Combining figures with models

Understanding the ups and downs of scale

A 1/32 scale '59 Chevy Impala provides the proper legroom for a 54 mm infantryman.

BY MARK HEMBREE

A simple question: How big is it? Another, not so simple question: How big should it be?

The question wouldn't come up if it weren't for the ambition to make something more of a kit by adding parts, or combining models for display.

Real trouble starts with the desire to place human figures (not supplied by the kit) with the models. Because the size of model figures is usually expressed in millimeters, not scale, the hobbyist is left holding a bagful of mathematical apples and oranges.
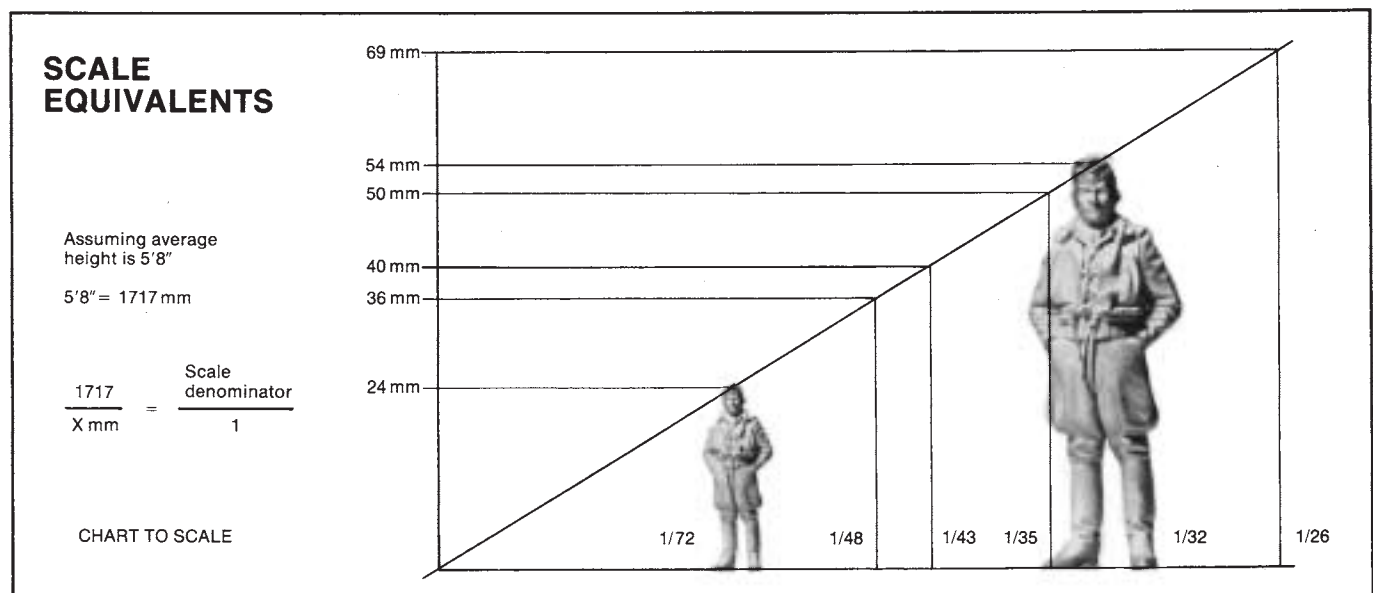
Measures. Scale is expressed as a fraction of the original (1/72, for example), or sometimes as a ratio (1:72). In other words, the real thing is 72 times larger than the model.

Finding the right size figure for a model (or vice versa) is a math problem to which there is no exact answer. To start with, there is no universally accepted way to measure a figure.

Master figure modeler Shep Paine said, "The millimeter system goes back to the origins of model soldiers as toys. Whether the size refers to the full height of the figure — with or without headdress — or only to the level of the eyes is a long-standing argument, and one that really doesn't matter in the long run. Each figure is a model unto itself, and direct comparisons are not necessary, or even enlightening."

Use your head. Sculptors worry more about proportion than size. Renowned figure sculptor Claude Risley said, "I think a figure with a smaller head looks more elegant. My figures

SCALE EQUIVALENTS

Assuming average height is 5'8"

5'8" = 1717 mm

$$\frac{1717}{X \text{ mm}} = \frac{\text{Scale denominator}}{1}$$

CHART TO SCALE

69 mm
54 mm
50 mm
40 mm
36 mm
24 mm

1/72   1/48   1/43 1/35   1/32   1/26

are about eight heads tall, with the groin being the midpoint. In general, the bigger the head, the shorter the figure looks; the smaller the head, the taller."

Paine concurred: "Many commercial castings of the same height clearly do not look right standing next to each other. The reason is the size of the head.

"A salient characteristic of human beings is that head size from one to another is pretty consistent. The difference between the smallest and largest common hat sizes is about an inch, or $\frac{1}{32}$" in 1/32 scale. We instinctively sense the height of a person without seeing the whole body by perceiving the relative size of the head."

Inaccuracies. Of no help in calculations is the fact that manufacturers will round off the size of the figure — you will not see many ads for 67.3 mm figures. This lack of exactness goes all the way back to the drawing board.

Risley's specialty is 54 mm figures. He said, "I always start with the same size artist's mannequin, but the actual height of the figure will vary by the time I'm through. It might end up being a 53 mm or 55 mm figure, but I'm not concerned about that as long as the figure is well-proportioned."

So it seems we must be tolerant of small discrepancies. Expert modelers accept these inaccuracies.

Paul Boyer, *FineScale Modeler* senior editor and ace modeler, observed: "Unless you have a calibrated eyeball, you probably won't notice the 4 percent difference between 1/48 and 1/50 scale. Ship modelers can rest easy with only a 2.8 percent difference between 1/700 and 1/720; car modelers deal with a 4 percent difference between 1/25 and 1/24, and armor modelers grapple with a 9 percent difference between 1/35 and 1/32."

"Average" height. Luckily, people are not all the same height, which is the only fact about figure sizes that is absolute.

"I think that a range of 5′ 10″-6′ 2″ [life-sized] is acceptable," said Risley, "though I tend toward the more heroic [taller]. Who wants to look at a bunch of dwarfs?"

The rule of height may not apply to all soldiers. Boyer noted, "Helmets may add height, and tank crewmen may be shorter than the average foot soldiers so they can squeeze into their vehicles."

Calculations. It is widely accepted that 54 mm figures can be used with 1/32 scale models. If we use that for a point of reference, and assume that the average tank crew member is 5′ 8″, we find a mathematical relationship that helps correlate figures (in millimeters) with popular modeling scales. The only

POPULAR MODELING SCALES

Scale	1 inch =	1 scale foot =	1 scale foot = (decimal)	1 scale meter = (in mm)	Comments
1/4	4″	3″	3.0	250.0 mm	Flying models, live-steam trains
1/8	8″	1½″	1.5″	125.0 mm	Cars, motorcycles, live-steam trains
1/12	1′	1″	1.0″	83.3 mm	Cars, motorcycles, dollhouses
1/16	1′4″	¾″	.75″	62.5 mm	Cars, motorcycles, live-steam trains
1/20	1′8″	¹⁹⁄₃₂″	.6″	50.0 mm	Cars
1/22.5	1′10½″	¹⁷⁄₃₂″	.53″	44.4 mm	G scale trains
1/24	2′	½″	.5″	41.7 mm	Cars, trucks, dollhouses
1/25	2′1″	¹⁵⁄₃₂″	.48″	40.0 mm	Cars, trucks
1/32	2′8″	⅜″	.375″	31.25 mm	Aircraft, cars, No. 1 scale trains
1/35	2′11″	¹¹⁄₃₂″	.343″	28.57 mm	Armor
1/43	3′7″	⁵⁄₃₂″	.279″	23.25 mm	Cars, trucks
1/48	4′	¼″	.25″	20.83 mm	Aircraft, O scale trains
1/64	5′4″	³⁄₁₆″	.187″	15.62 mm	Aircraft, S scale trains
1/72	6′	¹¹⁄₆₄″	.167″	13.88 mm	Aircraft, armor, boats
1/76	6′4″	⁵⁄₃₂″	.158″	13.16 mm	Armor
1/87	7′3″	-	.138″	11.49 mm	Armor, HO scale trains
1/96	8′	⅛″	.125″	10.42 mm	"⅛″ scale" ships, aircraft
1/100	8′4″	-	.120″	10.00 mm	Aircraft
1/125	10′5″	-	.096″	8.00 mm	Aircraft
1/144	12′	-	.083″	6.94 mm	Aircraft
1/160	13′4″	-	.075″	6.25 mm	N scale trains
1/192	16′	¹⁄₁₆″	.062″	5.21 mm	"¹⁄₁₆″ scale" ships
1/200	16′8″	-	.06″	5.0 mm	Aircraft, ships
1/220	18′4″	-	.054″	4.54 mm	Z scale trains
1/285	23′9″	-	.042″	3.5 mm	Wargame pieces
1/350	29′2″	-	.034″	2.86 mm	Ships
1/700	58′4″	-	.017″	1.43 mm	Ships
1/720	60′	-	.016″	1.38 mm	Ships
1/1200	100′	-	.01″	.83 mm	Wargame ships
1/2400	200′	-	.005″	.42 mm	Wargame ships

English-to-metric conversion knowledge required is that 5′ 8″ equals 1,717 millimeters. Skeptics can verify the results with a scale ruler. Remember, we are discussing *approximate* values.

The height of the real-life figure (from our discussion, a given: 5′ 8″, or 1,717 mm), divided by the height of the model figure, is equal to the inverse of the modeling scale (scale/1). For example, to estimate the scale for a 54 mm figure:

$$1{,}717/54 = ?/1$$

or, simplified:

$$1{,}717 \div 54 = ?$$

The answer is 31.796, or, rounded off, 32. Since the second half of the equation is actually the inverse of the scale, we find the proper scale for a 54 mm figure is 1/32.

But we knew that. What size figure goes with a 1/48 scale model?

$$1{,}717/? = 48/1$$

You can cross-multiply or use algebra. Here's a shortcut: To find the size of a figure, divide the height of the original (life-size, in millimeters, or 1,717) by the scale denominator (for 1/48 scale, that's 48). The answer is 35.77; a more popular size for figures would be 36 mm, which is certainly close enough.

As you might expect, the larger the scale, the bigger these small discrepancies become. For a figure size in 1/12 scale:

$$1{,}717/? = 12/1$$

The answer, rounded off, is 143. The closest popular figure size is 150 mm (although 140 mm figures are not unheard of).

No reason for gloom: remember, the figure may not be exactly the size advertised. Measure the figure to see just how big the difference really is. If you can tolerate a figure that's shorter or taller than average, you're still in business. Remember, it's all in the eye of the beholder. What can't be seen won't hurt you. **FSM**