DIESEL GARDEN RAILWAY CONTEST

1st Place

The Tortoise & Liz Garden Railroad

1. Tortoise Town station is a busy place. Ex-SP equipment (unrepainted) predominates on this line. Structures are a mix of kit- and scratchbuilt. Just beyond the centrally located depot stands a blooming snowrose.

ard Bash

A well developed, mid-'50s line

by Todd Brody | Santa Ana, California | Photos by the author

2. A view from the south of the larger leg of the "L." Plants are kept in scale through an ongoing pruning campaign. Similar trees grow near each other to show natural habitats.

It's late September, 1957. The residents of Tortoise Town go about their daily activities. Though established during the Depression era, the town now flourishes with the new gold strike at the mine. Nuggets the size of boulders are hauled from the natural volcanic tunnel.

With the bonanza, it became imperative to move goods on a timely basis. Due to lower operating costs and ease of maintenance, diesels stole the thunder and steam power is now relegated to recreational use. While the people had a hard time giving up their beloved steam engines, they recognized that it took diesel power to get the job done on schedule and on budget.

Based on the need for a quick "gear-up" and the availability of equipment from the Southern Pacific, most motive power was purchased second hand and still carries its SP colors. One nugget was enough to tide the SP lawyers, and the Tortoise & Lizard Bash is free to run the SP herald without further retribution.

Residents have lots of free time for leisure activities. Trains take people out to the hot springs, the lake, and to observe the volcanoes. Townsfolk can also take the aerial tram out to the island to visit the Lazy Lizard Dude Ranch. The aerial tram affords spectacular views for its riders as it parallels the trestle, passing over rail lines and waterfalls.

Some people toil in the mine, stamp mill, and brewery, or work the railroad. A 44-tonner regularly travels between the mine, the Lizard Lane Station, and the mill, delivering ore cars, water, and supplies. Ore cars are lifted from the rails by the sprinkler crane (see August 2010 *GR*), transferred to a separate track, and pushed into the structure where they are dumped. Ore is crushed and an elevator and conveyor system dump it into waiting hopper cars that share a spur with the Bear Whiz Beer Brewery, where Gustav and his crew actively ice the reefers (see October 2012 *GR*).

Other trains make regular stops at the Tortoise Town Station, where passenger and freight consists alternate travel in different directions. Diesels also serve the loops that handle cattle, sheep, and chicken ranching, as well as those goods to be delivered between Tortoise Town and Lizard Lane.

Philosophy

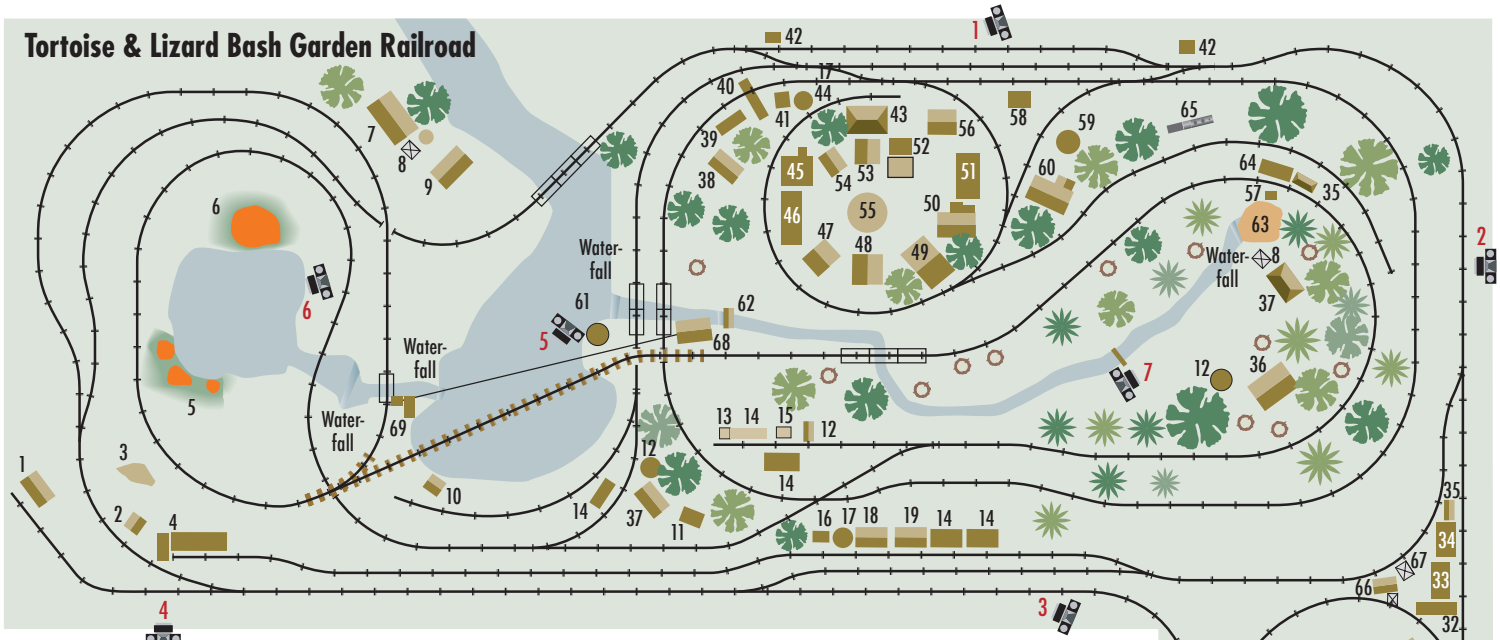
The Tortoise & Lizard Bash (T&LB) Railroad was constructed and is operated at reasonable cost, while ensuring reliable long-term operation. Most of the rock was trapped in the wild or donated. Track power with block control was chosen for its economics, ease of use, and reliability. Most electronics, rolling stock, and structures were obtained as surplus, in closeouts, in raffles and auctions, or were donated.

Another aspect of our philosophy is that, while situations need not be real, they do need to be plausible. If a structure sits on a hill, there must be a ramp for access. Additionally, we strive for originality, creativity, innovative thought, and animation.

Humor and whimsy play a subtle but important part in the railroad. Our dogs wait patiently in line to use the fire hydrant. For the younger crowd, finding Mickey Mouse standing under a tree or "Jack" next to the restaurant brings more smiles than a kitbashed structure. Observant adults will also find something to suit their fancies. Our Low-rider Train, complete with dancing car, is always a hit with visitors.

The garden

Since the railroad is in our front yard, it is viewed by all who come to the house. Therefore, I feel that the garden is the first priority. On average, I spend about



1. Passenger depot
2. Mine shack
3. Dinosaur excavation site
4. Mine and covered loading platform
5. Gidra (active volcano)
6. Dragon's Breath (active volcano)
7. Lazy Lizard Dude Ranch
8. Windmill
9. Horse barn
10. Fishing shack/boat rental
11. Chicken coop
12. Silo
13. Tower-lighting stanchion
14. Freight-loading pad
15. Sheep pen
16. Electrical-worker's shack
17. Water tower
18. Passenger station
19. Freight station
20. Brewery
21. Hobo camp
22. Auto-repair garage
23. Auto-storage garage
24. Filling station
25. Hot-air-balloon launch facility
26. Overhead loading and icing facility
27. Ticket booth for balloon facility
28. Bed & breakfast
29. Tavern and bawdy house
30. Keg advertising the bawdy house
31. Tavern-proprietor's house
32. Loading pier
33. Commercial building
34. Industrial building
35. Covered waiting platform
36. Cattle barn
37. Farm house
38. School house
39. Diesel-fueling facility
40. Coaling station
41. Speeder garage
42. Track-worker's shack
43. Tortoise Town station
44. Newspaper/shoe-shine stand
45. Barber shop
46. Post office/sheriff's office
47. Town hall
48. Cinema
49. Church
50. Auto-repair garage/ filling station
51. Hardware store/drug emporium
52. Open-air amphitheater/gazebo
53. Grocery store/dress shop
54. Bank
55. Town herald
56. Restaurant
57. Chameleon Caverns towel shack
58. Control tower
59. Gazebo pavilion
60. Boarding house
61. Lighthouse
62. Covered footbridge
63. Chameleon Caverns
64. Ramp over retaining wall
65. 10-wheeler in park
66. Stamp mill
67. Sprinkler crane
68. Aerial-tram power house
69. Aerial Tram Island landing/tower

ILLUSTRATION BY MARC HOROVITZ

an hour a day taking care of the garden so it stays nice at all times.

All vegetation is real and to scale. No plant is allowed to get as tall as my hips, which requires continual effort. I keep the myrtles trimmed in topiary fashion to look like a cheerleader's pom-poms and tell people they are "pom" trees. One day I'll cut one of the tree's spheres into cubes and tell people it's a "boxwood."

Groundcover is varied and includes over a dozen types of thyme. One type of thyme has hybridized on-site to form a new variety, creeping elfin thyme. With foliage like elfin thyme, it grows out like "dreadlocks" until these "locks" take root and spread as a mat. It takes full sun and tolerates the heat better than any other variety of thyme on the railroad. I've given this hybrid the name *Thymus rasta jamaciia*.

The garden is watered by a combination of sprinklers and drip-irrigation system. The sprinklers are not readily visible, as they are

The Tortoise & Lizard Bash Garden Railroad at a glance

Name: Tortoise & Lizard Bash Railroad
Size of railway: 52' x ~20' plus a 10' x 15' "L"
Scale: Trains, 1:29; structures, 1:24
Gauge: No 1 (45 mm)
Era: September 1957
Theme: Fantasy, town and country mainline, and switching
Age: 15 years
Motive power: Primarily diesel
Length of the mainline: 210'
Maximum gradient: 2.5%
Minimum radius: 4'
Type of track: Sectional Aristo-Craft with some LGB, all with European ties. LGB 4-foot radius with some Aristo-Craft 5-foot radius turnouts
Structures: Approximately five dozen plastic, wooden, and cement-coated structures, from scratch and various manufacturers.
Control system: Three Aristo-Craft Train Engineers/Mean Wells through sophisticated block control.
Website: *http://tortoiseandlizardbash.com*
YouTube videos:
Watch the railroad run itself: *www.youtube.com/watch?v=kUFmrN3SQJ4*
Water features: *www.youtube.com/watch?v=_mPGBcCOBsc*

3. The mine train (next to the station) stops for supplies at Lizard Lane on its way to the stamp mill, while lumber from the dock is loaded onto flatcars. Concrete pavers are handy for laying down the loading dock. Pink-flowering thyme blankets the knoll beyond the station.

4. With gold nuggets the size of boulders filling the ore cars, the mine is extremely lucrative. Silver carpet grows on top of the mine rocks.

enclosed in "faux rock" (see February 2013 *GR*) or are built into the structures.

The railroad

The railroad was built in an active volcanic area and the craters provide spectacular views for guests, both in 1:24 and 1:1 scale. These volcanoes release water through two backlit waterfalls on its way to the lake. Trains pass behind the falls on their way from the trestle.

Townsfolk can "take the waters," for either recreational or medicinal purposes, at Chameleon Caverns Mineral Springs. Brick hot tubs constructed along the hillside supplement the natural pools and falls. All of the water features utilize low voltage, ultrasonic misting units that produce both dramatic smoke-like mist and lighting at night.

The garden is detailed with over 60 structures, 300 people and animals, cars, motorcycles, and more. Structures are a combination of scratchbuilt, modified kits, and purchased wooden buildings. Many of the wooden buildings are now being swapped for modified plastic structures. My current construction method of choice, used on several structures and features, is hydraulic cement, sifted dry over Styrofoam or a covered wire armature, then misted to form a waterproof shell (see April 2011 *GR*).

The major urban area is Tortoise Town, with structures named for their reptilian counterparts. When sheriff Chuck Walla isn't getting a soda at Dragon Lizard Drugs, he may be getting a haircut at Cooter's Clip Joint or calling on Ms. Lizzie at Collared Lizard Clothiers. The Lounge Lizards jazz band is featured entertainment in the town circle. Tegu Terrace, located in Komodo Korners, includes a red-light district and is next to the Bear Whiz Beer Brewery and hot-air-balloon launch facilities. All buildings and major structures have lighting for night operations.

Making it work

The landscape covers about 1,200 square feet, with 600 feet of Aristo-Craft and LGB track and six bridges, including a 14-foot-long trestle. Eighteen LGB 1600-series and three Aristo-Craft five-foot-radius turnouts allow as many as seven trains to navigate the landscape simultaneously. Most track is sectional, with curves a

A partial listing of plants on the Tortoise & Lizard Bash Railroad

Orange County, CA
USDA Hardiness Zone 10a

MINIATURE TREES AND WOODY SHRUBS

Boxwood
Buxus microphylla
St. John's wort
Hypericum aegyptiacum
Australian tea plant
Leptospermum scoparium
Dwarf myrtle
Myrtus communis 'Compacta'
Dwarf pomegranate
Punica granatum 'Nana'
Snowrose
Serissa foetida (assorted varieties)
Oregano thyme
Thymus vulgaris 'Oregano'
Hokkaido elm
Ulmus parvifolia 'Hokkaido'
Seiju elm
Ulmus parvifolia 'Seiju'

DWARF CONIFERS

Boulevard cypress
Chamaecyparis pisifera 'Boulevard'
Dwarf Japanese garden juniper
Juniperus procumbens 'Nana'

GROUNDCOVER

Chamomile
Anthemis nobilis
False heather
Cuphea hyssopifolia 'Chiquita'
Dymondia
Dymondia margaritae 'Silver Carpet'
Baby tears
Helxine soleirolii
Corsican mint
Mentha requienii
Lemon thyme
Thymus × citriodorus
Creeping thyme
Thymus praecox
Woolly thyme
Thymus pseudolanuginosus
Dreadlock thyme
Thymus rasta jamaciia
Mother of thyme
Thymus serpyllum
Garden thyme
Thymus vulgaris
Society garlic
Tulbaghia violacea

5. An old SP FA hauls a short freight train across the 14' trestle over the lake. Compact dwarf myrtle trees (top) thrive in this area.

6. The volcanoes' fury, photographed at night. Effects are produced by ultrasonic misters combined with dramatic lighting. Even the Silver Carpet groundcover adds to the smoky-lava-field look.

minimum of four feet in radius. All rail joints use wire jumpers, with no failures since the railroad was installed.

Electrically, the railroad is separated into 23 blocks, each accessible by three Aristo-Craft Train Engineers (TE). Some blocks include switching that allows trains to run at reduced speeds or park, enabling that TE to be used to control an engine elsewhere.

A 16.5V, 16.5-amp transformer handles the AC for the turnout motors and features involved in the automatic operation. A similar transformer, located in the garage, is used for the lighting, including the volcanoes. Power for the pumps and misters is also taken from the garage, using a GFI receptacle. One of the pumps automatically drains the lake after the watering cycle so as not to leave standing water.

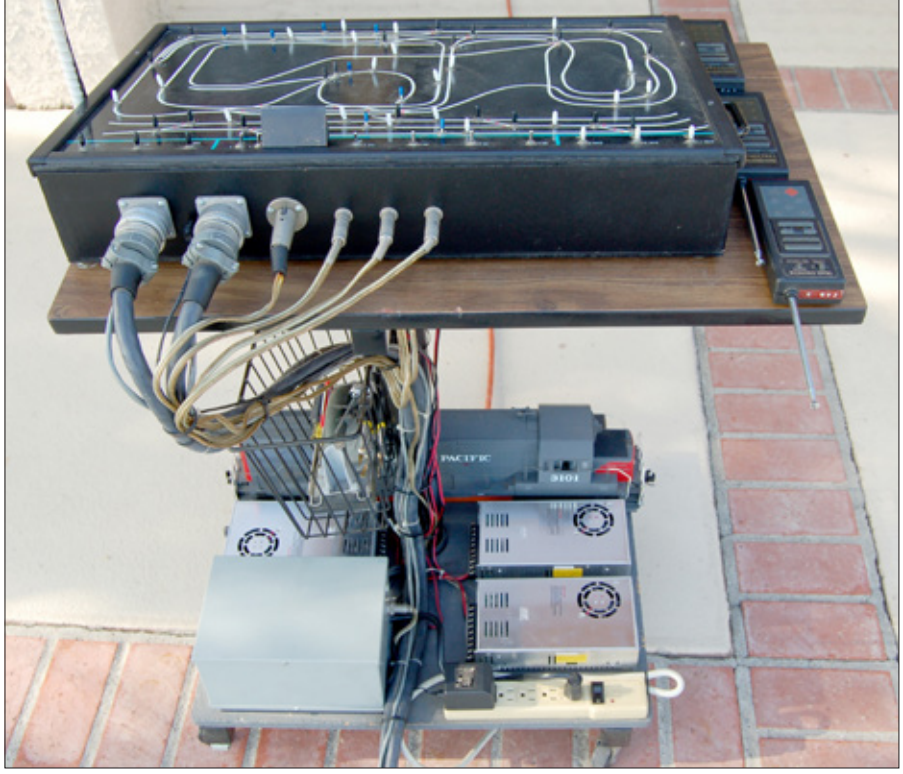
The control panel includes several features that make the operation of seven trains possible. Three reversing units are built in and can be applied to any or all three of the "cabs." Because all spurs are protected by diodes, trains will automatically run point-to-point between any two opposing spurs, simply by selecting the reverser option for that cab, aligning the turnouts and setting the blocks accordingly.

Another switch controls the automatic operations. This sends AC current that activates the "leap frog" operation at the Tortoise Town Station, trains slowing and/or waiting at the service facility, key "diode-protected" blocks along the mainline and sidings, and an MP3 sound system that produces the sounds of station activities in the station and service activities in the water tower. A three-minute sound loop was prepared using the downloadable Audacity software. Sounds are triggered by the inbound trains and the player will restart the loop randomly from any of 10 different places (i.e., 30 second increments) so as not to become "stale."

The panel also includes convenience features. Each of the three cabs may be shut off or its current reversed, regardless of the setting on its TE. Bipolar LEDs indicate the direction of current to the rails regardless of the panel/TE setting. The panel also includes a digital volt meter that can sample any of the three cabs' outputs. Finally, the panel includes a diode matrix that allows groups of turnouts to be operated with the push of a single switch. These switches set various routes or reset the turnouts (as many as 20 at once) to default positions.

7. The thyme always seems tastier across the river near the cattle ranch in this bucolic scene. Taller trees are pruned for airiness to open the scene and let in light.

Trains run either fully automated for open houses or hands-on for operating sessions. The automation system is of my own concept, design, and construction, using 555 timing chips and relays to control the blocks and activate the turnouts. This allows the trains to pause and wait for each other as necessary. Automated signals accompany these train movements. Inevitably, someone at an open house asks, "How do you run the trains by computer?"



This control center, designed and built by the author, allows a wide variety of operational possibilities on the railroad. Two 24-pin connectors at the track and an extension cord allow for quick disconnection and storage of the entire electrical assembly in the garage.

The trains

When I first put in the railroad, I was enamored of the steam engines. We have a Bachmann Shay, *Lyn*, Consolidation, and industrial Mogul, none of which get regular run time. One of a pair Aristo-Craft C-16s is still used to shuttle bathers out to the hot springs on a regular basis, and a Hartland 0-4-0 pulls the Low-rider Train. An Accucraft Galloping Goose or Aristo-Craft railbus may be seen on the run from the station to the lake.

However, all of the heavy work is now performed by diesels. Two Aristo-Craft FAs (one with an on-board TE/battery) and an FB may be found out on the line hauling freight. A USA Trains F3 typically hauls the heavyweight Daylight consist, while a couple of GP-9s also work freight duty, including the Bear Whiz Beer train. An Aristo-Craft RS-3 and USA Trains NW-2 and S-4 may be seen moving freight between Tortoise Town and Lizard Lane. USA Trains 44-tonners serve the mine and stamp mill.

Finally, an Aristo-Craft U25B has been modified to serve as a track-cleaning engine, with the addition of an articulated drywall sander between the trucks. The engine runs on either a 12-volt battery, to get the cleaning process started, or track power, once the rails are clean enough to keep the engine going.

Many of the engines and freight cars were weathered using an airbrush, and some of the engines include Sierra sound and auxiliary lighting. I replace the batteries with super capacitors, negating the need to ever charge them again.

Humble beginnings

To think that all of this began in the fall of 1996! While strolling through the Great American Train Store, we happened upon the large-scale equipment. I picked up Robert Schleicher's *The Large-Scale Model Railroading Handbook* and showed it to my wife, Linda. We decided it was pretty cool and we purchased the handbook and a copy of *Garden Railways* magazine.

I planned the railroad on graph paper and in January 1997 and ordered track and turnouts. Ground was broken in April and we had our first open house in October. Of this six months, a month was spent building the control panel. Track was laid out in three interconnected loops, allowing three trains to run simultaneously, if the operator remained observant of doings at the 30-degree crossing between two of the loops.

Over the next few years the railroad was expanded. I discovered the use of 555 chips and relays to control the blocks and began designing circuits to alleviate the problems at the crossing and allow several trains to run simultaneously.

The railroad now enjoys a following. We have three to six open houses per year for railroad events, garden clubs, club meetings, and the neighborhood. Additionally, we run operations here with one of the local groups a couple times a year.

While I enjoy running the trains and talking with visitors, working on the railroad and creating challenging new innovations is what brings me satisfaction of achievement.

About the author

Todd Brody is a self-employed Scientist/Environmental Specialist with a degree in Environmental Biology. As an independent consultant, he regularly prepares both noise and air-quality studies in support of Environmental Impact Reports and has worked in the environmental consulting field since 1978.

As a child, he had both Lionel 0 and Marx HO sets, and always had a fascination for trains. The garden railroad gives him a chance to collect his thoughts while contemplating his next project. He has been Vice President of the Orange County Garden Railway Society since 2000. Other hobbies include classic Corvettes and high-end audio.