

San Diego and the PCC Streetcar
By P. Allen Copeland

Part I

In the early 1930's, a group known as the Electric Railway President's Conference Committee (later shortened to the President's Conference Committee), started research on a design of streetcars that would modernize the vehicle fleet that were being used to haul passengers on the street railways of North America. While the rubber tired motor coach and trolley coach promised operating economies and an up to date appearance, many transit operators had a heavy investment in track, power systems and supporting infrastructure that necessitated new equipment to effectively utilize the capital investment until it could be fully depreciated. Further, it was thought that new and attractive vehicles would attract new business that was being pulled away from public transit by the use of the private automobiles and competing models of transportation.

The PCC car, as it was to be designated, did not preserve the electric railway industry, and could be said to have merely slowed the decline in the use of public transit that was carried by rail. However, the design of the PCC car was an unqualified success, the cars and components set new standards of ride quality, performance and energy efficiency. Even after the decline of streetcar service in North America, the technology of the PCC car was exported to Europe where it flourished, and continues to be refined and improved. In fact, in recent years much of this European transit technology has been reintroduced into North America as new light rail systems are constructed and enlarged, such as what has happened in San Diego.

The development of the PCC car will not be discussed here, for further information on the topic see the reference list. However it may be said that the PCC technology was a vast improvement over older electric railway equipment, especially in the area of motors, controls, braking, wheels and the supporting structure that carried the car (called trucks). While the bodies of the PCC cars could be built in various sizes to meet the specifications needed by the different operators, and while a majority of the cars built were similar in appearance, the concept allowed for various configurations. The streetcar bodies were developed along with the art deco style of industrial design, and while the streamlined and modern appearance was most obvious aspect of the new cars, this was not that important in comparison to the mechanical and electrical components, and comfort aspects, such as seats, heating and ventilation. PCC cars were built by two manufacturers, the St. Louis Car Co. of St. Louis, Missouri and the Pullman-Standard Car Co. of Worchester, Mass. The electrical and control equipment was produced by Westinghouse Electric & Manufacturing Co., and the General Electric Co. San Diego specified Westinghouse equipment on their PCC cars. Design elements of the PCC car bodies improved over the years from 1935 to 1952 when the last North American PCC car was constructed, with the most obvious being different window treatment (including small windows for standees), heating and cooling, and improved trucks for higher speed operation.

The San Diego Electric Railway, at its peak operated just over 100-miles of route miles that were served by electric streetcars. Up to this time, the only truly modern cars were fifty vehicles built in late 1923 to operate on the new interurban lines to Ocean Beach, Pacific Beach and La Jolla, and on routes serving the areas north and east of downtown. These cars were fast and comfortable, and as originally designed, were capable of running in trains. Although San Diego was not affected by the great depression as much as other metropolitan areas that relied on heavy industry, patronage declines were just as much of an economic problem to the company. Much of the service was operated with depreciated equipment dating back to the years before World War One. These old cars were characterized by wooden construction, slow speeds and uncomfortable seating. The company rebuilt most of this equipment so that it could be operated with a single operator to save wage expenses,, but the deficiencies of the old cars were obvious to the riders and the company.

In studies, the company determined that by the conversion of some lines that needed rehabilitation to motor coach, and the purchase of 25 new PCC streetcars, most of the rail service in San Diego could be operated with modern (i.e. steel) equipment. Accordingly, the San Diego company ordered 25 of the new

PCC cars from the St. Louis Car Co. on July 18, 1936. San Diego was the very first operator in Western North America to order and take delivery of the streamlined streetcars. Eventually, the Los Angeles Railway, Pacific Electric Ry. (both in Los Angeles), the San Francisco Municipal Ry. and the British Columbia Electric Ry. in Vancouver, British Columbia also operated these modern streetcars.

The new cars, introduced in March, 1937 showed a marked improvement in operation over older equipment and attracted new patronage. The company soon determined that the 25 cars were not quite enough to operate three complete routes with modern cars, so another order was placed with St. Louis for three additional PCC's which were delivered in 1938.

Given fleet numbers, 501-528, the San Diego cars were among the smaller fleets of new PCC cars, with only Johnstown, Pa. (17), Montreal, Quebec (18) and Dallas, Texas (25) having fewer. The San Diego Electric Ry. operated double ended cars up to the time of the PCC acquisition. Double ended cars could change direction at a terminal or other location merely by moving the active controls from one end to another and changing the trolley poles. Some changes were required to allow the new single ended PCC cars to be operated. Some downtown loops already existed, but new turning facilities or connecting tracks to allow weaving movements had to be installed so that lines could easily and safely operate the streamliners. The height of the overhead (electric) trolley wire was also a factor. The wire was higher than usual in San Diego due to the hauling of steam railway freight cars over trolley tracks, and the use of extra long trolley poles used to collect current caused problems when reversing or traversing complicated overhead wire junctions. In 1940, all 28 cars were equipped with towers on which the trolley poles were mounted to improve contact pressure. San Diego was unique in the use of these extended trolley bases on PCC cars.

The first three streamliners were delivered in San Diego on March 17, 1937. Car No.502 was parked at the north curb of Horton Plaza on that day to March 29th so that it could be inspected. Another car gave free rides on a downtown loop from March 25th to March 29th. The rest of the cars were delivered in May and June, 1937. The first PCC entered service on route #2 (Broadway-30th St.) on April 1, 1937, and one June 6th, the cars entered service on route #1 (5th Ave.-University). The new cars entered service on route #3 (5th Ave.-Washington Blvd.-Mission Hills) on June 20, 1937 and this became the very first line where all service was provided by PCC cars. When the three additional cars were delivered in January, 1938, all service on routes #1, #2 and #3 were provided by the modern cars.

Soon after the PCC cars were delivered, transit patronage increased as the effects of a buildup in the defense industry and the many military bases in the San Diego area. A number of streetcar lines were converted to bus operation from 1937-1940, and this released older cars to help on the lines that had the heaviest patronage. Some of the older cars were then used on lines featuring the PCC cars in rush hour and tripper service. Two used steel cars were acquired and rehabilitated for use on the isolated Coronado line, and for a short time, virtually all streetcar service was provided by 80 relatively modern vehicles. As the buildup to World War Two continued and the U.S. entered World War Two in December, 1941, San Diego experienced a 340% increase in transit patronage, the highest of any American city. Much of the increase was caused by gasoline and tire rationing, and to further save scarce resources, the U.S. Office of Defense Transportation prohibited the conversion of any more streetcar lines to bus for the duration. Fortunately for San Diego, some of the older cars that were replaced by buses and the PCC cars were not scrapped, but stored in the recesses of the Coronado and Adams Ave. car barns. These were brought back into service, and the company also purchased surplus rolling stock from Salt Lake City, Utah, Wilkes-Barre, Pennsylvania and New York City to assist in carrying war time traffic. A traffic check in May, 1944 found that on weekdays, lines #1, #2 and #3 were mostly served by PCC cars, with older cars being used in rush hours, and on Saturday afternoons, Sundays and holidays, all service was by the streamlined cars.

As World War Two wound down, the City of San Diego and the organization now known as Caltrans wanted to build a limited access freeway through a canyon in Balboa Park (this is now Highway 163). A new bridge would be required in Hillcrest. The electric railway was forced to "temporarily" discontinue route #1 and operate a replacement bus service. By this time, most of the streamlined PCCs were moved to other lines, and replaced by older equipment. The conversion of route #1 took place on June 30, 1946.

Up to this time, the PCC fleet had operated from the car barn on Imperial Ave. On September 15, 1946 the cars were moved to the car barn on Adams Ave. Route #2 was completely equipped with PCC cars, while #3 was assigned a few, and for the first time, route #11 (Balboa Park-Adams Ave.) was assigned a few. On January 3, 1947, PCC cars were taken off line #3, and all service was provided by older cars. The fleet was concentrated on lines #2 and #11. As traffic levels declined after World War Two, all evening service on these two lines was provided exclusively by the streamliners. Starting on September 24, 1947, all Sunday service on routes #2, #7 (Balboa Park-East San Diego) and #11 were operated by PCC cars, except for a few older cars used in tripper service from downtown to Balboa Park. This pattern continued until the end of rail operations. While the San Diego Electric Ry. had converted many of the rail lines to gasoline and diesel powered motor coaches after WWII, public statements were made that the three remaining rail lines would remain in service for the foreseeable future. Unfortunately, the electric railway was owned by the Estate of John D. Spreckles (who had died in 1926) and the heirs were anxious to dispose of the remaining assets of the estate. On September 10, 1948 the SDER was sold to Jesse Haugh and renamed the San Diego Transit System. Mr. Haugh soon announced that the the remaining three streetcar lines would be converted as soon as new motor coaches could be delivered from General Motors. On April 24, 1949, the last streetcar operations ended. PCC #510 was the last car to operate on the #11 route, and car #503 was the last car to operate on the #2 route. One of the 1923 steel streetcars was the last car to operate on the #7 in the early morning hours of the following day. San Diego was the first city in North America to completely abandon PCC streetcar in favor of rubber tired transit coaches.

After the conversion, all the remaining streetcar equipment was put in the Adams Ave. barn for storage, while the company looked for a buyer for the equipment. In February, 1950, cars 502-504, 506, 509, 511-514, 516-520, 523-525 were sold to El Paso City Lines in Texas. As a condition of sale, the cars were extensively rebuilt in San Diego including longitudinal seats so the cars passengers could pass custom inspection easily as the cars operated over a line that crossed the international border into Mexico and returned on another street. The old Adams Ave. barn was cleared and sold in late 1951 and the remaining PCC cars were moved to a storage lot near the site of the old Imperial Ave. barn. Three more cars, nos. 501, 507 and 521 were rebuilt and sold to El Paso in November, 1952. When the storage lot was needed for new buses in 1957, the remaining six cars, nos. 505, 510, 515, 522 and 526-527 were sold for scrap. Car 508 was resold to the Orange Empire Ry. Museum in Perris, Calif., and Car 528 was sold to the Railway Historical Society of San Diego, and placed on display at the San Diego County Fairgrounds in Del Mar. After the Fair Board decided that the railroad equipment on the fairgrounds should be removed, PCC #528 was donated to the Orange Empire Museum. After years of outdoor storage in the moisture and salt laden air of Del Mar, and the intense heat of Riverside County, both cars were placed in indoor storage in 2010, where they presently await badly needed restoration. El Paso City Lines 1500 (former San Diego 509) was sold to the San Diego Electric Railway Association in 1985 and moved back to the San Diego area. Before restoration could be undertaken, the car was damaged in an arson fire. The remains were sold to a collector in South Lake Tahoe, Calif. El Paso 1503 (former San Diego 503) was sold intact to a real estate company in Cloudcroft, New Mexico. The car was resold in October, 2002 to the Baltimore Streetcar Museum and is being restored as a Baltimore Transit Co. PCC with the number 7303. One El Paso car was sold for use as a restaurant. At last report, eight former San Diego PCC cars were reported to remain as the property of the Del Norte Streetcar Preservation Society. Their current status is not presently known.

SAN DIEGO ELECTRIC RAILWAY PCC CAR TECHNICAL SPECIFICATIONS

Class 6 cars. Nos. 501-525 St. Louis Car Co. job #1605 7/18/1936
Nos. 526-528 St. Louis Car Co. job #1611 11/9/1937

Height over standard trolley base platform: 10-feet

Length overall: 45-feet, 10.5-inches.

Width overall: 8-feet, 4-inches

Weight: 18,500-lbs. (average)

Seating capacity: 62

Step Heights: 16-inches, 8.5-inches, 8-inches.

Doors: Two doubleleaf doors at front and two at center. Each door operated by National Pneumatic Co. differential type electro-pneumatic engine controlled from operator's gang switch.

Trucks: Clark Equipment Co., Model B-2. Wheel Base 72-inches, track gauge 4-ft., 8.5-inches, steel, Resilient, with 3/4-inch (rubber) sandwiches, diameter 25.5-inch new, tread 3-inches, flange 1-inch by 3/4-inch, gear ratio 7.66 to 1.

Motors: Four Westinghouse Model 1432, 55-horsepower each.

Control: Westinghouse, parallel accelerator, foot operated with hand operated back-up controller and Dead man safety button.

Compressors: 25 Westinghouse Track Brake Company's type PC-1, and three type PC-22 with 2-12x 33-inch reservoirs.

Motor-Generator Set: General Electric Co.

Brakes: Dynamic, Air Magnetic Track and Hand.

Body and Sign Lights: Two circuits of 20 lights in series

Signs: Destination signs, Hunter roll type. Front sign curtain width 50.5-inches, now shows Destination and route number. Side curtain width, 25.75".

Heaters: One 1200 watt motormans heater.

Radio Interference Coils: One copper strap, concentric wound coil.

Fare Collection Equipment: Cars are wired and equipped with stand for Johnson Fare Box.

Trolley Catcher: Earll.

Gong: Electric Service Supply #62668 single stroke gong, 32-volt. Located at rear of car for reverse Movements.

Passenger Signal: Faraday Buzzer, 32-volt, Type "F" pull switch.

Life Guards: H.B. type life guard installed under front platform with provision for latching the catch Basket in the raised position.

Ventilation: Ventilation is obtained by drawing air from the upper portion of the car body through louvre slots in the vertical riser of the lower deck ceiling, and taking this air down to the pier posts into the side sill duct and exhausting it through the resistor compartment. A Sturtevant multi-vane, squirrel cage, size 8.5-inch fan connected to the motor-generator furnishes continual circulation of air.

Meters: Economy watt-hour.

SAN DIEGO PCC PAINT SCHEMES

The San Diego Electric Ry. employed one of the more colorful and complicated paint schemes of any street railway. As delivered, the PCC cars featured a light green and cream paint scheme. Side sheets and the letter boards (above the windows) were green. The window band, and a piece above the letter board was cream. A broad stripe running under the windows was painted black (this stripe was not carried across the doors). The roof was painted a dark brownish red. The words "RIDE & RELAX" were applied in silver, outlined in black in the green panel above the center of the car on both sides. The front of the car had a cream diamond shapes painted around the headlight, and at the rear end. On the door side, there were two shapes of different sizes ahead and back of the center door. Inside the larger shape back of the door appeared the words (in black): "TOPS IN TRANSPORTATION". In the smaller shape ahead of the center door, various slogans were used (also in black) "SAFETY", "COMFORT" or "ECONOMY". On the left side of the car, There were two different sized diamond shapes at the front and rear of the car. In the center was the largest shape of all, which contained the slogan "VISIT THE ZOO – BALBOA PARK-CAR No. 7 & 11". There are several variations to this slogan, cars No. 507 and 518 carried the slogan "CALIFORNIA TOWER-BALBOA PARK-CAR No. 7 & 11", and car No. 526 carried "NATURAL HISTORY MUSEUM-BALBOA PARK-CAR No. 7 and 11". The "wings" around the headlight and bumpers were chrome plated, as were window frames and windshield wipers. Due to collisions and wear, the bumpers in 1937 were painted green, then black. Car numbers were placed on the ends and sides in aluminum paint, outlined in black.

Advertising panels were soon placed on both sides of the car fronts, and sides (covering up some of the painted features).

During World War Two, cars 502 and 503 were used for advertising the American Red Cross. The sides were painted dark blue, with white being used for the belt rail and window area to the bottom of the red roof.

"RIDE & RELAX" lettering was placed above the windows in black. On the door side, the following messages appeared: "MAKE APPOINTMENTS TO GIVE REGULARLY" and "GIVE YOUR BLOOD"
RED CROSS DONOR CENTER
446 W. Beech

Both cars carried this scheme as of July, 1945. It is not known what slogans if any appeared on the left side of these cars.

In 1944, SDER experimented with a new paint scheme, where orange replaced the green. Several buses were repainted in this scheme, as well as two older steel streetcars. It is thought that at least one PCC car also received this paint scheme. However, the use of orange was discontinued, and the use of green resumed.

After the end of the war, cars 503, 506, 512 and 516 had the full letterboard painted cream. The "RIDE & RELAX" slogan was painted on the letterboard in black. The rest of the PCC fleet retained their (more or less) original paint scheme until the end of rail service in 1949.

Not related to the paint schemes, other modifications were made to the cars to improve passenger circulation. Car 508 was equipped with single seats on the right side of the car between the doors. This was observed November 6, 1943. Car 514 also was changed to single seats when observed October 17, 1943. The seats were later replaced with standard double seats as originally delivered.

Part II

After the construction by the San Diego Trolley of the routes which are now known as the Blue Line and the Orange Line, consideration was given to providing some kind of circular trolley service downtown for residents who live in the area, tourists and casual riders. One plan would have restored trolley service to on 5th Ave. in the Gaslamp district, but the expense and concern about disrupting the trains in regular service made the project unfeasible. Siemens, the builder of the current SDT fleet helped acquire three former Vienna cars for this project that were originally used on the Stadtbahn circular railway in Austria. Use of these small single truck cars was an innovative and attractive option, but their age and limited power proved incompatible with the present trolley system. These cars were then donated to the San Diego Electric Railway Association and are now on display and undergoing restoration in National City.

Harry Mathis, chairperson of Metropolitan Transit System, (operator of the San Diego Trolley), continued to look into the concept of some kind of historical trolley operation for downtown. Together with (now retired) Safety Director Andy Goddard, the San Diego Historic Trolley was organized to restore to operation some older streetcars if they could be obtained. Eventually, some retired San Francisco PCC cars (that were originally built for the St. Louis Public Service) were located in the area of South Lake Tahoe, where the owner had unsuccessfully attempted to build a trolley line. Two cars were purchased from the owner in December, 2005 (and another in 2006), plus a supply of spare parts. In 2009, another car was acquired from the Museum of Transport in St. Louis. This car was of Philadelphia, Pa. heritage. A similar car was obtained direct from Philadelphia in 2010. Extra parts and supplies were furnished by friends in various museums across the U.S. Arrangements were made by MTS for space so that the cars could be restored, and a fund raising effort established to provide money for the project. It was planned to use volunteer labor and donated services as much as possible for the restoration effort, and when the work was completed, the vehicles would be turned over to the San Diego Trolley for operation. When Andy Goddard retired, Dave Slater stepped in. Dave is currently President of the San Diego Electric Railway Association, and this has been beneficial to both groups, as they can help each other in obtaining technical assistance, finding spare parts and acquiring other resources. Sometimes the obstacles seemed insurmountable, but ways were found to overcome them. The PCC cars that were acquired had wheels that were configured to operate on light streetcar tracks, while the San Diego Trolley uses conventional railroad tracks and must meet Federal Railroad Administration standards. Each new wheel cost \$4,500 (each car uses eight wheels), but a manufacturer was found that could make PCC wheels to the higher standards, and more fund raising efforts were pushed through. The cars are being painted in a scheme similar to that used on the original San Diego PCC cars. In early 2011, the first car, No. 529 was pronounced ready and was turned over to MTS.

[Harry Mathis, Dave Slater, and others probably provide more information, and the names of the volunteers and important donors who have worked on the restoration. This is what I can remember from the various meetings, work sessions and written reports-PAC].

San Diego Historic Trolley Fleet (as of 7/1/2011):

Car Number	Builder	Lot Num.	Build Date	Remarks
529	St. Louis	1655	9-11/1946	Ex-San Francisco Muni #1122; orig. St. Louis Pub. Svc. #1716
530	St. Louis	1655	9-11/1946	Ex-San Francisco Muni #1123; orig. St. Louis Pub. Svc. #1728
531	St. Louis	1655	9-11/1946	Ex-San Francisco Muni #1170; orig. St. Louis Pub. Svc. #1777
532	St. Louis	1666	6-8/1948	Ex-Museum of Transport (St. Louis) #2186; ex-Southeast Penna. Tr. Auth. #2186; orig. Philadelphia Rapid Transit #2186
533	St. Louis	1649	3-4/1947	Ex-Southeast Penna. Tr. Auth. #2785; orig. Philadelphia Rapid Transit #2785.

St. Louis Public Service cars were built to a 4 foot, 10-inch (1.5-metre) track gauge and converted to standard (4-foot, eight and a half inches) prior to transfer to San Francisco. Philadelphia Rapid Transit cars were built for 5 foot, two and a half inch track gauge. #532 was given trucks from a Chicago Transit

Authority rapid transit car while owned by the museum of transport, #533 remains to be converted to standard gauge.

All cars have General Electric electrical equipment, and the post war body design with standee windows.

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