Run 231 October / November 2008

O GAUGE™ RAIL-ROADING

SPECIAL ISSUE
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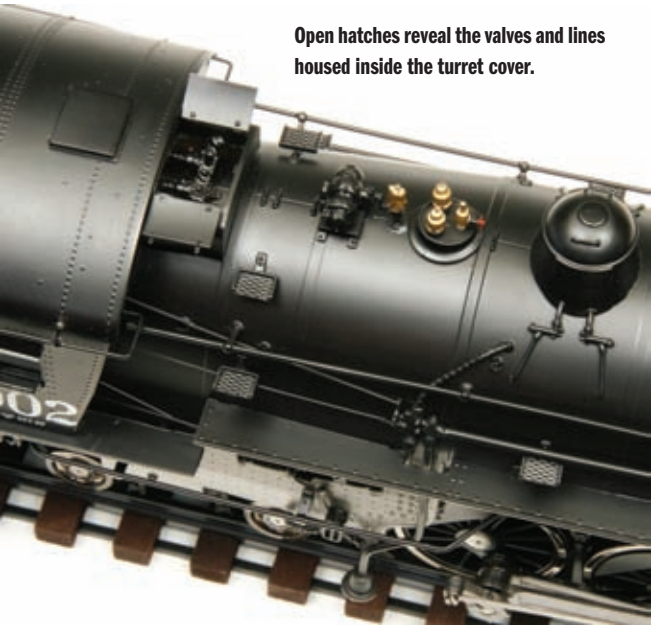
3rd Rail Southern Pacific 4-6-6-2 Class AM2

Review and Photos by George Brown

Southern Pacific's 12 Class AM2 (articulated Mogul) cab forwards of the 1930s were single-expansion, simple articulateds with a 4-6-6-2 wheel arrangement. However, Baldwin originally built them in 1911 as Class MM2 (Mallet Mogul) 2-6-6-2 double-expansion, compound Mallets for passenger service through the Sierra Nevada mountain range. Distinctive characteristics of these early cab forwards included their flat-faced cabs and external high-pressure steam pipes from the smokebox to the front engine's cylinders. Trailing these locomotives were the exclusively SP and exceptionally homely half-round "whaleback" oil tenders.

Soon after the MM2s started working passenger runs, tracking problems at speed resulted in frequent derailments of the two-wheel pilot trucks, and worse. Rebuilding the locomotives to four-wheel pilot trucks solved the derailment problem, but arrival of the faster and more efficient 2-10-2s quickly relegated the MM2s to freight duty. In the mid-1920s, all 12 of the small cab forwards were set aside.

In 1929, SP's Sacramento locomotive shops rebuilt three of the 4-6-6-2 cab forward Mallets into simple articulateds with sport cabs, which became the road's first Class AM2s. The remaining nine derelicts languished until the mid-1930s when they too exited SP's shops as AM2s. All 12 of the rebuilt and reclassified AM2s worked heavy freights through the WWII years between Eugene and Portland, Oregon, but were dismantled soon after the war ended.



Open hatches reveal the valves and lines housed inside the turret cover.

Construction and Features

The all-brass 1:48 scale model of the AM2 from 3rd Rail is the first of its type in O gauge. I can state unequivocally that even for a cab forward, it's different. But on the rails, the 4-6-6-2 looks downright natural at the head of a train of steam-era freight cars, especially a consist of 1:48 scale wood sheathed boxcars and reefers, with a few steel cars mixed in for visual spice. Other than driver diameter, I don't have any dimensional information to check the 3rd Rail model against, but my caliper micrometer showed the drivers slightly larger than the 63″ of a full-scale AM2. To me, this scale discrepancy of approximately 0.0024″ isn't all that significant. Overall, the 3rd Rail model measures 27″ (scale 108′) across the coupler knuckles, but this measurement includes the long drawbar necessary for running the locomotive on tight curves and also the oversized tinplate coil coupler.

Our evaluation AM2 with cab number 3902 wore SP's post-WWII trim, with silver paint on the front for visibility and Southern Pacific in large lettering on the tender. At this writing in June '08, cab number 3907 is also available in postwar markings, and number 3900 is decorated in SP's prewar trim. Prewar engines lacked the silver paint on their fronts while lettering on their tenders stated Southern Pacific Lines. Additionally, the cab front details on 3rd Rail's postwar and prewar versions of the AM2 differ slightly from each other.

As with previously released 3rd Rail locomotives, the AM2 is hand-built from sheet and bar stock brass. Low relief details, such as rivets on the cab, bolt heads on the firebox, and woodgrain planking on

Southern Pacific's exclusive and unusual "whale-back" tender wears the road's post-WWII lettering. Tenders for 3-rail track have a truck-mounted, coil-operated coupler.

the tender, are photo-etched into the sheet brass before assembly. The numerous separately applied details, like boiler backhead gauges and valves, classification and marker lamps, air pumps, generator, and so forth, are lost wax castings. Various sizes of brass wire serve as handrails and plumbing that often fit into cast fittings and unions.

A flywheel-equipped 9000-series Pittman motor powers all 12 drivers through 3rd Rail's inimitable Quiet Drive mechanism. Except for the toothed polyurethane timing belt and matching plastic drive pulleys, the entire drive mechanism is metal with steel drive shafts that run in ball bearings, steel worm gears, bronze axle gears, cast gearboxes, and a machined steel universal joint between the front and rear engines.

Two painted figures ride in their respective crew stations inside the illuminated cab and behind glazed windows. Soft white incandescent bulbs light the headlight, number boards, and directional backup light. At both ends of the AM2, LEDs illuminate the green classification and red marker lamps.

All six driver axles run in sprung journals while realistic articulated side rods allow independent vertical movement of each axle. Other operating features include opening cab roof vent, cab doors, and turret cover hatches. A hinged step plate between the rear platform and tender visually fills the wide gap between the locomotive and tender as well as partially hides the tether wires and plug. This 8-wire tether cable connects the tender-resident Lionel TrainMaster Command Control and Train America Studios Engineer-On-Board electronics to the locomotive's motor, lights, and TAS Turbo Smoke unit. RailSounds 4.0 electronics and speaker also reside in the tender and reproduce Lionel's generic repertoire for a simple, single-expansion articulated, which includes an automatic bell ringer and the hooter whistle of N&W fame. Controls for the command and sound systems are hidden under the opening water hatches.

For conventional transformer-controlled operation, 3rd Rail thoughtfully includes a factory-installed 9-volt alkaline battery. This battery provides RailSounds backup during power cycles for direction control but is not necessary in command operation. For running the AM2 exclusively in command operation, I recommend removing the battery. Even though alkaline batteries are a vast improvement over the acid dry cells of years ago, I have seen depleted alkaline batteries leak and make a mess, or worse.

From an overall perspective or close-up, the AM2's paint and lettering is about as flawless as a manufactured model can get. My only ding of an otherwise magnificent model is the bright finish on the wheels and driver rims. I initially took exception to the pilot truck, but upon studying the real AM2s' inside frame pilot trucks in old photos, they too were unusually plain, exposed, and … well ... ugly.

Speaking of ugly—that has been my impression of the SP whaleback tender for years. When Scott Mann, president of Sunset/3rd Rail, contacted me about reviewing the AM2, I was a bit concerned about how I would deal with its tender in my review. But a few weeks later with the cab forward just unpacked and sitting on my desk, I suddenly realized its tender wasn't ugly at all. In fact, I found it rather intriguing. After a few moments looking at the locomotive and tender from my elevated perspective rather than the low views in photos taken at trackside, I understood. Its half-round tank superstructure, the wood-planked decking around the oil tank cap and water hatches, the high-low handrails, the backup light, the catwalks along the sides of the tank, the steps up to the decking—all these components made for a handsome and visually striking industrial design of maximum utility and strength. All things considered, I now see the SP whaleback tender as rather handsome in its select way.

Slide switch under the cab selects steam exhaust chuff rate. Pilot details include the coupler cut lever and link to the scale dummy coupler.

Fluted main and side rods complement the complete Walschaerts valve gear and other details such as the brake shoe hangers and boiler plumbing. The vent on the cab roof swings open or closed.

At Trackside

Most scale articulateds are long and even those engineered for 3-rail operation usually need a

minimum curve of O72, but not so with the AM2. It is advertised as an O54 engine or 48″ minimum radius for 2-rail models. When running in either direction around three of my four O54 curves, the 4-6-6-2 performed well but naturally looked a bit awkward in these tight curves. But in the fourth and slightly tighter curve, a driver flange scraped against the articulated steam exhaust pipe that's underneath the smokebox.

On O72 or wider curves, the cab forward was in its element with smooth and faultless operation over a cumulative eight-plus hours of running, even through my modern-era Lionel O72 turnouts. I was also pleasantly surprised with the moderate amount of cab and boiler overhang on my O72 curves. For an articulated, the AM2 is not a particularly large locomotive, so it looked great on my small layout.

My only operational criticism is with the EOB motor driver electronics. At low speeds, rapid electrical pulses do an excellent job of running the motor at a precise speed with exceptional torque. But these pulses also create an inherent audible resonance from the motor that starts as a growl and transitions to a whine of increasing pitch but decreasing intensity as speed increases. Fortunately, with RailSounds volume at maximum, the steam exhaust chuffs pretty much drowned out the resonance.

While I'm on the topic of sounds, exhaust chuffs are switch-selectable at two or four per driver turn, and I ran the 4-6-6-2 exclusively with the realistic four chuffs. Cams on the rear driver axle and a corresponding pair of micro switches trigger the chuffs, and all these components are adjustable, if necessary, for evenly spaced chuff sounds.

As with most model articulateds, some of the boiler and motor weight rides on the fixed engine's drivers. A roller-equipped saddle between the boiler and the swinging engine realistically loads the rest of the boiler weight on that engine's drivers. Between weight of the boiler and motor, distribution of this weight across all 12 drivers, with rubber traction tires on four of them, the AM2 proved to be a prodigious puller. A low final drive ratio contributed to the locomotive's high tractive effort and also limited its maximum speed, which was still greater than the real AM2 could run.

At the End of the Run

Since each AM2 is a hand-crafted brass model, no two locomotives are identical, which is part of its charm. I thoroughly enjoyed my time with this smooth-running and well-detailed scale model of one of SP's early cab forwards. For the Southern Pacific steam aficionado, the 3rd Rail AM2 could be an incomparable addition to your locomotive roster.

Southern Pacific 4-6-6-2 Class AM2

Retail price $1,799.95 at 3rd Rail or 3rd Rail dealers

3rd Rail; 408-866-1727; www.3rdrail.com

3rd Rail Southern Pacific AM2 Performance

(smoke unit: off; sound: on; speed control: on)

Weight on Driving Wheels: 7 lbs, 3 oz

Tender Weight: 2 lbs, 1 oz

Distance Between Pickup Rollers:
1st and 2nd: 5″
1st and 3rd: 18-1/4″

Tractive Effort @ 18 VAC: 4 lbs, 6 oz @ 5.8 A, 104.4 W

Minimum Sustained Speed @ 18 VAC: 3 scale mph @ 1.8 A, 32.4 W

Maximum Tested Speed @ 18 VAC: 57 scale mph @ 1.9 A, 34.2 W

Test Train
15-car mixed freight; train weight 13 lbs; pull to move train 7 oz; recent-production O scale cars from various manufacturers

Three pickup rollers help to provide continuous electrical power in long switches or crossovers.