

The Bulletin



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The Bulletin

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Strasse
5/5/2019
Jeffrey Erlitz photograph

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A New Jamaica
and the Main
Line Complete
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7 TRAIN GETS AUTOMATIC TRAIN OPERATION

The following is from a press release issued by the Metropolitan Transportation Authority:

On May 9, MTA New York City Transit announced that it completed this week the implementation of "Automatic Train Operation," a technology that helps enable faster and more reliable service, on the Flushing 7 Line in Queens. It is the second such line in the system, after the L line. This news comes just months after the introduction of a modern, computerized signaling system called Communication-Based Train Control (CBTC) on the line that has already led to dramatic increases in on-time performance and other metrics associated with good service. Automatic Train Operation (ATO) is expected to further improve customer commutes on the line.

Under manual train operation, individual Train Operators with varying degrees of experience and confidence control the rates of speed including braking and acceleration.

Under ATO, the train is programmed to automatically provide optimal acceleration, braking, and cruising speeds, providing more regular and evenly spaced service and smoother, faster trips. Operators continue to instruct the train to depart a station, make sure that tracks are clear throughout the ride, and control emergency braking in the case of obstacles.

Our notes on ATO: When ATO is unavailable due to the presence of personnel on the track or for technical reasons, full CBTC protection and train spacing is also available under the ATPM (Automatic Train protection Manual) mode if all else is working properly. Under ATPM, the Train Operator is provided a maximum recommended speed which appears on a speed dial. Trains (if both are CBTC-equipped) can still close in to a distance of 25 feet behind the previously sched-

uled train in either ATO or ATPM mode, although the speeds reached under ATO are higher. There are other modes of operation for overcoming problems which space does not permit providing.

And now some comments from ERA member Max Diamond:

This is a momentous occasion. The reliability and resilience of the 7 line has certainly improved, although I will miss the once-ubiquitous US&S style R-2 signals that were used on the Flushing Line. The only location where these signal heads remain in service now is 239th St Yard.

One thing to look out for is the level of ATO availability going forward. I ride the 7 regularly and make a point of looking out the front cab door window to watch the Train Operator's Display to see what mode the train is operating in. I frequently see trains in ATO now, but I also often see instances in which ATO is not available in areas where there are no personnel on the roadbed. For example, on May 9 I observed ATO being unavailable for the entire stretch between Vernon-Jackson Ave and 61st St.

Given the tangible capacity/running time benefits of ATO operation, the goal should be to maximize the rate of ATO availability, ensuring that it is only unavailable in work zones. My hope is that NYCT will be tracking and reporting the rate of ATO availability, along with reasons for unavailability, for each station-to-station segment of all CBTC lines, as an operational metric.

I also think we should be publishing a "speed map" of each segment of the subway system, which would transparently show running times, and associated changes over time. I believe something like this exists internally, although I am not sure of how comprehensive it is.

THE GENESIS OF DASHING DAN — A NEW JAMAICA AND THE MAIN LINE COMPLETE by George Chiasson (Continued from May, 2019 issue)

GRADE SEPARATIONS IN QUEENS AND THE JAMAICA CENTER STATION FIASCO

Months before the new Jamaica station's opening, passenger confusion and its resultant castigation ensued, especially with regard to the new facility's "great distance" from the older stop's more centralized location, a circumstance which was suddenly (if not coldly, given the time of year) exposed to the riding public. This view was shared by the press and persons of prominence in the Jamaica community as well, most notably the many merchants along the Jamaica Avenue corridor who were suddenly faced with virtual isolation from the railroad, and a potential denial of the tremendous amount of foot traffic that "Old" Jamaica Station generated for their various establishments. As this rancor manifested itself into the potential for legal action against the railroad (likely a perceived threat before the new station was opened for use), negotiations aimed at a public redress commenced and would serve to temporarily sidetrack the issue. By the time the new station was ready to open in March of 1913, a case had been made between interests in the Jamaica business community and the Long Island Rail Road for a more appropriate accommodation in place of the "Old Jamaica" station, and the company acquiesced. By the March 9 inauguration, a set of hastily-devised, rather crudely-built, high wooden platforms with waiting rooms and shelters were installed on top of the North Siding and Montauk Number 1 between the Union Hall Street overpass and the grade crossing at New York Avenue, being christened "Union Hall Street" station when opened concurrent with the new Jamaica facility. It was initially used by extended trips of the LIRR's rapid transit service and some Hempstead Locals, then became even better served after a February 2, 1914 PSC decree that at least 12 additional local trips from Brooklyn be extended to Rockaway Junction. In reality, patrons for the most part were still required to "*schlep*" the short distance by train or on foot to the new Jamaica station for connections around the system.

Jointly, the construction of a long underpass at the Maure Avenue (130th Street) crossing was also undertaken over a two-year period between 1912 and 1914. This "underjump" was common to the Montauk and Atlantic Divisions and supported a slight realignment of the Montauk main line to the north as it approached the new "J" Interlocking. This aided in the elimination of its grade-level convergence with the Atlantic Division main line, as originally established by the South Side and Brooklyn & Jamaica Railroads in 1868 at "MP" (formerly Tower 67). Installation of the new brick tower at "MP" (Dunton) that was begun as part of the Van Wyck Avenue grade crossing eliminations in 1912 was not

completely operational until January 20, 1914. The new Maure Avenue underjump was finally completed around the same time, along with an entirely new Atlantic Division local (rapid transit) station at Dunton which consisted of two high platforms on the new elevation served by Atlantic Division Tracks 3 and 4. The station was guarded by an equally prominent depot building attached to the south (outbound) side which looked in many ways like a smaller brick and stone replica of the new Jamaica facility, though outfitted with a pair of tile-roofed canopies over the ticket windows and waiting room entrance. In turn the temporary platform sitting on the alignment of Atlantic Division Track #1 under the Montauk Division and eastbound Main Line flyover at Van Wyck Avenue could at last be removed and this last piece of track approaching the new station finally completed.

Also associated with the new Jamaica Station project was the installation of overpasses on the "outer" (eastward) portion of the Atlantic Division main line, generally referred to as the "Old Southern Road" in recognition of its origins apart from the original LIRR company. In what would become a common strategy as the railroad was expanded and improved in many places, the first three crossings encountered by this line after it diverged from the Main Line at "JE" (Hall) Interlocking were replaced by a 960-foot steel and concrete viaduct from Beaver to South Streets (now Beaver and South Roads). This supported the concurrent widening of Catherine Street (then a modest side road) into an extension of Liberty Avenue, which until this project was completed in 1914 ended at the Rockaway Turnpike. At South Street (where a station was later added in 1916) the outer end of the Atlantic Division ramped back to ground level and stayed there all the way to Springfield Junction, being peppered with 17 grade crossings en route that would ultimately last another 45 years or so.

As alluded to above, Holban Yard was literally bisected in November, 1912 due to an unfavorable legal judgment regarding local land conflicts and access. A topographic resolution was then pursued rather hurriedly and what developed beginning in 1914 was the so-called "Holban-Hollis Elevation." This called for the raising of Main Line and yard trackage at Hamilton Avenue by approximately 10 feet off grade level, with counter-depression of the underlying street by about 5 feet to create a maximum vertical clearance of around 12 feet at the center of an arched concrete passageway. This was about as large as could be functionally expected in that time given typical vehicle sizes; it also subscribed to the clearances provided through most of the "underjumps" built with the new Jamaica Station. By the

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The Genesis of Dashing Dan

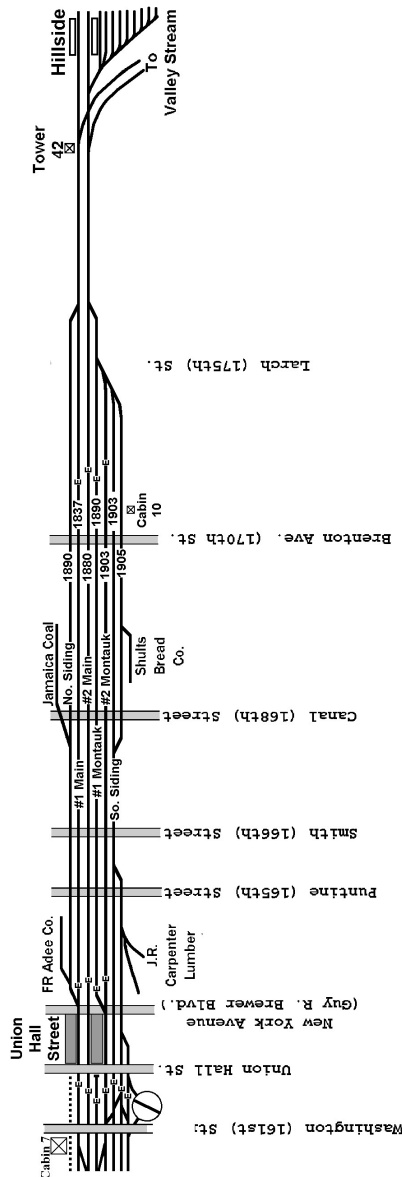
(Continued from page 2)

first half of 1915 the Main Line (then consisting of two tracks plus the electrified “holding track” for Holban) was placed on its overpass at Hamilton Avenue (183rd Street) which would ultimately be widened further for the raised tracks in Holban Yard. The necessity of establishing a gentle approach at either end of this new overpass resulted in permanent closure of the Carroll Street (182nd Place) grade crossing to the west and the simple elevation (*not* the reconstruction) of the Hollis station to the east. In addition the existing grade crossing at Old Country Road was replaced by another counter-depressed overpass, while the streets were concurrently realigned and Old Country Road itself became an extension of Hollis Avenue. The three LIRR tracks

ramped back to original grade level immediately after passing through the interlocking at “IS” Tower, but an abrupt new overpass was also added to extend Iroquois Avenue (195th Street) across the Main Line onto Atlantic (99th) Avenue Elevation and expansion of the freight yard and completion of the Hamilton Avenue underjump commenced in the second half of 1915 (probably August), with the overall project completed as of August 6, 1916. By that time Holban once again was made whole, but not necessarily “complete” in the contemporary sense, with even more tracks and facilities being added in later years. Of themselves, these improvements were intended as a lead-in to a larger, municipally-sanctioned expansion and elevation of the right-of-way, but World War I would serve to deny this objective for several years and so remained the Holban-Hollis Elevation in its initial form.

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New Jamaica-East
 March 1913 August 1913
 July 1913 March 1914



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SUBDIVISION “A” CAR ASSIGNMENTS
CARS REQUIRED MAY 9, 2019

| LINE | AM RUSH | PM RUSH | LINE | AM RUSH | PM RUSH |
|------|-----------------------|-----------------------|-----------------------------|-----------|-----------|
| ① | 10 R-62, 300 R-62A | 10 R-62, 300 R-62A | ⑤ | 350 R-142 | 360 R-142 |
| ② | 360 R-142 | 350 R-142 | ⑥ | 370 R-62A | 370 R-62A |
| ③ | 260 R-62 | 260 R-62 | ⑦ | 418 R-188 | 407 R-188 |
| ④ | 170 R-142, 180 R-142A | 170 R-142, 160 R-142A | ⑧ (42 nd Street) | 10 R-62A | 10 R-62A |

SUBDIVISION “B” CAR ASSIGNMENTS
CARS REQUIRED APRIL 29, 2019

| LINE | AM RUSH | PM RUSH | LINE | AM RUSH | PM RUSH |
|------|--------------------|----------------------------|--------------|-----------------------------|-----------------------------|
| Ⓐ | 70 R-32, 248 R-46 | 70 R-32, 256 R-46, 8 R-68A | Ⓘ | 184 R-143, 8 R-160 | 184 R-143, 8 R-160 |
| Ⓑ | 48 R-68, 152 R-68A | 40 R-68, 144 R-68A | Ⓜ | 184 R-160 | 176 R-160 |
| Ⓒ | 72 R-32, 72 R-179 | 64 R-32, 72 R-179 | Ⓝ/Ⓞ | 24 R-68, 8 R-68A, 290 R-160 | 24 R-68, 8 R-68A, 290 R-160 |
| Ⓓ | 232 R-68 | 224 R-68 | Ⓟ | 210 R-160 | 8 R-68, 210 R-160 |
| Ⓔ | 260 R-160 | 260 R-160 | Ⓠ | 240 R-46 | 240 R-46 |
| Ⓛ | 96 R-46, 320 R-160 | 96 R-46, 320 R-160 | Ⓢ (Rockaway) | 12 R-46 | 12 R-46 |
| Ⓜ | 52 R-68 | 52 R-68 | Ⓣ (Franklin) | 4 R-68 | 4 R-68 |
| Ⓝ/Ⓞ | 90 R-160, 64 R-179 | 90 R-160, 64 R-179 | | | |

THE R-42 AT FIFTY YEARS: A RETROSPECTIVE
by Alexander Ivanoff

May 9 marked the fiftieth anniversary of the entrance of the R-42 class of subway cars into service on the New York City subway. The R-42s entered service on the **N** train as part of a mixed train of modified R-40s, which they resembled externally and with which they frequently ran. Until the construction of the R-143 class, the R-42s were the last 60-foot New York City subway cars and were the first fully air-conditioned fleet. Only half of the R-40s were air-conditioned, including the 100 modified cars.

In his book *They Moved the Millions*, Ed Davis finds the R-42s to be essentially modified R-40s on the outside, but “the stainless steel siding below the window level had a wider fluting than used on the R-40, and the neat semicircular groove just below the window level was done away with.” One noticeable change with the R-42s was the use of solid-state converters rather than a motor-generator, for charging the low-voltage batteries for control power. Originally the cars were smooth-fronted like the M-1 commuter cars, but once the R-1 to R-9s were retired, pantograph gates from those cars made it on to the fronts, with a similar treatment given to the modified R-40s. The R-42 cars were the last without the distinctive first two notes of the Westminster Quarters played when the doors close that are found on all cars built since the R-44s.

Eric Oszustowicz’s article from [the August, 2005 New York Division ERA Bulletin](#) details early (though not the first) car rosters and assignments for the R-42 fleet. The January 5, 1970 “B” Division car assignment showed the following:

| NUMBERS | LINE |
|-----------|------------------|
| 4550-4583 | N |
| 4584-4695 | A, AA, B |
| 4696-4807 | CC, D |
| 4808-4851 | RR |
| 4852-4887 | QB, QJ |
| 4888-4923 | KK, LL, M |
| 4924-4949 | E, F |

The April 8, 1971 assignment was identical to the one from the year before.

From 1988-9, the R-42 fleet was sent out for General Overhaul (GOH), with cars 4550-4839 being done by Morrison-Knudsen in Hornell, New York. Cars 4840-4949 were done in-house at Coney Island. Unfortunately, the in-house cars were not done very well, with one of the cited reasons being that the shop was being rebuilt while the cars were being rebuilt. The in-house

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The R-42 at Fifty Years: A Retrospective

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cars were withdrawn from service first. The Coney Island-rebuilt R-42s also kept their original controllers and blue door indicator lights at the ends of the cars. Those indicator lights were removed with the Morrison-Knudsen rebuilds.

The R-42 assignments over the years have varied. In the late 1970s, they could be found on the AA(B, J), LL, (M), and RR. However, historical car assignment guides noted that the counts included the 100 modified R-40s. A 1984 New York Division *Bulletin* shows very similar assignments. By the end of that decade, the fleet was all but confined to the BMT Eastern Division routes (J/M/L/Z) trains, a pattern which lasted through the mid-2000s. Exceptions were made for bridge work and major shutdowns.

Sometime in 2005, a set appeared on the (W) and later the (N). During the retirement of the R-38 and R-40 types, the R-42s could be found on the (A, E, F, R, and V). Beginning in late 2007, the R-42s slowly started to be retired with the introduction of the R-160 fleet. During their final years en masse, the fleet moved around several times, with units based out of several yards. By the summer of 2008 only about 260 remained, by the summer of 2009 only 200, and by the spring of 2010 this number was down to 50. Originally, the R-42s were to be completely replaced by the R-160s, but as noted in the March, 2010 *Bulletin*, concerns with the NYCT R-44s' structural integrity put a hiatus on the retirements of the R-32 and R-42 fleets. The November, 2010 *Bulletin* noted that R-44 retirements were delayed during the summer of 2010 due to

air conditioning issues with the R-32s. As manufacturing and delivery delays persisted with their replacements, the R-179s, the retirement of the R-42 fleet was further pushed back.

The April 26, 2019 car assignments were the first to show the R-42s as not assigned during rush hour, but I have seen on social media that a train of R-42s still operates during rush hour on the Z. With the eleventh-hour changes to the Canarsie tunnel shutdown making rush-hour service modifications unnecessary, it is very likely that the R-42s will run their final revenue miles later this year.

Happily, several R-42s are preserved. These preserved units include modified R-40 4460 and R-42 4665, a married pair made up of two cars whose mates were retired after collisions, and unit 4572-3, featured in the 1971 movie *The French Connection*. In addition, cars 4736 and 4737 reside at Transit Tech High School, allowing a future generation of transit professionals to gain practical experience in the field and experience a venerable car type. (Special thanks to David Ross, Eric Oszustowicz, and Jeffrey Erlitz for assistance in writing this article, and the author's mother, Laura Baci-Clark, for some final editing and encouraging the author's love of electric traction.)

Personal anecdotes from Alexander Ivanoff: I remember seeing R-42s going by on the Jamaica "L" as a kid, oddly enough finding comfort in the loud bang of the subway cars operating overhead. However, the only rides I had on the R-42s was when they were migrated to Jamaica Yard, as we almost never used the Jamaica "L," preferring the Q37 (ex-Green Lines) bus to Kew Gardens-Union Turnpike, where we could catch the (E/F) trains.



R-42 4614 in Canarsie Yard, June 8, 2002.

Jeffrey Erlitz photograph

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The R-42 at Fifty Years: A Retrospective

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And now a selection of photographs showing the R-42 class from entry into service to present:



New R-42 cars at 57th Street-Sixth Avenue, July 27, 1969. Cars 4584-4695 would operate on the AA and **B** through the 1970s and early 1980s and also on the **A** until early 1977. Four-car AA trains would be combined to make an eight-car **B** train during rush hours. AA trains did not operate in the rush hours when **B** trains were extended to 168th Street.

Steve Zabel photograph, Eric Oszustowicz collection



4701 leads a train at Neck Road, September 12, 1970. Cars 4696-4807 would eventually be assigned to the **D** until the early 1980s. R-40Ms 4450-4549 would join this fleet in 1977. This combined 212-car fleet along with about half of the R-44 fleet would provide most **D** service during the late 1970s.

Steve Zabel photograph, Eric Oszustowicz collection

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The R-42 at Fifty Years: A Retrospective

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A southbound LL train at E. 105th Street on January 2, 1971. Pantograph gates have yet to be installed. By the mid-1970s, R-42 cars 4852-4949 would be assigned to East New York. This assignment would hold until the early 1980's. Upon rebuilding, all R-42s would be operated out of East New York until the arrival of the R-160s.

Steve Zabel photograph, Eric Oszustowicz collection

R42s 4924-49 were assigned to the **E** and **F** during the early 1970s. 4947 is seen here at Coney Island Yard on September 13, 1971. The sharp-eyed reader will notice that the car is "mated" to 4904, not 4946. Eventually, this would be rectified. By 1977, this group of cars would be assigned to East New York Yard and the 4900-series cars would receive small-profile roll signs.

R42s 4924-49 were assigned to the **E** and **F** during the early 1970s. 4947 is seen here at Coney Island Yard on September 13, 1971. The sharp-eyed reader will notice that the car is "mated" to 4904, not 4946. Eventually, this would be rectified. By 1977, this group of cars would be assigned to East New York Yard and the 4900-series cars would receive small-profile roll signs.

Steve Zabel photograph, Eric Oszustowicz collection



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The QJ operated from 168th Street-Jamaica to either Brighton Beach (initially) or Coney Island and operated from Monday, November 27, 1967 to Friday, December 29, 1972. By 1970, cars 4852-87 would carry QB & QJ signs. Initially, lower numbered cars carried these signs, but that is a long story. This photo at Sheepshead Bay was taken on June 28, 1972.

Steve Zabel photograph, Eric Oszustowicz collection



A southbound Culver Express is speeding through the Bay Parkway station on July 18, 1972 with car 4938 on the north end. By the late 1970s, R46s would take over most runs on the F Line and remain as such until the arrival of the R160s.

Steve Zabel photograph, Eric Oszustowicz collection

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The R-42 at Fifty Years: A Retrospective

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A southbound **A** train at Broad Channel on September 9, 1972. The **A** would share cars 4584-4695 with the AA and **B** until 1977 upon the arrival of the R40 Slants on the **A**.

Steve Zabel photograph, Eric Oszustowicz collection



The original interior of the R-42s. This photo of car 4761 in **D** service was taken on August 11, 1973.

Steve Zabel photograph, Eric Oszustowicz collection

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The R-42 at Fifty Years: A Retrospective

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R-42 4558 at 57th Street-
Seventh Avenue on April
16, 1976, the
terminal for
the **N** at the
time. 4550-83
would be as-
signed to the
N until 1977,
upon which
the cars were
transferred to
the RR.
Steve Zabel
photograph,
Eric Oszustowicz
collection



Upon transfer
from the **N** in
1977, cars
4550-83 would
receive a cos-
metic rehab
which also
involved the
installation of
small profile
roll signs.
These cars
joined cars
4808-51, which
kept their
large profile
signs until the
early 1980s.
Steve Zabel
photograph,
Eric Oszustowicz
collection

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The R-42 at Fifty Years: A Retrospective

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Car 4875 on a southbound M train at 50th Street on the West End Line, July 28, 1988. Eric Oszustowicz photograph



A northbound K train with car 4806 at 42nd Street-Eighth Avenue on December 4, 1988. The K was the replacement for the AA train, but since two-letter designations were now out of vogue, the K designation was created. A photo of the post-rebuilt car 4806 is also included in this issue. The IND version of the K operated from May 6, 1985 to December 11, 1988.

Eric Oszustowicz photograph

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Car 4692 on its way to Morrison-Knudsen via the Metro-North Hudson Line at Otisville, New York. Its trip would continue beyond Port Jervis on the Conrail Line to reach Hornell, New York, where rebuilding would take place.
Eric Oszustowicz photograph



Car 4668 at the Brooklyn Army Terminal upon its return from rebuilding at Morrison-Knudsen. The flatcar will be brought to the South Brooklyn Railway's connection to NYCT at 38th Street between Third and Fourth Avenues. There, the car will be rolled on a ramp down to surface tracks which connect to the West End Line north of the 36th Street station.
Eric Oszustowicz photograph

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A southbound  train headed by R-42 4561 on February 8, 1989. As part of the effort to create a graffiti-free fleet, the R42s (among other fleets) received a cosmetic rehabilitation which included power washing and the painting of the non-stainless steel surfaces. The interiors had freshly painted beige walls with dark blue doors. The cars would soon undergo a complete rehabilitation which also included the installation of stainless steel doors.

Eric Oszustowicz photograph



A southbound freshly rebuilt train of R-42s at Marcy Avenue on September 26, 1989.

Upon return from Morrison-Knudsen, all the 4550-4839 R-42 group would be assigned to East New York Yard. Cars 4840-4949 were rebuilt by Coney Island Main Shop. Cars 4806 and 4807 are part of the fifty-car fleet that still exists today.

Eric Oszustowicz photograph

Commuter and Transit Notes

No. 365

by Ronald Yee and Alexander Ivanoff

MTA METRO-NORTH RAILROAD

A brush fire near Metro-North tracks in the Bronx on May 24 stalled trains for nearly an hour at the start of the Memorial Day holiday weekend, authorities said. The small fire broke out at about 5:50 PM between the Wakefield and Woodlawn stations.

Power was shut off to the third rails so firefighters could extinguish the blaze. The fire was put out and service resumed after only a 40-minute delay.

Trains on the New Haven Line and New Canaan Branch faced delays of up to an hour because of the disruption caused by the fire. (*Editor's Note by Alexander Ivanoff: This comes after a person was fatally struck by a train near the Valhalla station earlier in the afternoon. According to News 12 Westchester, the train involved was heading towards Grand Central Terminal.*) (**New York Post**, May 24)

MTA LONG ISLAND RAIL ROAD

The Memorial Day weekend did not start out well for the LIRR either. Montauk-bound Train #8700 with 32 passengers on board side-swiped westbound equipment Train #5785 (Montauk to Jamaica) just east of the Speonk station at 3:15 AM, derailing the lead engine and first coach. #8700 had left Jamaica eight minutes late at 1:17 AM with five cars, DM30AC 511 leading and 514 trailing. The other train had been the equipment for Friday evening's *Cannonball* and had entered the South Siding at SK2 Interlocking. It was 12 cars long, with DM30AC 512 leading and 500 trailing. That trailing engine was also derailed. Service past Patchogue was expected to be suspended all day on the 25th, a Saturday.

The LIRR South Fork Commuter Connection service has suffered from extremely low patronage since its inception on March 4, 2019 (see March, 2019 **Bulletin**). This service uses a single multi-level cab car and a DE30 locomotive and operates between Speonk and Montauk, with alternate terminals at Hampton Bays and Amagansett. At East Hampton, Bridgehampton, South Hampton, Amagansett, and Montauk the trains are met with jitney bus services. Despite a \$4.25 one-way fare with a free transfer to the bus connections, the service has attracted very few riders. With such low ridership (the LIRR has not released any ridership statistics), the LIRR has cut back on the service, offering it only Monday through Thursday and reassigning the locomotive and cab coach on Fridays to other trains in support of the railroad's usual "enhanced" services offered on summer Fridays. With ridership at disappointing levels, the number of buses meeting the trains at each station has been reduced from four down to two. (*Editor's Note by Ronald Yee: Unfortunately, summer Fridays would have been the one day the railroad should have kept the service operational as many dozens of domestic service workers would have utilized this line to access employment at the posh*

homes in the Hamptons. As a result, just in time for the summer season, these employees and other hired help have been forced back into their cars and/or Hampton Jitney bus services with their employers paying the bus fares, continuing to clog Route 27 with needless traffic every weekend.) (**New York Post**, May 18)

AMTRAK

The Washington State Department of Transportation (WSDOT) will replace Talgo rail cars similar to those involved in a fatal 2017 Amtrak derailment near Dupont, local news media reported on May 22.

WSDOT officials made the announcement a day after the National Transportation Safety Board (NTSB) said the lightweight vehicles did not meet current crashworthiness standards and were permitted to operate only through a "grandfathering agreement" with the Federal Railroad Administration.

The NTSB earlier in the week issued its report on the causes of the December 18, 2017, incident in which an Amtrak *Cascades* train on its inaugural run derailed while speeding through a curve on an overpass. Three passengers were killed and 65 people were injured.

More than 50 Talgo rail cars that have served the Amtrak *Cascades* route since 1998 will be replaced "as soon as possible," the **Seattle Times** reported.

The NTSB said the Talgo Series 6 trains were prone to uncouple and rupture.

Talgo objected to the claim that its equipment is unsafe, and said the NTSB disregarded technical information the company provided, the newspaper reported. (**Progressive Railroading**, May 23)

OTHER TRANSIT SYSTEMS

BOSTON, MASSACHUSETTS

The Massachusetts Bay Transportation Authority (MBTA) this fall will begin late-night service on three commuter lines in Boston.

The Greenbush, Kingston/Plymouth, and Middleboro/Lakeville Lines will have trains leaving Boston daily at 11:20 PM or later, according to a **Scituate Mariner** report citing MBTA officials.

Advocates have been requesting the extended service for more than five years, MBTA Advisory Board member Richard Prone told **Scituate Mariner**.

The extension is expected to cater to riders who attend late-night concerts and sporting events in Boston. (**Progressive Railroading**, May 21)

KANSAS CITY, MISSOURI

The Kansas City Streetcar Authority received on May 13 a streetcar from vehicle manufacturer CAF USA Incorporated, which increased the fleet from four to five vehicles. Streetcar 805 is the first of two vehicles scheduled to arrive in Kansas City, Missouri, this year. While not mentioned in the **Progressive Railroading** article, the

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two cars on order are not being assembled in the United States for various reasons.

The new vehicle was to undergo final assembly at the Kite Singleton Vehicle Maintenance Facility and shop testing for several days before testing would begin. The new streetcar is expected to be ready for passenger service in early summer. (*Editor's Note by Alexander Ivanoff: This delivery has happened at the same time as my fascination with the Oregon Trail has come back to life. Nothing more than coincidence.*) (**Progressive Railroading** via Randy Glucksman, May 13)

DENVER, COLORADO

Denver's Regional Transportation District (RTD) inaugurated the 2.3-mile Southeast Rail Extension on May 17, bringing the town of Lone Tree onto the light rail E, F, and R Lines. The extension, which is part of RTD's Fastracks transit expansion program, serves new stations at Sky Ridge, Lone Tree City Center and RidgeGate Parkway, with parking spaces for 1,300 cars.

The \$233.1 million project was funded with the aid of a \$92 million grant from the Federal Transit Administration Small Starts program, \$9.4 million in Congestion Mitigation and Air Quality grant funding, and \$25 million from the City of Lone Tree and local stakeholders.

The extension was designed and built by Balfour Beatty Infrastructure under a contract awarded by RTD in 2015. Construction began in May, 2016.

Service will operate at five-minute intervals during peak periods and every six minutes at other times. (**International Railway Journal**, May 17)

SALT LAKE CITY, UTAH

News Editor Ronald Yee filed this report:

In May, 2013, I attended the Electric Railroaders' Association annual convention, which visited Salt Lake City over the Memorial Day weekend. Comprehensive coverage was provided of the rail and transit services operated by the Utah Transportation Authority (UTA).

Soon after the ERA's visit, UTA extended the Blue Line of its light rail system (TRAX) southward on August 18, 2013 by three stations, from its former southern terminus at Sandy Civic Center to a new terminus at Draper Town Center. On December 8, 2013, UTA opened a new two-mile-long, seven-station streetcar line officially designated the S Line (originally called the Sugarhouse Streetcar Line). This extension linked the community of Fairmont in South Salt Lake with the Central Pointe transfer station for the Blue, Red, and Green LRT lines as well as several UTA bus routes. The line serves part of South Salt Lake that is undergoing explosive growth in transit oriented development with new apartment complexes being constructed at a rapid pace along the route.

In the spring of 2019, UTA completed additional double-tracking on key sections of the line, permitting the headways to be improved from 20 minutes down to 15 minutes. The Siemens S70 class LRVs assigned to this line are decorated in a white-and-light-gray color

scheme, defining its separate designation as a streetcar line from the rest of the TRAX light rail transit. As the S70 class cars are physically identical, one would have assumed that a small block of 4-5 consecutively numbered cars would be assigned to the separately branded S Line. Instead, this contributing editor observed S70 class LRVs 1146, 1170, and 1177 painted in the S Line light gray and white colors.

TRAX is currently undergoing a rail replacement program in downtown Salt Lake City that has cut the light rail system in half with the tracks being replaced between the Gallivan Plaza and Courthouse stations. For those customers unable to walk the distance between these two stations a bus shuttle connects the two stations. As a result of this physical severing, the LRV fleet serving the north portion of the TRAX light rail system, serving the Blue Line from downtown to Salt Lake Central as well as the Green Line to the Airport, is isolated from the main repair and maintenance shops of the system.

The northern portion of TRAX is now exclusively served by the fleet of newer Siemens S70 (77 cars in this class) LRVs and the older Siemens SD100 (23 d.c. motored cars) and Siemens SD160 (17 a.c. propulsion cars) class LRVs are confined to services south of Courthouse, mixed in with the remainder of the S70 fleet. The southern portion of the Green Line has been converted into a shuttle between the Center Pointe station and West Valley Central.

Frontrunner commuter rail service is unchanged since the ERA Convention. It continues to utilize 15 Motive Power Incorporated MP-36-PH-3C locomotives powering a fleet of 38 Bombardier-built multi-level push pull coaches and 25 former NJ Transit Comet I single level push-pull coaches. The standard consist is a multi-level cab control coach, two multi-level push-pull coaches, and one former NJ Transit Comet I single-level coach positioned next to the locomotive to form a four-car train. During my ride to and from Ogden, we passed by the Frontrunner shop and yard and I observed three of the former NJT Comet Is on a yard track, one looking worse for wear with a muddy side and without window panes, with a faintly stenciled lettering "BDLX 1754" on its side. Coupled to it was another Comet I, also without windows. Are these cars destined for the scrapper?

PHOENIX, ARIZONA

Valley Metro on May 18 was to begin operation of the 1.9-mile Gilbert Road light rail extension in Mesa, Arizona. The agency was to mark the opening of the more than \$180 million extension by offering limited free transit passes to riders, according to a Valley Metro press release.

The Gilbert Road Extension runs from Mesa Drive to Gilbert Road and includes two new stations, a park-and-ride, and a transit center. Including the new extension, Valley Metro's rail system includes 28 miles of track and 38 stations. (**Progressive Railroading** via Randy Glucksman, May 13)

(Continued on page 16)

Commuter and Transit Notes*(Continued from page 15)***TORONTO, ONTARIO, CANADA**

Metrolinx, Toronto Transit Commission (TTC), and Ontario government officials earlier this week unveiled six new light rail vehicles to be used on the future Eglinton Crosstown Line that will run between the Mount Dennis and Kennedy subway stations in Toronto.

Delivered by Bombardier and a part of the Flexity line of LRVs, the six vehicles are the first of 76 scheduled to enter service in 2021 when construction on the nearly 12-mile, 25-station light rail line is completed.

Metrolinx owns the Eglinton Crosstown Line, which will be operated by the TTC. (*Progressive Railroading*, May 24)

KITCHENER, ONTARIO, CANADA

ERA member Eric Oszustowicz was in Kitchener on May 13 and reported seeing cars 507 and 508 making simulated service. The Kitchener-Waterloo ION Line has been delayed for various reasons. Meanwhile, CBC News reported on May 8 that the line would open on June 21, with 11 days of fare-free service. In November, 2018, the Waterloo regional staff said they aimed to have the line up and running by spring, 2019 after several delays due to issues with Bombardier's production and transport of the vehicles. Nearly C\$3 billion in development has been spurred by the line. (CBC News, May 8)

VANCOUVER, BRITISH COLUMBIA, CANADA

The oldest SkyTrain cars on Vancouver's automated metro network are to be replaced under a C\$1.47 billion upgrading and enhancement plan unveiled on May 23.

Announced by British Columbia's Minister of Transportation and Infrastructure Claire Trevena and federal Minister of National Defense Harjit Singh Sajjan, on behalf of Minister of Infrastructure and Communities Francois-Philippe Champagne, the Expo Millennium Upgrade Program includes additional vehicles and other works to increase capacity, reduce overcrowding, and improve reliability on the city's oldest SkyTrain lines.

Approximately 200 new vehicles will be procured to replace the original 150 SkyTrain cars, which are nearing the end of their service life. The small-profile linear-motored ICTS Mark I vehicles were delivered by UTDC in three batches between 1984 and 1995. The larger fleet size is expected to increase peak capacity by more than 5,000 passengers.

An additional rolling stock stabling facility is to be built, while the existing vehicle operations and maintenance center will be modernized. Power supplies and train control systems will also be improved on both the original Expo Line and the later Millennium Line to support longer and more frequent trains.

The Canadian government is contributing C\$493.3 million from the C\$28.7 billion Public Transit Infrastructure stream within its 12-year Investing in Canada Plan, which has a total budget of C\$180 billion. British Columbia's provincial government is providing C\$579 million

and the remaining C\$397.7 million will be funded by local transport authority TransLink. (*Metro Report International*, May 24)

LYON, FRANCE

Alstom has delivered the first of 30 MPL16 trainsets that it is supplying to the Lyon metro. The train is due to enter service on Line B in 2020.

In October, 2016 transport authority Sytral awarded Alstom a €140 million contract that includes options for up to 18 more trains. The order forms part of Sytral's Future Metro 2020 program, which aims to increase the capacity of metro lines A, B, and D.

The rubber-tired trainset is 36 meters long with capacity for 325 passengers at 4 per square meter. Service braking is entirely electrical, rather than a blend of electrical and mechanical, to increase the amount of regenerated power and reduce maintenance requirements. (*Metro Report International*, May 2)

AVIGNON, FRANCE

Test running has started on the Avignon tramway, ahead of planned opening to passengers in October.

The 5.4-kilometer route from Porte Saint-Roche in the city center to Saint-Chamand in the southeast will serve 10 stops, offering an end-to-end journey time of 15 minutes.

Civil works were undertaken by a consortium led by NGE Group subsidiary TSO and including Alstom, Guinoli, EHTP, and Agilis. Alstom and TSO supplied trackwork, overhead wires, and an electrical substation.

Alstom is supplying a fleet of 14 Citadis X05 compact trams, the first of which arrived in Avignon in November. The three-section trams have a capacity of 140 passengers and are being assembled at Alstom's La Rochelle factory. (*Metro Report International*, May 2)

PORTO, PORTUGAL

Metro do Porto has received three bids for a contract to supply 18 light rail vehicles, the authority announced on April 30. Metro do Porto called tenders in December for the contract with an estimated value of €56.1 million, including five years of maintenance. Bids have been received from CRRC Tangshan, Siemens Mobility, and Skoda Transportation.

The tender specifies that the bidirectional vehicles must have a minimum capacity of 240 passengers, including 60 seated, and a maximum speed of at least 80 kilometers per hour. Tenders will be evaluated on technical criteria (with a weighting of 40%); capacity, comfort and accessibility (35%); and price (25%).

Deliveries are envisaged to take place in 2021-3 at the rate of one per month. The vehicles would be used on all lines of the Metro do Porto network, augmenting the current fleet of 72 Eurotram and 30 Flexity Swift LRVs supplied by Bombardier.

On April 5 Metro do Porto called tenders for contracts to build a new 2.5-kilometer line and extend Line D south by 3.2 kilometers. Work on these two projects is expected to begin in early 2020 and be finished in 2023. (*Metro Report International*, May 1)

(Continued on page 17)

Commuter and Transit Notes*(Continued from page 16)***BRUSSELS, BELGIUM**

The board of Brussels Transport Company (Stib) has approved the acquisition of 30 additional New Generation Tram (TNG) low-floor LRVs from Bombardier at a cost of €67 million. The additional cars are required as part of a line extension currently under construction.

Stib awarded Bombardier a framework contract in April, 2018 to supply up to 175 TNG vehicles based on the company's Flexity platform, with an initial €169 million order for 60 vehicles. The first cars will be delivered in 2020. (*International Railway Journal*, May 24)

GENOA, ITALY

The Municipality of Genoa and Italian State Railways (FS) have signed a Memorandum of Understanding to develop land owned by the railway to support the long-proposed extension of the city's metro to Martinez and Canepari.

The MoU, according to the municipal administration's plans, supports extending the metro line towards the districts of San Fruttuoso and Rivarolo and is considered a breakthrough towards getting the project up and running in Genoa.

Genoa's existing 7-kilometer metro has eight stations. The first 2.5-kilometer-long section was inaugurated in 1990, and the current line opened in December, 2012. Around 11 million passengers use the metro annually. (*International Railway Journal*, May 14)

POTSDAM, GERMANY

The autonomous tram trial in the German city of Potsdam has been expanded from the original 6-kilometer section of line in the city's suburbs to 13 kilometers, extending all the way to the Line 96 terminus at Marie-Juchacz Strasse.

The route includes a roofed 800-meter section shared with buses, enabling a wider range of scenarios to be tested and measured.

Siemens together with the Association of German Transport Companies (VDV) are working together to draft a safety and legal framework for the use of autonomous light rail vehicles as German (and European) law currently does not currently provide for such operation.

Siemens is also working with German Rail (DB) to develop similar technology based upon radar, Lidar, sensors, and the algorithms developed by Siemens in Potsdam for use on the heavy rail network. Initial trials using the DB Advanced Train Lab at up to 40 kilometers per hour are planned within the next year. (*International Railway Journal*, May 10)

STUTT GART, GERMANY

The Stuttgart City Council voted on May 9 to allocate €72.5 million in grant funding to Stuttgart Tramways (SSB) for the acquisition of 23 new LRVs and the construction of a new depot. The city says ever-increasing ridership and expansion of the tram network make the acquisition of additional rolling stock a necessity.

The city's investment includes €40 million towards the €87.7 million cost of 20 additional DT8.12 LRVs from

Stadler, which are being ordered without any funding from the state of Baden-Wurttemberg.

These vehicles will increase SSB's LRV fleet to 224 vehicles. With the expansion of the fleet, SSB will require additional depot capacity. A site at Ditzingen in the north of the city was identified for SSB's fourth tram depot in October, 2018. Construction is due to begin in 2023 with commissioning scheduled for 2025. The city will contribute €25 million towards the €60 million project and SSB is also seeking a further grant through the federal government's Municipal Transport Financing Act (GVFG).

The city is also providing €7.5 million towards the €17.7 million cost of three new rack-equipped LRVs and three bicycle cars for Line 10, which runs from Marienplatz to Degerloch. (*International Railway Journal*, May 10)

GDANSK, POLAND

Gdansk Bus and Tram (GAiT) has exercised an option with Polish rolling stock manufacturer Pesa for 15 additional Jazz Duo low-floor LRVs.

The order is an option from a contract for 15 bidirectional vehicles, which was awarded in February, 2018.

The additional vehicles will be funded in part using penalties for delays to the delivery of LRVs in the main order. The first five vehicles were due for delivery in January but are not expected to arrive in Gdansk before July. Pesa is incurring contractual penalties of Zlotys 8,800 (US\$2,300) for each day of delay.

Delivery of the first batch is now due to be completed by November. All the vehicles in the option are due to be delivered by the end next year. (*International Railway Journal*, May 6)

AARHUS, DENMARK

The first phase of the Aarhus Letbane light rail network was completed with the entry into service of the last sections on April 30.

The 69-kilometer single-track railway between Aarhus H and Grenaa to the northeast has reopened as a light rail line, having been closed since 2016 for modernization including electrification; 14 stations were refurbished.

Service operates between 5 AM and 11 PM, running every 30 minutes between Aarhus H and Ryomgaard. Every other trip continues to Grenaa, and there are plans to run every train to the end of the route. The journey time from Aarhus H to Grenaa is a little under an hour and fifteen minutes.

The new-build tram part of the network has also been completed with the opening of the 5-kilometer Lisbjerg-Lystrup section. The first part of this was opened on December 21, 2017 between Aarhus H and Universitetshospitalet, followed by an extension from Universitetshospitalet to Lisbjergskolen last August.

Construction of the network began in June, 2013 and was undertaken by a consortium of Stadler and Ansaldo STS. Stadler has supplied 12 three-section Tango tram-trains to operate Odder-Grenaa service and 14 low-floor Variobahn trams for the tram section in the city center. (*Metro Report International*, April 30)

THREE ISLANDS OF ITALY

by Jack May
(Continued from May, 2019 issue)
(Photographs by the author)

MONDAY, APRIL 11

Our excellent breakfast was taken in the B&B's rooftop garden, with great views of the harbor. Unlike the preceding day, several other families also spent the night at the Marino di Castello. With the weather warm and sunny, we decided to leave the car parked (I bought some more chits for the dashboard) and use public transportation for our activities; I would cover Cagliari's new tramway while Clare would visit various museums. Cagliari is Sardinia's largest city, with about 160,000 inhabitants.

The 950-millimeter-gauge MetroCagliari's route operates almost entirely on reserved track; there is no street running whatsoever. The just under eight-mile system is a little complicated to explain (but I will try). The major part of its route is over the right-of-way of the southern end of a narrow-gauge railway that had been cut back from the city center and now has been converted to electric traction (four-plus miles). The balance of the system consists of new construction (one-plus miles, mostly elevated) and shared usage with diesel trains over a short part of the railway's remaining portion, i. e., a tram-train operation (2½ miles).

The railway, formerly the *Ferrovie della Sardegna* (FdS), but now integrated into Sardinia's public transit system, the *Azienda Regionale Sarda Trasporti* (ARST), was built to the Italian narrow-gauge standard of 950 millimeters starting in 1888. (This is the same gauge as the Circumetnea (which we rode the previous Tuesday) and other lines like the Circumvesuviana (Naples) and Rome's Fiuggi interurban (which was seriously truncated and now operates only to the city limits.)) The FdS/ARST comprises Sardinia's secondary railway system (standard-gauge Trenitalia is the primary) and operates over various unconnected segments on the island, principally through mountainous areas. In the last half century it was pruned down, but still covers a substantial number of route miles (380). In this section of the report we are only concerned with the portion of the ARST that operates in the Cagliari area—there will be descriptions of other line segments in succeeding chapters.

But this is as good a place as any to provide the reader with a little background on ARST. The organization was founded back in 1970 to take over a number of failing bus lines in the rural and suburban areas of Sardinia, many operated by SITA, the Italian Greyhound-style over-the-road bus company. Under government ownership, it gradually grew, taking over other rubber-tired operators and also provided bus substitution as the FdS began to shed rail passenger services and also abandon lines outright. In the years shortly after 2000 the Sardinian government decided it wanted to have a single entity to run regional public transportation and soon

the remaining narrow-gauge railways were taken over. In 2010 rail and bus were integrated into today's ARST.

As far as the 950-millimeter-gauge rail lines are concerned, only the busiest ones continue to have regularly scheduled passenger service, and that includes the new tramways in both Cagliari and Sassari. However, with many of the lines traversing spectacular mountain scenery and tourism becoming a major player in the island's economy, in 1989 it was decided to continue passenger operation over that secondary trackage on an "as-needed" basis. As a result, starting in 1995 four such lines have regularly scheduled service in the summer season, with the organization encouraging charters, which are managed by local commercial travel agencies, religious, social and civic organizations, as well as promoters of rail journeys for rail enthusiasts the world over. These services are called Green Trains, or *Treno Verde*. To get this going steam locomotives were restored, track was rebuilt, and rolling stock was renovated. Much of the funding for this came from Italy's national tourism organization, ecological groups, and the European Union. Our visit was just on the edge of the beginning of such trips for 2016; had we planned to visit Sardinia a few weeks later, no doubt we could have (and probably would have) participated in one of the scheduled charters, which are usually combined with sightseeing and visits to restaurants for good food and drink.

The FdS originally ran from the Maritime District of Cagliari (location of our accommodations) northward through the city and its suburbs, continuing on to various rural villages, and ending for all practical purposes in the town of Isili, some 50 miles north. After World War II the increase in motor traffic brought about the usual decrease in patronage and therefore the conversion of certain branch lines from rail to bus to reduce costs. That, combined with the need for urban renewal in the center of Cagliari, resulted in the railway being cut back in 1968 from its old Viale Bonaria terminal to Piazza della Repubblica, about a mile north of the Mediterranean and city center. At the same time new shop and servicing facilities were built in the suburb of Monserrato. In the next three decades further traffic congestion and the desire for swifter and more attractive "green" transportation eventually brought about the conversion of the section of line between Repubblica and Monserrato to modern electric light rail, taking advantage of the right-of-way that runs directly between the two points (compared to local bus lines operating through narrow twisting streets, some with steep grades).

The new light rail system between Repubblica and Monserrato, christened MetroCagliari, was inaugurated

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Three Islands of Italy

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on March 17, 2008. At that time diesel railcar service to Isili was cut back to the San Gottardo station in Monserrato, with an across-the-platform connection. This was the first step in a plan that in 2015 would extend the light rail line further to Policlinico and electrify the railway to Settimo San Pietro to create a tram-train operation.

Skoda supplied ARST with nine double-ended, five-section 70-percent low-floor trams, which are maintained in the Monserrato-San Gottardo complex. Ever since the system reached its present configuration in 2015, two services have been operated: Route 1 between Repubblica and Policlinico and Route 2 between San Gottardo and Settimo San Pietro (SSP). They connect at San Gottardo (see <http://www.urbanrail.net/eu/it/cagl/cagliari.htm> for details). Route 1 service runs every 20 minutes in base periods and on weekends, while 10-minute headways are operated during extended rush hours on weekdays. Route 2 runs every 20 minutes, but on weekdays diesel railcars that run beyond SSP to Dollanova, Gesico, and Isili substitute for the trams on those schedules. Diesel railcar service does not operate on Sundays.

Apparently the line from Repubblica was mostly double track originally, but today's tram route is now almost entirely single track south of San Gottardo. There are seven way stations on this segment with most containing passing tracks. A further four stations bring the total to 11, not counting SSP on the tram-train. It is remarkable how well the 10-minute frequency is maintained over the single track. (Metro West in Lausanne, Switzerland also operates a single-track line with 10-minute

headways.) That said, on the negative side I found the Skoda Elektra 06T cars noisy and rough-riding when compared to LRVs in service on similar lines in other parts of Europe — and North America as well. At least no graffiti is smeared over them, unlike the right-of-way and ARST's diesel railcars, which have this abomination to various degrees. Since my visit three CAF Urbos 100 cars were added to the fleet and have been in operation since 2017.

I purchased a day ticket at a tobacconist and rode a trolleybus to Repubblica. The facade of the station blends in with the other buildings, so it took me a few moments to locate the entrance, which is outfitted with a manned window supplying transit information and tickets. I first rode all the way to the end of Route 1 at Policlinico (a bit over 20 minutes), where a university makes the outer terminal a major traffic generator. Ridership was quite decent, with many students also connecting from the diesel railcars and tram-trains at San Gottardo to get to their classes. I then worked my way back, stopping for photos. Finally, I rode the Route 2 tram-train to SSP and also spent a while at San Gottardo to photograph the diesel railcars. There seemed to be more service on the SSP line than what is enumerated in the public timetable, but it is possible that the extra trains I saw were "second sections" of scheduled trips. The ride on the single-track line from San Gottardo to SSP takes six minutes, and the trams lay over at both terminals for four minutes. I returned to the B&B to meet Clare for some afternoon activities at about 14:00.

The photos shown below and on the next page follow Route 1 from south to north as far as San Gottardo. While the photographic angles on most of them are similar, each one is included to illustrate various aspects of the line.



Piazza della Repubblica, the southern terminal of MetroCagliari, contains a center platform serving two stub-end tracks. Even during 10-minute headway periods, it is rare that the left side track is used, which explains its rust. This passenger whisked by me as he ran and just missed a Policlinico-bound tram.



Route 1 is double-tracked from its Repubblica terminal to this point just north of Gennari, the first stop. An inbound tram is shown hurtling through verdant surroundings.

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Three Islands of Italy

(Continued from page 19)



Most of Route 1's passing sidings are on either side of various station platforms, although a few are between stops. The width of the right-of-way indicates that a second track may once have been in place along these parts of the line. The left photo is just north of Mercalli station, while the right photo is more interesting, showing a double-crossover with the unwired track leading nowhere. Note that both tracks are embedded in the grade crossing's pavement, which is a common sight on the line—even where there is no crossover. This photo was taken just north of the Vesalio station.



The mall adjacent to the Centro Commerciale station is a major traffic generator for the line. The sign shown in the left view is the only one of its type at way stations, and it contains a map and a timetable. Similarly, the right photo shows the station's hexagonal brick platform and its covered waiting area.



This view of the rear of a Polyclinico-bound tram just south of the Centro Commerciale stop emphasizes the width of the line's right-of-way. Note the mountain in the background.



Lastly, an inbound car is shown operating through a section of line that is clearly not wide enough for double-track operation. It is approaching the platform of the Redentore station in the suburb of Monserrato. *(Continued next issue)*