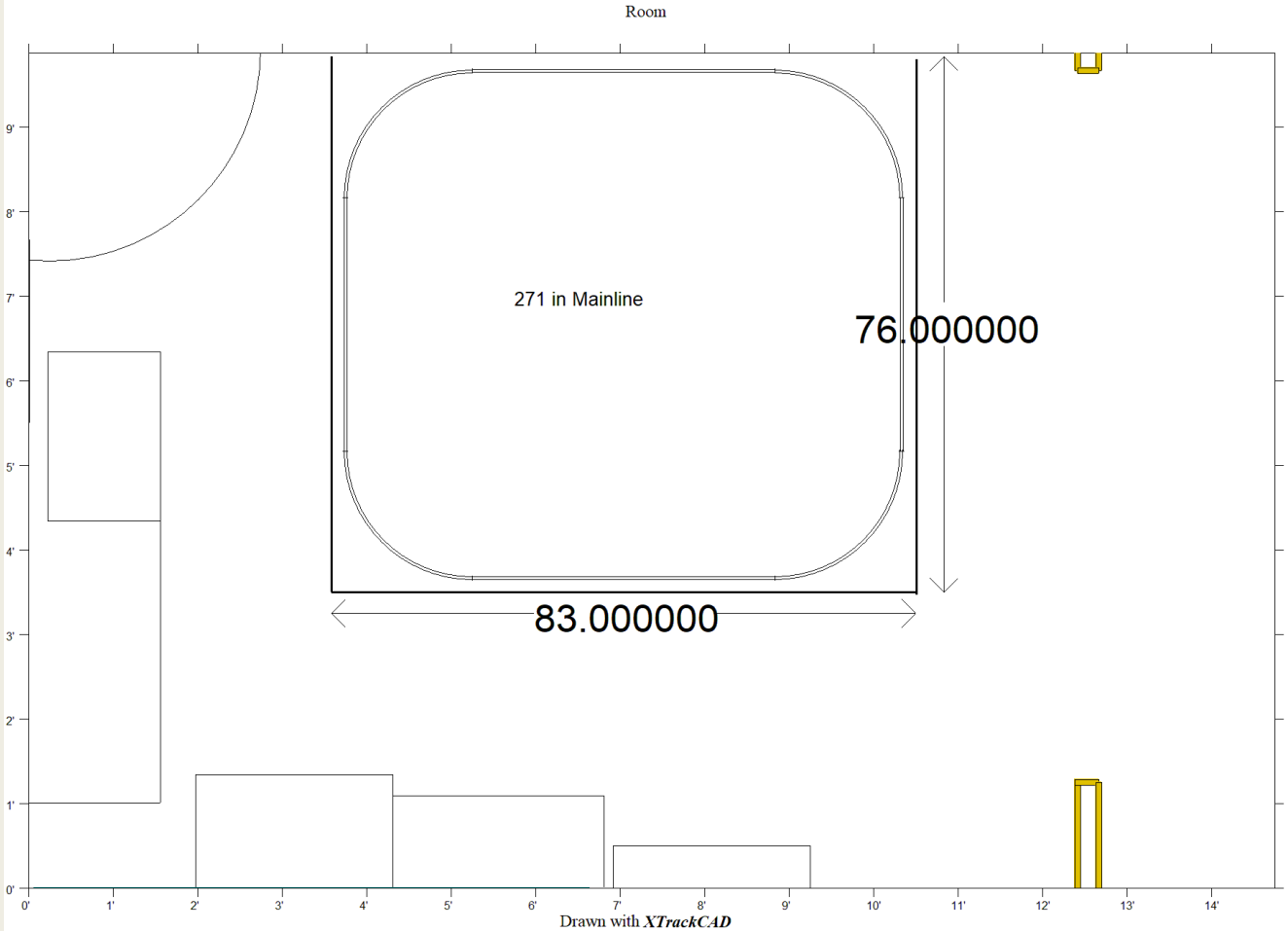
Test Fit – An Island



Test Fit – An Island, with Furniture



Test Fit – An Island, Against the Wall



The Vexing Question

How much layout will fit
in a given space?

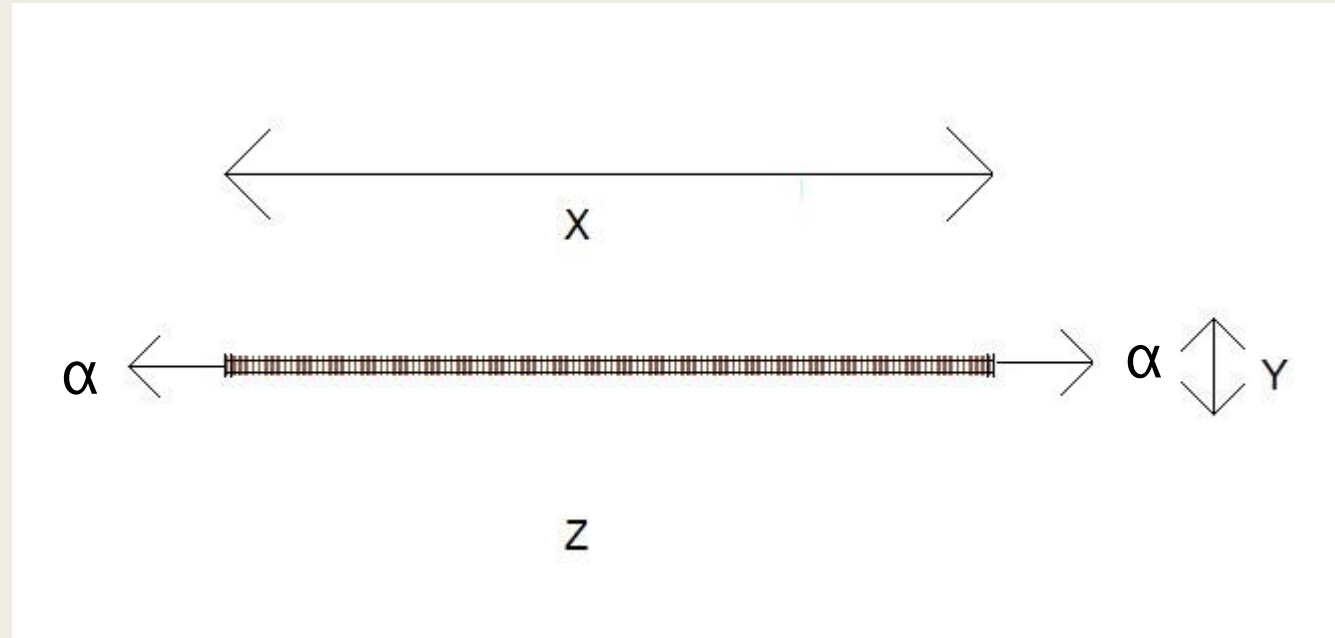
(Like a Kid in a candy store, we want everything!)

7 Deadly Temptations

- Sacrificing aisle access for “1 more track”
- Squeezing tracks too close together
- Fudging track radius
- Running tracks too close to the edge
- Ignoring clearances
- Too deep (reach)
- Inappropriately sharp turnouts



Track Properties



Angles – My Achilles Heal

- Misalignment creates kinks
- Kinks lead to derailments
- The most likely places are
 - Out of curves
 - Diverging route on a turnout
- Vertical curves
- Sectional track lines up better than flex track

An Armstrong Square

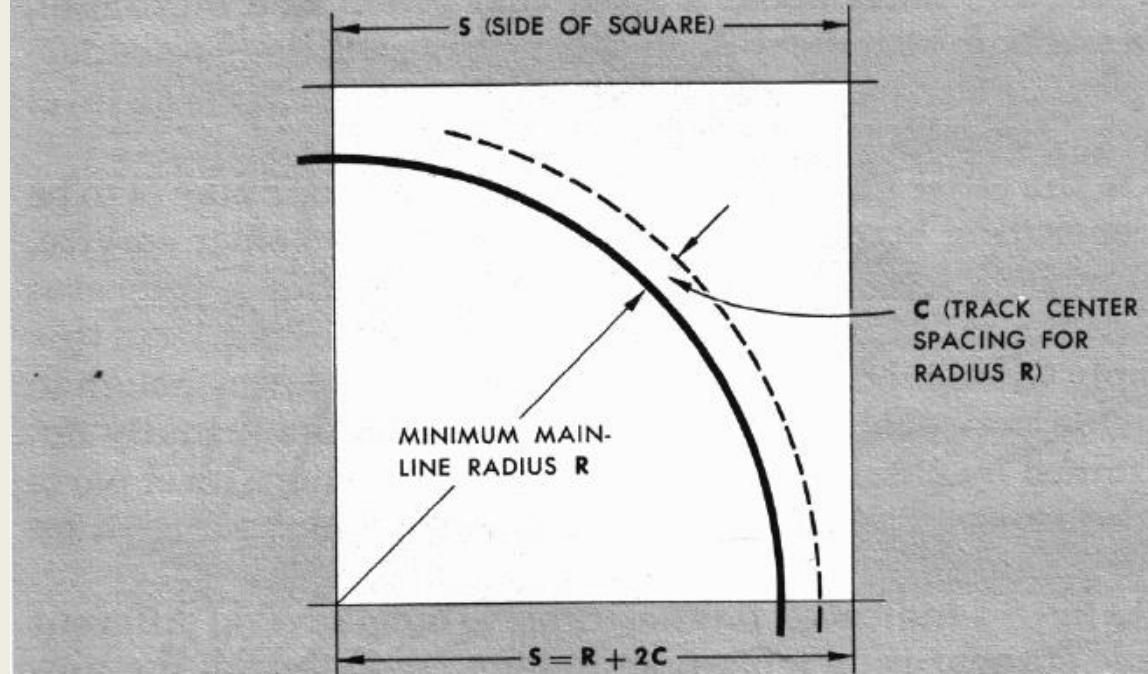
$S = R + 2C$,
where

S is length of a
side

R is minimum
track radius

C is track
spacing

Fig. 6-1 Definition of a square



(MINIMUM TRACK CENTER SPACING MAY BE OBTAINED FROM NMRA STANDARD S-8)

SQUARES ARE OF THE FOLLOWING APPROXIMATE SIZES:

	N	HO	S	O
SHARP CURVES	13"	22"	32"	42"
CONVENTIONAL CURVES	16"	28"	38"	50"
BROAD CURVES	20"	34"	48"	64"

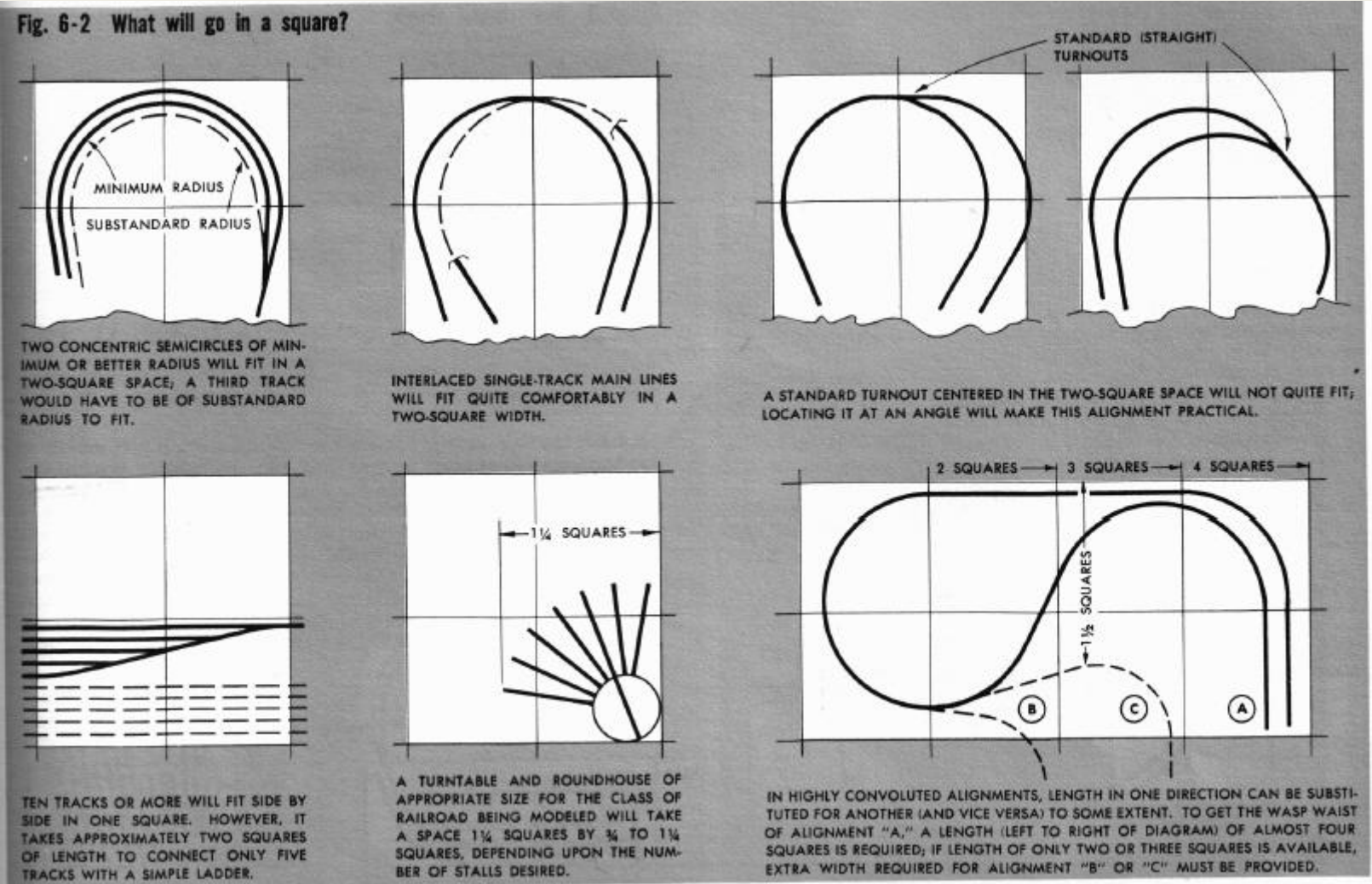
1 square for a 90°
turn. Consumes
space in both axis.

Typical Layout Sizes (ca. 1989)

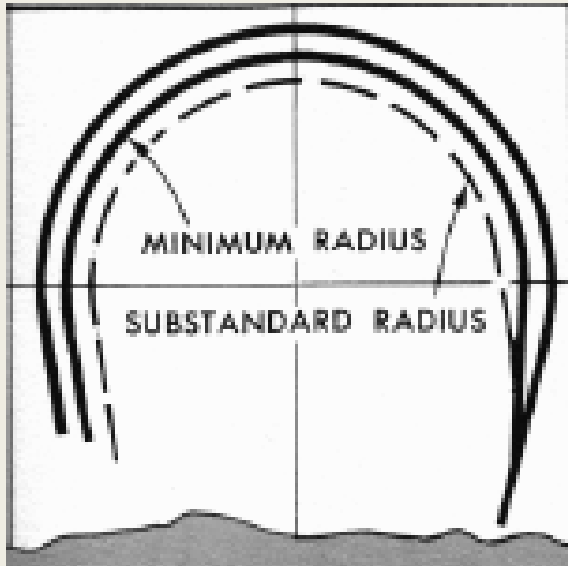
Pike size category	Typical dimensions in squares	Corresponding sizes in feet			
		N	HO	S	O
Small	2 x 4	2½ x 4½	4 x 8	6 x 12	8 x 15
Average	3 x 5	4 x 7	7 x 12	10 x 16	14 x 22
Medium	4 x 6	6 x 9	10 x 15	12 x 21	18 x 28
Large	5 x 8	7 x 12	12 x 20	15 x 27	22 x 35
Club	6 x 12	10 x 20	18 x 36	27 x 48	35 x 65
	(and up)	(and up)	(and up)	(and up)	(and up)

Note that size of square in a given gauge varies, as discussed in fig. 6-1.

Sample Track Geometries

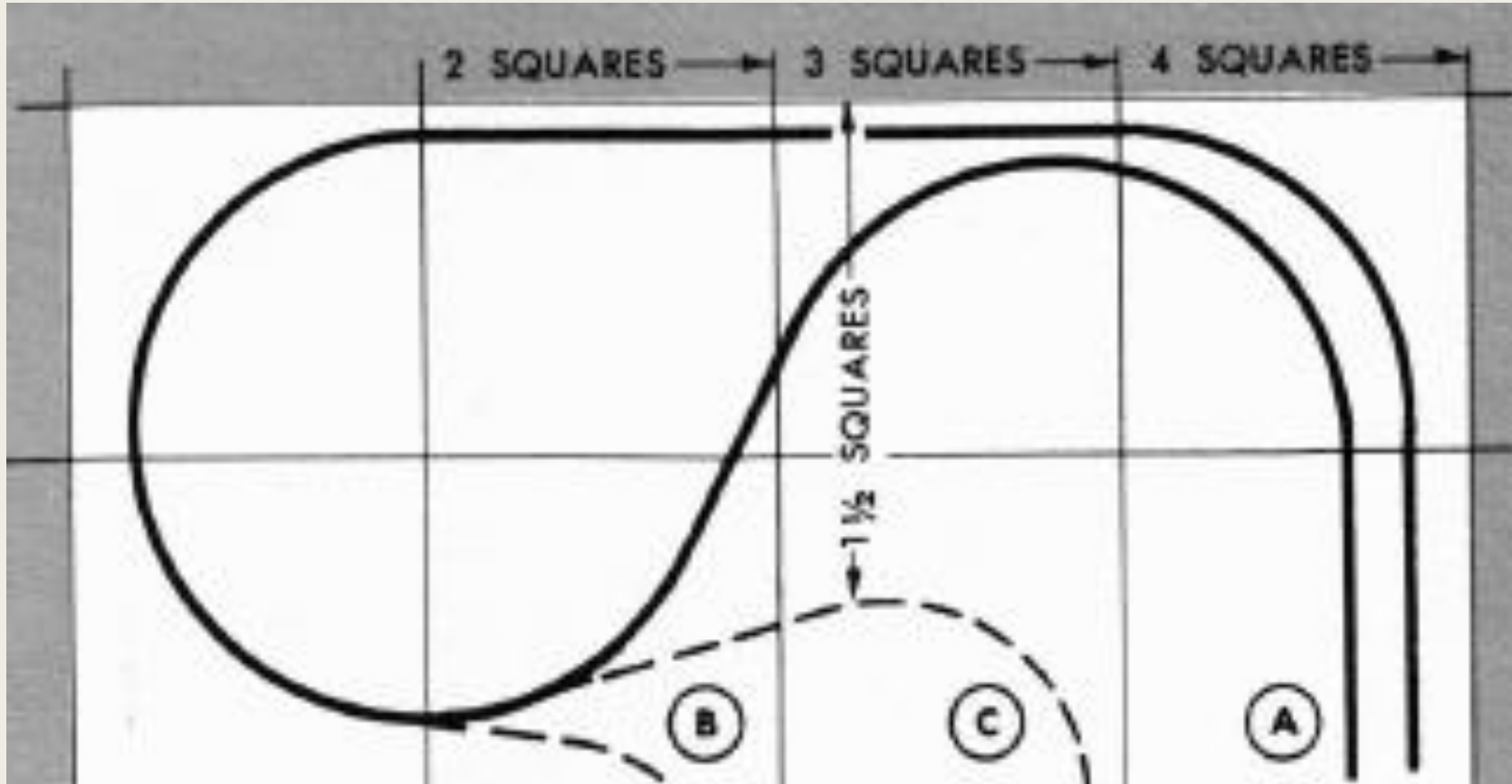


Reversing Turns



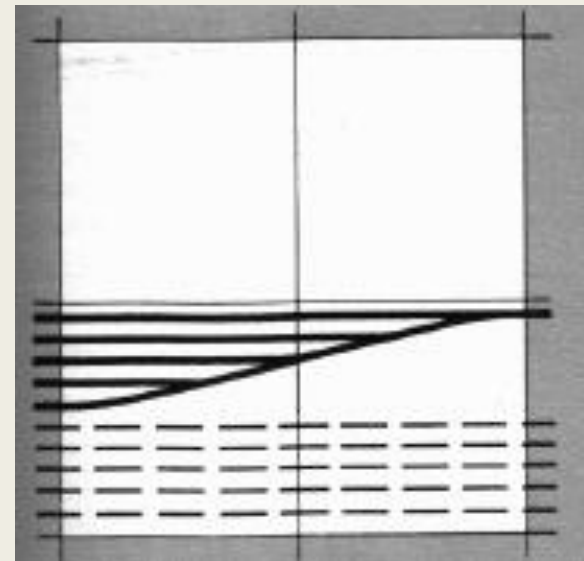
- 180° consumes 1 square on one axis and 2 squares on the other axis
- 360° (a circle) consumes 2 squares on each axis
- An S turn consumes almost 2 squares on each axis

Compound Turns

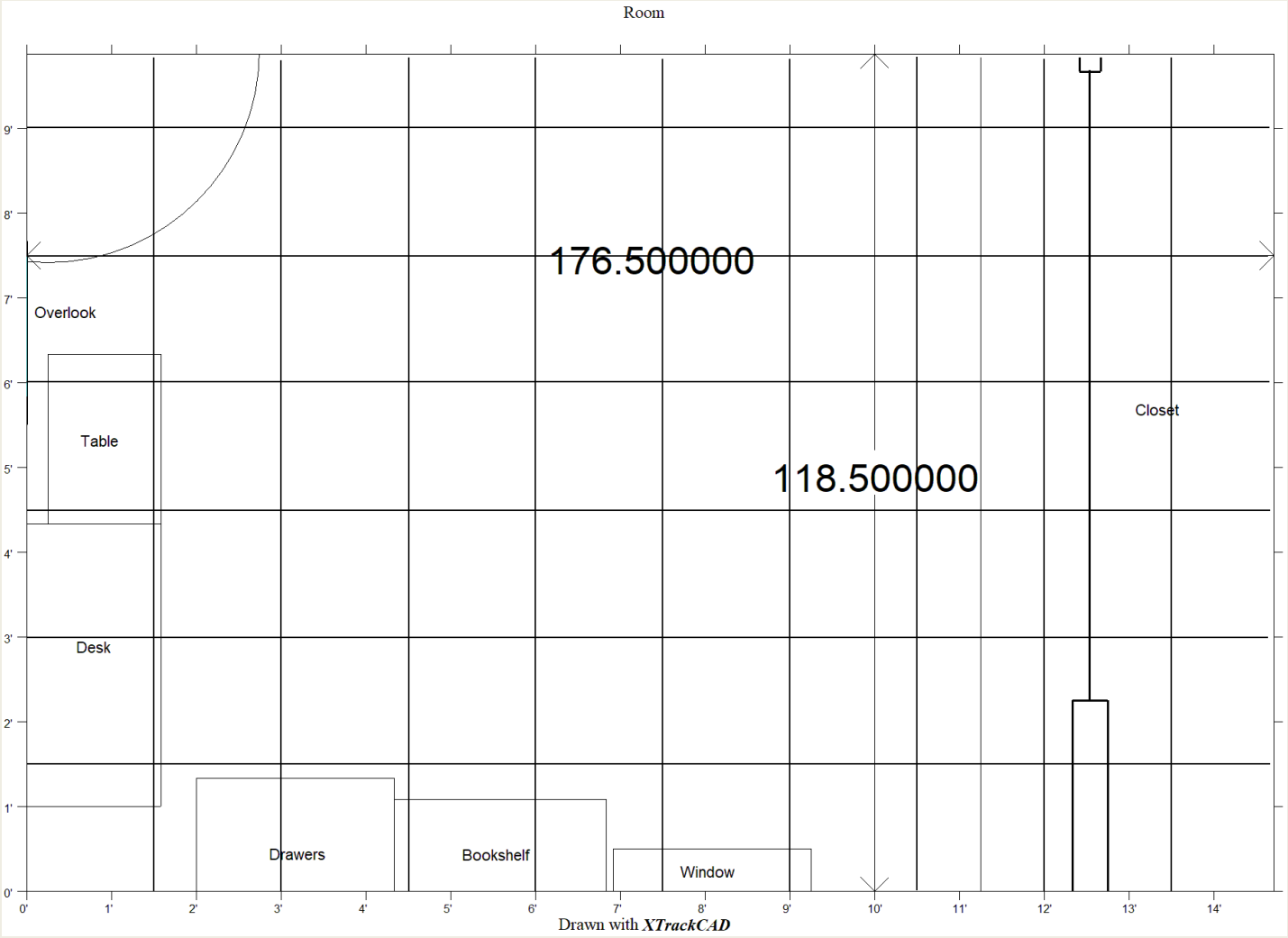


Straight (Tangent) Track

- For this exercise, since tangent track does not change directions, tangent track will be considered elastic – it can stretch or shrink to connect corners and turnouts as needed
- Parallel tracks consume space
- Turnouts have a direction changing component; thus, do consume space, but not as much as 90° in either direction

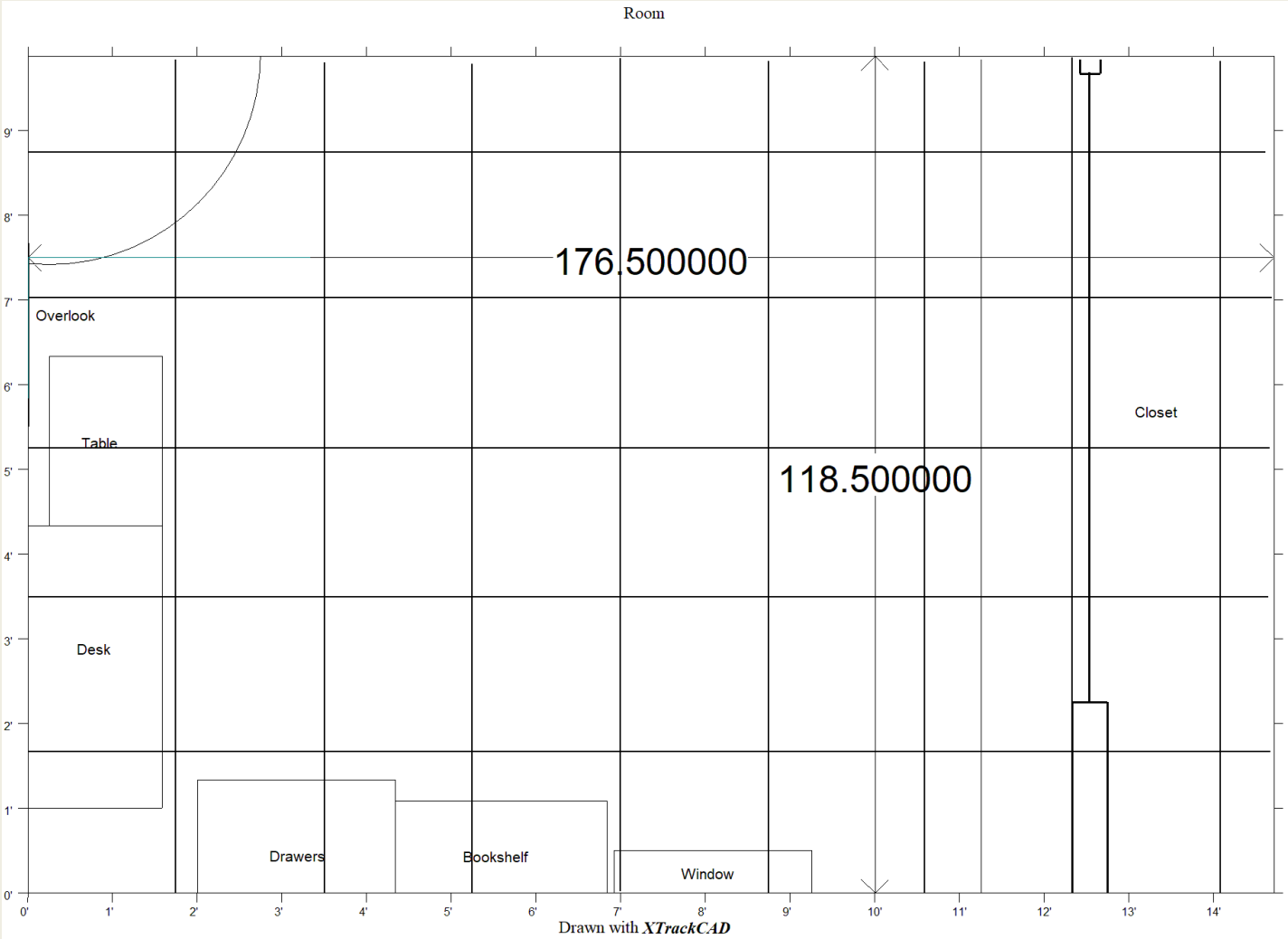


Armstrong Squares = 15" Standard Radius



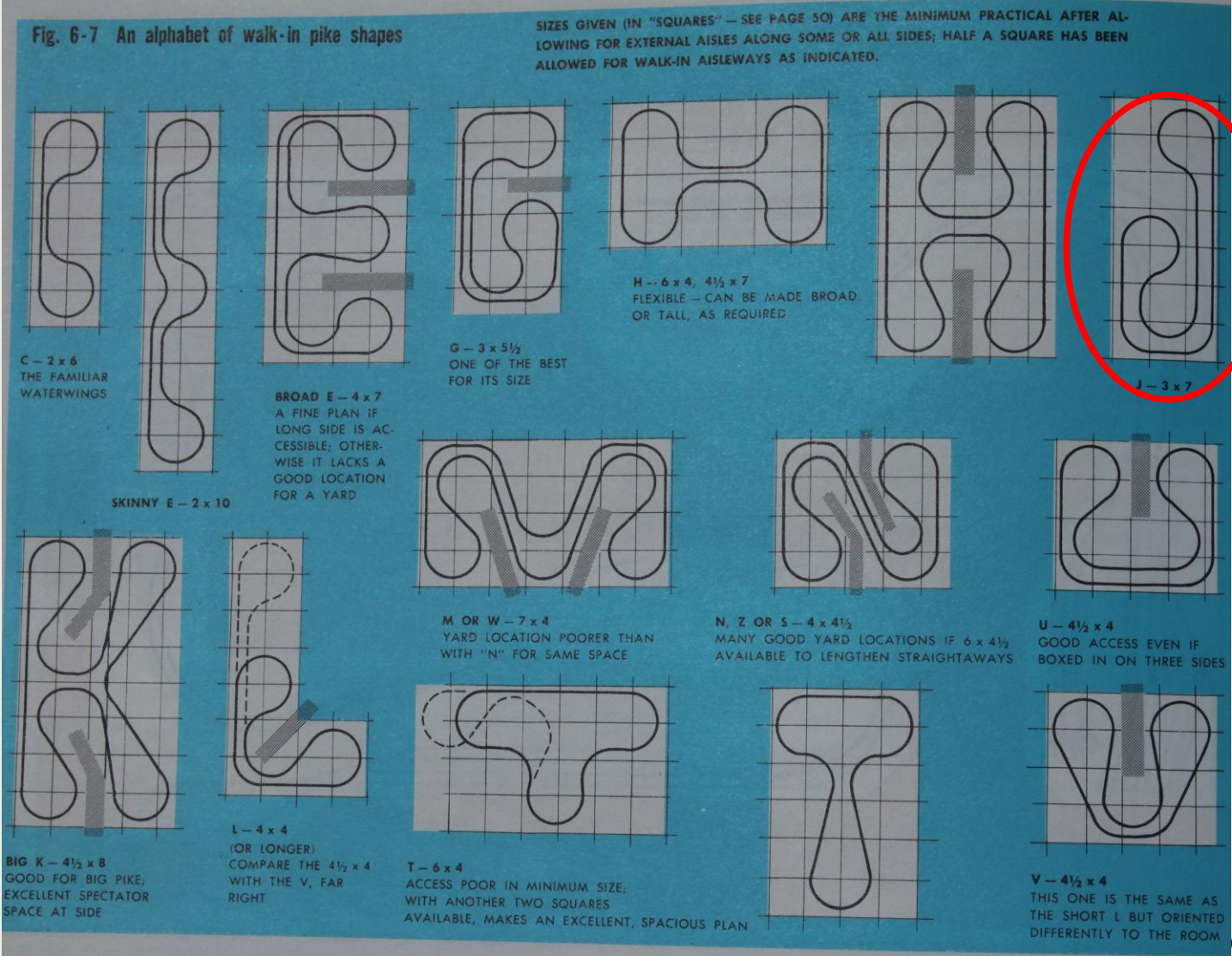
6x9
(18" Sides)

Armstrong Squares = 18" N Scale Standard Radius



5x8
(21" Sides)

Alphabet Layouts



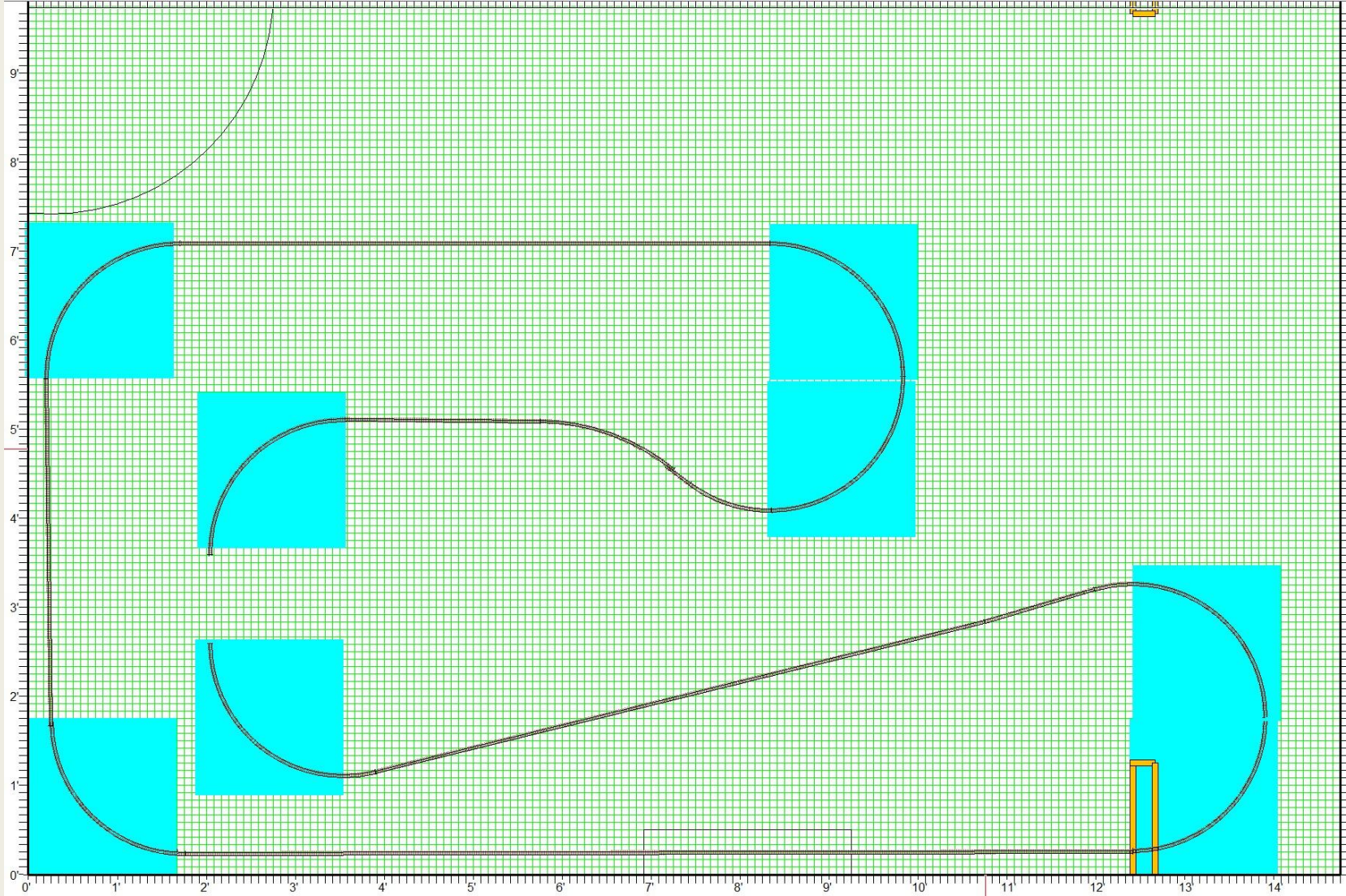
Limitations on Squares

- Estimating overall size – the maximum “wiggles”
- Sized for 90° curves – anything more (or less) creates non-orthogonal angles and shrinks or enlarges the square size
- Does not account for elevation changes

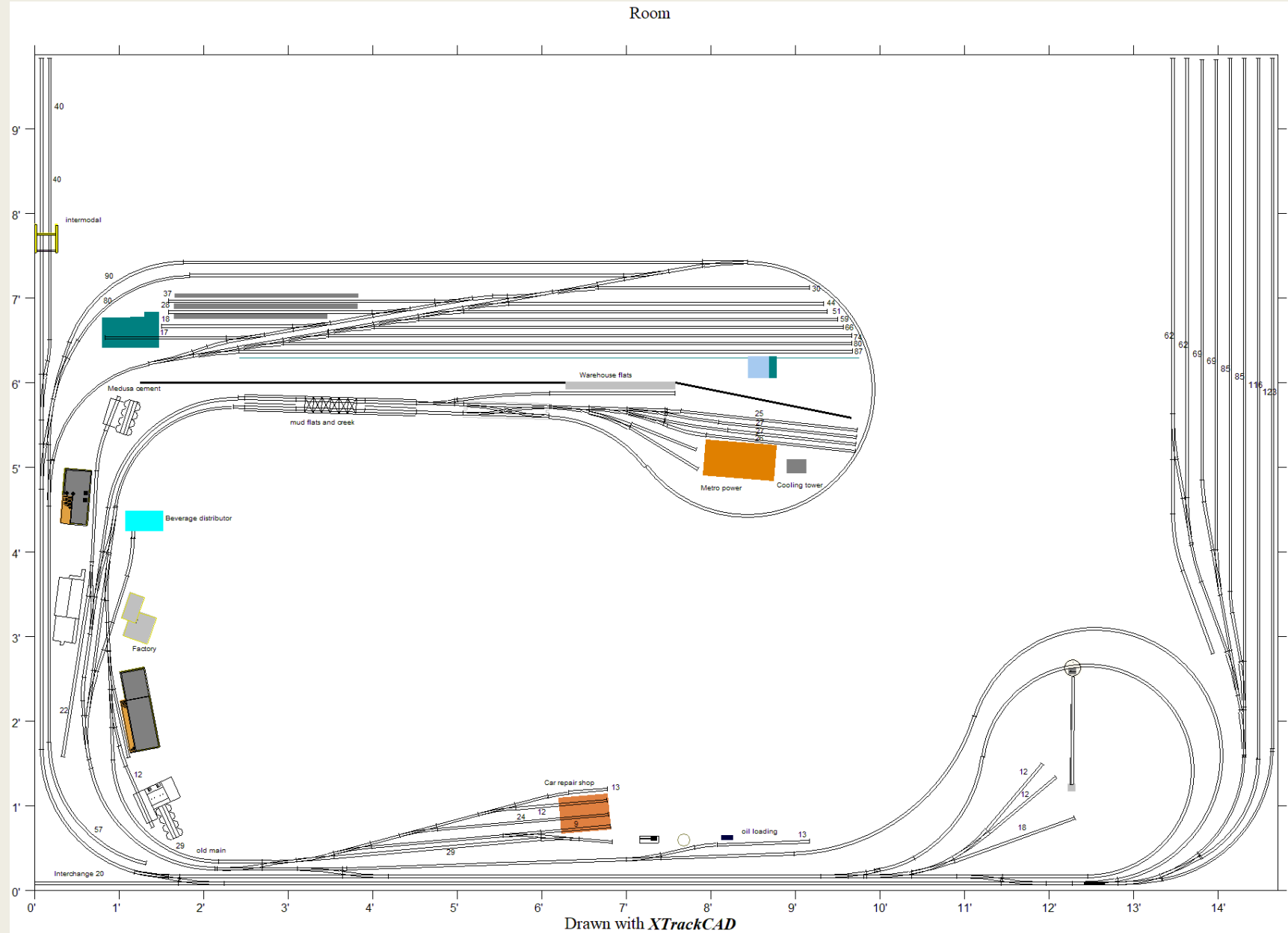
Apply Squares to My Space

- Could work from interior out, but I'm going to work from the edges in
- Sketch out the maximum perimeter
- Utilize Armstrong squares to determine the maximum number of “wiggles”
- The goal is not to “tile” the space, but ensure the sum of the space needed does not exceed the space available on each axis

First Tweak



Latest Tuning



Turn the Vexing Question on It's Head

What space is required for
a given layout geometry?

Red Oak Track Plan

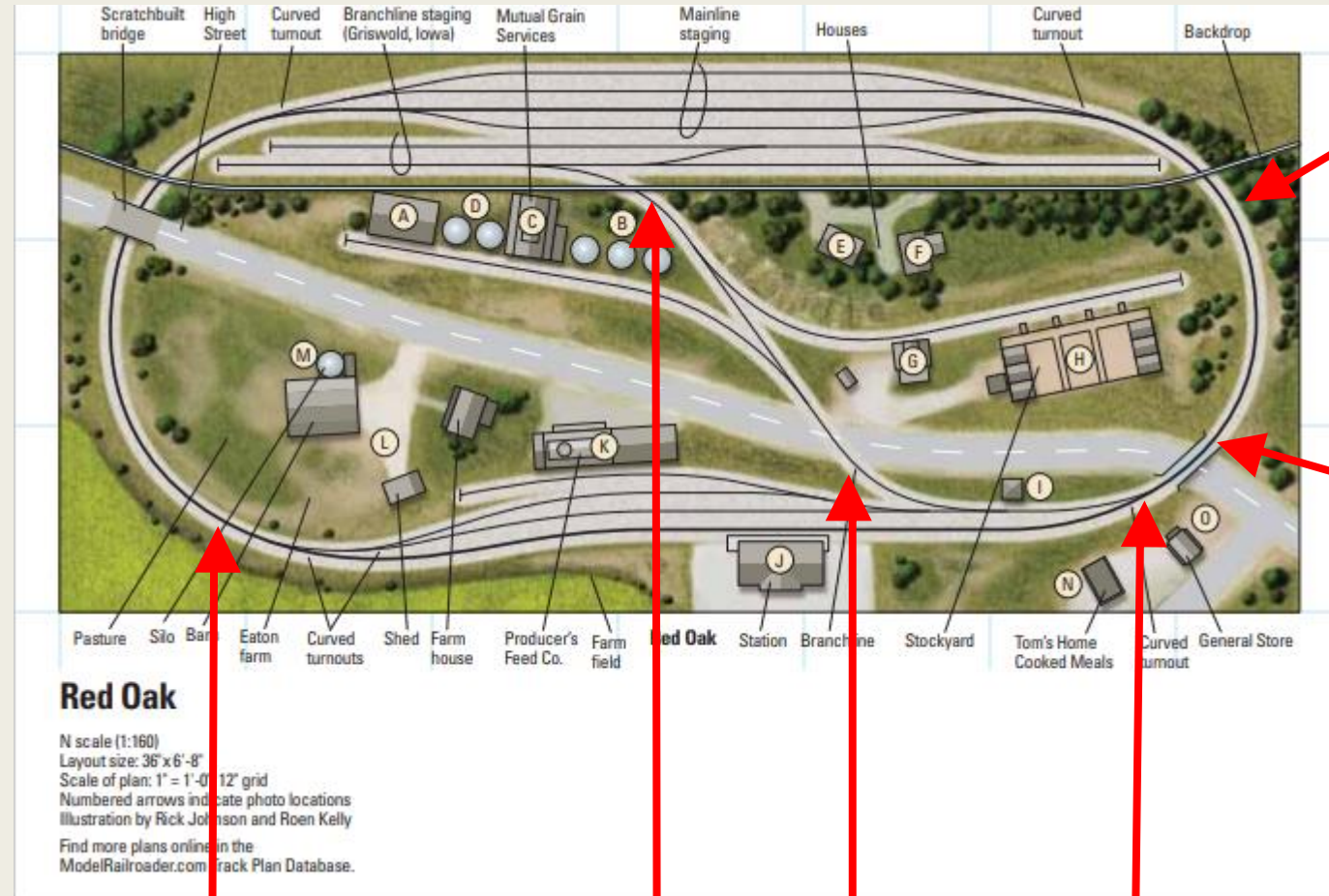
Published size is
36"x80"

13" standard
radius

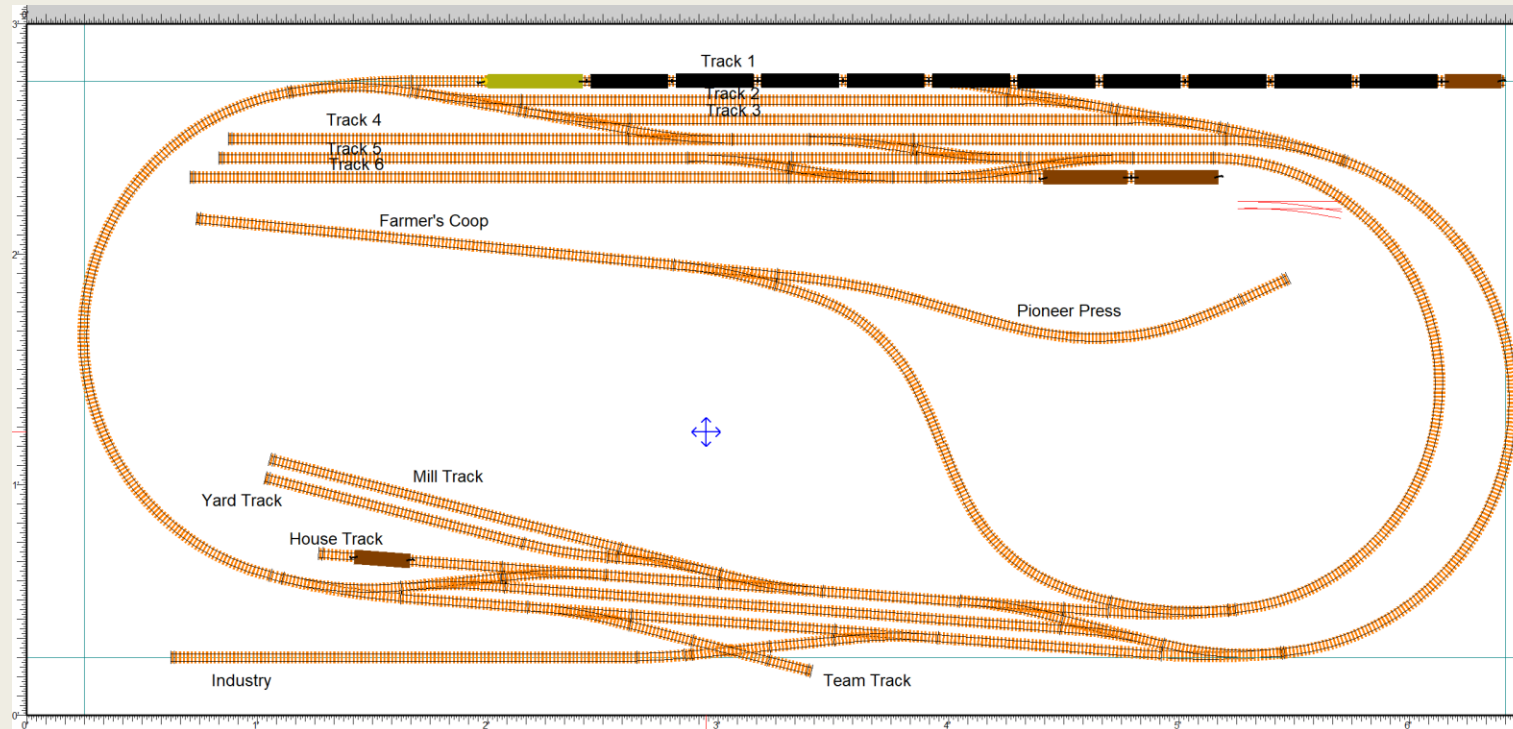
16" square

At least 2x4
squares

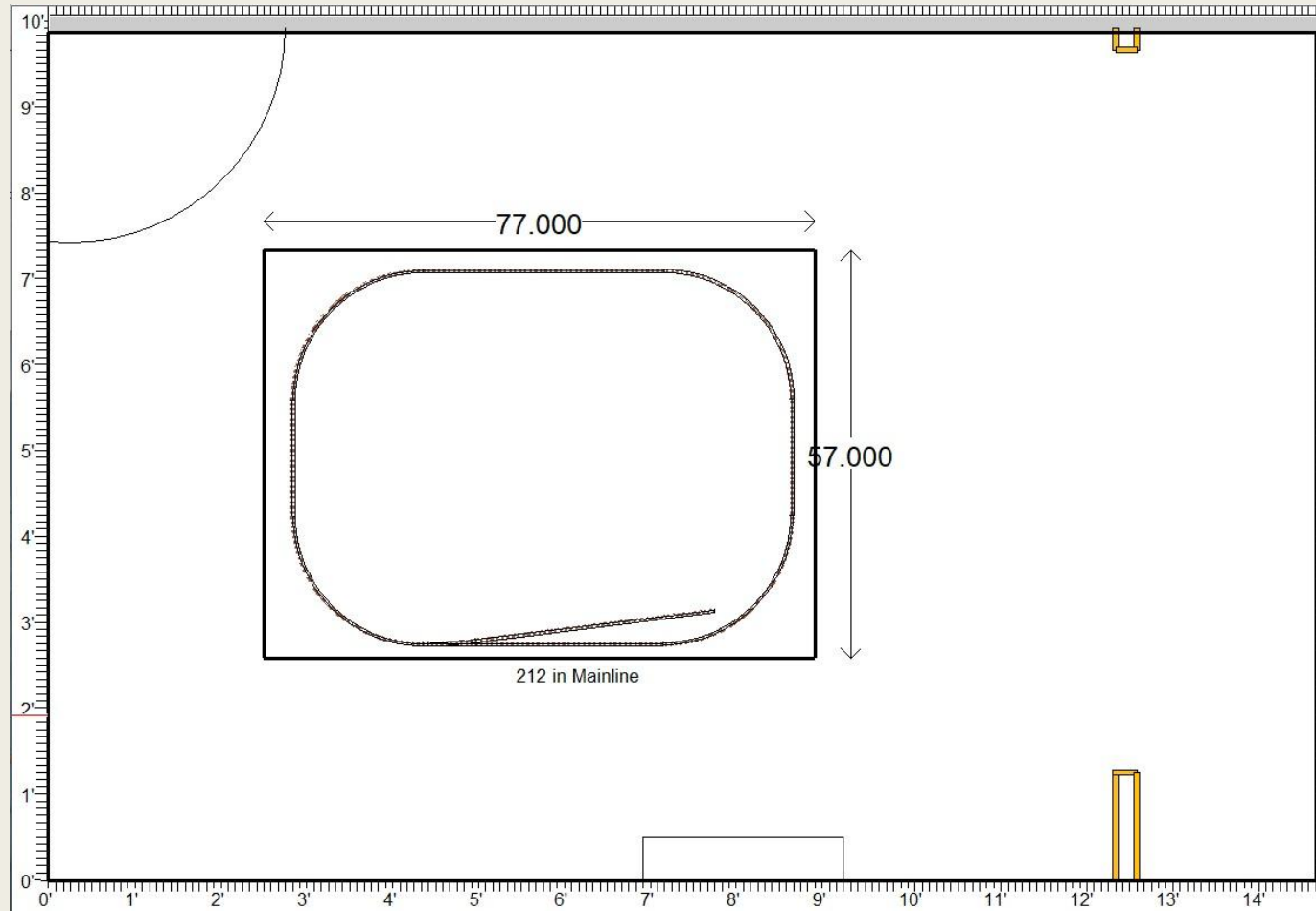
At least 32"x64"



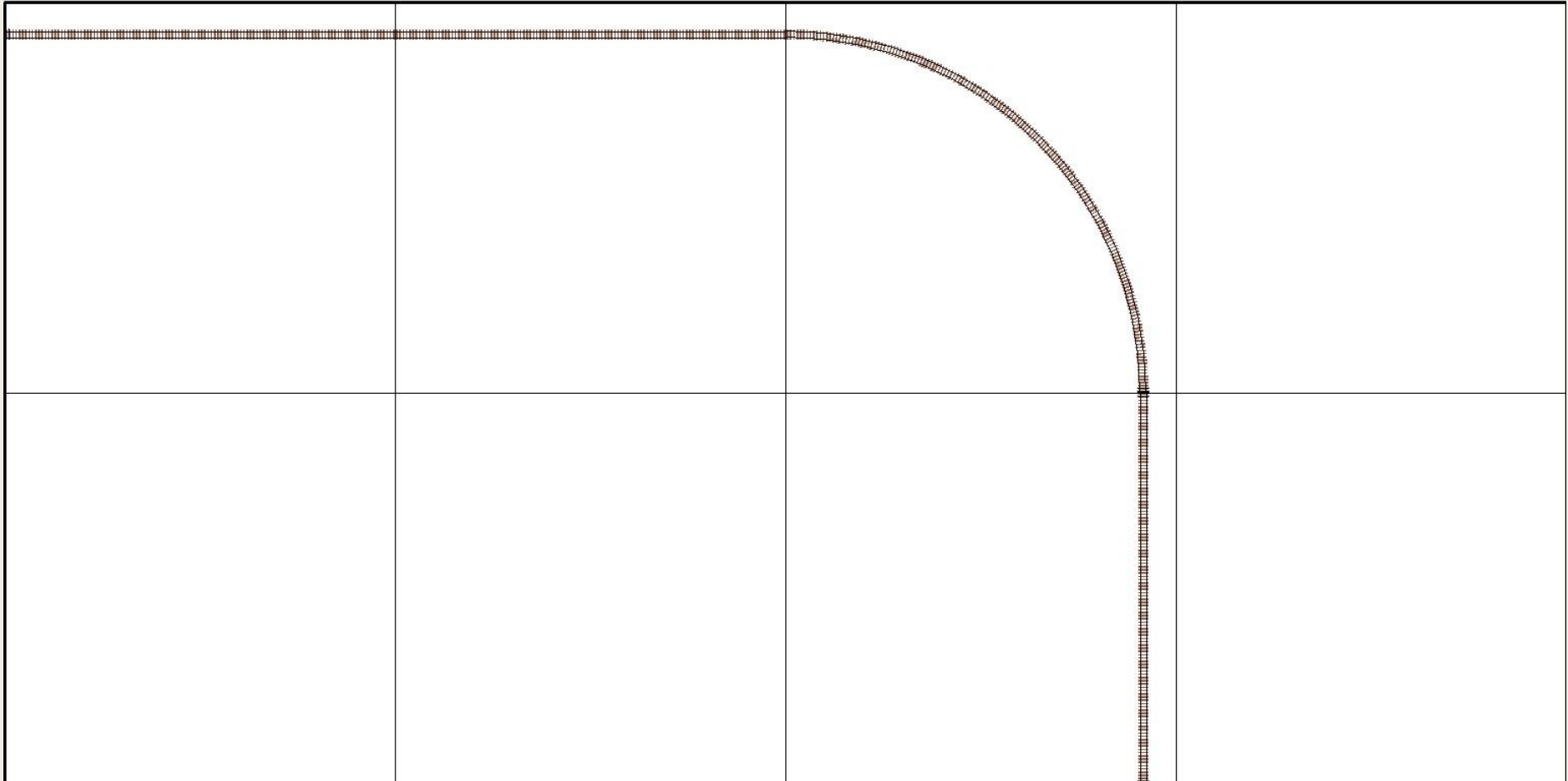
The Modified Result



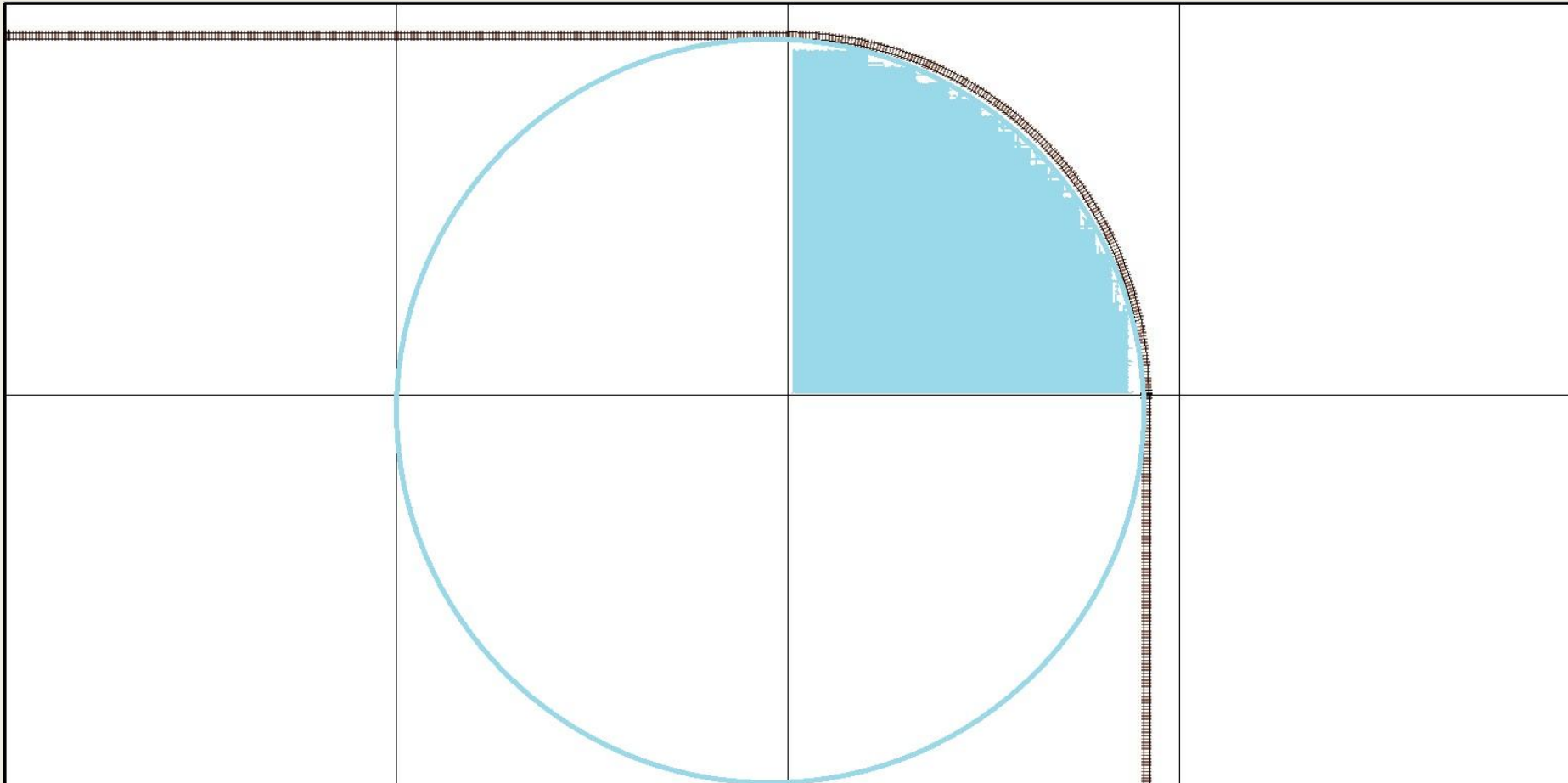
Filling in the Details



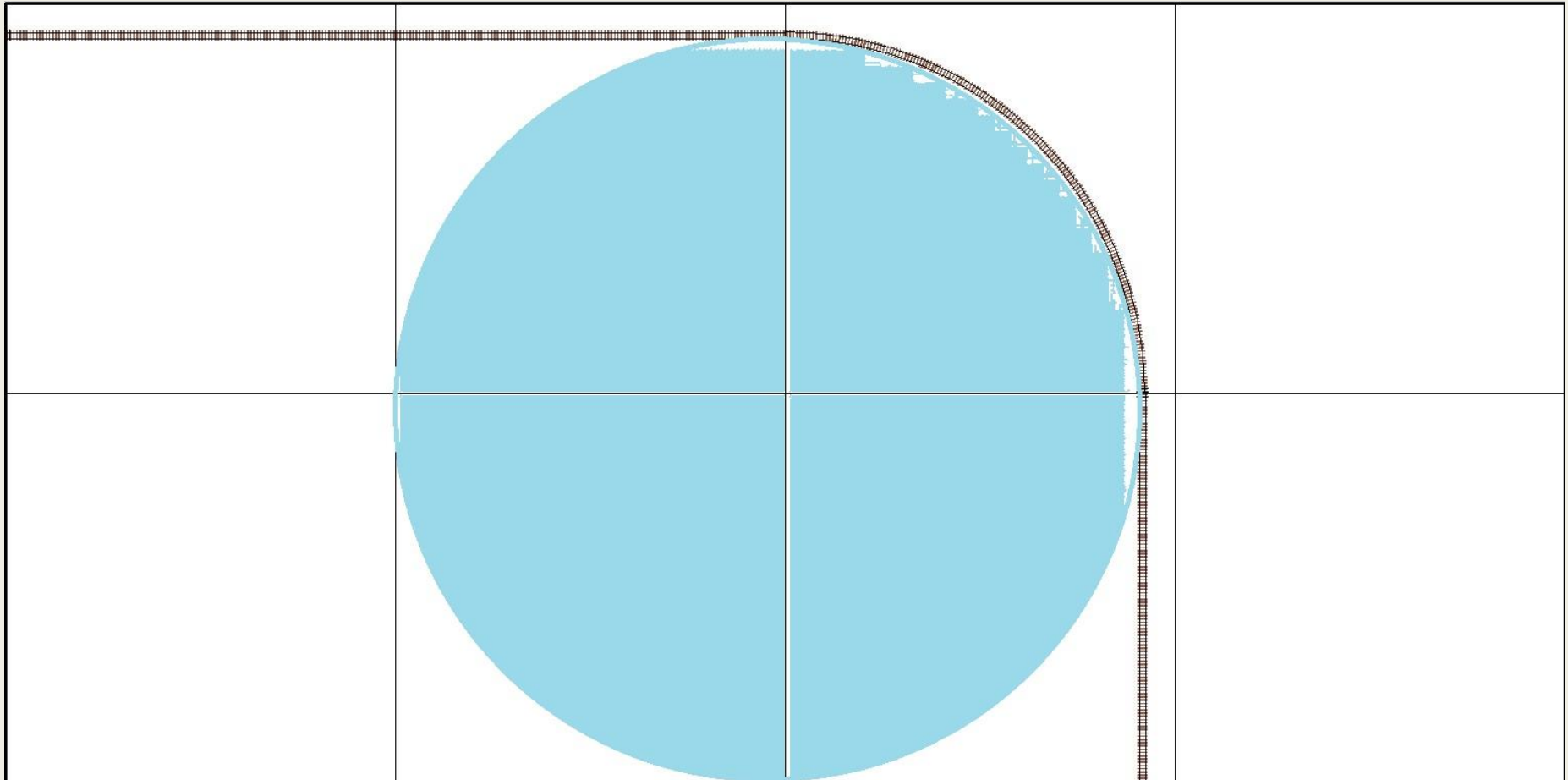
Discovering the “Unreachable Zone”



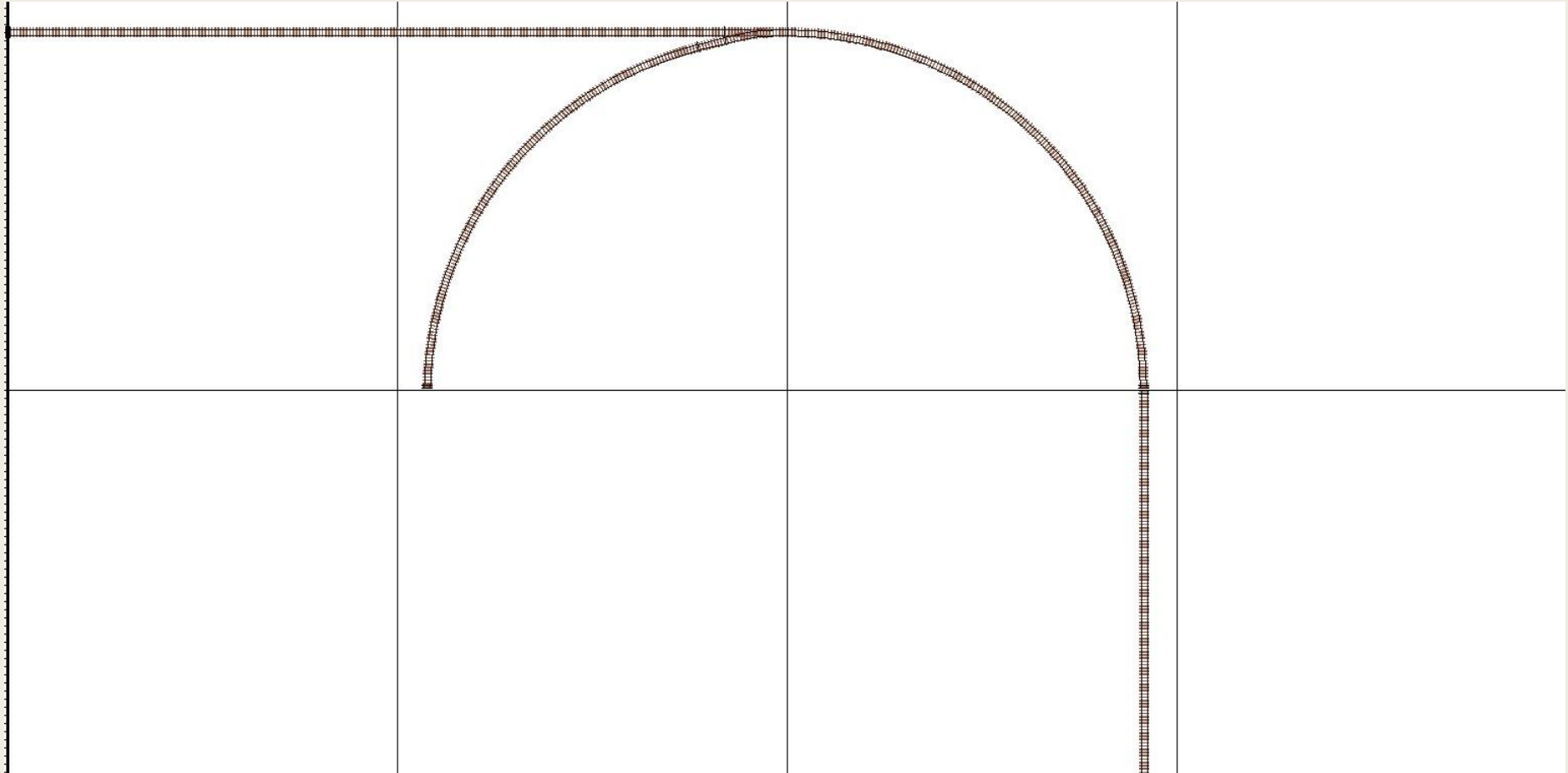
1 Square?



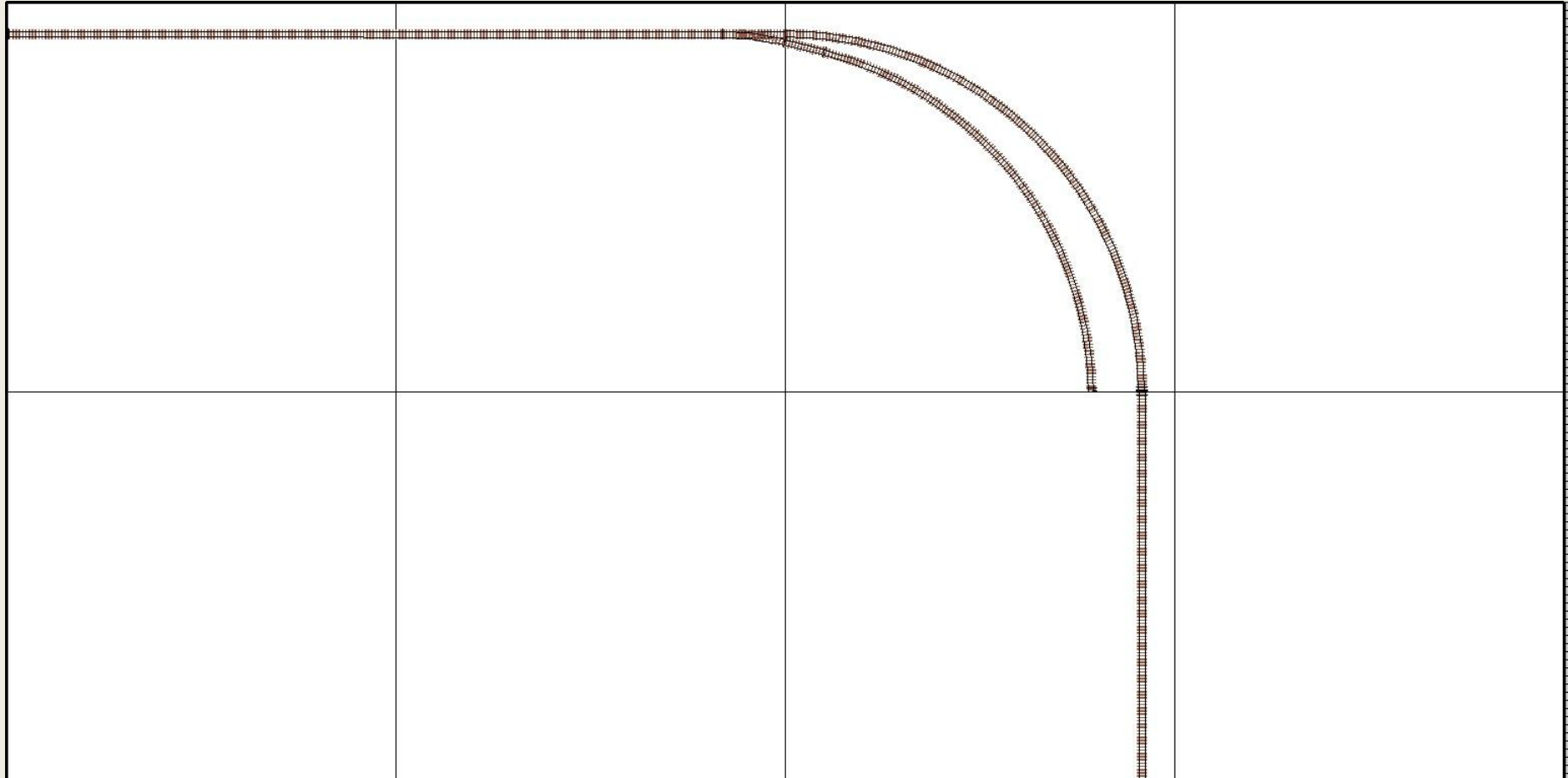
4 Squares



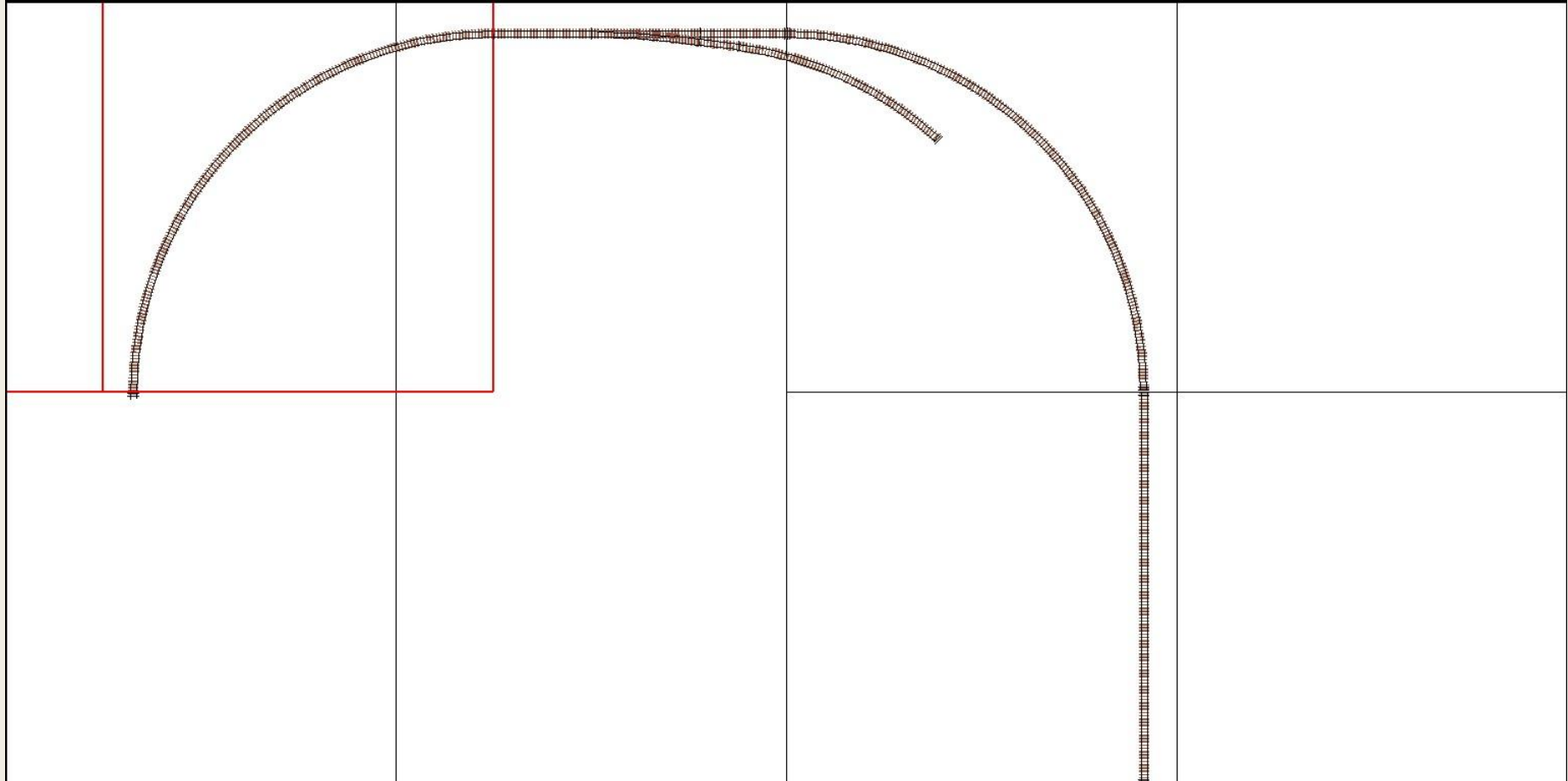
Standard Radius



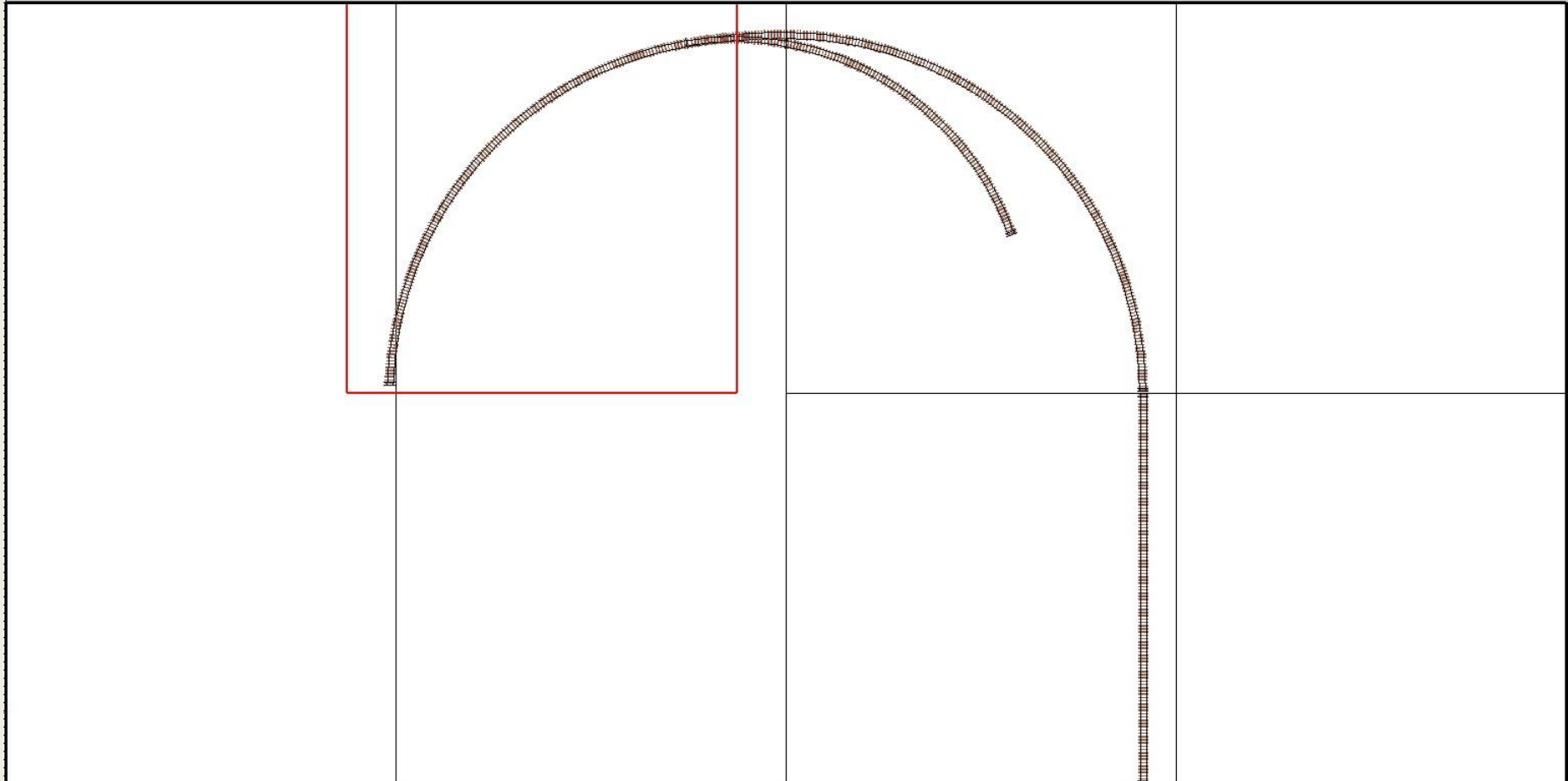
Enter From 180°



Pushes Squares



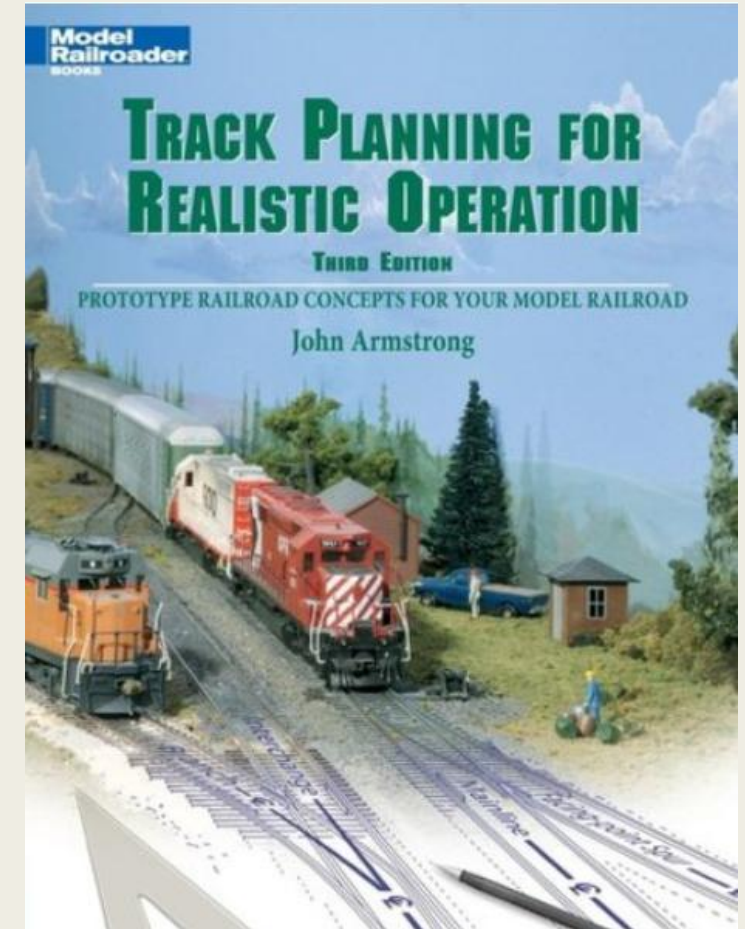
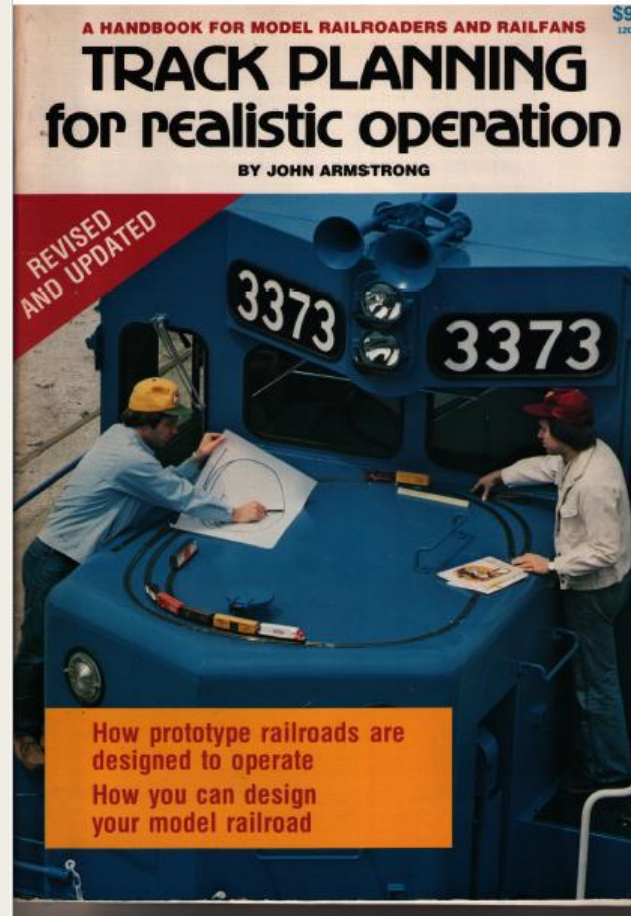
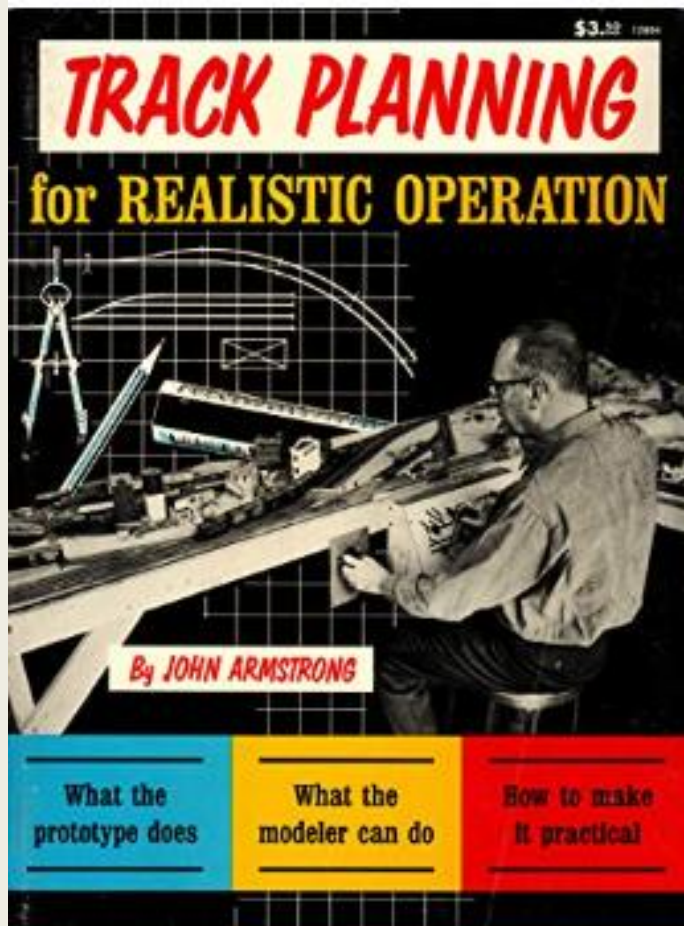
Curved Turnouts May Help



A Design Process

- Figure Out What is Wanted
- Estimate How Much of the Wants Will Fit in the Space
 - Determine the Space Dimensions
 - Pick a Standard Radius
 - Compute the Dimensions on a Square
 - Divide Each Space Dimension by the Side of a Square
 - Place Squares and Sketch the Perimeter
- Fill in the Details

Main Reference



End of Train

