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5300's ARRIVE - TTC

Cover: Photo of TTC 5301 at a station and an insert of a nose of one. 0196-001.jpg
Photo: Interior of 5300. 0196-002.jpg

The first two Montreal Locomotive-built subway cars are now on TTC property, car 5300 having arrived on April 15th. (unloaded on the 17th.) and 5301 arriving on April 20th. (unloaded on the 23rd.). Both cars were delivered by the CNR to the TTC's Davisville shop property. A specially built, 12-wheel C.P. flat car carried the cars over C.P. rails from Montreal. The arrival of these cars marks the delivery of the first rapid transit cars ever manufactured in Canada.

These cars comprise the first two-car unit in the series of eighteen (36 cars) currently on order with MLW. They are considerably more "North American" in appearance than the British built cars now at work in the Yonge subways and in many other aspects embody changes from the earlier equipment, even to the extent that the new cars will not train with the Gloucester cars.

The most significant and noticeable departure in the new cars is, of course, their greater length. The TTC specified lightweight cars with a view to higher performance standards for a given power consumption; tenderers were allowed to submit quotations for cars longer than originally anticipated but it was specified that six of the new cars must have the same capacity as eight of the older units. Another basic specification was that body surfaces require a minimum of painting and that the cars, generally, embody the latest advances in rapid transit car equipment.

Tenders were called in May, 1960 for "40 to 50" cars. Bids were received from ten companies, of which five tendered on long cars; the interested builders were located in Japan, Germany, England, United States and Canada. Montreal Locomotive Works was awarded the contract in December, 1960 on the basis of the following comparison of its offerings of long and short car equipment:

	Weight (lbs.)	Accelerating Current	KW-HRS Round Trip Bloor Line
8 short cars	409,000	6720 amps.	640
6 long cars	369,000	5550 amps.	530
Percentage saving	9.8	17.4	17.2

Also of substantial significance was the saving in capital costs of six long cars over eight short cars. The principal disadvantage incurred in the use of longer equipment involved the necessity to make certain alterations in the existing subway structure by virtue of the greater overhang on curves; however, these costs are non-recurring and of small moment alongside the savings to be expected in the use of the extra-long rolling stock. The clearance tests were carried out using a specially constructed test car and all alterations required were completed well in advance of the arrival of the new cars.

In common with the present Yonge cars, those in a two-unit pair are dissimilar as to the underbody equipment. The "A" cars (even numbers) carry a motor-alternator set for main lighting in addition to rectifiers and batteries to supply the low voltage D.C. for controls and cab lights.

"B" cars (odd numbers) carry the motor driven air compressor which provides compressed air for the use of both cars in the pair. Both cars carry a complete set of motor control and braking equipment. The A-B combinations are joined with manually operated automatic couplers. The cab end couplers are remotely controlled from the operator's cab and have automatically retracting covers over the electrical contacts carried by the coupler.

CAR BODIES: The length of the car (74 feet) permits the use of four doors on each side, so that a six-car train of the new stock presents the same 24 door openings as does an eight-car train of the older cars. The seating arrangement is on the same pattern as with the Gloucester cars but the total capacity is 84 seated passengers per car. All window such are fixed in view of the pressure ventilating system which has been built into the roof.

There is a greater use of stanchions with these cars, and the retracting hand-holds of the older equipment have been replaced by horizontal grab bars. The carbody interior is decorated in shades of blue, grey and yellow in an eye-pleasing combination. Rounded corners have been used wherever possible to facilitate interior cleaning.

The car body is constructed largely of aluminum alloys. Various extrusions of aluminum are used for body rails, posts, louvre frames and trim. Low alloy steel has been used for the under frame ends including centre and side bearings, coupler anchors and anti-climbers. The main longitudinal under frame members are aluminum extrusions, while the cross-members are steel. Body side sheets are corrugated below the belt rail for enhanced appearance and strength.

TRUCKS: An inboard bearing truck frame is used, this having been made possible by the adoption of lightweight traction motors as well as hypoid gearing (as used on all PCC cars). Truck frames and bolsters are of cast steel fabrications. Combined coil and air springs are provided to solve close clearance problems, and hydraulic shock absorbers stabilize the body in the horizontal plane. A newly designed traction motor by CGE, rated at 125 hp., is required to meet the performance requirements of the long cars.

The pneumatic element of the multiple braking system employs one composition brake shoe per wheel. The current collectors and trip cocks are mounted on a wooden beam which is attached to the truck frame through the brake cylinder unit.

CONTROL: A motor driven camshaft and magnetic contact or propulsion control is used on the new cars. The 29 position drum controller is used for all functions including dynamic braking. The cars can be operated on the same schedule as the older cars by means of a performance selector switch that sets the acceleration rate to either 1.9 mph/sec. or 2.5 mph/sec. The use of air springs allows car loading to be measured and this information used by the motor and braking controls to maintain constant acceleration and braking rates regardless of the load on the car. This is accomplished by an air operated variable resistance type of transducers.

BRAKING: The system for controlling the dynamic and air brakes is essentially electro-pneumatic. Air brakes are applied automatically as the dynamic brake fades at very low speed or if it fails completely. A complete pneumatic system is supplied for use in the case of a failure of the power supply, for use of the passengers' emergency train stop, and for the signal system (trip cock) train stop. If the dynamic brake fails on a single car, the electro-pneumatic brakes take over on that car only. All three brake systems are matched as closely as possible so that equal retardation is provided by a given controller position regardless of the system in use.

The compressor is a two-stage, air cooled unit belt driven by a 600 volt D.C. motor. Compressor operation on all "B" unit cars is synchronized in train operation.

HEATING AND VENTILATION: The system selected for use in the 5300's involves dynamic brake waste heat recovery as this was felt to offer a saving over the use of standard electric heating. Car body air is blower circulated through the control resistor box; when heat is not required, it is passed outside by the opening of a damper. Heat is directed into the car through louvres in the seat pedestals. Cold air returns through ducts located above the side windows and down ducts in the door pockets to complete the cycle. For heating cars while standing in the yard, the resistor compartment contains two auxiliary 12 KW heaters.

Summer ventilation is provided by five overhead axial flow fans with a total capacity of 15,000 cubic feet/minute. The fan motors are wound for 120 volts D.C. and are connected in series to the 600 volt supply. Fan speed is controlled automatically by the temperature within the car, the fans cutting in at 65°F and increase to maximum speed by 86°F.

<u>OTHER EQUIPMENT</u>: A radical departure on the new cars is the motor-alternator set, which contains no brushes and generates only alternating current. The set comprises of four rotating machines on a common shaft to supply the power requirements of the various electrical systems. Transistors are used in the controls for the set in an effort to reduce the number of moving parts, and hence maintenance. Power is supplied at 600 volts, 400 cycles per second to the fluorescent lighting fixture system used in the cars. To obtain the low voltage D.C. necessary for controls, a three-phase output of the M-A set is rectified by static devices.

The car doors are electrically operated and interlocked. One door engine is used on each pair and the second door is mechanically linked to the first. An emergency handle is provided at the forward (cab end) door of each pair to enable manual opening.

An elaborate two-way voice communications system is provided, including car to wayside, wayside to passengers, motor man to passengers and between motor man and guard. Transmission from the wayside units is over the power rail and contacts at quarter mile intervals feed the signal onto the rail. Coupling units on the cars connect the third rail shoes to the transmitter-receiver unit. A portable transmitter, receiver and power amplifier unit is located in the motor man's cab as well as a telephone selector unit and a public address amplifier feeding six loudspeakers mounted in the ceiling of the car.

The motor-alternator prevents breaks in the illumination at gaps in the third rail but battery powered emergency lighting is provided over each door as was done in the older cars. The battery-rectifier system also provides power under normal circumstances for running lights, gauge lights controls and door motors.

<u>TEST RUNS</u>: To the time of writing, two special test runs involving 5300 and 5301 have been made. At 8:00 am. on Sunday, April 29th., a round trip for the benefit of the Commissioners and other officials, in addition to press and radio representatives, was operated over the Yonge line.

On Wednesday, May 2nd., the cars were operated between regular schedule runs, for the benefit of members of the American Transit Association. The cars will not be put into revenue service, according to present plans, until at least four more arrive, when a full six-car train can be operated. No further deliveries are expected until the latter part of the year, although the TTC plans to exhibit two cars at the Canadian National Exhibition, which cars will reportedly be delivered straight to the exhibition grounds from Montreal.

<u>Sketch:</u> Elevation of 5300 subway cars. <u>0196-003.pcx</u>

<u>SPECIFICATIONS</u>:

Length over coupler faces -	74' 5 5/8"	Compressor -	Vertical 2 cylinder
Width over sill sheets -	10' 3 7/16"		2 stage, motor driven
Height -	11' 11 1/2"		
Weight Empty -	64,500 lbs.	Door Openings -	3' 9"
Weight Crush Load -	109,000 lbs.	Couplers -	Canadian Ohio Brass
Seating Capacity -	84		Tomlinson automatic
Total Capacity -	310	Heat -	Dynamic brake waste

heat recovery with auxiliary electric heat (Vapour Heating Company)

Trucks - Dofasco cast steel inboard
Truck Centres - 54' 0"
Truck Wheelbase - 6' 10"
Wheel Diameter - 28"
Gear Ratio - 7.14:1
Traction Motors - CGE 125 h.p.
Traction Control - CGE simplified cam magnetic
Acceleration Rates - 2.5/1.9 mph/ps average to 20 mph.
Brake System - Westinghouse, electro-pneumatic controlling dynamic with standby pneumatic.
Exterior Finish - Aluminum alloy sheet with air brushed finish.

Motor Alternator Set - Motor - 600 Volt D.C. 14 h.p.
Alternators - Brushless
Output 1- 600 Volt, 400 cycle, 2 phase (lighting)
Output 2- $37\frac{1}{2}$ Volt D.C. 3 phase
Blowers- 2 fans each delivering 1500 c.f.m.

THE ECONOMIC RESULTS OF DIESEL ELECTRIC MOTIVE POWER ON THE RAILWAYS OF THE UNITED STATES OF AMERICA
PART 2

By H. F. BROWN, Ph.B., Fellow A.I.E.E.,
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Chart: Figure 18 0196-004.pcx
Chart: Figures 19 & 21 0196-005.pcx

THE BASIC DIFFERENCES

What then, are the basic differences in the two types of motive power and was the right thing done in the mass conversion that took place? Prior to 1939, there were only 90 diesels in road service and, because they were used in preferred service on long runs, they could be used to the limit of their availability, which was high, and hence produced apparently great savings over comparable steam operations. The basic differences in the two prime movers is shown in Figure 18, where two locomotives with equal weight on their drivers are compared. It can be seen that the diesel has a higher tractive effort at low speed and hence is less likely to stall with a given load than is the steam engine with its limited tractive effort at low speeds. However, at operating speeds, the higher horsepower, and hence the ability to maintain higher speeds with the same load, is obvious. It should be clear from the foregoing too, why three diesel units are often assigned to high speed trains in this area that formerly used only one Northern type engine. The high starting tractive effort is not required, but the high horsepower is necessary to maintain the operating speed.

As a result, it is not surprising to see that the average locomotive in 1957 consisted of 2.4 diesel units and consulting Figure 3, one sees that steam locomotives of equal horsepower had already been developed for over 20 years. Thus, had modern steam locomotives been used in 1957, only 7870 of them might have done the work of the 18,959 diesels actually used.

AVAILABILITY:

One of the more desirable attributes of the diesel is its 90~ availability when new. Similarly, modern steam locomotives would have an availability of 60% when new, but the availabilities of both types of motive power reduce as the units age. To establish a fairer basis of comparison of operating costs of diesel locomotives (not units) versus modern steam power, it should be assumed that the number of serviceable engines is inversely proportional to their availabilities. Thus 90/60 x 7870, or 11,800, steam locomotives would be the hypothetical equivalent of the 18,959 diesel units of 1957.

THE EFFECT ON THE NUMBER OF TRAINS AND TRAIN-MILES:

Next, author Brown considers the effects of diesel operation on the number of trains, and hence the number of train-miles, operated from 1953 to 1957. Figure 7 shows that train-miles declined drasticly after 1946. Did the diesel have anything to do with this? Diesel manufacturers claim that the principle of multiple-unit operation enabled the scheduling of fewer but longer and faster trains, thereby making great savings in lab our costs. However, Figure 3 shows that from 2 to 5 diesel units are necessary to equal the horsepower of the available steam power, hence, multiple-unit operation is not a virtue but a necessity.

This drop in train-miles must be explained in either of two ways. First, the tonnage of two trains could have been combined into one longer train and the number of diesel units increased. This would decrease the number of train-miles but increase the number of diesel units per train in proportion to the reduction in train-miles. Or, secondly, the same increase in cars-per-train and tons-per-train, as well as the reduction in train-miles, could be accomplished by withdrawing any remaining short-haul runs. The long-haul traffic remaining would show the characteristics of Figure 8 due to the elimination of the shorter trains that decrease the average train length, and the number of diesel units per locomotive would need rise only slightly.

Statistics on diesel operations alone have been available only from 1953 on and these figures show that train-miles decreased from 492 to 447 million, or 10% from 1953 to 1957. Meanwhile, gross tons per train rose from 2870 to 3220 (12%) and cars per train rose from 64 to 70 (9.3%). However, units per locomotive rose only 5.3% indicating improved operating skills, rather than superior motive power, was responsible for the utilization of train-miles. Thus, the second explanation best fits the observed data.

ANALYSIS OF OPERATING EXPENSES:

When one compares repair costs on an equivalent basis, it is not surprising to see the diesel, with its multitude of complex wearing parts, far outstrip steam and electric locomotive costs. Figure 21 shows the equivalent costs as the units age. Graph "A" is a calculated cost for a locomotive with an economic life of 15 years, if such were possible. Ir-regardless, repair costs have decreased, and the reason for this is shown in Figure 19, where the repair costs and the product of number of locomotives and their age is shown. Both curves follow each other closely.

OVERALL COMPARISON:

As a final consideration, it is interesting to compare actual costs of dieselized operation in 1957 with hypothetical costs had steam traction been retained, but the overall traffic patterns been allowed to develop as they did. These comparative costs are shown in Table 4.

Summarising the main details of the above table, it may be seen that diesel locomotives, in total, would have made operating savings of $137 million over steam operation, on the basis of 1957 costs. However, the total investment would be $1800 million greater for diesels, and fixed charges would also be $165.5 million greater, or the operating savings are exceeded by costs by $28 5 million. Further reference to the table reveals that savings realised in yard operation are not realised in road service by diesels. There is nothing to justify the hollow claim that diesels will produce a 30% return on their investment. If this were so, lower operating ratios and increased earnings would immediately result, but, in fact, earnings in the 1950's were less, in spite of higher traffic volume, than in 1925 to 1930 when all motive power was either steam or electric.

Table 4. Comparative costs diesel operation versus operation with equivalent modern steam on basis of 1957 costs.

All figures in millions of dollars

	Diesel	Steam		Diesel	Steam
	Cost			Cost	
Road power			*Yard power*		
Repairs:			Repairs		
Diesel and equivalent steam	377.7	293	Diesel and equivalent steam	76	52.8
Other	51.6	51.6	Other	8.1	8.1
Fuel			Fuel:		
Diesel and equivalent steam	366.7	451.7	Diesel and equivalent steam	40.5	118
Other	23.2	23.2	Other	3.4	3.4
Engine men	388.3	407.7	Engine men	242.7	242.7
Engine house expense	104.2	126.5	Engine house expense	29.9	45.5
Water	5.3	32.2	Water	1.1	19.8
Lubricants	27.2	7.7	Lubricants	4.4	3.1
Other locomotive supplies	8.8	8.8	Other locomotive supplies	2.2	2.2
Total road locomotive expense	1352.7		Total yard locomotive expense	408.3	495.6
Investment			Total expense, road and yard	1761.0	1898.0
Road locomotives	2760	1925			
Yard locomotives	1120	555	*Fixed charges*		
			Depreciation of equipment		
Total locomotives	3880	2480	Road	165.6	61.0
Facilities (pro-rated 300 road, 100 yard)	400		Yard	50.4	17.5
			Interest on un-depreciated equipment	55.2	38.5
Total investment	4280	2480	Road	22.4	11.1
			Yard		
Total, all charges road	1573.5	1501.9	Total fixed charges, equipment	293.6	128.2
Total, all charges yard	481.1	524.2			
Total, all charges road and yard	2054.4	2036.1			

INDIRECT CONSIDERATIONS:

Although diesels are generally cleaner, they still require expensive ventilation equipment in long tunnels and should be excluded from built-over urban terminals (viz. Central Station, Montreal). The small-diameter driving wheels and lower centre of gravity produce much higher track and rail stresses and examination of maintenance-of-way costs will show that these costs have increased slightly with diesel traction.

CONCLUSIONS:

Since 1940, railway management has been beset by problems never imagined in the early 1900's and it has been forced to take bold steps to surmount these problems or be forced to the brink of abandonment as the N.Y.O.& W., L.N.E., and Rutland have been. Operating methods and equipment have been improved greatly with the adoption of new cars, locomotives, terminal facilities, yards, signals and permanent way improvements. Vast sums have been spent on these improvements, including $2500 million for locomotives and facilities, $4000 million for cars and another $2500 million for the rest. To claim, however, that the diesel is responsible for all the operating economies made since 1945, is to belittle the skill of management, and expropriate the credits due to these other investments. Such claims cannot be made equitably for any one factor. All have made their contribution. This study simply states that the all-embracing economies claimed for the diesel motive power do not appear in the statistical record. The diesel locomotive has not "revolutionized" American railroad economics. In road service, diesel motive power has added to the financial burden of the railways.

What, then, is the answer, if any, to this predicament? It should be obvious that something had to be done immediately following World War II, and, as coincidence would have it, the vigorous General Motors organisation had what seemed to be the apparent solution. To the perplexed managements of the time, dieselization seemed to be their only salvation, as electrification had always been dismissed without a fair trial because of its high initial cost. But, as this paper illustrates, the path taken was not the best one, and by now there is no turning back. Perhaps as the result of this expensive lesson, electrification may be considered on a more favourable basis the next time there is need of a "revolution" in motive power. What do you think?

This paper was first published by the Institution of Mechanical Engineers, London, England, and we are indebted to them for the use of the graphs shown herewith.

SOUNDPROOF SPAN FOR SUBWAY

Photo: Model of Enclosed Bridge over Rosedale Valley, designed by De Leuw Cather & Company, forms part of D-3 subway contract. 0196-006.jpg
Map: Key Map Bloor - Danforth Subway 0196-007.pcx
Sketch: Cross section "C" of Rosedale Bridge. 0196-008.pcx

Certain basic construction details on the Bloor Subway contract D-3 (Glen Road to the west end of the Prince Edward Viaduct) have been released, although the contract has not yet been awarded and probably not be the subject of bids until the Fall of 1962. Those sections labelled "A" on the key plan shown on the right will be constructed in undisturbed soil using standard single and double track reinforced concrete box sections. The easterly section will also include the structural elements of Castle Frank Station and the bus loop at this location.

Section "B" involves unstable earth (filled ground placed on the side hill of the Rosedale Ravine to accommodate Bloor Street) and would have double track reinforced concrete box sections supported on vertical and battered foundation piles which penetrate to the undisturbed earth beneath.

Section "C" is an elevated structure used to cross the Rosedale Valley ravine. The diagram illustrates how the alignment of the rapid transit line will ease the "V"-bend in Bloor Street, with a curve of 1000 foot radius on this elevated structure. The elevated section will be 522 feet in length, involving a 206-foot reinforced concrete open spandrel arch bridge (mentioned previously in the *Newsletter*) and seven continuous, reinforced concrete approach spans, each of 48 feet, four to the west of the arch, and three to the east. A thin reinforced concrete shell will enclose the tracks (see cross section on left) for the full length of the above-ground section, having a curved outline chosen for its external aesthetic appeal only. The purpose of the shell, of course, is to avoid visibility of the subway trains for residents of the nearby apartment buildings (and vice versa), although the wall of the enclosure will create a visible block at least from certain floors of these buildings, and there is room for doubt that all residents thereof will necessarily welcome it.

The approach spans have been chosen in lieu of fill in order to preserve trees and the vista along the Rosedale Valley - another concession to the aesthetic appeal of the area. The rail elevation at the valley crossing will be 32 feet below the present surface of Bloor Street and 58 feet above the valley floor.

A delivery point will be established in this contract for rail and other track accessories for adjoining contract areas as well as D-3. Construction on this contract, expected to take 18 months, is scheduled to begin in January, 1963. The engineering consultant on this unusual contract is De Leuw Cather and Company of Canada, Limited.

T.T.C. HAPPENINGS

Effective 9:00 am. Tuesday, May 8 the reconstruction of the Don Bridge on Dundas Street East necessitated the rerouting of the HARBORD line both ways via Gerrard and Parliament Streets, for a period of approximately four months. This is the second time in recent months that the HARBORD cars have been diverted because of a major works project.

Necessity action switches were installed at the following locations to facilitate the movement of street cars during this diversion: Parliament and Dundas, south to west; Parliament and Gerrard, north to east; and Parliament and Gerrard, west to south. The necessity action switches normally used by HARBORD cars at Gerrard and Broadview and at Broadview and Dundas were readjusted to become self-restoring. There is approximate]y 200 feet of track and overhead on Dundas Street west from Broadview and east from Parliament for the storing of disabled cars if necessary.

Also affected by this project are the KING cars routed via Parliament and Dundas Streets during the evening rush hour. This service has been discontinued for the period of reconstruction, and all KING cars will follow the normal route via Queen Street.

- Subway contract D-2, awarded to Robert McAlpine Limited, and on which construction has just commenced, will use 17,000 segments of cast iron for lining the two 16 foot diameter tunnels. These will be supplied by Canadian Iron Foundries Limited. A new, 68-ton British built tunnel shield was received recently and was immediately lowered into the start of the tunnels at Bloor and Sherbourne Streets.
- The diversion of the HARBORD route over College and McCaul Streets ended at 9:00 am., April 18th.. Several days later, the necessity-action switch motors and their controls were removed from the three turnouts on which they had been recently installed (see *Newsletter 193*, Page 16).
- The following 16 small Witt cars are stored unserviceable at Russell Division:
  2706, 2714, 2722, 2736, 2746, 2748, 2750, 2752, 2756, 2794, 2798, 2800, 2810, 2826, 2864, 2874.

MEMBERS' ADVERTISEMENTS

WANTED: Does anyone have a good action photo of C.N. 5284? Robert Buck, 229 Nile Street, Stratford, Ontario, wishes to obtain such a picture as a reminder of the time he spent as an operator at Acton station in 1956.

- Want to trade negatives and photos of steam and electric equipment? Write Peter Cox, 2936 West 28th. Avenue, Vancouver 8, B.C. for his list of negatives, including many west coast oddities.
- Bulletin No. 37, the 64 page booklet entitled "*Four Whistles to Wood-Up*", is again available. This book, written by Dr. F. N. Walker (author of "*Daylight Through the Mountain*"), is a complete and interestingly presented history of the Ontario, Simcoe and Huron Union Railway, later the Northern railway of Canada, that was constructed from Toronto to Collingwood during the mid-nineteenth century. Copies are available at 50¢ each from the Corresponding Secretary at Box 122, Terminal "A", Toronto.

CANADIAN NATIONAL NOTES

Subject to Board of Transport Commissioners' approval, the C.N. plans to abandon the tortuously graded Montfort Subdivision from St. Jerome to Lac Remi, Quebec. The operators of the Quebec Autoroute toll road are hoping to purchase the right-of-way between St. Jerome and St. Sauveur (13 miles) for an extension of their four-lane roadway northwards to Ste. Adele or Mont Rolland on the Canadian Pacific's Ste. Agathe Subdivision.

The line from Shawbridge to Huberdeau was built during the 1890's as the narrow-gauge Montfort Colonization Railway and was sold to the Great Northern Railway of Canada in 1903. In 1906, this was one of the lines absorbed by the Canadian Northern Quebec Railway, who later extended the line south to St. Jerome. The north end of the line was completed by the Canadian National.

Its narrow-gauge beginnings are shown by the many sharp curves and steep grades that the track follows over the rough countryside of the Gatineau Hills. The summit of the line, north of Montfort, is 1365 feet above sea level while St. Jerome, 24 miles to the South, is at an elevation of 311 feet.

Current service over the branch consists of a northbound run (No. 93) on Fridays which returns to Montreal on Saturday as No. 99, and a round trip on Sundays as Nos. 92 and 100. Freight service in the future would be provided by trucks which already handle the express in this area. Curiously enough the toll for driving an automobile over the Autoroute from Montreal will be $1.00, which is probably more than the present rail fare over the same distance!

- Two-way radio equipment is now in system-wide use on the Canadian National. The equipment includes semi-permanently mounted transmitters and receivers in locomotives and smaller portable sets for use by train conductors and maintenance-of-way personnel. The use of this system is more than justified economically by the operating savings that it introduces. Better communications speed up service by eliminating unnecessary stops and reducing confusion where switching is to be done, as well as decreasing the accident hazard in normal operations.

In the Great Lakes Region there are fixed transmitting stations located at strategic points along all major lines. These are located at: Toronto, Oakville, Hamilton, Niagara Falls, Fort Erie, Thorold, Welland Junction, Brantford, Woodstock, London, Stratford, Windsor and Sarnia in the London Area while in the Northern Ontario Area they are at Barrie, South Parry, Sudbury, Capreol, North Bay, Hornepayne, Longlac, Nakina and Armstrong.

First experimental use of UHF communications was made by the C.N. in 1955 and a complete experimental installation was tried out between Hornepayne and Longlac for several years. The decision to adopt system-wide train radio was made in 1959 with complete equipment being installed west of Port Arthur by 1961.

MOTIVE POWER NOTES

- "North British Locomotive Company Limited, which has made railway engines at Glasgow since 1833 is to go into liquidation." This course will be proposed by the Chairman at a meeting this month. "Accounts for 1961 show a loss of £645,000."

The North British Company, whose shops are located at Hyde Park and Queen's Park in Glasgow, was formed by an amalgamation of Neilson, Reid & Company; Sharp, Stewart & Company and Dubs & Company. It should be remembered that North British built many locomotives for Canadian railways, including 52 4-6-0's for the CPR, six 2-8-2's for the Newfoundland Railway, and two similar 2-8-2's for the Anglo-Newfoundland Development Company's Botwood Railway.

- The Canadian National has rebuilt nine of its class GS-9d General Motors built 900 h.p. switchers at Transcona Shops for hump-yard service. Engines 7253 to 7261 have been renumbered 7600 to 7608, repainted in the new scheme and had various hump control equipment added. The units have been ballasted to increase their weights from 233,000 to 249,000 pounds, thus increasing

their tractive effort from 36,000 to 40,000 pounds.
Photo: 5300-5301 show off, May 2nd. 0196-009.jpg

TIMETABLE CHANGES

➢ With the spring change from Standard to Daylight Saving Time comes a new set of passenger timetables from the C.N. and C.P. Besides the usual seasonal adjustments, there are several major changes.

In Quebec, the C.N. has added one run in each direction between Quebec and Montreal while deleting trains 171 and 172 between Quebec and Riviere a Pierre.

On the Montreal - Toronto service, Nos. 18 and 19 now leave 15 minutes after Nos. 16 and 17 respectively, except on Sundays when they follow their former schedules carrying the numbers 118 and 119. In addition to those listed in *Newsletter 195*, other changes have been made in the Toronto - London service. Nos. 83, (183), 75, 80 and 82 have been cancelled, while No. 77 now provides local service to points where the accelerated No. 17 no longer stops. Between London and Windsor Nos. 18 (118), 83 (183) and 12 have been cancelled but No. 106 replaces 12 as the *Intercity Limited* service.

On the Niagara Peninsula, No. 83 has been cancelled while 694 now leaves Hamilton at 2:30 pm. rather than 7:05 pm., having originated at Dundas where it connects with No. 6. No. 695 now leaves Niagara Falls at 5:20 pm. rather than 8:15 pm., while a new (sic) train, No. 89-90 leaves Niagara Falls at 6:15 pm. and arrives in Toronto at 8:55 pm. Since this is the third set of changes in as many timetables, it seems that the C.N. is still looking for the right combination of services for this area.

On the Brampton Subdivision, No. 34 has been cancelled, but a new train No. 26 provides another early morning service from London (4:00 am.) to Toronto (7:50 am.)

Two other changes strike the eye on glancing through the new folder. Gone are the tiny "read up" or "read down" instructions; their function is now served by bold arrows at the top of each table. For the first time ever, the C.N. folder is completely bilingual. Former tables gave French notes only for services in the province of Quebec.

Few differences are evident in the latest C.P. system folder which carries the same cover as it has for the last four consecutive summers. With the withdrawal of the gas-electric car from the 22-mile Fredericton Junction to Fredericton, NB run goes the last operation of this type of rolling stock on Canada's major railways.

U.C.R.S. ANNOUNCEMENTS

The May meeting of the Society will be held in Room 486, Union Station commencing at 8:30 pm. on May 18th.. Members are invited to bring their favourite 35mm slides for showing. Here is your chance to show off your best steam and electric shots to a large audience. To avoid duplication, please do not include photos of local excursions.

➢ The May meeting of the Hamilton Chapter will be held at the home of Doug Page, 27 Rutherford Avenue, commencing at 8:15 pm. on Friday, May 25th.. Members are invited to bring any slides or movies for showing.

➢ The June outdoor meeting, to be held on Friday, June 1st., will be a tour of the TTC's Davisville shops, and will afford members the opportunity to inspect the two new subway cars 5300 and 5301. Members should convene on the Chaplin Crescent bridge (at Davisville Station) at 8:00 pm., where they will be met by a Commission representative. Following the shop tour, members will be allowed to visit the control tower at Davisville.

➢ A bigger bargain you will never find! That could describe the June 9th. excursion on the Oshawa Railway. The fare, only $2.50, includes the trip to and from Oshawa on CN trains 14 and

5 (leave Toronto 10:55 am. DST, return by 6:05 pm.) as well as the trip over the electrified O.R. Equipment will included a freight motor, gondola and caboose, and several run-pasts are planned. Because of the special nature of this trip, children under 16 cannot be accommodated, and tickets must be purchased in advance.

➢ And don't forget the June 10th. excursion to South Parry. Members are reminded that they may purchase tickets for themselves and their family at $8.00 each rather than the price listed on the pamphlet. There is no reduction on half fares, however.

➢ Enclosed with this issue is a flyer describing the C.N's double headed excursion from Montreal to Garneau, Quebec on June 24th.. In addition, a bus tour of the C.N. Montreal Yard will be made on Saturday, June 23rd., with Sunday's ticket being good on the bus tour as well. For the exclusive benefit of Society members, a tour of Montreal Locomotive Works is also being arranged, and information on this will be sent to those returning the coupon below.

➢ For the convenience of those travelling to Montreal for the above week-end's activities, the Society will charter a sleeping car, going on train 16 on June 22nd. and returning on either No. 119 or No. 17 on June 24th.. The fare will depend on the number of passengers (minimum of 18 required) but the maximum space charge, per person, return (in either bedrooms or roomettes), would be $11. Week-end excursion fares are valid for this trip. If you are interested in this excursion, please complete the coupon below and return it as soon as possible.

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Excursion Committee,
Upper Canada Railway Society,
Box 122, Terminal "A",
Toronto 1, Ontario.

Please reserve ______ space(s) for me on the special UCRS sleeper to Montreal.

I prefer to return on No. 119 (arrives Toronto 7:00 am. EDT) _____ Please
or No. 17 (arrives Toronto 8:00 am. EDT) ___ check one

I prefer a roomette (return space charge $11.) ______ Please
double bedroom (return space charge $8 per person) ____ check one

NAME ....
ADDRESS ....
CITY .... ZONE .... PROVINCE ....