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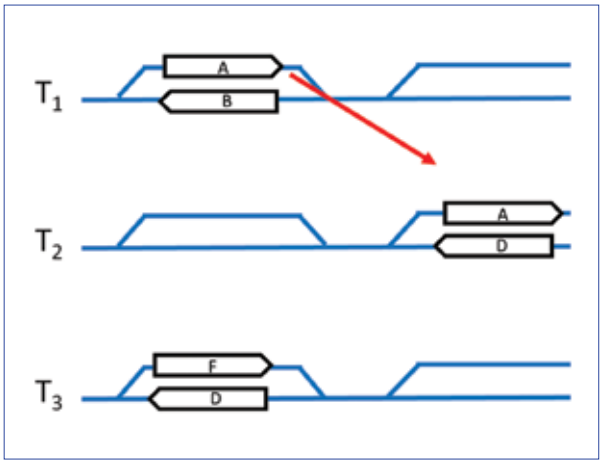

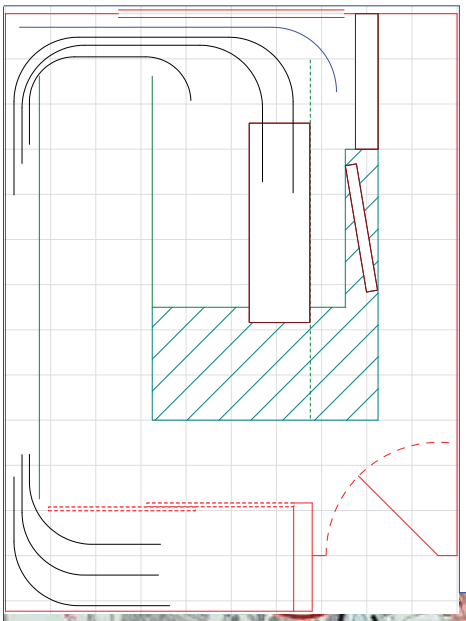

Exhibition Layout Lessons for All
“Old School” Cajon Challenge
Planning for Layout Capacity
Jersey City Terminal Switching
Salt Lake City NMRA 2019

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Design Lessons from *B.A. Bodil*

Exhibition-style masterpiece engages and inspires

by Nicholas Kalis

Three friends – with some valuable help from their wives – set out to model a Swiss alpine scene bracketed by an animated blacksmith scene on the left and an auto repair shop on the right (the eponymous "Garage B.A. Bodil"). In between is a striking valley over which towers a backdrop of snow-capped mountain peaks. All of this was to be accomplished in .75 square meters or less (just over 8 sq. ft.). Peter Dillen, Hans van den Boom, and Hugo Baart have created a masterpiece of layout design and implementation.*

What does the *B.A. Bodil*† 1:25 exhibition layout offer its viewers? Excellent craftsmanship? Yes. A layout that can be finished in a modest – by basement empire standards – time frame? Yes. Portability so that it can be shared with a larger public than is possible with a basement layout? Yes. Innovation? Yes. Consider the use of four modeling scales. A rider disappears as he broads from the open-sided passenger shelter. Clever animation and sound? Yes. Operations? Yes. While no schedule is used and no car cards are required, this layout does show how a self-propelled railbus carries a passenger from point A to point B. Mastery of perspective? Yes. In summation, this layout captivates and entertains.

* *The layout is impressive in video:* https://youtu.be/E0UeZOPKVLg

† *We're following the European and U.K practice of referring to the layout name in italics.* – BH

Inspiration for all

Indeed, *B.A. Bodil* does not just inspire those venturing into building an exhibition layout, but also offers ideas for much larger layouts. It inspires by example all layout builders in any scale to think outside the box.

The rolling stock consists of scratchbuilt railbuses (from rear to front) in 1:100, 1:50,

This overall view shows the amazing amount of atmosphere and workmanship achieved in this the compact single-scene exhibition layout. The railbus arrives from the left and then appears to move back and forth across the scene as it traverses the distant valley. Photo by Hugo Baart.

“Old School” HO Cajon Pass

Mountain Challenge plan revisits ‘50s theme and approach

by Rick Mugele

Cajon Pass is the famous entry into Southern California shared by the Santa Fe and the Union Pacific railroads* in the transition era. The mountain grades and high-desert scenery continue to inspire railroad fans and modelers.

The intent of this Mountain Challenge layout design is to capture the essence of the pass so that walking into the layout room transports one into the miniature world of trains working through the high desert pass. Step through the doorway and there are trains and mountains and San Bernardino – all set against a backdrop of more mountains.

This layout design was inspired by my own visits to Cajon Pass in 1969 and 1975 and the Cajon Pass, Salt Lake & Santa Fe plan by John Armstrong in *101 Track Plans*, published by Kalmbach in 1956†. The track plan unapologetically reflects 1956 in the prototype location, design concept, and model offerings (see sidebar page 13).

Layout design comes of age

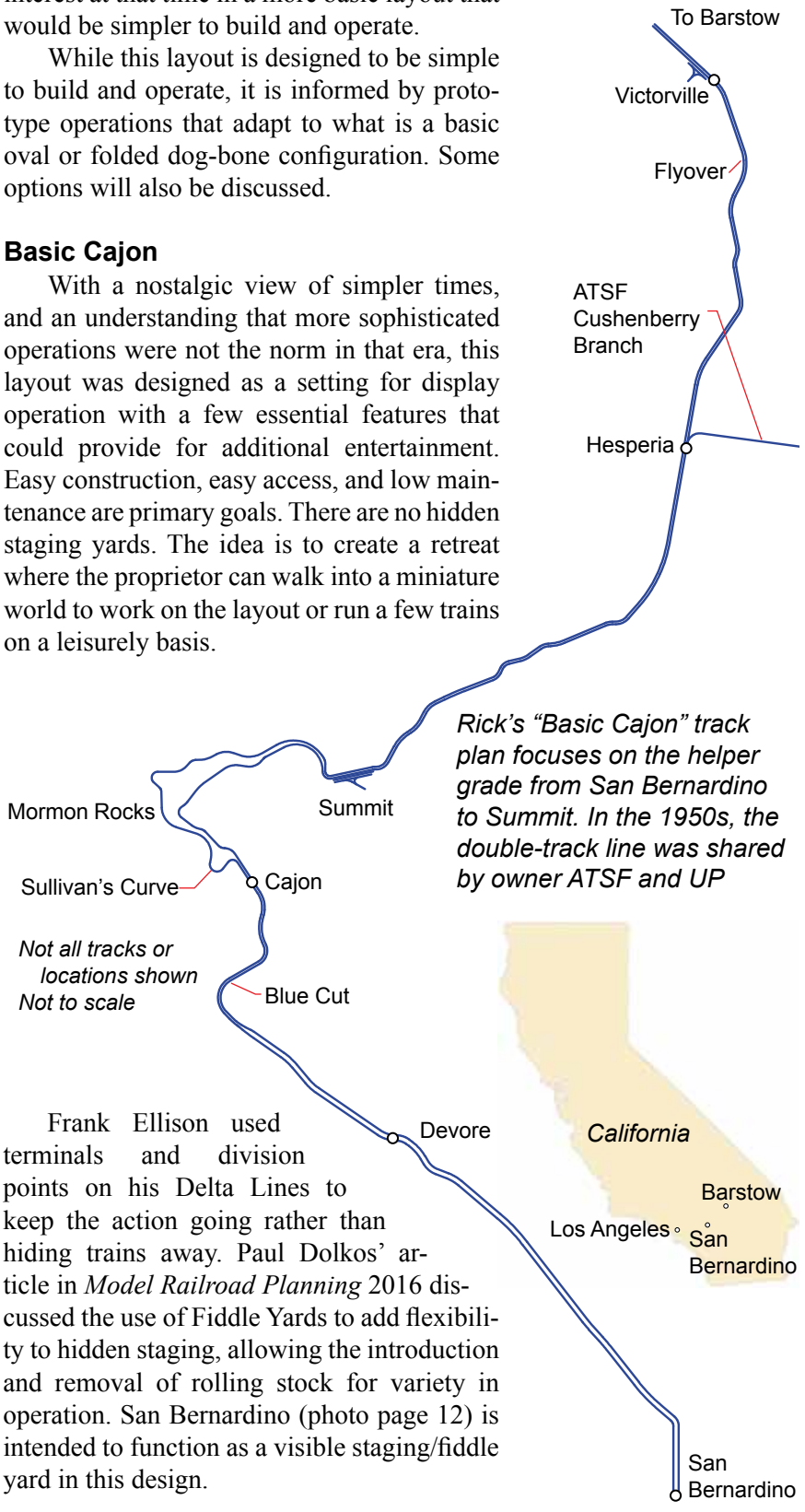
On page 61 of *Track Planning for Realistic Operation* by John Armstrong (first published in 1963) there is a photo of the action at Cajon Pass. This sort of action was described in *The Art of Model Railroading*, by Frank Ellison‡.

Trains would meet, pass, and drop helpers, all on a schedule designed to capture the drama of the high iron. Yet most of the John Armstrong layouts were designed for one or two operators. This would suggest a stronger interest at that time in a more basic layout that would be simpler to build and operate.

While this layout is designed to be simple to build and operate, it is informed by prototype operations that adapt to what is a basic oval or folded dog-bone configuration. Some options will also be discussed.

Basic Cajon

With a nostalgic view of simpler times, and an understanding that more sophisticated operations were not the norm in that era, this layout was designed as a setting for display operation with a few essential features that could provide for additional entertainment. Easy construction, easy access, and low maintenance are primary goals. There are no hidden staging yards. The idea is to create a retreat where the proprietor can walk into a miniature world to work on the layout or run a few trains on a leisurely basis.



Rick’s “Basic Cajon” track plan focuses on the helper grade from San Bernardino to Summit. In the 1950s, the double-track line was shared by owner ATSF and UP

Frank Ellison used terminals and division points on his Delta Lines to keep the action going rather than hiding trains away. Paul Dolkos’ article in *Model Railroad Planning* 2016 discussed the use of Fiddle Yards to add flexibility to hidden staging, allowing the introduction and removal of rolling stock for variety in operation. San Bernardino (photo page 12) is intended to function as a visible staging/fiddle yard in this design.

** Southern Pacific added a separate line through Cajon Pass in 1967 as the Palmdale-Colton Cut-off. Rick’s design focuses on the earlier shared ATSF/UP tracks. – BH*

† Armstrong’s detailed article on the plan, including an interesting discussion of developing the schematic and scenery profiles, appeared in the October 1956 Model Railroader *(*MR*) and was reprinted in* The Classic Layout Designs of John Armstrong (*Kalmbach, 2001) with some additional comments by Armstrong.*– BH*

‡ Originally published in MR *beginning in March 1944; reprinted August 1964 through January 1965; as of this writing available for* MR *subscribers to download at:* http://mrr.trains.com/~/media/import/files/pdf/3/9/4/august_online_extras_new_1.pdf

Application to the model

There is no similar simulation system for model, and even if there were, the time and effort required to create a simulation would almost certainly not be worth the trouble. As modellers though, we can take a lesson from the prototype – operating crews on a model railroad will tend to get bored and lose focus if they spend too much time waiting in a siding.

Like the prototype, there is no simple way to precisely define how much wait time is too much. Having said that, most would agree spending 45 minutes of a two-hour operating session in one siding would take much of the fun out of that operating session.

The concept of having a maximum average delay time per train is useful for model railroad design to ensure crews enjoy an operating session. This is not to say we should, or even can, design a model railroad for no meet and pass delay.

Waiting in a siding or at an absolute stop signal for another train is a routine part of a railroad's operation (photo page 18) that modellers try to simulate. What we do want to design for, though, is a *reasonable* amount of delay so we can retain the fun of an operating session. Without the use of a computer simulation, there is no precise way to calculate delay time in advance, but we can anticipate some of the issues to try to design around them.

Single-track capacity

Single maintrack[3] train capacity is typically determined by the number and spacing of sidings. Diagram 1 below shows a line with four sidings over three time periods (T_1, T_2 and T_3). It illustrates the maximum capacity of a single track railroad. Dispatchers often call this level of utilization "doing the weave" for the constant weaving of trains in and out of sidings.

Essentially, the maximum number of trains that can be operated at one time is equal to the number of sidings (or 1+ the number of sidings if you have an odd number of sidings). Try playing around with this diagram a little – there is no way to operate more trains.

The maximum is not the norm

In my 37-year railroad career, I saw this level of utilization only very rarely and only over short sections of track. In fact, a real railroad is typically starting to become congested at about half of this level of utilization[4]. This type of utilization is practically only possible with Centralized Traffic Control (CTC) because communication time for verbal radio-based control like Direct Traffic Control (DTC), Track Warrant Control (TWC) or Occupancy Control System (OCS)[5] quickly overwhelms a dispatcher – and don't even think about this type of utilization with Timetable & Train Order (TT&TO) rules!

After a few operating sessions on model railroads that attempted to operate trains at this level of capacity, I found the same issues arise on model railroads. Inevitably something goes off-plan or slows down, be it dispatching[6]; slow trains; mechanical, track or electrical issues; or human error – and every train on the layout stops until the issue is resolved.

Fleeting fails?

One controversial issue in Diagram 1 is fleeting of trains. Many real-world dispatchers feel additional trains can be run if they fleet them (e.g., run two or more trains in the same direction, one right behind another). Academic research and simulation has shown, howev-

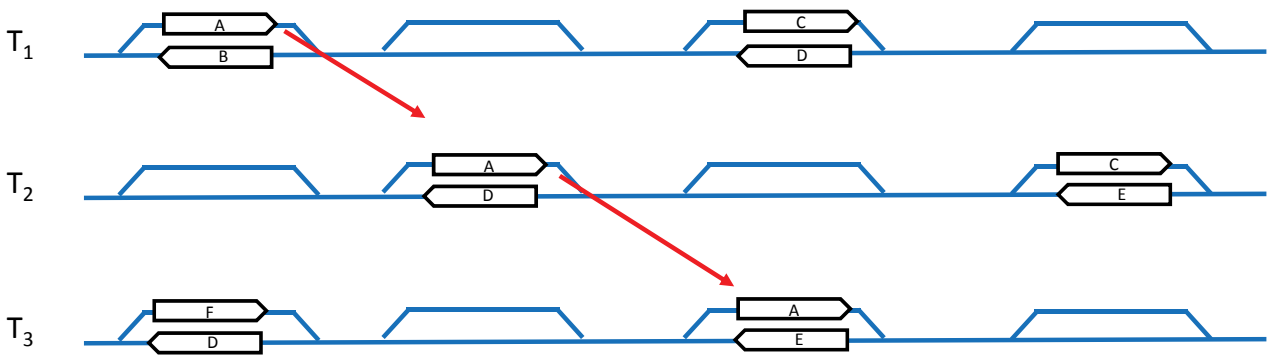


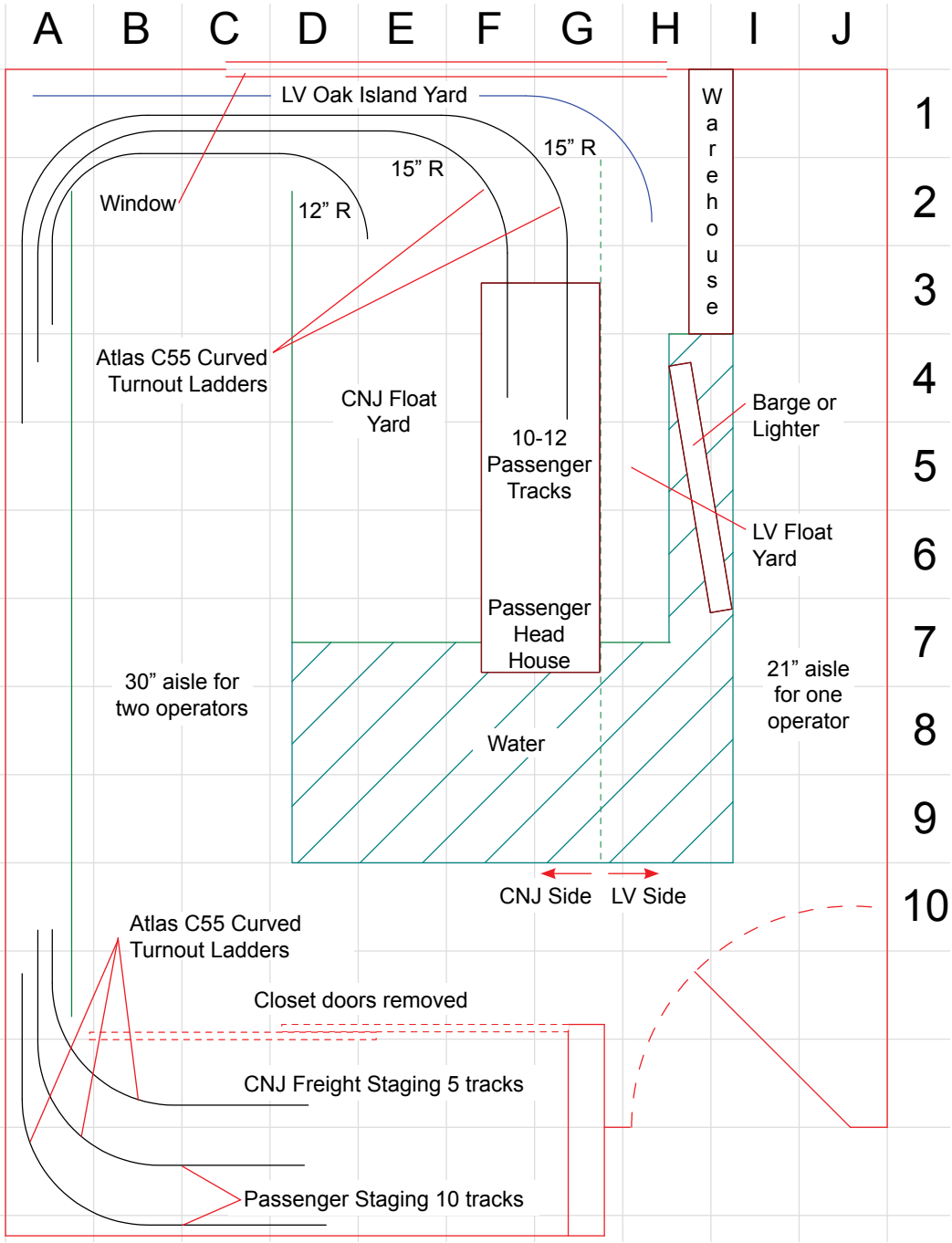
Diagram 1 – Single Maintrack Capacity – average one train/siding. (The red arrows illustrate the progression of train A over time.)

to gain length. The aisle here is 21” wide, adequate for one operator to run trains.

Curved turnouts key

The CNJ side is both freight and passenger, with the passenger being mostly commuter traffic to the ferry terminal. Curved turnouts (Atlas Code 55) are suggested to get to the passenger terminal, with enough space for 10-12 tracks. Although impressive, the real thing was originally 20 tracks across.

The tracks would all be 3’-4’ long depending on where they come off the ladders. Five



CNJ Jersey City Terminal Concept
N scale, 10’ X 10’ 10” plus closet
1 foot grid
15” Pass. / 12” freight min. radius
Atlas C55 #5 min. turnout

Michael’s conceptual plan for the LDJ Switching Challenge space mimics the prototypes’ dense trackage with extensive passenger and freight facilities. Access to closet and window are not the easiest, but he proposes some solutions in the text.

Lehigh Valley side:

A1-F1: Staging for Lehigh Valley, represents connection to LV Oak Island yard. There is room for five tracks, each 4’-5’ long. Depending on final layout of the float yard, it may be necessary to push trains from staging.

Access to the LV Oak Island staging yard is not the best, but the ladder would be located near the end of the aisle, which is where problems are most likely to occur.

I4 -I6 area: Angular pier/covered barge with warehouses on either side.

H7 -I9 area: Room for two car floats and related float bridges, all modelled full-size.

CNJ side:

A1-Al0: The conceptual plan shows three mainline tracks, two feeding the passenger station and one on the freight side. The bench work is 9” wide here, so there is room for some industrial flats, or more mainline tracks if desired. CNJ traffic was pretty intense in this area, sometimes with a mainline six-tracks-wide. This shelf could also be narrowed a bit in favor of aisle width.

F7-G9: There would be room for two full-size ferries, as well as the passenger head house. The real head house had room for four ferries, but this could be reduced. During rush hour, ferries ran on five-to-ten-minute intervals to Manhattan.

D7-F9: Room for up to four car floats and related bridges, all modelled full size. This would probably still leave about ten inches of width to use, either as yard lead or warehouse with barges or lighters. – *MP*