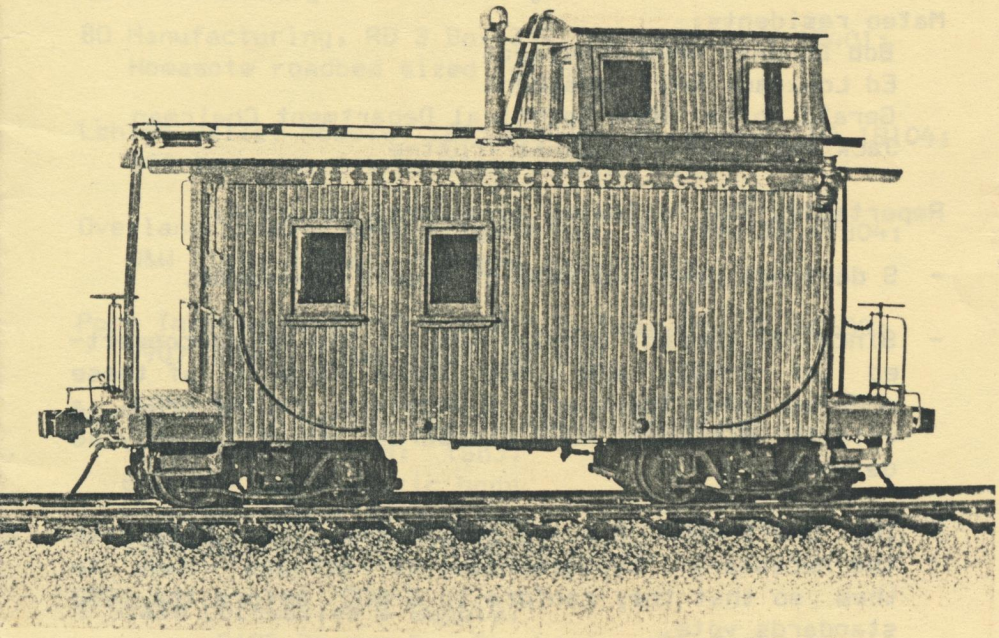
ESSENCE

Newsletter of the NMRA
S Scale Special Interest Group

1:64 scale modeling with 1:1 fun

October 1987



This Sn3 caboose is a model, according to Gene Cox. Without the "Viktoria & Cripple Creek" roadname, we might question his assertion. It is scratch built of styrene with commercial castings for the main body side windows, steps, marker lights, and smoke stack.

Gene was awarded first place in Scratchbuilt Freight & MoW in the Craftsman category at the NASG convention for this excellent "crummy". Another Cox model took "Best In Class".

Coordinator's Corner

GOOD NEWS, WE HOPE

Remember the rhubarb over NMRA standards for S scale modules? Perhaps right, truth, and justice will gracefully prevail. Before I could oil up the typewriter and pour out pleas for mercy to the officers of the NMRA, Bill Nielson called. You will recall that Bill is the newly-appointed NMRA Chairman for S Scale Standards.

According to Bill, a sort of summit meeting on S module standards was held among the following Menlo Park/San Mateo residents:

Bob Dupont, NMRA President
Ed Louxeau, NASG President
Gerald White, NMRA Technical Department Chairman
Jack Wall, NMRA Regional Trustee

Reportedly, the following agreements resulted:

- S does not need two sets of module standards.

- Since all current modules are (or are being converted to) S-MOD, and since there are more of these modules than there are S modelers in the NMRA, a vote for different NMRA standards would probably be defeated.

- The draft NMRA S scale module standards will have the necessary "typographical corrections" made to them so that they conform to S-MOD before the 1988 standards vote.

- The revised draft will be sent to Don DeWitt for comment before appearing in the **NMRA Bulletin.**

According to Bill Nielson and Don DeWitt, an NMRA standard module will mate with S-MOD modules, but the NMRA standard may be more restrictive. When we talked, Don had not yet received the revised draft. Until the draft has been reviewed, there is a risk of standards incompatibility through clerical error. Stay tuned.

Whistles

Here is a list of new 1:64 products first advertised in the past two months which you may not have heard about. Don't forget to enclose a business size stamped self-addressed envelope (SSAE) when writing for information.

American Models, 10088 Colonial Industrial Dr,
South Lyon, MI 48178
EMD GP9/GP18 r-t-r diesel locomotive.

Big Boy Toys, 2127 E Palmdale Blvd.,
Palmdale, CA 93550:
Replacement sideframe castings for AM diesels.

BO Manufacturing, RD 3 Box 357, Kingston, NY 12401:
Homasote roadbed sized for S.

Lehigh Valley Models, 1225 N Arch, Allentown, PA 18104:
300 ton concrete coaling station kit.

Overland Models, 5908 Kilgore Ave, Muncie, IN 47304:
N&W Class A 2-6-6-4 steam locomotive.

Pope Imagineering, PO Box 30318, Chicago, IL 60630:
1907 Jewett interurban car kit.

Railmaster, 4 Karamu St, Te Atato, Auckland 8,
New Zealand: (Sn3)
EBT M-1 gas electric body.
Figures, about 50 new ones.
1936-38 Chevy cars in white metal.

S Scale Locomotive & Supply,
7120 Oregon Dr, St. Louis, MO 63121:
36" nickel silver wheelsets insulated one side.

Simpson Products Co, PO Box 256, Smith Flat, CA 95727:
S/Sn3 straight brass flat strap stock.

Triple "S" Supplies, PO Box 343, Secane, PA 19018:
Tunnel portals, 4 types cast plastic.

AND IN THIS CORNER ...

The Quest for a Perfect Curved Module

by Ken Mackenzie

From time to time I read good articles on the design and construction of model railroad modules. But they all concentrate on "linear modules" - rectangular modules whose mainline trackage runs roughly straight from one end (or "face") to the other. We all prefer linear modules, because:

- Railroads themselves are mostly linear.
- Straight trackage simplifies turnout placement.
- Linear modules fit nicely along the wall.
- Linear modules are simple to design and build.

But what about "curved modules"? These are modules whose mainline trackage forms an arc. When you want to assemble a modular layout, curved modules are indispensible for:

- creating continuous run trackage (balloon loops and ovals), and
- turning trains to avoid obstructions (such as the walls of the layout room).

After the Badgerland S Gaugers club built its first few linear modules in 1985, we began to think about the need for curved modules. The club's previous layout had been a sectional oval, so the new curved modules were designed as 180-degree "end modules" for use in forming a similar oval.

All of the Badgerland modules use Skip MacDonald's MLS system of benchwork with aluminum corner extrusions and tubular aluminum legs. Starting with a pair of the MLS pentagonal bench sections, a triangular section was added to create the semicircular "end module" shown in Figure 1. Two such "end modules" were built.

This design provides spiral easements into continuous curves of 48" radius or better. All equipment operates smoothly and looks good going around these curves. And

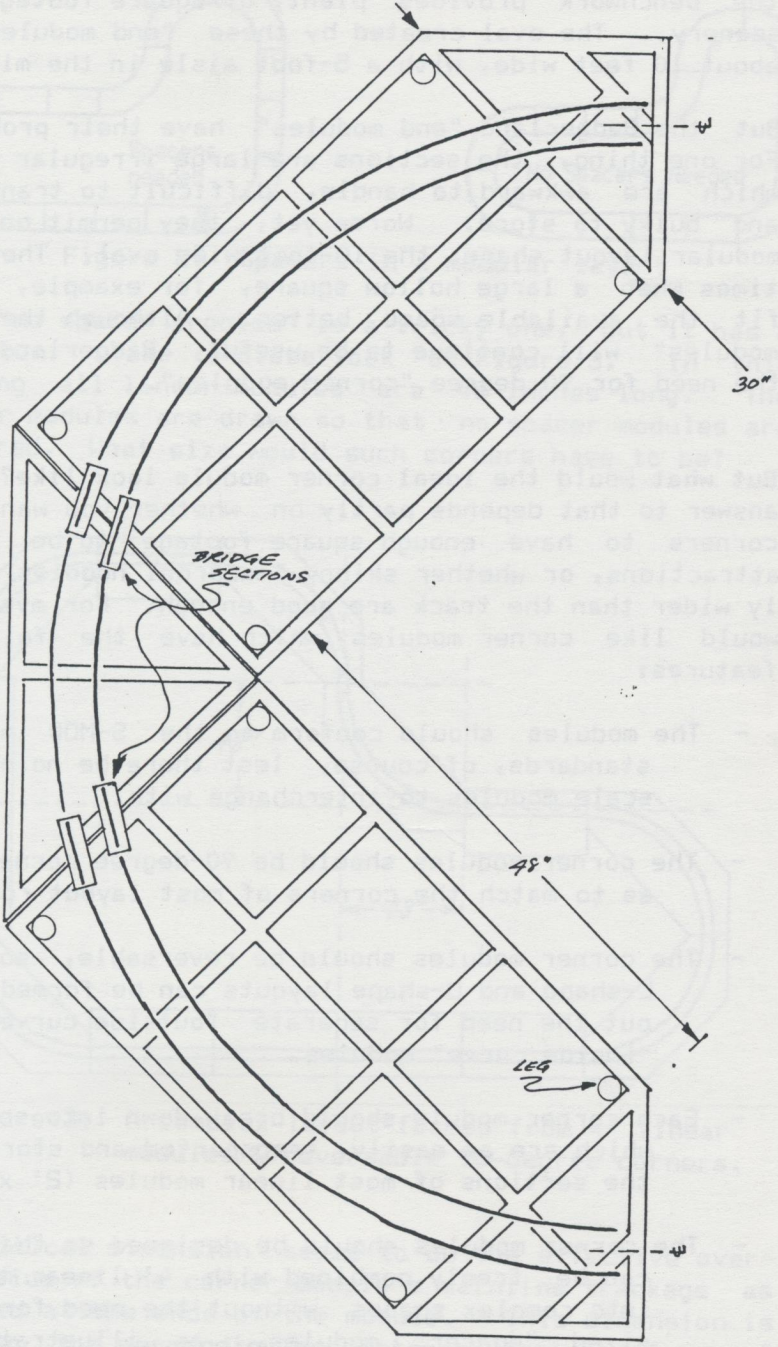


Figure 1: 180-degree "end module" design used by the Badgerland S Gaugers club in Milwaukee.

the benchwork provides plenty of square footage for scenery. The oval created by these "end modules" is about 10 feet wide, with a 5-foot aisle in the middle.

But the Badgerland "end modules" have their problems. For one thing, the sections are large irregular shapes which are awkward to handle, difficult to transport, and bulky to store. Worse yet, they permit only one modular layout shape: the 10-foot wide oval. There are times when a large hollow square, for example, would fit the available space better. Although the "end modules" will continue to be useful, Badgerland sees the need for 90-degree "corner modules".

But what would the ideal corner module look like? The answer to that depends partly on whether you want your corners to have enough square footage to be scenic attractions, or whether skinny "macaroni noodles" barely wider than the track are good enough. For myself, I would like corner modules which have the following features:

- The modules should conform to the S-MOD modular standards, of course, lest there be no other S scale modules to interchange with.

- The corner modules should be 90-degree corners, so as to match the corners of most layout rooms.

- The corner modules should be reversable, so that L-shape and U-shape layouts can be formed without the need for separate "outside curve" and "inside curve" modules.

- Each corner module should break down into sections which are as easily transported and stored as the sections of most linear modules (2' x 4').

- The corner modules should be designed so that they can be freely combined with 4' linear modules into complex shapes without the need for odd-sized "spacer" modules, as illustrated in Figure 2.

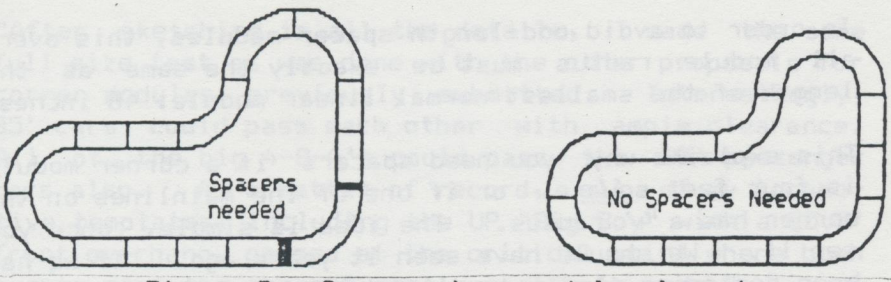


Figure 2: Spacers in a modular layout

The "no spacer problem" is a tricky one, but it has a solution. Take a close look at Figure 3. In this drawing all linear modules are 48 inches long. The corner modules are drawn so that no spacer modules are required. What size would such corners have to be?

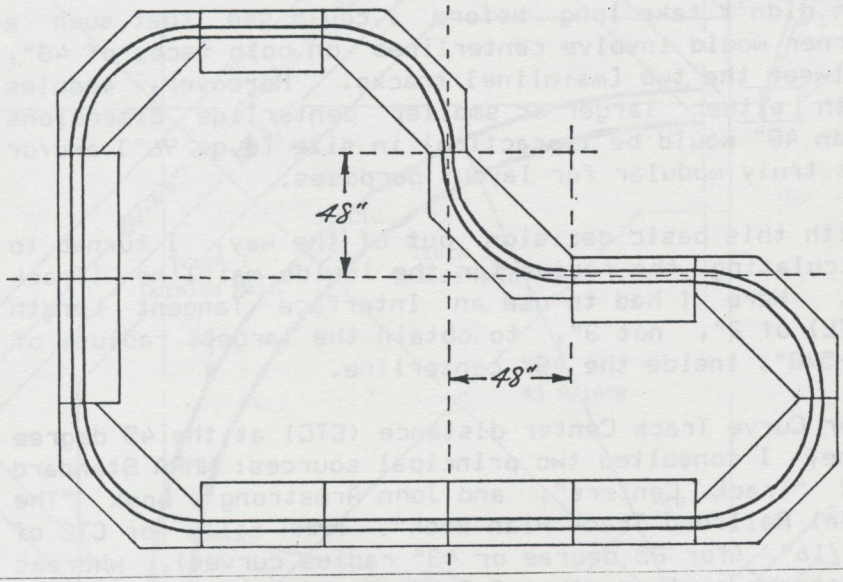


Figure 3: A complex layout formed from 4' linear modules & reversable 90-degree corners.

The critical dimension seems to be the effective overall radius of the corner module's mainline trackage as measured at the ends of the module. This dimension is equal to the perpendicular distance from one face of the corner module to the mainline trackage centerline of the opposite face.

In order to avoid odd-length spacer modules, this overall module radius must be exactly the same as the length of the smallest normal linear module: 48 inches.

This explains why you need spacers if a corner module is four feet square, or if one of the mainlines on the corner has a 4' radius. The idea is simple, once you see it. We should have seen it years ago. If we had been designing single-track modules, we probably would have.

The definitive design for a spacer-less reversible corner grew out of the S-MOD standards correspondence. Bill Krause, at the instigation of Don Thompson and Don DeWitt, developed the corner design shown in Figure 4. Here is Bill's own description of the design:

"It didn't take long before I could see that such a corner would involve centerlines on both faces of 48", between the two [mainline] tracks. Moreover, modules with either larger or smaller centerline dimensions than 48" would be impractical in size [e.g. 96"] and/or not truly modular for layout purposes.

"With this basic decision out of the way, I turned to calculating the radius for the inside mainline (Track 2). Here I had to use an Interface Tangent Length (ITL) of 2", not 3", to obtain the largest radius, of 44-5/8", inside the 48" centerline.

"For Curve Track Center distance (CTC) at the 45 degree line, I consulted two principal sources: NMRA Standard S-8 "Track Centers", and John Armstrong's book "The Model Railroad Track Plan Book". NMRA calls for CTC of 3-9/16" (for 25 degree or 43" radius curves), whereas Armstrong contends that 3-3/8" is sufficient. I chose 3-1/2", and am happy that I did, with later testing.

"With that decision, it was a simple matter to determine that the outside mainline (Track 1) should have a 45-9/16" radius. John Armstrong states that all sizes of equipment will operate comfortably on these radii, but 85' passenger cars and 89' freight cars will not look so 'realistic'.

"After sketching in all the details, I made the same full size test as was done with the other proposals for corner modules previously submitted. Interestingly, 85' cars could pass each other with ample clearance. All of the big 4-8-4's could pass the 85' passenger cars also. As a matter of record, all of my locomotive templates, including the UP "Big Boy" with a 35.5' front overhang, passed at the critical point where both curves meet the tangent sections at both ends."

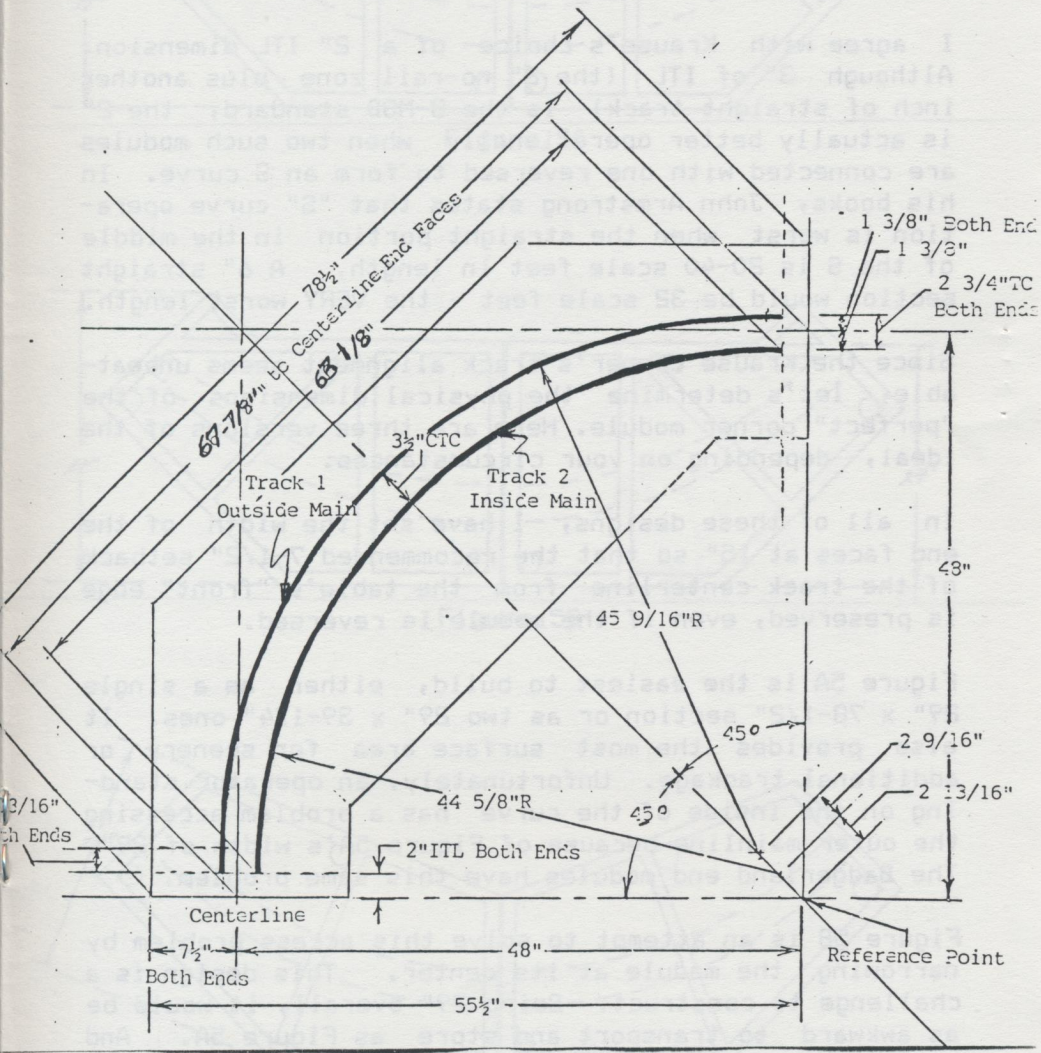


Figure 4: Trackage geometry of the Krause corner.
(Courtesy of W. H. Krause 1/27/87)

My trigonometry skills are admittedly rusty, but I disagree with Bill when he says that determining the outside mainline radius is "a simple matter". A similar calculation in the preparation of Figure 8 took me half an afternoon.

In any case, Bill Krause has solved the design problem of the spacer-less reversable corner module. I suggest we refer to any corner module with this characteristic as a "Krause corner" in Bill's honor.

I agree with Krause's choice of a 2" ITL dimension. Although 3" of ITL (the 2" no-rail zone plus another inch of straight track) is the S-MOD standard, the 2" is actually better operationally when two such modules are connected with one reversed to form an S curve. In his books, John Armstrong states that "S" curve operation is worst when the straight portion in the middle of the S is 20-40 scale feet in length. A 6" straight section would be 32 scale feet - the VERY worst length.

Since the Krause corner's track alignment seems unbeatable, let's determine the physical dimensions of the "perfect" corner module. Here are three versions of the ideal, depending on your circumstances.

In all of these designs, I have set the width of the end faces at 15" so that the recommended 7-1/2" setback of the track centerline from the table's "front" edge is preserved, even if the module is reversed.

Figure 5A is the easiest to build, either as a single 29" x 78-1/2" section or as two 29" x 39-1/4" ones. It also provides the most surface area for scenery or additional trackage. Unfortunately, an operator standing on the inside of the curve has a problem accessing the outer mainline because of Figure 5A's width of 29". The Badgerland end modules have this same problem.

Figure 5B is an attempt to solve this access problem by narrowing the module at its center. This design is a challenge to construct. Being 29" overall, it would be as awkward to transport and store as Figure 5A. And it may not provide enough table space for an additional track inside the inner mainline.

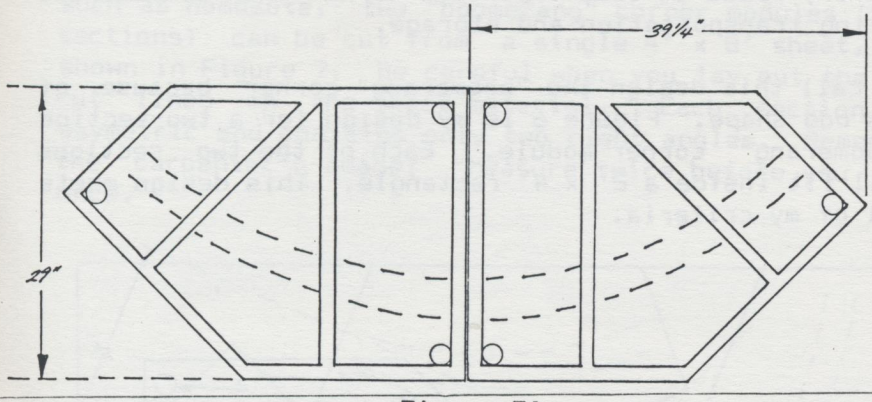


Figure 5A

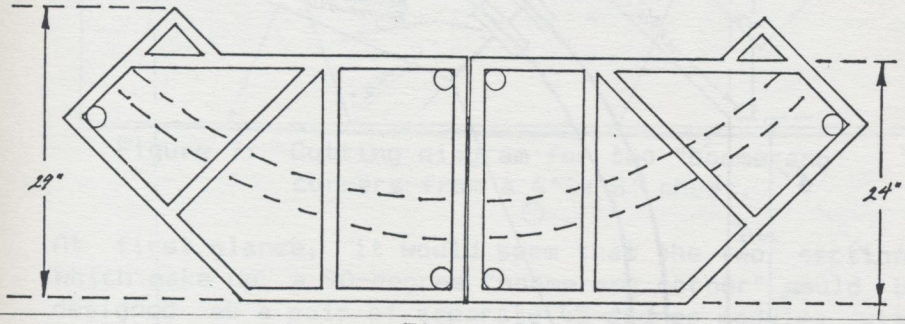


Figure 5B

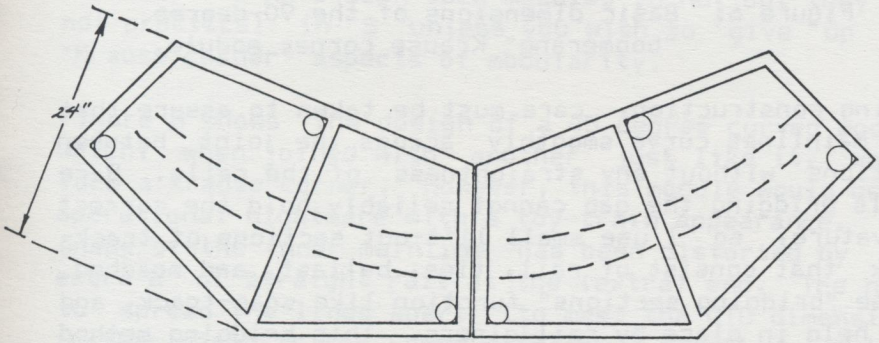


Figure 5C

Figure 5C gets my vote. Where corners are concerned, scenery space is less important to me than compactness during transportation and storage.

I call this design the "boomerang" corner because of its odd shape. Figure 6 is my design for a two-section "boomerang" corner module. Each of the two sections will fit inside a 2' x 4' rectangle. This design meets all of my criteria.

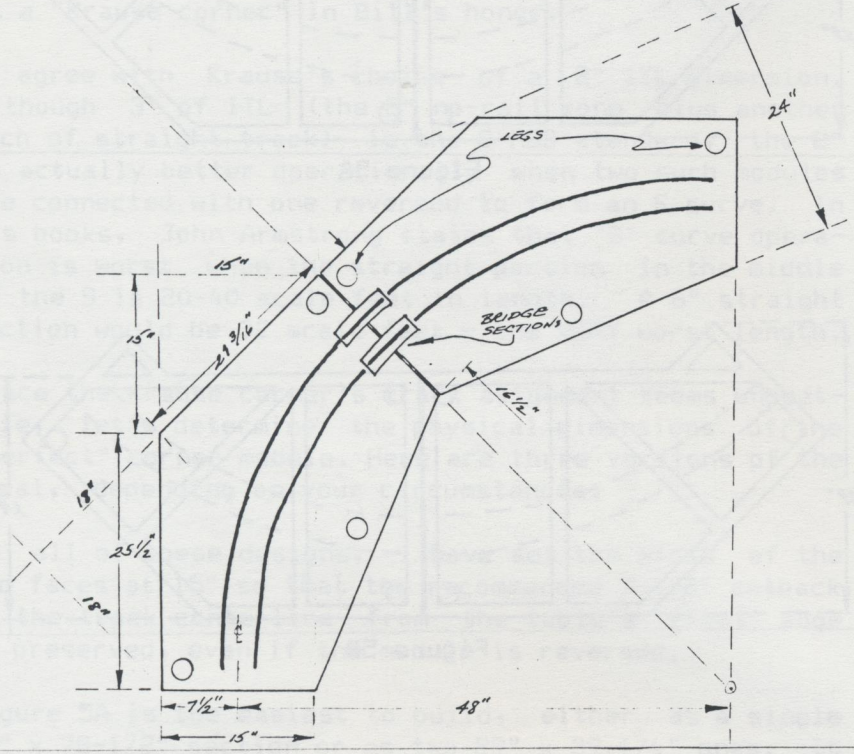


Figure 6: Basic dimensions of the 90-degree "boomerang" Krause corner module.

During construction, care must be taken to assure that the mainlines curve smoothly across the joint between sections without any straightness of the rails. Bare rails bridging the gap cannot reliably hold the correct curvature, so I use small lift-out sections of track-work that consist of rail, ties, ballast, and roadbed. These "bridging sections" function like snap-track, and are held in place by railjoiners. This bridging method has proven itself on the Badgerland "end module".

If you wish to cover the module with sheet material, such as homosote, two "boomerang" corner modules (four sections) can be cut from a single 4' x 8' sheet, as shown in Figure 7. Be careful when you lay out the the cut lines on the sheet material. Each section is asymetric and contains only two right angles. Remember the carpenter's adage: "Measure twice before you cut once."

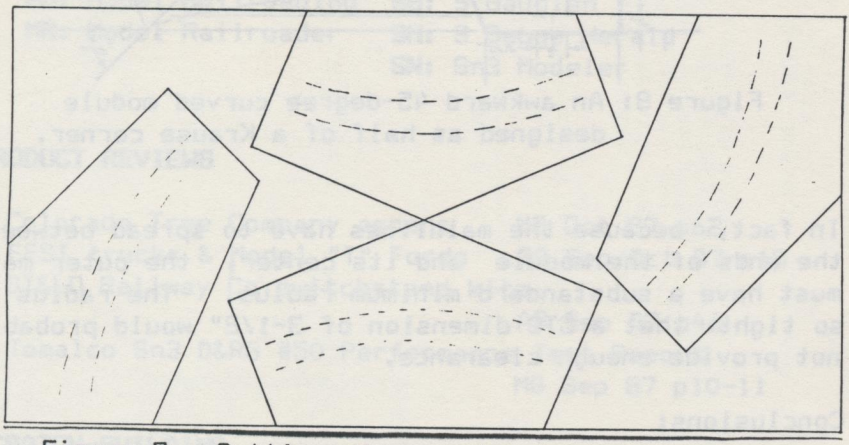


Figure 7: Cutting diagram for two "boomerang" corners from a 4' x 8' sheet.

At first glance, it would seem that the two sections which make up a 90-degree "boomerang corner" could be designed as a pair of separate 45-degree modules with standard S-MOD interfaces on each end. This would give more flexibility since a pair of linear modules could be joined by a single 45-degree curved module, if desired. I have seen such modules in HO, but they are not practical in S unless you wish to give up the "Krause corner" aspects of modularity.

Figure 8 shows the design of a 45 degree curved module which, when joined with another just like it, would form a Krause corner. However, this module would be an operational nightmare with a toy-train appearance. The shape of the inner mainline has been distorted by the extra 2" of straight rail at the (extra) end. The need to spread the lines apart (to meet the CTC dimension) further distorts the inner mainline, creating a 4-1/2" straight track per end and a sub-standard radius.

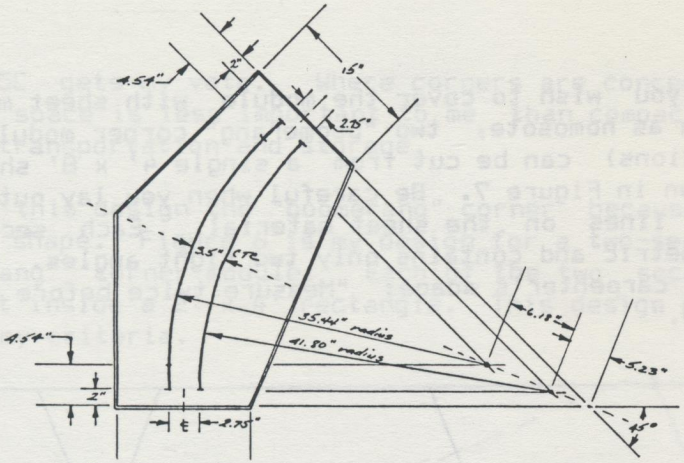


Figure 8: An awkward 45-degree curved module designed as half of a Krause corner.

In fact, because the mainlines have to spread between the ends of the module and its center, the outer main must have a substandard minimum radius. The radius is so tight that a CTC dimension of 3-1/2" would probably not provide enough clearance.

Conclusions:

1. Stick with 90-degree corner modules, rather than 45, 60, or 180-degree modules.

2. Stick with Krause corners. They are reversible and may be used in complex loop layouts without spacers.

3. The boomerang-shaped corner module design provides operational adequacy in a very compact section size.

However, even the leanest corners are bulky. A full circle's worth of "boomerang" corners will take as much space in your car as eight 2' x 4' linear modules.

Curved modules are relatively scarce in S scale today - so scarce, in fact, that clubs are occasionally paid to bring their curved modules to a major modular meet. If your club hasn't built two full circles of 90-degree corner modules, it should. When deciding how to build your next corners, consider the "boomerang" design.

S Dispatchs

S. Cratchit

Here is some S-related material which appeared in the hobby press during September and October. Magazine abbreviations are:

AB: NMRA Bulletin
DI: NASG Dispatch
MG: Model Railroading
MR: Model Railroader
NG: N.G. & Short Line Gazette
RC: Railroad Model Craftsman
SG: S Gaugian
SH: S Gauge Herald
SN: Sn3 Modeler

PRODUCT REVIEWS

Colorado Tree Company aspens	MG Oct 87 p62
EFSI trucks & Model "T" Fords	SG Sep/Oct 87 p13
ST&LO Railway Co switchstand kits	AB Sep 87 p46
Tomalco Sn3 D&RG #50 Performance Test Report	MG Sep 87 p10-11

SCRATCH-BUILDING

Building an 0-8-0, part II	SG Sep/Oct 87 p-20-23

MODELING ARTICLES

ACF-style 40-foot Box Cars	MG Sep 87 p56-57
ACF-style 40-foot Box Cars	MG Oct 87 p56
EMD NW2 Diesel Detail Close-up	MG Oct 87 p58
$90 Sn3 Locomotive (Tomalco)	MG Sep 87 p7-9

SCALE DRAWINGS

Shipfitter's Hardware Store	NG Sep/Oct 87 p79

OTHER

New S Gauge Products	SG Sep/Oct 87 p16-19
Photo of Jim Wild's S scale water tower, a winner in national NMRA model contest.	AB Oct 87 p21
S Gauge National Convention	SG Sep/Oct 87 p24-29

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