

JUBILEE ISSUE

TEN YEARS of ERA Headlights, TWENTY YEARS of PCC Development, FIFTY YEARS of Sprague M.U. Control



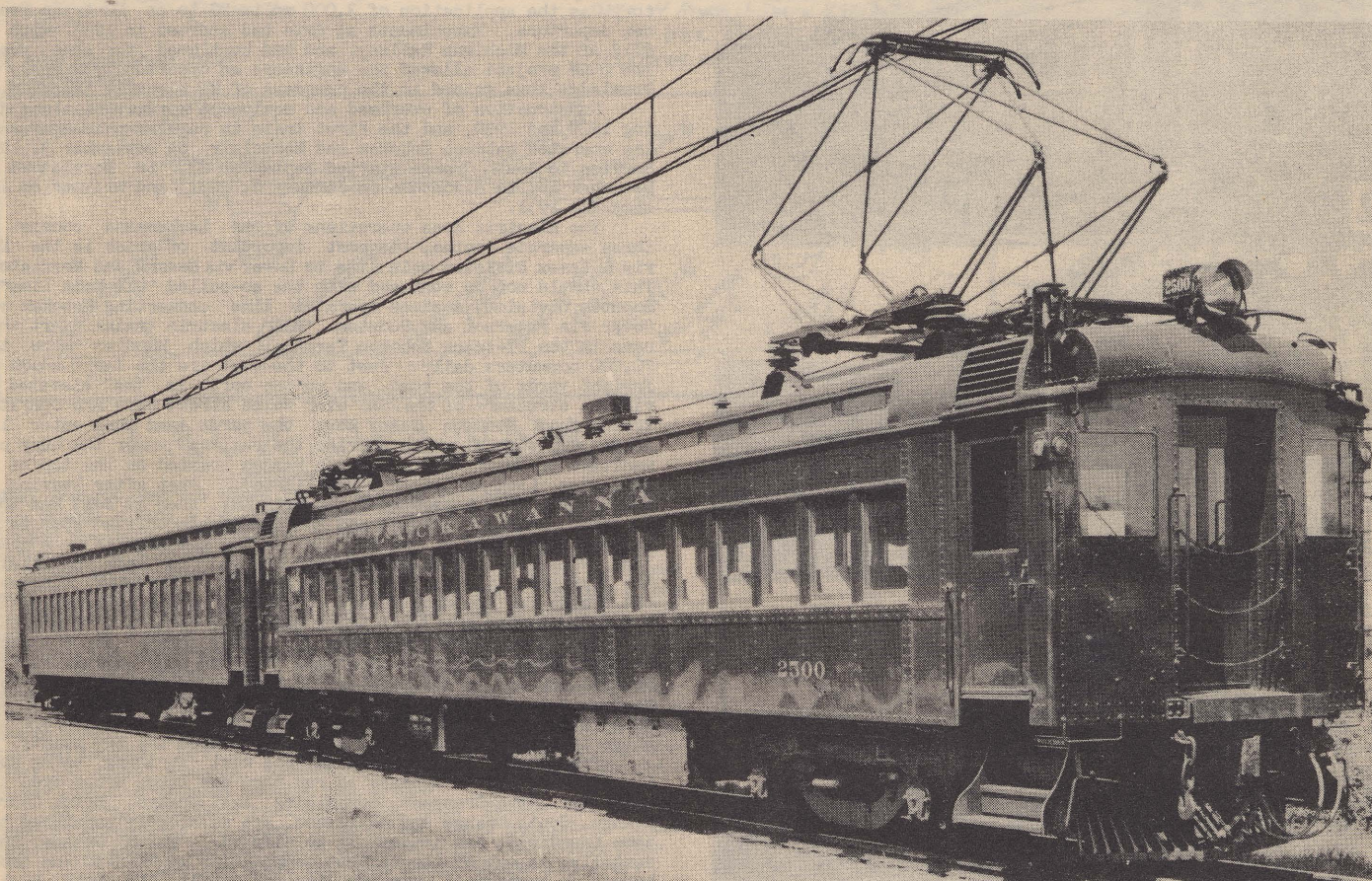
HEADLIGHTS

PUBLISHED MONTHLY BY THE ELECTRIC RAILROADERS ASSOCIATION INC.

VOL. 11, NO. 1

Lackawanna Terminal, Hoboken, New Jersey

JAN 1949



LACKAWANNA

by STEPHEN MEYERS

Lackawanna Railroad

Commuters on the Lackawanna Railroad like the service! In an area where commuters generally have unkind comments on the service rendered by their line, the Lackawanna Railroad draws unsolicited praise from its patrons. And rightly so, for the Electric Zone of the Delaware, Lackawanna & Western Railroad is one of the finest examples of electric suburban service in the United States today.

More than any other single factor, the electrification of the Lackawanna Railroad has been the reason for the fine suburban development in Essex, Morris and parts of Somerset counties in northern New Jersey. The fast, frequent and relatively inexpensive train service offered by the railroad, together with the fact that the trains are powered by cinder-free electricity, has drawn more and more people into the suburban area it serves, one of the finest such areas in the New York metropolitan district.

Early in its history, the DL&W had realized the value of its New York Suburban zone and made many improvements to better serve its patrons. The fine terminal at Hoboken where passengers transfer to the railroad ferries or to the Hudson Tubes for New York City, just across the Hudson River, was one of the most important improve-

ments made. It is on the upper Ferry Concourse of this terminal that the Electric Railroaders Association has its main Headquarters which is shared with the New York Society of Model Engineers.

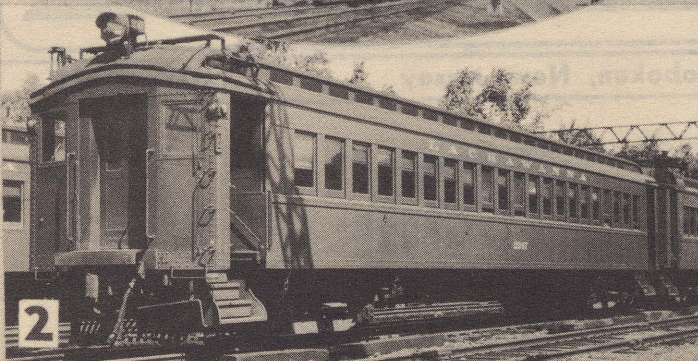
By 1926, it was apparent that railroad traffic along the inner 40 miles of the DL&W was so heavy that measures had to be taken to handle the load without a breakdown of the vital service. Since additional tracks were out of the question, better utilization of the existing tracks was the only alternative and this could best be accomplished by electrification. Therefore, late in 1928, the road asked for bids for electrifying its so-called Morris & Essex Division from Hoboken Terminal to Dover with branches to Montclair, Gladstone and the Secaucus freight yard and shops.

In considering the electrification, the DL&W was faced with a number of possible voltage combinations which could be used. There was the standard 650 volts DC used by many (continued on page 2)

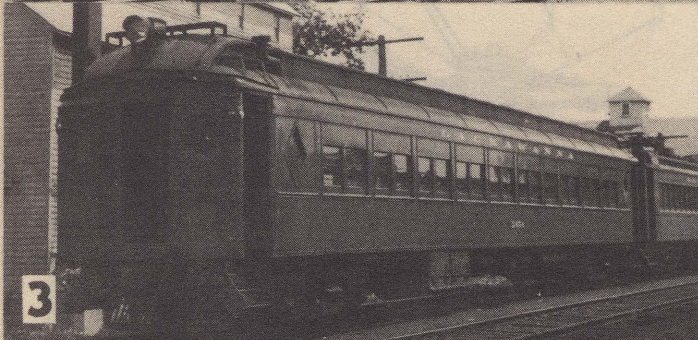
Fifty years ago, in the summer of 1898, the Chicago South Side EL was completely equipped with electric cars using multiple unit control invented by Frank J. Sprague, ERA #1. The article above describes the advanced electric operation of the Lackawanna RR, a direct descendent of this original MU installation in Chicago.

Lackawanna Railroad

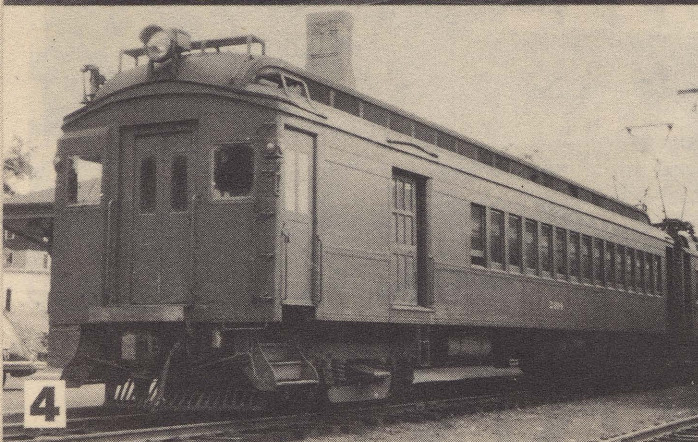
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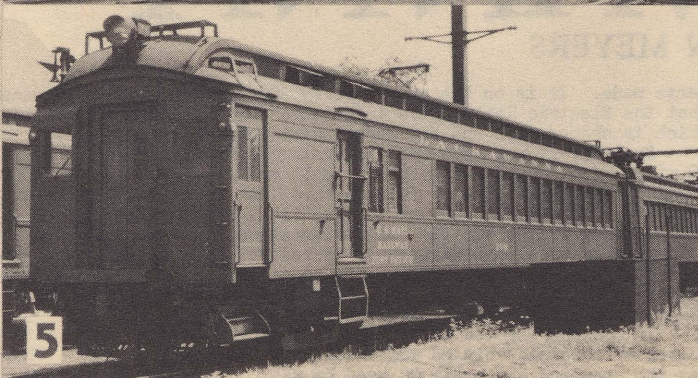
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3



4



5

- 1: Suburban train at speed near Summit, New Jersey.
- 2: DL&W control trailer #2247 (ex steam trailer).
- 3: DL&W control "Commuter Club" car. Note stained upper sash.
- 4: DL&W control Baggage-passenger trailer #2404.
- 5: DL&W control RPO-passenger trailer #2441.

2

(continued from page 1)

third rail suburban and rapid transit lines, the 11,000 volts AC overhead used by the New Haven and the Pennsylvania RRs, and the 3,000 volts DC overhead used by the Milwaukee road, the longest railroad electrification in the United States. It was, finally, decided to use the 3,000 volt system, as it was planned at the time to extend the electrification on the main line as far west as Scranton, Pa, and to use heavy duty electric locomotives to haul heavy trains over the Pocono Mountains. And so the Lackawanna built its 3,000 volt DC overhead system, which is also used not only by the Milwaukee, but also the Cleveland Union Terminal, Mexican Ry, Paulista RR (Brazil), and several others the world over. But the dream of electric power over the Poconos has just about died with the rapid rise of the diesel locomotive.

The first test operation of a Lackawanna suburban electric train occurred in the summer of 1929 on the test track of the General Electric Co at Erie, Pa. Two former steam coaches were rebuilt for this experiment. The motor car was numbered #319 and housed a great deal of electrical testing equipment for use at Erie. An unusual feature was the application of diaphragms at the car ends, a practice not continued on the actual cars used today. Much experimentation was required before everything was satisfactory, as the application of 3,000 volts DC to an MU train was a new departure. Experiments at Erie had started in 1923 with car #812 of the Michigan Railway, and had continued for some years. The DL&W project allowed the engineers an opportunity to apply the knowledge thus gained to the progress of MU electric traction.

Construction of overhead and equipment was hurried along during 1929 and 1930, and the first train in regular passenger service operated between Hoboken and Montclair on September 3, 1930. Service to South Orange started September 22, to Morristown on December 18, to Gladstone on January 6, 1931, and to Dover on January 22, 1931.

The Electric Zone operations of the Lackawanna consist of three separate routes, the most important of which is the Morris & Essex Division main line to Dover via Newark and Morristown. This should not be confused with the so-called "Old Main Line" or Boonton Division, a steam operated line connecting Hoboken with Dover via Paterson and Boonton. "M&E" electric trains start their runs in the 17-track Hoboken Terminal which handles more than 70,000 commuters daily. Just to the west are the large coach and freight yards of the road, and to the north is the elevated and viaduct structure of the PSNJ over which street cars are operated. Trains from Hoboken pass thru the yards and then enter long Bergen Hill tunnel which carries the railroad under the busy communities of Union City and North Bergen located on the top of the Palisades (see August 1948 Headlights). Just after leaving the tunnel, the line passes over the Erie RR; then at West End tower the steam Boonton Division and the former electrified spur to Seacaus Yard branch off to the right. Now the line is on a gradeless swamp, the famous Jersey Meadows, and is soon paralleling the busy main line of the Pennsylvania RR. The DL&W narrows to two tracks for the draw bridge over the Passaic River at Newark, but soon returns to a three track main that continues to Millburn.

The outer tracks are used for local trains and the center track is used in either direction for rush hour express service. Several express trains regularly cover the 20.1 miles from Hoboken to Summit in as little as 28 minutes, an average speed of 50 MPH. This is an even more impressive performance if one remembers that there is a rise of more than 375 feet between the two points.

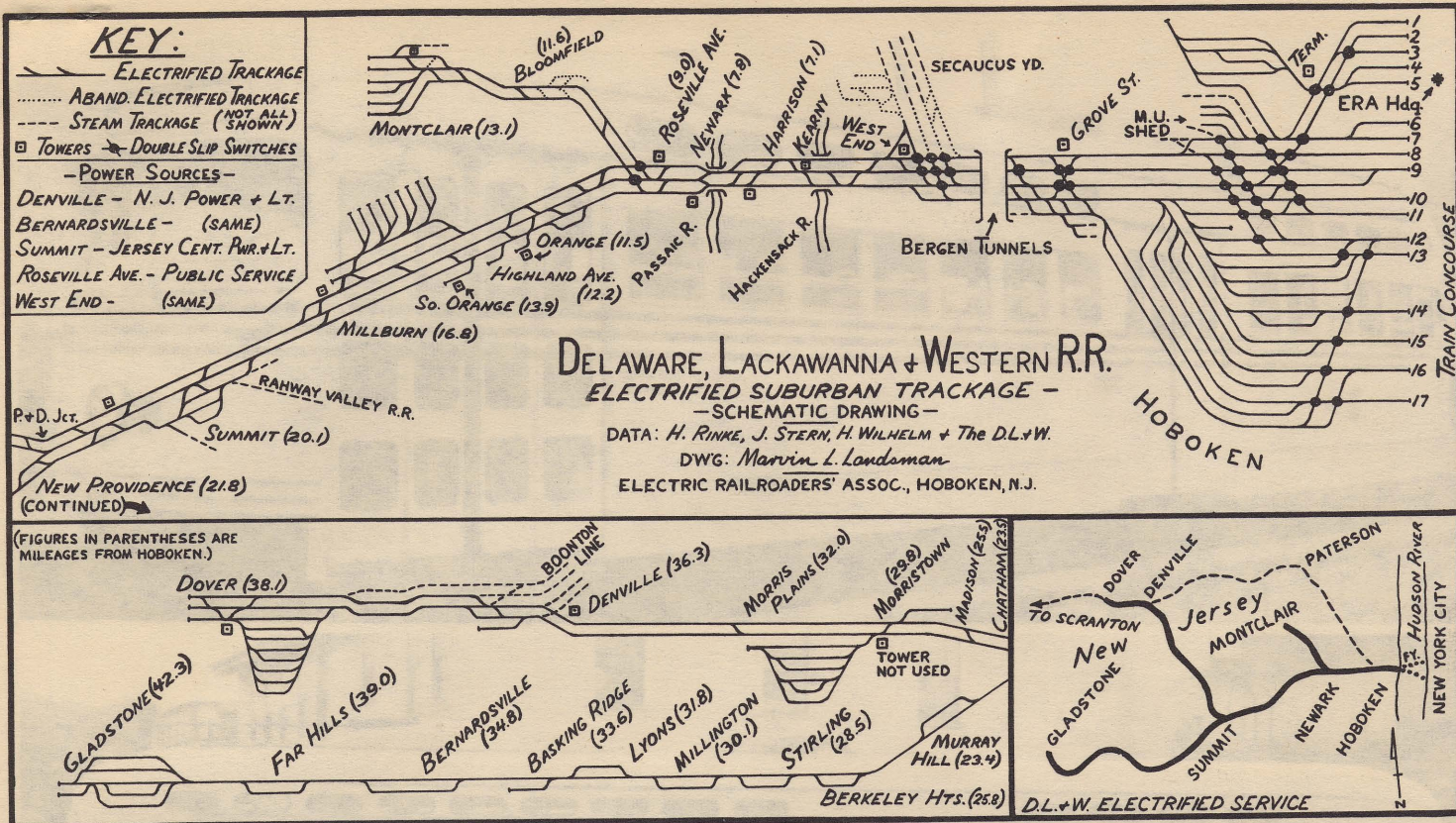
From Newark to South Orange, the most striking thing about the line is that it appears to run thru one large urban area. And so it is. "The Oranges", comprising East Orange, Brick Church, Orange, South Orange and Maplewood, are so closely populated that town boundaries are impossible to discern. South Orange, incidentally, is one of the richest communities in the U.S, and tho it boasts an average of over two cars per family, the DL&W hauls a large majority of the commuters and shoppers to the city daily.

It is on this stretch of line that the track is either on an elevated structure or in a long deep concrete open cut. At Roseville Ave station in the open cut, the Montclair branch turns off to the right. This is a very busy tho unspectacular two track branch which boasts of half-hourly service during the mid-day. It has four local stations on its 4.1 mile run and terminates at a modern six track stub-end terminal in the heart of Montclair.

Beyond South Orange, the line finally assumes the aspects of a heavy-duty railroad. Heavy rail, well-ballasted right-of-way, and a simple, well-proportioned catenary power distribution system present an imposing combination along with the many beautiful stations and landscaped lawns maintained by the Lackawanna. At South Orange, a coach yard is maintained for those trains terminating there. Millburn Tower is one of the "hot spots" on the railroad, for here the three track main narrows to two for the rest of the run to Dover, and it is also at the foot of the long grade leading to Summit, a main junction point with the electrified Gladstone branch and the steam-powered Rahway Valley RR.

Service on the Gladstone Branch (known to the employees as the Passaic & Delaware RR) closely resembles that of an interurban line and is rural in nature. The branch is single track, with turnouts. Wooden line posts hold the catenary. Headway on this, the third part of the road's Electric Zone, varies from a weekday 90 minutes down to a total of but six trains on Sunday. A non-rush-hour train usually consists of simply a combine (either RPO or baggage) and a regular passenger motor, and it shuttles between Summit and Gladstone, passengers changing at Summit for Hoboken and main line points. On most trips, however, thru cars or trains are operated to Hoboken. This branch serves the smart suburban area of Somerset county as well as a prosperous farming section.

(continued on page 3)



LACKAWANNA

(continued from page 2)

What freight service there is, is handled by steam locomotives, the branch having a daily "peddler" freight. An interesting point is the spectacular high-level steel trestle which carries the Gladstone branch over one of the streams feeding the Passaic River.

But to get back to the main "DL&W" Division which continues west from Summit to Morristown, Denville and Dover, serving a very attractive suburban area. This part of the line is noted for its outstanding station buildings, fine suburban homes, beautiful scenery, and continuous curves and grades. A coach yard is maintained at Morristown, and a number of trains terminate here. But service to Dover and way points is never on longer than one hour headway, even on Sunday. At Denville the line is joined by the steam Boonton line which also operates passenger service to Boonton and beyond. Most main line trains for points beyond Stroudsburg are diesel powered, however, and operate over the Morris & Essex Division between Hoboken and Dover.

As a "neighborhood railroad", the DL&W follows all the way thru by purchasing its power from three local utilities. These are:

- (1) Public Service Gas & Electric Corp, with connections at Hoboken (West End) and Newark (Roseville Ave);
- (2) Jersey Central Power & Light, at Summit;
- (3) New Jersey Power & Light, at Denville and Bernardsville.

The purchased AC power is converted to direct current in railroad owned mercury-arc rectifier substations. The DL&W had one of the first large scale installations of this type of rectifier in the United States. These machines have a dual advantage over motor generator and rotary converters in that they have a negligible loss of power in the conversion, and also have an extremely long potential life due to a minimum of moving parts. In addition to the substations, the railroad maintains tie stations at Hoboken, Harrison, South Orange, Montclair, Morristown and Dover.

The equipment used on the Electric Zone of the Lackawanna Railroad is of two main types, motor cars and trailers. There are 141 motor cars in service, representing the entire original order. These are low roof cars numbered #2500 to 2640. They are equipped with four 255 HP GE type #700 nose suspended motors and have an automatic acceleration of 1.5 MPH per second with an optional manual control. Braking is at the rate of 1.75 MPHPS. Cars are 70' 1 1/2" long and have a total light weight of 148,000 lbs. A motor unit will seat 82 passengers. Top free running speed is 67 MPH.

The roster of trailer cars presents a somewhat more complicated picture, however. The trailers are of four types: all-passenger, RPO-passenger, baggage-passenger, and club car. The all-passenger trailers may be subdivided into three general groups:

- 68 cars - #2300-2367 - high-roof ex-steam trailers with closed vestibules added at time of electrification. Seats 78.
- 50 cars - #2200-2249 - low-roof ex-steam trailers. Built with closed vestibules. Seats 82.
- 2 cars - #2451, 2455 - high-roof converted club cars. #2451 is only MU car with leather seats; all others have rattan. #2451 seats 76 passengers while #2455 seats but 68.

In addition there are 15 baggage-passenger trailers numbered #2400-

2444. These cars seat 58 passengers. Then there are 4 commuter-club cars which are chartered to commuter groups. These are high-roof trailers and are assigned to the following trains:

Car #2450 on trains #510 and #633	
2452	508
2453	510
2454	533
	410
	429

Last on the passenger roster are the 3 RPO-passenger trailers, numbered #2440-2442, and seating 52 passengers.

All cars, both trailer and motor, are equipped with a control station at one end. The cars, therefore, are coupled semi-permanently back to back, with a trailer and a motor car comprising a "multiple". Trains are generally made up with from 2 to 12 cars, with an occasional train carrying an odd number of cars.

The control end of each car, whether trailer or motor, has headlight, air horns, motorman's seat, pilot, end door and built-in marker lights. The opposite, or inside, ends of the cars have no inter-communicating doors, headlights, etc, but do have an extra jumper line connection between roof ends to serve as a bus line to supply current to the trailer.

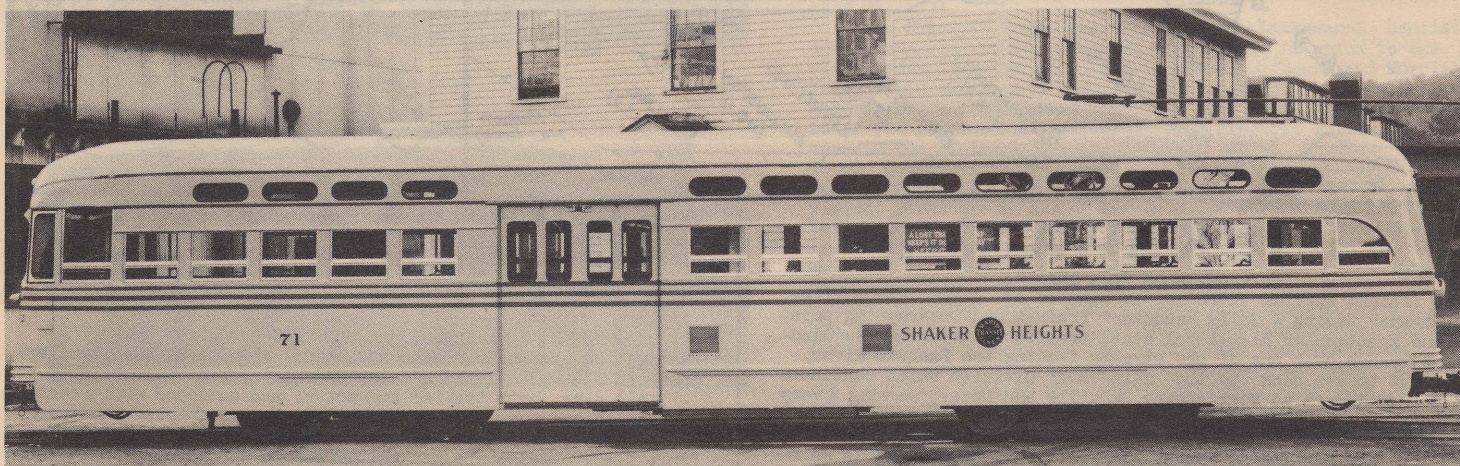
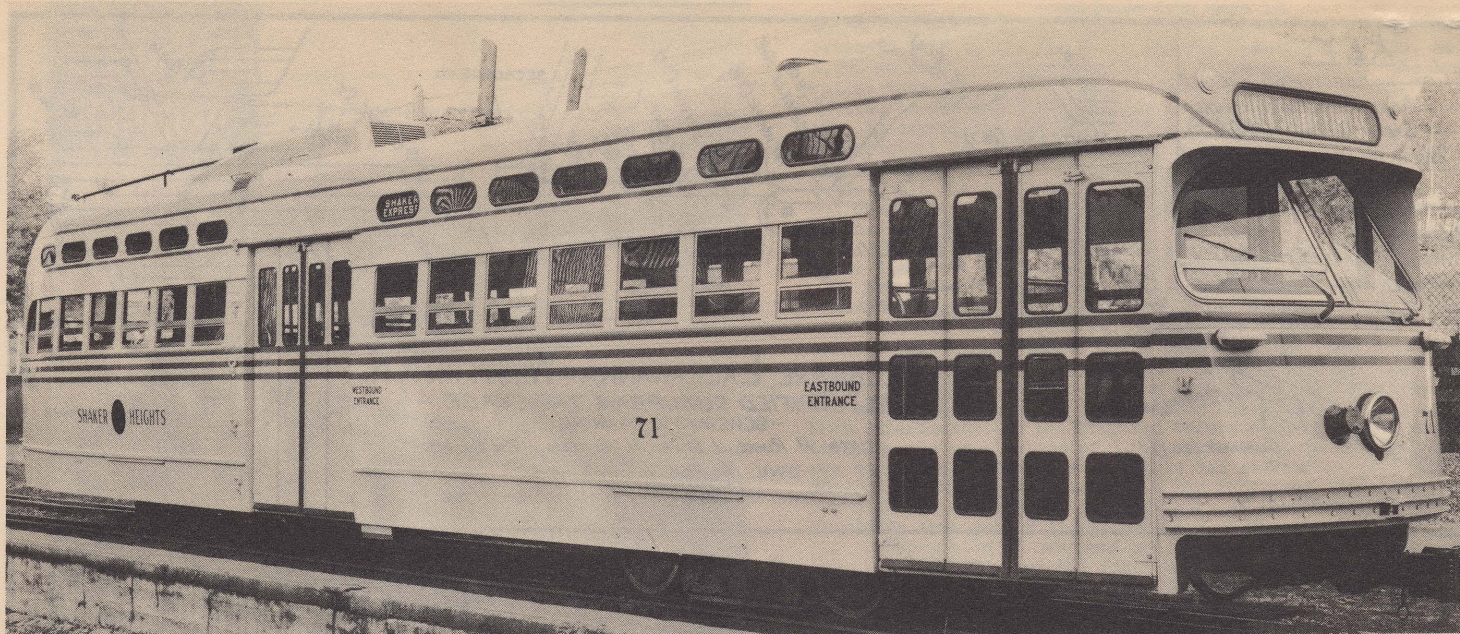
The roof ends of the motor cars have been modified to accommodate air intakes for the traction motor cooling system. All of the cars are regular railroad roof type, but the height varies. The reconstruction work on those trailers which did not formerly have the closed vestibules was done at either the main Kingsland shops of the DL&W or at the Berwick plant of the American Car & Foundry Co (Berwick, Pa). All cars are of steel construction. An odd feature of the motor cars is that they carry roll signs in the side windows for the display of train numbers.

In addition, two three-powered (overhead, battery & diesel) electric locomotives were built (#3501 and 3502) which were used for several years in freight transfer service between Secaucus & Hoboken. These have since been scrapped.

The famous Hoboken Terminal of the Lackawanna, briefly mentioned earlier, is quite a transportation center. There are three levels of electric transport at this point. For beneath the surface is the three-track terminal of the Hudson & Manhattan tubes, which provide fast subway service to both uptown and downtown New York, as well as locally in Hudson county, New Jersey. At street level are the tracks of the Lackawanna RR, and also the lower level of the Public Service of New Jersey Hoboken terminal. While the lower level is now used only by diesel buses, the upper level, above the street, retains all its original trolley car service as it connects with the Hoboken Viaduct.

In addition there are six ferry slips used by Lackawanna RR ferries for both Christopher and Barclay Sts on Manhattan island. Railroad passengers use this ferry service at no charge.

Thus the Lackawanna Railroad, long known as the route of "Phoebe Snow" and dependent on anthracite coal, has today the ultimate in clean, cinderless operation in its suburban electrification. The fast MU cars provide a service along the 70 route miles and 160 track miles which has won the respect of the commuting public. The olive green electrics offer suburbanites the best transportation available. Just ask any commuter on the Lackawanna.



SHAKER HEIGHTS MU PCC CARS

The Latest in Suburban Rapid Transit Equipment

by Arnold R. Bushnell & William E. Harmon

The 25 Pullman-built PCC cars just delivered to Shaker Heights Rapid Transit represent the latest achievement in suburban electric railway design, combining the benefits of Sprague multiple unit control and the one million dollars spent on PCC research since the foundations of the Transit Presidents' Conference Committee were laid just twenty years ago.

Here is an electric railway proud of its long record of fine transit service, and proud too of an unusual feat in these days: it makes a handsome profit. Its progressive management might well set the example for suburban transit the country over.

The new cars are equipped for multiple unit operation in trains of up to six cars—the longest PCC trains yet, as Pacific Electric and MTA (Boston) can run only three-car trains. These are among the first all-electric cars in MU service. Car dimensions and specifications are as follows:

Length, car body proper	50' 2"
Length over coupler faces	52' 7 7/8"
Width over belt rails	9' 0"
Height from rail to top of roof	10' 1 1/4"
Truck centers	24' 10 1/2"
Truck wheel base (B-2 truck)	6' 10"
Wheel diameter	26"
Track-gauge	4' 8 1/2"
Seating capacity	62
Light weight, including trucks	43,100 lbs
Class of car	One-man single end MU

Car numbers are #71-95. Electrical equipment is by GE. On all but the lead car, trainmen act only as conductors, to open doors and collect fares for their individual cars.

On November 29, some 75 invited guests were taken for an inaugural ride in a two-car train of the PCC's, from Union Terminal

in the heart of Cleveland, to Green Road terminus of the Shaker Division. The train glided smoothly over the open tracks of the rapid transit line with scarcely any sway, and no bumping at all.

Mayor William J. Van Aken of Shaker Heights selected the canary yellow exterior color, while Paul K. Jones, Director of Transportation of the municipally owned line, chose the interior three-tone green color scheme. Jones said the new cars cost \$33,000 each, and pointed out some of their up-to-date features: safety glass, standee windows, greater acceleration and deceleration than the older equipment, and 5 MPH higher speed. It should be possible to reduce running times by one minute, as the new cars have a level track speed of 45 MPH, or 55 MPH downhill. They will eventually replace 25 of the older cars, or about half the earlier equipment.

At this writing, the PCC's are operated in weekday base service only from 9 AM to 3 PM. One three-car train continues to operate thruout the PM rush hour due to a shortage of older cars. They will gradually be worked into night and rush hour operation. It is suggested that the power situation may have some bearing on the slow introduction of the new cars. A new \$60,000 substation is being completed at Shaker Blvd & Warrensville Center Road, which soon will guarantee adequate power for the PCC's.

Some size differences between the Shaker Heights PCC cars and those on the Cleveland Transit System may be pointed out. CTS cars seat only 52, or ten less than SHRT, and are only 8' 1/4" wide and 46' long.

Other features of the million dollar improvement program of the already excellent Shaker Heights system include:

- ** Enlarged parking areas at all stops, to double the capacity of the present auto parking lots;
- ** Improved lighting at all stations;
- ** More frequent schedules from Union Terminal to both the Shaker Blvd and Moreland Blvd divisions, and improved loading facilities at the Terminal.

THIS WAS OUR FIRST ISSUE:—



E R A Headlights

Vol. 1 No. 1

Published Once a Month

December 15th, 1939

Another meeting has rolled around and we find this on our hands. Whether or not it is ever published again will depend on its reception to-night (OK "To-night", then). Following is our staff:

Editor Larry Gaillard
Asst Editor Larry Gaillard
Sec'y Larry Gaillard
Treas. Larry Gaillard
Circ. Mgr. Larry Gaillard
Advtg. Mgr. Larry Gaillard
Newsboy Larry Gaillard

We should like to see the entire staff fired and a new one elected or appointed. What to do about the whole thing we'll let EQJ decide.

PERSONALITIES

BOB GRAHAM mentioned he saw "a beautiful job" the other day. We thought he referred to a trolley model but were wrong. It was a Brooklyn blonde.

FIGHTING FOR T A R S

It is encouraging to see an organization like the NY Car Riders Ass'n formed to make a last stand for rail transportation in the City. Following are the reactions of one NYORA member to his four weeks of campaigning:

1. The majority of regular riders prefer street cars to buses.
2. 60% signed the petition.
3. Those who did not sign were out-of-towners, disinterested, afraid, or really

preferred buses.

4. As the first three groups comprised at least 20% of the non-signers we can safely say that only 20% actually like stink-buggies.

5. A number of passengers praised our efforts and said they would write the newspapers and the Mayor. Here are some comments we heard on the cars:

OLD LADY: I loathe buses; they smell so.

DISTINGUISHED GENTLEMAN:

Why it would be an outrage to take these new cars off.

OLD MAN: I've been hoping someone would start something like this.

YOUNG ITALIAN: I wouldn't sign nothin'. Last time I signed my name I was sued for a hundred thousandbucks.

SOCIETY LADY: (after seeing others sign): Oh, I'll sign. I thought the man was selling something.

MESSENGER BOY (in rear): The guy's a Red. Throw him out.

OLD MAN: Maybe these cars are new but my feet are cold. Where's the heat?

HIS WIFE: Shut up, John, and sign. (He did).

YOUNG CO-ED: I hope you win. I'm just ka-ra-zy about the new cars.

If you like statistics here are some furnished by the NYORA member:

No. Cars Ridden	76
No. Speeches Given	84
No. People Addressed	3915

No. Signatures 1540

#Estimated

(We hope you are not Bored with this Estimate.)

A SUGGESTION:

Friendly kibitzing and our impatience to talk shop or look at the other bird's pictures often slows up our business meeting. Than we writhe in our seats with impatience. We have the solution in our own hands ---- TO-NIGHT.

OUT-OF-TOWN NUZE

St. Louis, Mo. order for 100 PCC's has gone through.

Capital Transit, Wash., DC has ordered 35 more PCCs.

ANOTHER SUGGESTION:

Instead of trying to eke a seed out of us, once a year how would it be to assess us 10 cents a week at meetings (whether we attend or not). This would give the treasury 20 cents more per person per year and make us all dues-conscience.

THIS SPACE AVAILABLE FOR ADVERTISING.

Our thanks to Peggy, Watson of the New York Central for the scroll work at the top. She did it just for us- because she hates trolleys



ERA HEADLIGHTS

is published monthly, by the Electric Railroaders Association Inc, Lackawanna Terminal, Hoboken, N.J. Free to active members. \$2.50 per year for all others.

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VOLUME 11, NUMBER 1 -- JUBILEE ISSUE

With this issue of ERA HEADLIGHTS, we mark Volume 11, Number 1 in our history. In the past 10 years we have witnessed the development of HEADLIGHTS from a small one-page publication of our New York Division (see copy of our first issue on page B-1) to its present position as the leading publication of its kind.

In reviewing the past ten years of ERA HEADLIGHTS one should note the continued improvement from month to month in the content and makeup of the magazine. Last year witnessed a total number of 188 pages for HEADLIGHTS, a new record. More pictures, maps, rosters and other material were also published in 1948 than ever before. These improvements are the result of the combined efforts of more than 30 ERA members located throughout the USA and Canada who have given freely of their time to the publication of ERA HEADLIGHTS. It is probably a surprise to many of our members, but the ERA does not maintain a paid office staff at ERA Headquarters, but relies on the volunteer efforts of the membership. Among the daily chores at ERA headquarters are such varied details as keeping the addressograph list up to date, answering of membership inquiries, operating the mimeograph machine (all mimeograph

work is done on the ERA's own machine), filling of material orders, processing of ERA membership applications and the enormous job of keeping ERA's Sprague Library and files in order.

Then too, the actual work of producing HEADLIGHTS is performed by individual members. In addition to the actual writing of the news and feature material, all composition of ERA HEADLIGHTS is completed by ERA members. Typing, art work, maps, layout work and other jobs are all "home" jobs and only the offset illustrated sections of HEADLIGHTS is commercially done. Once the publication has been returned from the printer, there still remains the large job of collating the mimeograph pages and inserting the completed issue in the envelopes. The use of a mailing permit eliminates stamp sticking and speeds HEADLIGHTS on its way each month. All this is the work of ERA members, serving without pay. Thus we find the progress of ERA HEADLIGHTS the work of many individuals, each adding his small bit to the overall job of making ERA HEADLIGHTS a better publication. Such work cannot be discounted in any review of the past ten years.

During those years, a number of important events have occurred in our history. These are listed below:

First issue: December, 1939*
First 8 1/2" page size issue: January, 1942
First track map: May, 1942
First offset page: November, 1944
First regular offset issue: January, 1946.

*It should be noted that ERA's other publication, ELECTRIC RAILROADS, was first published in 1935.

ERA HEADLIGHTS has had five editors since the first issue came out in 1939. In the order they served, they were:

Lawrence L. Gaillard (ERA #98)
Henry W. Ruschmeyer (ERA #554)
Jack W. Farrell (ERA #527)
Hugh J. McCabe (ERA #505)
Harold H. Geissenheimer (ERA #827).

In connection with this special "Jubilee" issue, we have received a number of congratulatory messages. From Larry Gaillard, founder and first editor of ERA HEADLIGHTS, comes the following:

"I hope I am not too late to send in the following message to your fine publication on its Tenth Anniversary:
(Continued on page B-11)

LIST OF ELECTRIC STREET RAILWAY, INTERURBAN, AND RAPID TRANSIT LINES OPERATED FOR PASSENGER SERVICE, DECEMBER 15, 1948

*Operates FCC's or other modern streamlined cars.

ALABAMA:

*Birmingham Electric, Birmingham

CALIFORNIA:

Calif. Street Cable R.R., San Francisco

*Key System Transit Lines, Oakland

*Municipal Ry., San Francisco

*Pacific Electric Ry., Los Angeles

*San Diego Transit Lines, San Diego

COLORADO:

Denver & Intermountain, Denver

Denver Tramways, Denver

Fort Collins Municipal, Ft. Collins

DISTRICT OF COLUMBIA:

*Capital Transit Co., Washington

FLORIDA:

St. Petersburg Municipal Ry., St. Petersburg

GEORGIA:

Georgia Power Co., Atlanta

ILLINOIS:

*Chicago, Aurora & Elgin, Wheaton

*Chicago, North Shore & Milwaukee, Highland

Chicago, South Shore & South Bend (See Indiana)

*Chicago Transit Authority, Chicago

*Illinois Terminal, Springfield

INDIANA:

Chicago, South Shore & South Bend, Michigan City

Indianapolis Rys., Indianapolis

IOWA:

*Cedar Rapids & Ia. City, Cedar Rapids

Charles City Western, Charles City

Des Moines & Central Ia., Des Moines

Des Moines Rys., Des Moines

Ft. Dodge, Des Moines & S., Boone

Waterloo, Cedar Falls & Northern, Waterloo

KANSAS:

*Kansas City Public Service (See Mo.)

KENTUCKY:

Cincinnati, Newport & Covington, Covington

LOUISIANA:

New Orleans Pub. Service, New Orleans

MARYLAND:

Baltimore & Annapolis, Annapolis

*Baltimore Transit Co., Baltimore

*Capital Transit Co. (See D.C.)

Potomac Edison, Frederick

MASSACHUSETTS:

*Metropolitan Transit Authy., Boston

MICHIGAN:

*Dept. of Street Railways, Detroit

MINNESOTA:

Minneapolis Filtration Plant, Minneapolis

*Twin City Rapid Transit, Minneapolis

MISSOURI:

*Illinois Terminal (See Illinois)

*Kansas City Public Service, Kan. City

*St. Louis Public Service, St. Louis

St. Louis Waterworks Ry., St. Louis

MONTANA:

Anaconda City Lines, Anaconda

NEBRASKA:

Omaha & Council Bluffs, Omaha

NEW JERSEY:

*Atlantic City Transp., Atlantic City

Hudson & Manhattan, Jersey City

Delaware River Joint Comm., Camden

(See PTC)

Public Service Co-Ordinated Transp., Newark and Jersey City

NEW YORK:

Hudson & Manhattan (See New Jersey)

International Ry., Buffalo

*New York City Transit System, N.Y.

Queensboro Bridge Ry., L.I. City

Rochester Transit, Rochester

Third Ave. Transit, Yonkers, Mt.

Vernon and New Rochelle

NORTH CAROLINA:

Piedmont & Northern, Charlotte

OHIO:

Cincinnati, Newport & Cov. (See Ky.)

*Cincinnati St. Ry., Cincinnati

*Cleveland Transit System, Cleveland

Community Traction Co., Toledo

*Shaker Heights Rapid Transit, Cleveland

OKLAHOMA:

Sand Springs Ry., Sand Springs

OREGON:

Portland Transit, Portland

Portland Ry. & Term. Div., Portland

PENNSYLVANIA:

Altoona & Logan Valley, Altoona

*Johnstown Traction, Johnstown

Lack. & Wyoming Valley, Scranton

*Lehigh Valley Transit, Allentown

*Phila. Suburban Transp., Lanerch

*Phila. & Western Ry., Norristown

*Phila. Transp., Philadelphia

*Pittsburgh Rys., Pittsburgh

Scranton Transit, Scranton

West Penn Rys., Connellsville

Wilkes-Barre Transit, Wilkes-Barre

SOUTH CAROLINA:

Piedmont & Northern, Greenville

TEXAS:

*Dallas Ry. & Terminal, Dallas

El Paso City Lines, El Paso

Texas Electric, Dallas

ELECTRIC LINES (Continued from page B-3)

TROLLEY MUSEUMS

UTAH:
*Bamberger Railroad, Salt Lake City
Salt Lake, Garfield & Western, S. L.
City

VIRGINIA:

*Capital Transit (See D.C.)
Virginia Transit Co., Richmond

WISCONSIN:

*C.N.S. & M. (See Illinois)
Milwaukee Elec. Ry. & Transport, Milwaukee
Northland Greyhound, Milwaukee

The following states have no inter-urban or street railway passenger service:

Arizona	Nevada	Tennessee
Arkansas	New Hampshire	Vermont
Connecticut	New Mexico	Washington
Idaho	N. Dakota	W. Virginia
Maine	Rhode Island	Wyoming
Mississippi	S. Dakota	

CANADA

ALBERTA:

Calgary Municipal Ry., Calgary
Edmonton Radial, Edmonton
Lethbridge Mun. Ry., Lethbridge

BRITISH COLUMBIA:

*British Columbia Electric, Vancouver
Nelson Street Ry., Nelson

MANITOBA:

Winnipeg Electric Co., Winnipeg

NOVA SCOTIA:

Nova Scotia Light & Power, Halifax

ONTARIO:

Cornwall St. Ry., Cornwall
Grand River Ry., Preston
Hamilton Street Ry., Hamilton
Lake Erie & Northern, Preston
London & Port Stanley, London
Niagara, St. Catharines & Toronto,
St. Catharines
Ottawa Transportation Comm., Ottawa
Sudbury-Copper Cliff Suburban, Sud-
bury

*Toronto Transp. Comm., Toronto

QUEBEC:

Montreal & S. Counties, St. Lambert
*Montreal Tramways Co., Montreal
Quebec Ry., Light & Power, Quebec

SASKATCHEWAN:

Regina Municipal, Regina
Saskatoon Mun. Ry., Saskatoon

NEWFOUNDLAND:

Newfoundland Light & Power, St. Johns

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(Note--This list does not include electrified railroads.)

BRANFORD ELECTRIC RAILWAY ASSOCIATION:
(Short Beach, Conn.) Write to P. O.
Box 293, Clifton, N.J.

CENTRAL OHIO RAILFANS' ASSOCIATION:
(Worthington, Ohio) Write to Mr.
Bernard J. Kern, 452 Woodbury Ave.,
Columbus 4, Ohio.

CONNECTICUT ELECTRIC RAILWAY (Affilia-
ted with Conn. Valley Division, ERA)
Write Mr. Roger Borup, Warehouse
Point, Conn.

EQUIPMENT DIVISION, BAY AREA ELECTRIC
RAILFANS' ASSOCIATION: Write Mr.
Addison H. Laflin, Jr., 2119 Marin
Ave., Berkeley 7, Calif.

MUSEUM OF TRANSPORT (Barretts Station,
Mo.; affiliated with St. Louis Divi-
sion, ERA): Write to Mr. John P.
Roberts, 304 Belt Ave., St. Louis 12,
Mo.

SEASHORE ELECTRIC RAILWAY (New England
Elec. Ry. Hist. Soc., Kennebunkport,
Me.): Write to Mr. George Burdick,
25 Roslyn St., Salem, Mass.

ERA DIVISIONS

--*

ANTHRACITE DIVISION, c/o John Endler,
23 Hughes St., Forty Port, Pa.

CONNECTICUT VALLEY DIVISION, c/o Roger
Borup, Warehouse Point, Conn.

MILWAUKEE DIVISION, c/o James Harper,
2910 North 28th St., Milwaukee, Wis.

NEW YORK DIVISION, c/o ERA, Lackawanna
Terminal, Hoboken, N.J.

ST. LOUIS DIVISION, c/o John P. Roberts,
304 Belt Ave., St. Louis 12, Mo.

SOUTHERN OHIO DIVISION, c/o Clifford R.
Scholes, 215 Livingston Ave., Dayton

WASHINGTON DIVISION, c/o Robert S.
Crockett, 6319 Blair Road N.W., Wash-
ington, D.C.

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PHILADELPHIA NEWS

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PTC will ask the Public Utility Com-
mission for permission to run shuttle
buses on Spruce and Pine between 3rd
and 24th sts.

Engineers have made their report to
the Delaware River Joint Commission on
South Jersey rapid transit. They want
to extend the present bridge line west
to 16th & Locust sts., Phila., and east
from Broadway, Camden, to Glassboro,
Clementon, Haddonfield and Moorestown.--
W. H. Watts, E. J. Armstrong, Joseph
Carter.

CHICAGO

NORTH SHORE RR OWNERS APPROVE SHORE LINE CLOSING;
SWEEPING CHANGES PROPOSED IN CTA ELEVATED SERVICE

by Raymond De Groote & Ralph Beaudry

STOCKHOLDERS VOTE TO DROP CNSM SHORE LINE: Stockholders of the Chicago, North Shore & Milwaukee electric line have voted 390,000 to 106 to authorize abandonment of the 40-mile Shore Line route between Chicago and North Chicago, Ill. An application to abandon has been filed with the Illinois Commerce Commission, and this must be approved before final action is taken. The Commission already has the road's application for a bus service thru most of the Shore Line communities. The company now operates daily 85 trains carrying 13,000 passengers, on this line, but still claims it loses \$600,000 a year on it. Opposition from the affected towns remains strong, and the mayors' group referred to here last month hopes to get CTA to take over the line. They claim that "continued use of this right of way is a necessity for meeting the transportation needs of the north shore". A new plan for joint operation using the C&NW entry into Chicago, and the yet-unopened Milwaukee Ave subway into downtown, is receiving favorable attention. Diesel hauling would be required along the C&NW trackage, overhead in the suburbs and third rail in the subway. The Skokie Valley and Mundelein lines of the CNSM will continue in any case.

REVOLUTIONARY "L" PLANS ANNOUNCED: Chicago Transit Authority has proposed a sweeping reorganization of the north-and-south elevated and subway service which would eliminate local trains and devote virtually all of the rapid transit facilities to express service; running times would be cut by 20% and headways reduced to between 1 and 3½ minutes. Under this skip-stop plan, every station would be designated "A" or "B" (major stops both "A" & "B"). "A" trains would run from Howard St. to Jackson Park, "B" trains Howard St. to Englewood. The Ravenswood trains presently operating thru the subway to Englewood and Normal Park would be diverted to the "L" and run around the loop; these trains also will be marked "A" & "B". (Howard St.-Jackson Park and Englewood trains would run in the subway.) Local trains plying between Wilson Ave. on the North Side and 42nd Place on the Kenwood Branch would be eliminated; the Kenwood branch itself would be abandoned and replaced by buses from Indiana Ave. The Normal Park Branch was not mentioned one way or the other in the plan.

Evenston Express trains, from Linden station to the Loop, would run rush hours only, but at all hours a shuttle would operate between Linden Ave and Howard St. An improvement in fare collection would be made at Howard St., where ticket collectors now pass thru the trains to secure suburban fares outbound and city fares inbound. Collectors would ride between Howard and the next stop north, instead of holding the trains at Howard St., so as to further speed service.

A total of 33 stations on the branches involved would be closed down to reduce stopping times and eliminate a large expense. Two of these stations are the North Water St stub at the Merchandise Mart from which a number of PM rush hour trains depart for Howard St. or Ravenswood, and the old Congress St station (of the original State St Alley "L"), from which four trains—two to Jackson Park and two to Englewood—leave in the PM rush. The North Water elimination would inconvenience a good many people in the Mart, but relatively few commuters know of the Congress St runs.

No date is set for any of these changes, since public hearings will first be held, and the city council will review the plan. It is hoped to make service sufficiently attractive to win auto riders to the rapid transit, thus reducing Loop traffic congestion. As a precedent, CTA cites the Lake St "L", which received the all-express service on April 5, 1948. Since then, running time has been reduced 20 to 30%, traffic is up 15% in rush hours, or 6 3/4% overall, and more cars have been added to some trains. Passengers riding between an "A" and a "B" station on the same line must either change at an "A&B" station or transfer to parallel surface vehicles. How the new plans will appeal to the riders remains to be seen.

WESTERN AVE IN THE NEWS: The Western Ave muddle is now finished. On Dec 12, the #49-Western PCC line was cut back 1.75 miles from Devon to a new loop at Berwyn Ave (5 blocks north of Lawrence), eliminating the necessity of running the cars east on Devon to Clark in order to turn them around. On that same date, buses that used to operate between Howard and Devon were extended to a new off-street under-cover bus

(continued on page B-6)

CHICAGO NEWS (cont'd)

terminal at Western Ave station of the Ravenswood "L". This is the first such arrangement to be established by CTA, altho other similar terminals are planned. The actual construction of the loop was delayed several weeks while the zoning board heard complaints from residents of the area, but it finally gave approval. At present only the trolley car facilities have been built, but future plans call for the construction of a bus loop inside the car loop, with direct transfer to be made via sheltered platforms. Despite the shortening of the car line, track repairs are being made on the discontinued section between Berwyn and Devon, presumably for barn movements.

IMPROVEMENTS FOR 1949: CTA will spend over \$26 million in 1949 for its new equipment and modernization program, it was announced recently by the Transit Board budget committee. Purchase of 400 buses and 130 "L" cars, already ordered and due to be delivered in 1949, will cost \$11.2 million. With delivery of this equipment CTA will have a total of 2,248 modern buses, street cars and rapid transit cars — all part of the ten-year \$150 million modernization program. To speed up rapid transit service, over \$3 million will be spent for modernizing equipment, signals, stations, track and other facilities. Field tests of a new electronic method of providing signal protection for rapid transit trains will be made in the middle track on the structure above 63rd St between Dorchester and Calumet Aves. If successful, it is estimated that this electronic system at a cost of \$2.5 to \$3 million can duplicate the performance of a \$7.5 million signal system of the conventional type. The final stages of the tests will be made under actual operating conditions. Of the \$26 million to be spent all told, CTA has \$12 million on hand. It is presumed that additional funds will come from another bond issue.

WEEKEND BUS SERVICE FOR CAR LINES: For the first time in Chicago's transit history a car line has been replaced by buses on weekends only, from 5 AM Saturday until 2 AM Monday. The first line so affected is the North Damen route between Blue Island and Fullerton, effective Dec 11. The Chicago Daily News adds, "Schedule studies are now being conducted on many other CTA routes to work out the week end bus arrangement." #44-Wallace-Racine is rumored to be next in line for part time bus service.

SHORT TRIPS: CNSM has asked for permission to discontinue station agents at the Harmswoods, Highmoor and Sheridan Elms stations on the Skokie Valley Route, because agents there do not take in enough money to pay their own wages. For example, daily ticket sales at Sheridan Elms average \$3.50, or 42% less than the agent's salary. Stations would be kept open and heated, however, for passenger convenience.....Another change is due for the Lake St "L". Forest Park, present western terminus of the line, will be discontinued as a passenger stop, but the tracks into the station will still be used for yard movements. Rush hour trains now are sometimes delayed up to ten minutes waiting to enter Forest Park station. So passenger runs will end at Marion station (two blocks east), and a yard motorman will operate the trains to the Forest Park crossover and back to Marion. \$19,000 is being spent on trainmen's facilities for Marion. In addition, the Lake St "L" stations eliminated last April are now being torn down. Others, however, could use a good coat of paint.....On Dec 13, PCC cars were placed on #42-Halsted-Archer-Clark line, which operates from the north end of the Halsted line to 79th & Halsted via downtown. This eliminates the delays formerly caused by the heavy deck-roof cars running in competition with the PCC's on Clark St.

E X T R A

B O A R D

"THE TURNOUT" (Boston Chapter NRHS publication), special Convention issue, Sep 1947, still available in limited numbers. Well illustrated number issued on 50th anniversary of subway operation in America. This fine issue for 30c postpaid. Stamps are NOT acceptable. Remit to Wm. V. Kenney, 90 Walworth St, Boston 31.

PHOTOS FOR SALE: New list of 1200 prints, all electric lines. Milwaukee area negatives to trade for those from other regions. James P. Harper, 2910 North 28th St, Milwaukee 10, Wisconsin.

ADVERTISE IN THE "EXTRA BOARD"
NO CHARGE TO READERS OF HEADLIGHTS

Pittsburgh Receiving Latest Hundred PCC Cars

by Charles Dengler & Joseph Carter

About December 1, Pittsburgh Railways Co received its latest PCC car, the first of an order of 100. These will increase the company's total PCC fleet to 666. This newest group cost \$28,350 each, or almost twice the figure of \$15,735 each for the cars PRC bought in 1936. The new streamliners are St Louis built.

These new cars, the first of which went into service on #22-Crosstown line, are entirely a new design from the wheels up. The windows are made of a Pittsburgh Plate Glass Co glass which absorbs 60% of the sun's heat rays. The windows are not as high as those on the earlier PCCs. Opening of the windows is not necessary. (Incidentally, the cars have standee windows too.) Four large ventilating fans, concealed in the ceiling and evenly spaced down the center of the car, take fresh air from the modified "monitor" or clerestory in the roof and force it thru louvers to all parts of the car. The fans are thermostatically controlled and were made by the Minneapolis-Honeywell Co. The heating is similarly controlled.

The cars have roof headlights to supplement the regular ones; blinker doors; and all cross seats (new for Pittsburgh). They are all-electric; drum brakes on each of the four motor shafts are spring applied and electrically released. There are no brake shoes on the wheels. Improved control circuits make operation smoother. These improvements include:

(1) Extended dynamic braking. On the new cars, motor brakes drop the car speed to one mile per hour and the drum brakes complete the stopping.

(2) An improved method of cushioning the shutting off of power, known as Easy Power Shut-off, preventing jerking of the car when repeated power applications and shut-offs have to be made. (These features are also found on some other late model PCC cars.)

(3) A change in motor control to permit increased acceleration. This allows faster climbing on grades. A speed governing relay holds the car to a predetermined speed.

Twenty-five of the new cars will be specially equipped for use on the inter-urban lines. They will have whistles, baggage racks, special trucks, headlights and cowcatchers in addition to the aforementioned improvements.

The public was furnished with no end of information about the new cars thru the efforts of Pittsburgh Rys, the Pittsburgh Press and the manufacturers of the cars and their equipment. The December 7th issue of the Press can justly be called the "Trolley Number, since pages 27 thru 31 were replete with pictures, articles concerning the cars, their equipment, PCC development history, and many aspects of Pittsburgh Rys' operations—roadbed maintenance, mileages, snow fighting, and the famous South Hills tunnel used by 60,000 riders daily. Besides all this, numerous advertisements were inserted by companies which had a part in the new trolleys.

Los Angeles: Pacific Electric is conducting an extensive survey in the use of diesel freight engines. Arthur Jenkins, formerly with the PUC (see next page), is consultant. The only definite word available is that the company is favorably impressed with the diesels' quick pickup, ease in backing, and use of rail signal contacts. Tests were made on the long San Bernardino line, which is freight-only east of Covina. More tests will be made on other lines before any decisions are made. The study was to have been completed by now but it has been extended to about Feb 1. It also includes the PUC's suggestions of one-man operation, substitutions, etc.

The fate of PE's Long Beach-San Pedro line is still in the hands of the PUC.

It is opposed by Pacific Greyhound, which claims the PE buses would compete with theirs on the same route (Coast Hwy).

On Los Angeles Transit Lines, trolley coaches replaced street cars on the "B" line (Brooklyn & Hooper Aves) on Dec 5. Same day, #5-Eagle Rock-Hawthorne line was changed from two-man to one-man cars.

Buenos Aires, Argentina: According to Bus Transportation for November, 300 "latest type" street cars are on order for this city, along with about 2000 buses. This is as a result of the bids mentioned on page B-5 of September 1948 Headlights. No details or identity of the manufacturers are given in this report.

—William S. Gorton Jr.

LATE FLASH---The Queensboro Bridge Ry (NYC) has purchased six MASTER UNIT type cars from the Union Street Ry (New Bedford). #611 arrived in NYC on January 7th, 1949.

SAN FRANCISCO

DIME FARE REJECTED; MORE SURVEYS IN PROSPECT
by Claxton Searle & William S. Gorton Jr

Despite warnings of Utilities Manager Turner that rejection of a 10c fare would require service curtailments, the Board of Supervisors voted 6 to 4 to retain the present fares, stating they may reconsider in March, hoping for the Mayor's support at that time. President Landis of the Utilities Commission suggests replacement of H (Potrero) cars south of Market, and M (Ocean View) cars by buses, rescheduling of K (Inglewood) and schedule studies on several losing bus lines. It was also planned to review the issuance of free passes, of which 4000 are in use, but in the face of numerous energetic protests this idea was dropped.

On Jan 16, TC's will relieve buses on #22-Fillmore, by which date track removal there is to be completed. Buses released, plus new arrivals, will go on #9-Valencia, #11-Mission and #14-Daly City; but no funds are presently available for removing these tracks. 45-second rush hour headway is to be provided on Mission between 5th and 24th. Line #9 will get TC's early in September. #14 will have both local and express service. Shuttle bus from #14 Daly City terminus will reach Holy Cross Cemetery, replacing part of #40-San Mateo interurban to be abandoned this month. Much opposition to rubber tired vehicles on Mission was voiced, and President Foley of the CIO Carmen's Union plans to contest the substitution as a violation of the agreement made when voters approved the bond issue. "Buses just won't do in the Mission", he says.

Opposition of taxpayer groups is developing toward recently disclosed plans of Charles DeLew for a Market St subway from 2nd to Eucalyptus Sts. Mayor Robinson is on record as favoring a subway bond issue in 1950. Meantime he has engaged Col Sidney Bingham of New York to formulate plans for a lesser subway under Market from 2nd to Guerrero, to cost \$30 million, plus \$10 million for cars and track, skipping the branch to the Mission proposed by DeLew. Further, Arthur Jenkins, San Francisco consulting engineer, has been allowed up to \$20,000 to make an "efficiency survey" of Municipal Ry operations. Jenkins is said to favor "high capacity vehicles", and makes favorable, if brief, mention of street cars in an article in November Mass Transportation.

Commissioner Sam McKee asked the PUC to restrict trolley coach operation on Market St to that portion east of Haight St. Present plans call for overhead east to Castro to permit substitution of #8-Market St. Work on the Market St TC overhead is to commence about Jan 1, to be completed in March when #5-McAllister and #21-Hayes will change from bus to TC. #6 & #7-Haight will get TC's in June.

A new route number system will become effective Feb 1 to eliminate duplication between street car and bus route numbers. All present car routes will retain their numbers and new ones will be assigned to duplicating bus lines. When the conversion program is completed, only street car routes will be lettered, buses and TC's having numerals.

OAKLAND-KEY SYSTEM FEUD CONTINUES

With motorization of Key System Transit Lines' last four local car lines (#1-E 14th St, #3-San Pablo, #4-Shattuck and #5-Telegraph-Grove) on Nov 29, only the Bridge trains offer electric railway service in the East Bay area. The cars are still in storage for the present.

The City of Oakland proposed a new franchise for KSTL which would require city approval of any abandonments, extensions, route changes or change in type of vehicle. Franchise would be non-exclusive, the city guaranteeing no competition will be allowed as long as KSTL does not default on its obligations. Key System turned down the franchise, saying (among other reasons) equipment and

route decisions were legally the right of only the state PUC to make. Key wants to continue discussions.

A public hearing is scheduled for Jan 4 in Oakland on creation of an East Bay Transportation Authority with power to control and operate car and bus service in and between the nine East Bay cities. Oakland's Mayor said it might very well supplant Key System.

S F Muni Ry Supervisor Marvin Lewis, also chairman of the S F Bay Area Rapid Transit Committee supports a similar plan for the whole Bay Area and reports that Los Angeles is seeking State authorization for a county transit authority, and urges cooperation in getting such a law.

--Claxton Searle, S.D.Craws & J.Carter

REIFSCHNEIDER'S REPORTS:MULTIPLE UNIT CONTROL

by Felix Reifschneider

The basic idea of Frank Sprague's multiple unit control was that a single motorman from a position at the head of a train could control one or a dozen cars in the train, each car supplying power to help move the train as a whole. There has been no change in this concept, which seems simple today, now that we are so familiar with it. At the time it was invented, no one had ever thought of such a thing, and it was openly scoffed at. In fact, railway managements resisted its installation.

When electric propulsion was first proposed for the Manhattan elevated, everyone was thinking in terms of an electric locomotive, pulling a train of 3 or 4 of the same cars that were being pulled by steam locomotives at the time. When rolling stock was being designed for the first New York subway—which, incidentally, was opened in October 1904—the following idea was the one scheduled for adoption. The first car was to be a motor car, with controller at the head end for the use of the motorman. Then there were to be two or three trailer cars, with another motor car at the rear end. When the direction of movement of the train was reversed at terminals, naturally the rear car would become the first car, and vice versa. Between these two motor cars, one at each end of the train, heavy control cables were to be run thru the trail cars, carrying the power to operate the motors. The cables had to be heavy as they had to be designed to carry the large starting current of the large traction motors in the two motor cars. With only four motors to propel a 4 or 5 car train, it is obvious that each motor would have to develop a lot of power.

The scheme just outlined was cast aside only when Sprague pointed out the fire hazard from carrying the heavy cables with high amperage current thru the trail cars. It does illustrate to what lengths people were willing to go to avoid the use of multiple unit control.

The obvious advantages of MU control will not be discussed here, but we will point out two advantages that were put forth originally which have not worked out in practice. With MU control it is possible to control the train from any car, not only from the first one. However, the motorman can get a better view of the track ahead, judge his stopping distances and stopping locations more accurately, observe signal indications, etc, much better from the head end of the train than from, let us say, the second or third car. The only time when this feature is of any value is when there is trouble with the control system in the first car. In such an event the motorman can disconnect the first car electrically from the train, operate from the control cab of the second car, and push the first car ahead of him as if it were a trailer. Or, if the trouble with the first car is confined to the master controller, it is possible to go to the second car without any other ceremony, and operate the train from that car until the terminal is reached and the defective car can be cut out of the train.

The other advantage which has been little used is that it is possible to make and break up trains while in motion. This smacked too much of the "flying switch" technique for conservative railroaders, but in a few cases it has been used successfully. One of these was on the Key System in Oakland, California. Here a 7-car train would be operated from the Ferry Terminal at the end of the Key Mole. It was a three or four mile run for the 7-car train, first over a trestle, then along a solid fill, and finally on tidal flats close to the mainland. When the junction was reached, each motorman would be in the proper cab, buttons would be pushed to break up the train at the proper points, and while still moving, trains of one or two cars would be on their way for three or four different destinations. The writer never observed this personally, as the Key System had abandoned the practice when he visited California for the first time.

The Chicago, Aurora & Elgin used a somewhat similar scheme at Wheaton, Ill. Here trains from three different branches were combined into a single train for an express run into Chicago. Also, when the Interborough subway was first extended east of Atlantic Ave, Brooklyn, the first part of the train was destined to East New York, while the rear half of the train was sent south over the Nostrand Ave branch. Trains were broken up eastbound at the station just before the junction, and combined again at the same point on westbound trips.

(continued on page B-10)

REIFSCHNEIDER - MULTIPLE UNIT CONTROL (cont'd)

It is regrettable that this feature of MU control has not been more widely adopted, as it could be made very useful. Of course, there have been other applications in addition to those mentioned above.

One of the most remarkable things about MU control is that, while it seems quite complicated, it is very reliable. Control failures on MU trains are very rare. In this case, simplicity and reliability do not necessarily go together.

It is obvious that if we have a five car train, each car of the same size and weight, same motors, trucks, gear ratio, etc, the cars should "MU" satisfactorily. But what if all the cars of the train are not identical, can they still be operated together in the same train satisfactorily? The answer is, "It all depends". As a matter of fact, all the cars of a train are never the same. There is, for example, a difference in weight between an empty car and one full of passengers. When electric cars have been operated for a number of years, and motors have been rewound a number of times or otherwise repaired, it is very common for the fields to be weaker in one motor than in another. This usually explains why, in a group of several apparently identical street cars, one is said to be a "fast car", or faster than the rest of the group. In general, the "fast car" will be found to have weak fields. The same thing happens in MU trains; some cars are faster than others.

Then there is the matter of wheel size; a car newly equipped with, say, 36 inch wheels, will have them worn down after a few months on the road, to perhaps 35 inches or less. In an MU train, the diameter of the wheels will differ a great deal from one car to another.

On the Long Island RR, where the original class MP-54 cars were built about 1908-10 with motors of a type in vogue at that time, it was desired more than twenty years later to purchase new cars of a better design and with modern motors. The motors on these newer cars were much lighter than the old motors, yet new and old cars can be operated in the same train. This was done by designing the new motors to have the same electrical characteristics as the old ones. This means, roughly, that they will draw the same current as the old motors at the same speed.

In order to understand this phenomenon, one must realize that an MU train moves over the rails as a train, not as a collection of individual cars. Each car contributes a certain amount of tractive effort needed to move the train as a whole. Each car of the train moves at the same speed as the train itself, and this speed is the result of the sum of the tractive efforts contributed by all of the cars together; i e, it is the speed produced by that tractive effort with the train of a certain weight, gear ratio, wheel size, etc. If the train were lighter, it would go faster; if the track were upgrade, the train would go slower than if it were on the level. But each car of the train does not make the same contribution to the force required to move the train. Some cars contribute more than others. This extra contribution is measured by the fact that the motors of the car doing more work draw a heavier current than the other motors.

For example, let us say we have a car with a motor which has weak fields. This motor wants to speed up. But it cannot, because it is part of a train and all cars must move at the same speed. Therefore this particular motor is being held back to a lower speed, and will draw more current, since the slower the armature rpm, the more current a series motor will draw. As this motor draws more current and does more work, its armature and fields will heat up more. If the extra work and extra heat are within reason, all is well; but if the motor overheats, it will burn out. To avoid this, the shop tries to avoid weak fields in motors, and removes the field coils for rewinding whenever this is discovered during an overhaul.

The opposite effect is observed when a motor is geared to an axle on which the wheels are worn so that they are smaller than standard size. These wheels will turn over faster for the same train speed; thus the armature rpm will be higher, the current will be lower, and the motor will do less work. It is not contributing its share of pulling the train, and the load which it shirks is distributed among all the other motors in the train. In a train of five or six cars, the extra load on each individual motor due to one motor shirking its load because of small wheels is not enough to matter.

It should also be pointed out that cars cannot operate MU in a train unless

(continued on page B-11)

REIFSCNEIDER - MULTIPLE UNIT CONTROL (cont'd)

they all have the same control system, or systems especially designed to work together.

It is an impressive fact that altho MU control was fifty years ago, a new and marvelous advance in the art of electric traction, the very first MU cars designed are still in operation, or were up to a few years ago. Their retirement from active duty was not due to any failure or lack of suitability of the control system. Multiple unit control was a success from the start, and no changes have been necessary in the fundamental principle. Design changes have been merely to effect reduction in weight or cost, or some such purely subordinate factor. The writer remembers having ridden on elevated railway cars in Brooklyn, with MU control installed about 1902, which were chugging away just as contentedly almost 40 years later. They did require the equivalent of an extra cab behind the motorman's cab to hold the apparatus, and the pneumatic engine chugged like a small steam locomotive; too noisy, perhaps, for the sensitive ears of modern people, but it worked just as well as it ever did.

The use of trail cars in MU trains has usually been an afterthought. Cars are designed and operated in trains, and then somebody discovers that the motors can stand 20% more heating without danger. This is determined by putting thermocouples in various parts of the motor, and taking temperature readings while the car is in actual operation. As a result, the engineers instruct the operating force that up to a maximum of one trailer to four motor cars can be used safely. This has happened in almost every installation that one can think of. For instance, the Long Island RR MP-54 class car was designed for use in all-motor trains, and so operated for about ten years. Then, during the first World War, it was discovered that one car in three could be a trailer. Even such closely designed cars as the BMT subway cars of 1914 were finally certified for one trailer in six cars on express runs only. (This type generally operates in semi-permanently coupled three car units.) The Interborough discovered much earlier that it could use three trailers in a ten-car train on express runs, while locals had to have all motors.

The use of trailers in a train does effect the flexibility of the operation to some extent. There is some improvement if the trailers are equipped with control, even if they have no motors. But flexibility is not of prime importance; on many roads it is found that trains of the same cars operate together for long periods of time, and are broken up only when sent to the shop.

Multiple unit control made possible the design of a "dead man's handle" or emergency device for stopping the train in event of the incapacity of the motorman. This feature has been somewhat overrated, altho there have been accidents which have been prevented by its use. In later years, the same feature was provided with K-type control on the Birney safety car.

A much more important contribution to the safe operation of trains has been the electropneumatic brake. This is a direct application of the principles of multiple unit control to the braking system.

Can maximum traction trucks be used under a MU car? Of course they can, altho it is rare. The only instance that comes to mind is the Staten Island Rapid Transit car. Each truck has one motored axle and one trailer axle. The motor axle has 31-inch wheels and the trailer axle 30 or 31 inch wheels (these figures are from memory and may not be exact). The bolster was offset a few inches toward the motor axle so as to throw more of the weight of the car body on that axle. It has worked well.

There are some limitations on the length of train which may be operated MU. The writer has seen trains up to 15 cars in length operated successfully on the Long Island RR, altho this is unusual. The two following statements may be made: First, MU control will operate successfully with as long a train as other considerations of the railroad will allow—such as platform length, signal spacing, etc. Second, if multiple unit trains are desired, of greater length than can be operated with the MU control system now installed, it would not be difficult to modify this system so as to work successfully in longer trains. [The longest trains of PCC cars now in use are those on the Shaker Heights Rapid Transit. Further details on this system, which can operate six-car MU PCC trains, will be found on page 4 of this issue of ERA Headlights.--Ed]

BOSTON

MTA HAS HUGE OPERATING DEFICIT, FACES 15c FARE
by H. Dean Quinby & S. D. Crews

Boston's Metropolitan Transit Authority is badly in debt, with an operating deficit for 1948 of \$9 million. MTA's five-man board of trustees has now recommended a 15c fare, as high as any in the country. Subject to approval by the state PUC, the new fare structure would be 10c for a subway or elevated ride, 5c for each surface vehicle. No transfers would be issued, so a patron using a local car or bus and then the rapid transit would pay 15c, or if riding two surface lines a 10c fare.

Politics has entered the transit picture, with the MTA having been accused of not taking action during the election year just ended to raise the fare, when there were abundant signs that there would be a huge deficit before 1948 was over. In July 1948, MTA was forced to appeal to the Boston Metropolitan District for a loan of \$4 million to meet the operating deficit for the first six months of 1948. Newly elected Governor Paul Devers charges that the 15c fare, as described above, is a "political fantasy". Political advertisements just before the election stated that the five MTA trustees and twelve top executives receive "more money than the combined salaries of the governors of all the states east of the Mississippi River." Included in the executive group is Richard A. ("Buses Only") Sullivan, formerly of the Detroit municipal operation.

A new list of proposed vehicle changes for the near future has just been released by MTA. All are from street car to trackless trolley, as follows:

Dec 25, 1948 - #15 (Uphams Corner-Dudley)	Jan 29, 1949 - #44 (Seaver St Loop-Dudley)
Jan. 8, 1949 - #22 (Ashmont-Dudley Sta);	Feb 19, 1949 - #19 (Fields Corner-Dudley
#23 (Ashmont-Dudley Sta via Washington);	Sta); #17 (Fields Corner-Andrew Sta)
#18 (Ashmont-Fields Corner Sta)	Feb 25, 1949 - #15 (Grove Hall-Dudley)

It has not been learned whether this program got under way according to schedule.

ST LOUIS

DEVELOPMENTS IN THE COUNTY ABANDONMENT CASE
by Raymond Gehl

Here are details on the seven car lines authorized for abandonment by St Louis Public Service Co, as mentioned here last month:

#12-MARYLAND - The only purely city line in the group. Short one-car shuttle. On Dec 29, replaced by Lindell-Maryland buses, really only turnback Lindell buses which do not go all the way to the suburb of Clayton. #53-54-55-56-MANCHESTER - 12 mile PCC operated line. Over half of track is PRW, all is double track and in fine shape. From downtown St Louis thru suburbs of Maplewood, Webster Groves and Kirkwood, parallels MoPac main line in many places. Will go in a few weeks unless Kirkwood takes prompt court action. Will be St Louis' first PCC abandonment. #65-WOODSON - Partly PRW, track fair; used to go all the way to St Charles, Mo. As highway parallels entire line, substitution will be easy and case was uncontested. To go shortly. #01-KIRKWOOD and #05-CREVE COEUR - Two excellent double track PRW lines. St Louis County towns have decided to fight the change in court, hence both lines will stay at least a year. However, University City will withdraw its opposition if StLPS grants it some PRW for use as a city street. #04-CLAYTON - Entirely PRW, running thru most exclusive county communities, where people would prefer no service at all to buses on their streets. Case will go to court. #57-BRENTWOOD - A short, all PRW line, served by one car, of the system's oldest type. Track is very poor. Still, the case will go to court.

The 5-man PSC split 3 to 2 in the case of the Creve Coeur, Clayton & Kirkwood lines. The changes are opposed because the new bus routes would deviate up to one-half mile from the present car lines. The company claimed modernization of the 7 car lines would cost \$5,110,950, against \$2,227,500 to motorize them. It also argued that these lines lost \$643,000 per year, and buses would lose only \$204,000 per year. The City of St Louis did not join the other communities in their protests. Some towns found they could veto the PSC abandonment order, in which case the company could withdraw the cars and furnish no bus service either, if the PSC approved it. Then these towns would have no transit unless independently furnished.

With the PSC apparently willing to grant St Louis Public Service almost anything it asks, approval may be expected on the latter's petition for a straight 15c fare, 2 rides for 25c. Present rate is 10c straight, with several types of weekly pass, the regular one costing \$1.50.

NEW YORK AREA DEVELOPMENTS - by - H. J. McCabe, E. P. Doyle & David Klepper

On December 1, the Board of Transportation submitted a 6-year \$900 million program to the city. The relatively new items include a connection between the Dyre Avenue rapid transit line and the IRT White Plains Road line at E 180th St in the Bronx; a connection between the Williamsburgh Bridge-Manhattan Bridge-Nassau St BMT line, the IND Houston St line and the proposed Second Ave trunk line, to be built between Canal and Houston Sts; construction of two additional tracks on the IND Sixth Ave line from West 14th St to 34th St (this section is now only double track); track alterations and enlarging of the DeKalb Ave, Brooklyn, BMT Station; and alteration of the IRT Pelham Bay line in the Bronx to accommodate wider cars if and when the line is connected with the proposed Second Ave subway.

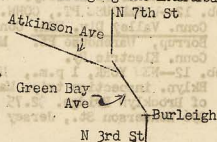
The 27 Mack buses which ousted BMT trolleys from the Williamsburgh Bridge on Dec 5, run between Allen & Delancey Sts in Manhattan and S 5th & Havemeyer Sts in Brooklyn. The tracks are being torn up to give the bridge two more auto lanes. The buses use congested streets on the Manhattan side, whereas the trolleys had an underground terminal. Here were three loops, one each for Mostrand Ave, Ralph-Rockaway and Bridge Shuttle routes. Formerly, when most BMT trolleys in the Williamsburgh area crossed the bridge, there were more loops. Many years ago there was a second pair of tracks (conduit) on the bridge, over which the Third Ave Ry and the New York Rys ran some of their lines to Williamsburgh Bridge Plaza, Brooklyn.

Trolley coaches have replaced temporary gas buses on Tompkins Ave, Brooklyn. On Nov 21, Flushing Ave line went bus. Car #8108 made the last trip from Maspeth to Park Row and return early that morning. Trolley bus wire was being strung while the cars were still running, but it is thought the workmen wanted them stopped so that they could string the wire in peace. On Dec 21, Graham Ave cars were discontinued, with buses now running between High St and Vernon Blvd via a slightly different route. McDonald Ave cars now always run to Park Row.

On Nov 30, convertible car #4573 arrived at the Branford Electric Ry museum at New Haven, Conn. Mr Edward Watson comments thus on the Brooklyn car observations in November 1948 Headlights: The #100-series, except #1100 itself, were converted to pay-as-you-enter in 1919 (the beginning of the one-man era, as the Birneys arrived in that year), but #1100 had been converted in 1911 as an experiment. These #1100's pulled trailers by heavy couplers, not by drawbars. No #1100 car ever pulled an open bench trailer. The trailers they pulled were the 6000-6099 series, renumbered in the 5100's when motorized in 1925. Only #5100-5153 were motorized. #4300-4304, 3953, 3954 were made PAYE in 1919 along with #4101-4199. R.F. Cashion thinks #4500 may have been a "Duplex" or articulated car like those in Baltimore.

MILWAUKEE RAPID TRANSIT PURCHASE PLANNED - by - James Harper & Joseph Carter
Officials of 9 Wisconsin communities, led by Milwaukee's Mayor Ziedler, chose a committee of 3 attorneys to plan an engineering survey of the Milwaukee-Waukesha electric railway now owned by Kenosha Motor Coach Lines, Inc, a subsidiary of Northland Greyhound, Inc. The owners have 3 petitions before the PSC: (1) reduced service; (2) higher fares; (3) abandonment. Ziedler favors public ownership as a last resort. An offer to buy the line was made by a group of Cleveland businessmen headed by Jay Maeder. Maeder has been conferring with shippers along the line and disclosed that he has been seeking the property for a year and a half. He believes Greyhound would like to get \$375,000. He pointed out that his group does not represent traction interests but would like to make the Waukesha line a "proving ground" to show what electric traction can do. Maeder says he was in the building construction business before the war but now wants to make a "full time" career of managing the interurban.

The editor apologizes to Mr Stanley D. Crews for garbling his report in November Headlights (page B-3). Atkinson Ave was the route #19 shuttle service and N 7th St was the route #37 shuttle service, which was operated north of Burleigh after N 3rd St cars were abandoned. The reference to "N 7th St shuttle car on Atkinson Ave" is mixed up. The Atkinson Ave segment became part of N 3rd St trackless trolley line, while N 7th St became a short motor bus line, beginning Oct 10. Sorry, Mr Crews!



ELECTRIC RAILFAN ALMANAC

- Jan. 12--BOSTON, 8 p.m., Boston NRHS, MTA Meeting Room, 24 Faulkner St., Fields Corner.
- Jan. 15--NEW YORK, 4 p.m., Kew Gardens Station (IND)--Inspection trip. Joint Railfan Trip Committee, 296 Henderson St., Jersey City, N.J.
- Jan. 18--PITTSBURGH, PA., 7:30 p.m., Anthracite Div. ERA, 155 Hill St.
- Jan. 19--WASHINGTON, D.C., 8 p.m., Washington Div. ERA, Petworth Library, Georgia and Upshur sts. N.W.
- Jan. 20--ROCHESTER, 8 p.m., Rochester NRHS, B&O Bldg., 155 Main St. W. Speaker.
- Jan. 21--NEW YORK, 8 p.m., New York Division ERA, YMCA, Penn Sta. Movies, Incl. Texas Elec., New Orleans, etc.
- Jan. 21--BUFFALO, 8 p.m., Buffalo NRHS. University Church of Christ, Englewood and Cornell aves.
- Jan. 21--TORONTO, ONT., 8 p.m., Upper Canada Railway Society, #486 Toronto Union Station. Annual reports.
- Jan. 28--CHICAGO, 7:30 p.m., Central Elec. Railfans' Assn., 84 E. Randolph St.
- Feb. 2--DAYTON, O., Southern Ohio Division ERA, contact G. King, 218 N. Garland St.
- Feb. 4--MILWAUKEE, 8 p.m., Milwaukee Div. ERA, Interurban car, C.N.S.&M. station.
- Feb. 4--BERKELEY, CALIF., 8 p.m., Bay Area Elec. R.R. Assn., Hotel Shattuck.
- Feb. 4--BUFFALO, 8 p.m., Buffalo NRHS. Univ. Church, Englewood & Cornell.
- Feb. 4--TOLEDO, 8 p.m., Toledo Railfans Assn., #219 Toledo Terminal Bldg.
- Feb. 10--BOSTON, 8 p.m., Boston NRHS, MTA Meeting Rm., 24 Faulkner St., Fields Corner.
- Feb. 11 to 22--HOBOKEN, N. J., Annual exhibit of the New York Society of Model Engineers, Lackawanna Terminal. Daily 5:30-10 p.m., Sundays & Holidays 1-10 p.m. Come and see one of the largest model exhibits in the world and also visit ERA HQ., shared with the model society.
- Feb. 12--WAREHOUSE PT., CONN., 2 p.m., Conn. Valley Div. ERA. Contact Roger Borrup, Warehouse Pt. Meetings at Conn. Electric Ry.
- Feb. 12--NEW YORK, 1 p.m., NYCTS South Bklyn. inspection trip. Manhattan end of Brooklyn Bridge. \$2.75 from JRTO, 296 Henderson St., Jersey City, N.J.

Feb. 15--NEW YORK, 8 p.m., Railfan Soc., 20W 40 St. Movies & speaker on CMJ.

Feb. 22--NEWARK, N.J., 12:15 p.m., PSNJ trolley at PRR station. Inspection trip of Essex Division. North Jersey NRHS. Tickets \$1.50 in advance from G. Walrath, 1080 Warburton, Yonkers, N.Y.

NATIONAL ERA HQ. at Lackawanna Terminal, Hoboken, N.J., open every Monday and Tuesday evening 6:30 to 10 p.m.

ST. LOUIS DIV. ERA meets every Sunday on property of the Museum of Transport, Barretts Station, Mo.

NEW YORK SOCIETY OF MODEL ENGINEERS meets every Wednesday and Saturday evening at Lackawanna Terminal, Hoboken, N.J.

JUBILEE ISSUE (Continued from page B-2)

"1939-A tiny flicker timidly pointing the way to better understanding among local ERA members.

"1949--A brilliant flame carried to all corners of the world as proof that the spirit of the Electric Railway industry lives on.

"Your sensational progress in ERA HEADLIGHTS has been the more commendable when it is realized that the last ten years have presented more problems than the preceding thirty. War, manpower shortages, newsprint scarcity, followed by skyrocketing prices and disheartening postwar outlook of railroads have all seemed to unite you toward more efforts rather than make you give up, which must have seemed the easier thing to do many a time. Congratulations again and keep it up!"

From E. C. Vrausmain, Vice-President of the St. Louis Car Company:

"We have noticed many exceedingly interesting articles in your fine publication and take this opportunity to extend best wishes to you for the coming year."

From J. V. Horn, Editor of the Modern Tramway, published by our affiliate the Light Railway Transport League:

"We heartily congratulate you on the completion of your tenth year of publication, and assure you of our goodwill and all possible assistance in the future. It is precisely the work that you are doing so well in the New World that encourages us to persevere in the Old, and the unity of aim of our two publications, separated as they are by the broad Atlantic, is but another proof, if proof were needed, of the truth of our policy and the justice of our cause."

DETROIT — MORE PCC SERVICE ADVOCATED

Detroit's Street Railway Commission has voted unanimously to follow the recommendations of the first section of the Conway report (described here last month) and has formally abandoned all plans for underground bus terminals in the downtown area. This, however, comes only after a costly legal battle over land condemnation which went all the way to the Michigan Supreme Court.

The second section of the Conway report recommended that the DSR equip the Jefferson line with PCC's and combine it with the Woodward line, which is now PCC operated. Under the plan, alternate Woodward cars (all of which now operate to the river) would instead turn on Jefferson. The remaining Woodward cars would continue to operate to the Third St boat piers.

Until 1929, the seven mile Jefferson line was joined to the late Grand River line which was fourteen miles long, forming one of the country's longest local street car lines.

The report also made tentative recommendations that the Michigan and Gratiot lines be joined to eliminate downtown looping. If this plan is carried out, Detroit will have a 19-mile street car line, about three miles longer than the present longest. Further study will be made before Conway commits himself definitely.

The second section of his report to the Rapid Transit Commission termed subway and elevated lines in Detroit as "not feasible" because of high construction costs and the city's low population density. The Detroit City Council is apparently satisfied with the Conway study for it has appropriated \$28,000 for him to extend his work from 3 to 6 months.

But the most encouraging news of all is that Leo Nowicki, DSR General Manager, has stated that he wished PCC's were now running on at least three more lines—Gratiot, Michigan and Jefferson. He further stated that the chances for PCC cars on these lines in the future are "very, very good." The financial position of the DSR is the only factor that prevents their immediate modernization, he emphasized.

—Thomas Dworman

Vancouver, B C: The City Council has approved plans for B C Electric Ry to establish TC service on South Granville as the first part of its 1949 program. Next in line may be Vic-

CLEVELAND — MORE MOTORIZATIONS PLANNED

Cleveland Transit System General Manager Donald Hyde has just returned from a little trip up to the General Motors plant in Pontiac, Mich., a Cleveland newspaper states, and with his return a plan for widespread changes in transit on Cleveland's West Side was announced. 45 trackless trolleys now on order from St Louis Car Co will replace street cars on Fulton, Detroit and (eventually) Madison lines, as well as the buses on the Clifton Blvd line. There will soon be express buses on both Madison and Detroit lines, making no stops from the Public Square to West 117th St. These plans, however, must meet approval of the CTS planning committee.

CTS announces that it intends to remove all street car lines within a few years, if it gets a \$16 million loan from the Reconstruction Finance Corp for the east-west rapid transit route. In 1945 the city had 31 car lines, but only ten now remain. The decision on the loan will decide the fate of St Clair, Euclid-Hayden, E 55th St and Lorain lines, the last ones CTS will abandon according to present plans.

The chances of CTS getting the loan are considered good if it accepts conditions affecting its corporate setup. The RFC wants the Transit Board's membership increased from 3 to 5 men, and says it should be self-perpetuating for the duration of the loan (about 30 or 40 years) so that CTS may be free from political control. The Mayor would lose his power to fire a Board member. To effect all this, changes in the law would be required.

—H. J. McCabe Jr & H. D. Quimby

toria Drive, previously scheduled to go in 1950. This is a PCC line, but street surfacing "is in terrible shape" and requires early repaving. 1949 substitutions planned for 14th Ave-West Point Grey, Broadway East, Stanley Park (also a PCC line) and Powell St routes may have to be deferred for lack of money this year to complete prerequisite street paving projects.

Eight cars (7 double-enders and one 2-man single-ender) have been scrapped so far. The rear units of the former Fraser-Kerrisdale two-car trains, which had moved to Kitsilano Yards for scrapping, got a last minute reprieve, and were returned to Prior Barn. These fine cars are now being used for hockey specials, etc.

—Robert S. Wilson

BALTIMORE:

BALTIMORE & ANNAPOLIS RR HIT BY STRIKE; BTC GETS
FARE RISE, CONVERTS #2 CAR LINE; OTHER NEWS
by P. Richard Myers

The Baltimore & Annapolis RR shut down all rail and bus operations on Dec 8 when operating employees went on strike, following 13 months of unsuccessful wage negotiations. Employees sought the same increases awarded nationally on Nov 1, 1947. B&A President H. T. Connolly declared this would bankrupt the road. A compromise was reached Dec 13, of 10c per hour boost (the national increase was 15⁰⁰c), with further negotiations to be held. B&A bus routes, including the Baltimore-Annapolis supplementary line, resumed operation Dec 16, and after inspection of the right-of-way and overhead the electric line went back into service on Dec 19. An emergency fare rise to cover the added cost of the wage increase has been asked of the PSC, and hearings on a permanent rise will be held Jan 4. If granted, this will be the first general rate boost the railroad has had since 1924 (under the old WB&A). Commutations would jump about 40%, regular fares about 10%. B&A's net income declined from \$162,147 in 1943 to \$5,859 in 1947 and a bare \$5,000 profit in 1948 is estimated.

While the B&A was out, substitute motor truck and bus service was furnished by several local operators on a temporary basis with PSC approval.

Last full day of operation of Baltimore Transit's #2-Carey St-Fort Ave street car line was Dec 10, with motor buses taking over on Dec 11 & 12, replaced in turn by new ACF-Brill trolley buses on Dec 13. Service with the TB's brought the line back to its old Baltimore St routing thru downtown. Brill single end semi-convertible deck roof car #5740 made the last trip on #2 line in the early morning of Dec 11. Electrified rail service on this line was instituted in 1893.

Just in time for Christmas, the PSC approved fare increases for BTC effective Jan 1. The single fare rate is up from 10c to 13c, or 2 tokens for 25c. Two-trip slips, good with 5c cash for a second ride, will be issued 10 AM to 4 PM Monday thru Friday only; formerly they had also been issued Saturday mid-day and all day Sunday. Suburban fares, formerly 10c (20 tickets for 90c) per zone, are a straight 5c cash.

Pullman PCC's in the 7100 & 7300 series formerly operating out of Park Terminal barn have been transferred (except for two on the #32 line) to Edmondson Ave barn for the #14 and #14 lines, as a result of the #2 change. Most of the semi-convertibles used on #2 line are in storage and will probably be scrapped.

CAPITAL BENNING, BRANCHVILLE LINES TO GO

The DC PUC has reconsidered the case of the Benning car line, and has authorized Capital Transit Co to abandon it on May 1. Track removal will begin May 2, with replacement buses using G and I Sts NE while H St tracks are being torn out. Only the trackage east of 2nd St NE is now due to be removed.

The shuttle line in Maryland between Beltsville and Branchville will also be abandoned shortly, but no details as to date of the change are available.

--Landis E. Welch, Stanley D. Crews &
William F. Ellis

Kansas City: Buses replaced street cars on the Observation Park line Nov 28, and this service was linked up with the new Summit St bus line which started Nov 29 and is to operate on a 6 months' trial basis.

OUR THANKS to Messrs T. Sponsler, J. Carter, W.H. Watts & S.D. Crews for some of the data in the Chicago report in this month's issue of Headlights.

CHEERFUL NEWS FROM ANACONDA

Anaconda Transit Lines has recently relocated 250 feet of the Opportunity interurban car line to accommodate the crossing of a new Butte, Anaconda & Pacific RR spur. This was a surprise move, as it had been thought this last car line in Montana would give way to buses soon.

--Robert S. Wilson

Nelson, B C: The City of Nelson is considering whether to substitute buses or TC's or get out of the transit business entirely. An estimated \$36,000 would be required to place the little street railway in "fair running condition". A vote last year signified that the people want TC's. --R.S.W.

***** ROSTERS NEEDED *****

A complete file of electric railway rosters is being formed by ERA as part of its historical records and for use in Headlights. Send a list of systems for which YOU have rosters to Russell L. Olson, 3708 26th Ave S, Minneapolis 6, Minn, to help fill in the gaps.

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VOLUME ELEVEN JANUARY TO DECEMBER, 1949

ERA HEADLIGHTS IS PUBLISHED MONTHLY BY THE ELECTRIC RAILROADERS ASSOCIATION, INC.,
LACKAWANNA TERMINAL, HOBOKEN, N. J.

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ABBREVIATIONS		
A&L Altoona & Logan Valley Elec.		
Railway		
B&A Baltimore & Annapolis		
BTC Baltimore Transit		
C&N Cincinnati, Newport &		
Covington		
CS Cleveland Transit System		
D&T Dallas Railway & Terminal		
DRR Denver Railway Corp.		
DM&T Des Moines & Central Iowa		
DSR Detroit Street Railway		
FD&M Fort Dodge, Des Moines		
& Southern		
GRU Grafton & Upton RR		
I&N International Railway Co.		
J&WJ Jacksonville, Westfield &		
Northwestern		
K&C&W Kansas City, Clay Coun-		
ty & Western Ry.		
L&R London & Port Stanley Ry.		
LIR Long Island Rail Road		
L&L Los Angeles Transit Lines		
MTA Metropolitan Transit Au-		
thority		
M&S Montreal & Southern Coun-		
ties Ry.		
MU Multiple Unit		
PE Pacific Electric		
PTC Philadelphia Transportation		
Company		
PCO President's Conference		
Committee		
PSC Public Service Commission		
PSMT Public Service of New		
Jersey		
RR Rapid Transit		
SLPS St. Louis Public Service		
Co.		
SHRT Shaker Heights Rapid		
Transit		
TE Texas Electric		
TH&RT The Milwaukee Electric		
Railway & Terminal		
T&T Third Ave. Transit System		
TTC Toronto Transportation		
Commission		
T&T Twin City Rapid Transit		
T&B Trolley Bus		
U&M University of Michigan		



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JUBILEE ISSUE

TEN YEARS of ERA [Electric Railroaders Association] Headlights, TWENTY YEARS of PCC Development, FIFTY YEARS of Sprague M.U. Control

ERA HEADLIGHTS

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VOL 11. NO. 1, Lackawanna Terminal, Hoboken, New Jersey, JAN 1949

LACKAWANNA

by STEPHEN MEYERS

Commuters on the Lackawanna Railroad like the service! In an area where commuters generally have unkind comments on the service rendered by their line, the Lackawanna Railroad draws unsolicited praise from its patrons. And rightly so, for the Electric Zone of the Delaware, Lackawanna & Western Railroad is one of the finest examples of electric suburban service in the United States today.

More than any other single factor, the electrification of the Lackawanna Railroad has been the reason for the fine suburban development in Essex, Morris and parts of Somerset counties in northern New Jersey. The fast, frequent and relatively inexpensive train service offered by the railroad, together with the fact that the trains are powered by cinder-free electricity, has drawn more and more people into the suburban area it serves, one of the finest such areas in the New York metropolitan district.

Early in its history, the DI&W had realized the value of its New York Suburban zone and made many improvements to better serve its patrons. The fine terminal at Hoboken where passengers transfer to the railroad ferries or to the Hudson Tubes for New York City, just across the Hudson River, was one of the most important improvements made. It is on the upper Ferry Concourse of this terminal that the Electric Railroaders Association has its main Headquarters which is shared with the New York Society of Model Engineers.

By 1926, it was apparent that railroad traffic along the inner 40 miles of the DL&W was so heavy that measures had to be taken to handle the load without a breakdown of the vital service. Since additional tracks were out of the question, better utilization of the existing tracks was the only alternative and this could best be accomplished by electrification. Therefore, late in 1928, the road asked for bids for electrifying its so-called Morris & Essex Division from Hoboken Terminal to Dover with branches to Montclair, Gladstone and the Secaucus freight yard and shops.

In considering the electrification, the DI&W was faced with a number of possible voltage combinations which could be used. There was the standard 650 volts DC used by many (continued on page 2)

[Boxed note at bottom of page [1]] Fifty years ago, in the summer of 1898, the Chicago South Side El was completely equipped with electric cars using multiple unit control invented by Frank J. Sprague, ERA #1. The article above describes the advanced electric operation of the Lackawanna RR, a direct descendent of this original MU installation in Chicago.

[Captions for five photos at the left on page 2]

- 1: Suburban train at speed near Summit, New Jersey.
- 2: DL&W control trailer #2247 (ex steam trailer).
- 3: DL&W control "Commuter Club" car. Note stained upper sash.
- 4: DL&W control Baggage-passenger trailer #2404.
- 5: DL&W control RPO-passenger trailer #2441.

(continued from page 1) third rail suburban and rapid transit lines, the 11,000 volts AC overhead used by the New Haven and the Pennsylvania RRs, and the 3,000 volts DC overhead used by the Milwaukee road, the longest railroad electrification in the United States. It was, finally, decided to use the 3,000 volt system, as it was planned at the time to extend the electrification on the main line as far west as Scranton, Pa, and to use heavy duty electric locomotives to haul heavy trains over the Pocono Mountains. And so the Lackawanna built its 3,000 volt DC overhead system, which is also used not only by the Milwaukee, but also the Cleveland Union Terminal, Mexican Ry, Paulista RR (Brazil), and several others the world over. But the dream of electric power over the Poconos has just about died with the rapid rise of the diesel locomotive.

The first test operation of a Lackawanna suburban electric train occurred in the summer of 1929 on the test track of the General Electric Co at Erie, Pa. Two former steam coaches were rebuilt for this experiment. The motor car was numbered #349 and housed a great deal of electrical testing equipment for use at Erie. An unusual feature was the application of diaphragms at the car ends, a practice not continued on the actual cars used today. Much experimentation was required before everything was satisfactory, as the application of 3,000 volts DC to an MU train was a new departure. Experiments at Erie had started in 1923 with car #812 of the Michigan Railway, and had continued for some years. The DL&W project allowed the engineers an opportunity to apply the knowledge thus gained to the progress of MU electric traction.

Construction of overhead and equipment was hurried along during 1929 and 1930, and the first train in regular passenger service operated between Hoboken and Montclair on September 3, 1930. Service to South Orange started September 22, to Morristown on December 18, to Gladstone on January 6, 1931, and to Dover on January 22, 1931.

The Electric Zone operations of the Lackawanna consist of three separate routes, the most important of which is the Morris & Essex Division main line to Dover via Newark and Morristown. This should not be confused with the so-called "Old Main Line" or Boonton Division, a steam operated line connecting Hoboken with Dover via Paterson and Boonton. "M&E" electric trains start their runs in the 17-track Hoboken Terminal which handles more than 70,000 commuters daily. Just to the west are the large coach and

freight yards of the road, and to the north is the elevated and viaduct structure of the PSNJ over which street cars are operated. Trains from Hoboken pass thru the yards and then enter long Bergen Hill tunnel which carries the railroad under the busy communities of Union City and North Bergen located on the top of the Palisades (see August 1948 Headlights). Just after leaving the tunnel, the line passes over the Erie RR; then at West End tower the steam Boonton Division and the former electrified spur to Secaucus Yard branch off to the right. Now the line is on a grade- less swamp, the famous Jersey Meadows, and is soon paralleling the busy main line of the Pennsylvania RR. The DL&W narrows to two tracks for the draw bridge over the Passaic River at Newark, but soon returns to a three track main that continues to Millburn.

The outer tracks are used for local trains and the center track is used in either direction for rush hour express service. Several express trains regularly cover the 20.1 miles from Hoboken to Summit in as little as 28 minutes, an average speed of MPH. This is an even more impressive performance if one remembers that there is a rise of more than 375 feet between the two points.

From Newark to South Orange, the most striking thing about the line is that it appears to run thru one large urban area. And so it is. "The Oranges", comprising East Orange, Brick Church, Orange, South Orange and Maplewood, are so closely populated that town boundaries are impossible to discern. South Orange, incidentally, is one of the richest communities in the U S, and tho it boasts an average of over two cars per family, the DL&W hauls a large majority of the commuters and shoppers to the city daily.

It is on this stretch of line that the track is either on an elevated structure or in a long deep concrete open cut. At Roseville Ave station in the open cut, the Montclair branch turns off to the right. This is a very busy tho unspectacular two track branch which boasts of half-hourly service during the mid-day. It has four local stations on its 4.1 mile run and terminates at a modern six track stub-end terminal in the heart of Montclair.

Beyond South Orange, the line finally assumes the aspects of a heavy-duty railroad. Heavy rail, well-ballasted right-of-way, and a simple, well-proportioned catenary power distribution system present an imposing combination along with the many beautiful stations and landscaped lawns maintained by the Lackawanna. At South Orange, a coach yard is maintained for those trains terminating there. Millburn Tower is one of the "hot spots" on the railroad, for here the three track main narrows to two for the rest of the run to Dover, and it is also at the foot of the long grade leading to Summit, a main junction point with the electrified Gladstone branch and the steam-powered Rahway Valley RR.

Service on the Gladstone Branch (known to the employees as the Passaic & Delaware RR) closely resembles that of an interurban line and is rural in nature. The branch is single track, with turnouts. Wooden line posts hold the catenary. Headway on this, the third part of the road's Electric Zone, varies from a weekday 90 minutes down to a total of but six trains on Sunday. A non-rush-hour train usually consists of simply a combine (either RPO or baggage) and a regular passenger motor, and it shuttles between Summit and Gladstone, passengers changing at Summit for Hoboken and main line points. On

most trips, however, thru cars or trains are operated to Hoboken. This branch serves the smart suburban area of Somerset county as well as a prosperous farming section.
(continued on page 3)

[top of page 3: Delaware, Lackawanna & Western R.R., Electrified Suburban Trackage, Schematic Drawing. Note: the map shows mileage distances from Hoboken.]

(continued from page 2) What freight service there is, is handled by steam locomotives, the branch having a daily "peddler" freight. An interesting point is the spectacular high-level steel trestle which carries the Gladstone branch over one of the streams feeding the Passaic River.

But to get back to the main "M&E" Division which continues west from Summit to Morristown, Denville and Dover, serving a very attractive suburban area. This part of the line is noted for its outstanding station buildings, fine suburban homes, beautiful scenery, and continuous curves and grades. A coach yard is maintained at Morristown, and a number of trains terminate here. But service to Dover and way points is never on longer than one hour headway, even on Sunday. At Denville the line is joined by the steam Boonton line which also operates passenger service to Boonton and beyond. Most main line trains for points beyond Stroudsburg are diesel powered, however, and operate over the Morris & Essex Division between Hoboken and Dover.

As a "neighborhood railroad", the DL&W follows all the way thru by purchasing its power from three local utilities. These are:

- (1) Public Service Gas & Electric Corp, with connections at Hoboken (West End) and Newark (Roseville Ave);
- 2) Jersey Central Power & Light, at Summit;
- 3) New Jersey Power & Light, at Denville and Bernardsville.

The purchased AC power is converted to direct current in railroad owned mercury-arc rectifier substations. The DL&W had one of the first large scale installations of this type of rectifier in the United States. These machines have a dual advantage over motor generator and rotary converters in that they have a negligible loss of power in the conversion, and also have an extremely long potential life due to a minimum of moving parts. In addition to the substations, the railroad maintains tie stations at Hoboken, Harrison, South Orange, Montclair, Morristown and Dover.

The equipment used on the Electric Zone of the Lackawanna Railroad is of two main types, motor cars and trailers. There are 141 motor cars in service, representing the entire original order. These are low roof cars numbered #2500 to 2640. They are equipped with four 255 HP GE type #700 nose suspended motors and have an automatic acceleration of 1.5 MPH per second with an optional manual control. Braking is at the rate of 1.75 MPHPS. Cars are 70' 1-1/2" long and have a total light weight of 148,000 lbs. A motor unit will seat 82 passengers. Top free running speed is 67 MPH.

2 cars - #2451, 2455 - high-roof converted club cars. #2451 is only MU car with leather seats; all others have rattan. #2451 seats 76 passengers while #2455 seats but 68.

2454 410 429

The famous Hoboken Terminal of the Lackawanna, briefly mentioned earlier, is quite a transportation center. There are three levels of electric transport at this point. For beneath the surface is the three-track terminal of the Hudson & Manhattan tubes, which provide

fast subway service to both uptown and downtown New York, as well as locally in Hudson county, New Jersey. At street level are the tracks of the Lackawanna RR, and also the lower level of the Public Service of New Jersey Hoboken terminal. While the lower level is now used only by diesel buses, the upper level, above the street, retains all its original trolley car service as it connects with the Hoboken Viaduct.

In addition there are six ferry slips used by Lackawanna RR ferries for both Christopher and Barclay Sts. on Manhattan island. Railroad passengers use this ferry service at no charge.

Thus the Lackawanna Railroad, long known as the route of "Phoebe Snow" and dependent on anthracite coal, has today the ultimate in clean, cinderless operation in its suburban electrification. The fast MU cars provide a service along the 70 route miles and 160 track miles which has won the respect of the commuting public. The olive green electrics offer suburbanites the best transportation available. Just ask any commuter on the Lackawanna.

[end]