

DURBAN MODULAR RAILROADERS – Part One

This an edited version of two articles which appeared in the North Star Chronicles – Vol 1 numbers 3 and 5 March and May 2013 respectively.

One Tuesday evening in February 1981 a group of model railways enthusiasts met in an office furniture showroom in Durban. While the individuals shared a basic common interest, their modeling backgrounds were diverse including 3 rail OO British Hornby Dublo, HO German Fleischman, HO and Hon3 North American. From this unlikely beginning emerged a group which in one form or another stayed together for 20 years and did much to promote the model railroading hobby to fellow enthusiasts and the public in South Africa.

At the outset some general observations are appropriate about the modular approach to the hobby. A distinction must be drawn between a home layout constructed on a modular basis but which is not designed to be portable and portable modules specifically designed to be part of a modular group. With the tendency for space to be at an ever increasing premium and also taking account of the possibility of having to move premises, there is much to be said for constructing a 'permanent' i.e. non portable layout on a modular or perhaps better described as a sectional basis.

This article is intended to describe a different approach – firstly the modules had to be portable but more importantly they had all to be built to a set of common standards. This enables each member's module or set of modules to interface without problems to every other member of the group's modules.

DMR, while evolving its own specifications, drew heavily on standards already prevalent in the US (National Model Railway Association Guidelines for Modular Modeling). Details of those standards can be found in the Specifications part of this website but basically they involved two track mainlines constructed on modules 1800mmx900mm. These dimensions illustrated the main difference between DMR and NMRA specifications namely the size of the modules. The former's were considerably larger. A number of factors accounted for this: firstly the standard lengths in which chipboard and softboard were sold; secondly even in the early stages and in the interests of enhancing operating possibilities some of the group had grandiose ideas of the track configurations they wished to develop.

The resultant size and weight of the modules posed transport and handling difficulties and required some ingenious solutions to be developed to overcome these problems. In a number of cases the dimensions of the modules determined the cars people purchased!

Corner modules of which at one time DMR boasted 8 were built to a wide radius (915mm or 36") on the outside track. This had two advantages: firstly from an operational aspect long trains could be run without derailments; secondly aesthetically there is something majestic about a long train on a wide radius curve.

Reverting to specifications, while the two track mainlines were compulsory, the configurations the owner incorporated behind them ('local') were his business as long as the yards involved adhered to the group's electrical specifications.

Each module was a block which could be electrically isolated from the rest (for example if the operator wished to cross onto the mainline while retaining control of his loco). In addition the yards were normally isolated from the mainline which permitted marshalling operations in the yard without interfering with trains crossing the module on the mainline.

Strict standards were applied in relation to the prototype modelled and locos and rolling stock permitted. The unifying theme was North American prototype. At the time of inception of the group excellent quality equipment was available ex the US, chiefly Atlas locos, at a reasonable price. My first US prototype loco cost US\$29 equivalent to R29 in those days! The loco concerned was fitted with a can motor, flywheels and pick up on all wheels. It is still an excellent runner 35 years later and maybe a candidate for having a sound decoder fitted.

All locos and rolling stock were fitted with Kaydee magnetic couplers which enabled remote (hands free) coupling and uncoupling (well in theory anyway. We did not invent the expression 0-5-0 ing but there is photographic evidence that some members were guilty of the practice!) Uniform standards did not preclude expansive complicated track configurations. Some members built sets comprising 3 modules with extensive marshalling yards for freight or passenger operations. Others, less operationally orientated, concentrated on adding detailed scenery to their modules, incorporating mines or small towns. All this perhaps begs the question why modular railroading and not each individual building a portion of a portable layout?

The major advantage of the modular approach is that it does not require each member of the group to be present when the modules are erected for an operating session.

Bearing in mind we are talking about the hobby of 35 years ago and there have been great technological advances since then particularly in the field of electronics, it was quite an achievement that each member built his own SCR (Silicon Controlled Rectifier) throttle and also quick recovery capacitor discharge unit which ensured switches changed properly.

So we had our modules, what now?

Initially, our meetings were held on a Sunday in the parking garage of the building where I worked.



Photo taken at an early DMR meeting in the parking garage of Norwich Union House, now 6 Durban Club Place, Durban. Photo shows basic corner and standard modules. The straight one nearest the corner with the bridge was originally intended as a scenery only module . However subsequently a Hon3 line was added to both modules.

From the parking garage we moved up in the world to the hall in the Visitor's Reception Centre of the Sugar Terminal on Maydon Wharf. This was an ideal venue for us because we could set up on Friday night operate on Saturday and Sunday and dismantle the modules late on Sunday afternoon. But we were beginning to be noticed and invitations to display began to be received from shopping centres, the SPCA and Colin Penn's Disney Exhibition. This enabled the group to meet one of its primary objectives namely: to stimulate interest in the construction and operating of model railroads. Our other objectives were to improve the knowledge and skills of model railroaders and to raise standards within the hobby.

The peak of our achievements certainly in terms of the number of modules and the attractiveness of the configuration (based on a 'Z') were displays at Overport City Shopping Centre. Note two 'fillers' were required with this configuration because of its asymmetric shape arising from the use of reverse corner modules.

Overport City Public Display Circa 1983



Soon after its inception a decision was made by certain members of DMR to incorporate a HOn3 track in their modules. Arising from an earlier decision with respect to the depth of the corner modules (far less than the straight modules – refer photo below) this was not that easy. However 3 members co-operated and built a 5 module end to end HOn3 layout.

Another Shot Taken At Overport Featuring the HOn3 Modules. I wonder who that is 0-5-0 ing bottom right?!

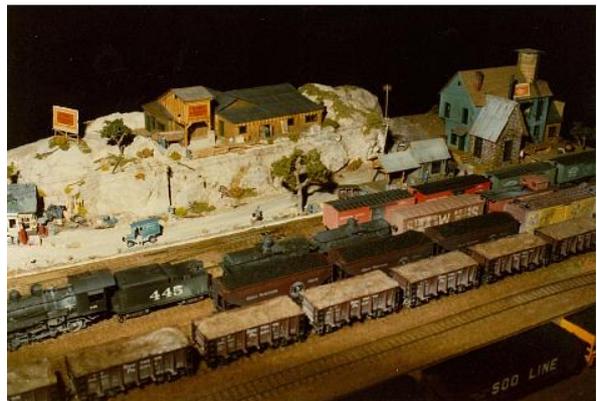
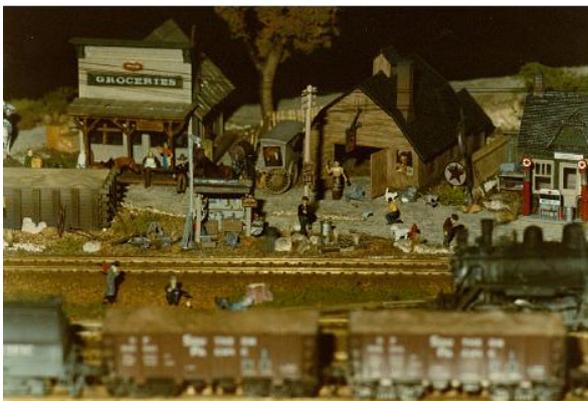
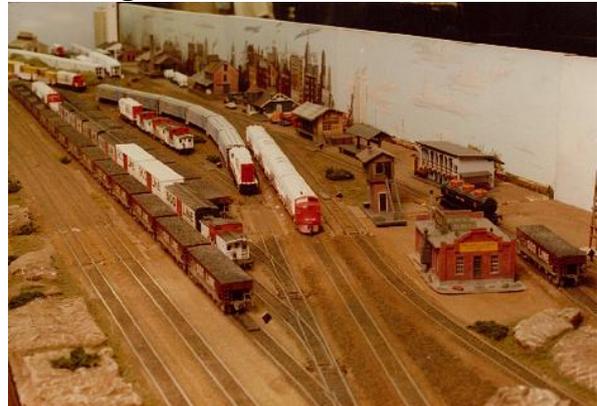


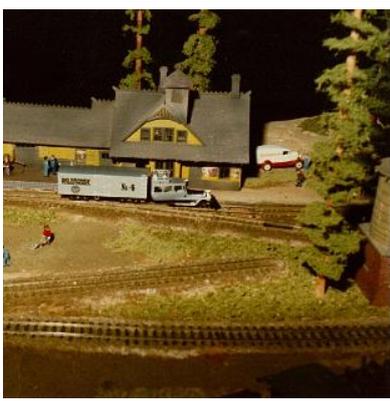
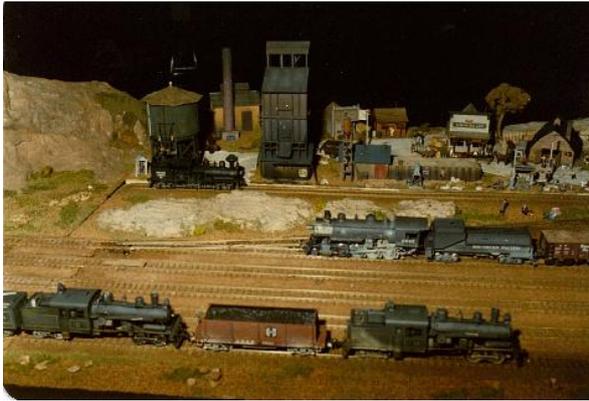
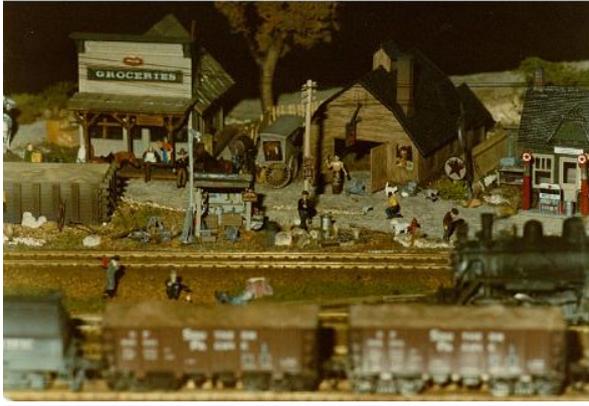
The section of the layout left and bottom of the photo shows the 4 straight and 1 corner modules with Hon3 track. The HO/HOn3 interchange yard module had no scenery at that stage.

Overport was an ideal venue for us as we could drive our vehicles into the centre of the complex for loading and unloading purposes, there was plenty of space and a gallery around the floor enabled spectators to view the display from above.

Layout configurations were planned using cardboard templates of each member's module(s) on the basis of who was to be available on the day. In those early days operations were simple, particularly when exhibiting to the public. In our experience what the public wants to see is trains running! Thus each member taking it in turns to run freights on one line and passengers on the other for say 20 minutes was often the norm. While waiting his turn each other member would make and break trains on his 'local' section. The HOn3 line added to the fun of operating the layout and to public interest.

The early days. Note HO/Hon3 interchange middle left.





DURBAN MODULAR RAILROADERS - Part 2

The first part of this article covered the history of DMR when the modules were still being erected only temporarily. A significant development occurred in the middle eighties when the club moved to permanent premises in a thatched rondavel in Kloof originally built as a billiard room. This room was oval shaped, 26' wide at its narrowest and 28 feet at its widest. The floor was Rhodesian teak parquet. It was able to accommodate two 3 set modules back to back located in the middle part of the room still leaving space for wide curves at the ends of these modules and a further 3 module set along the far wall opposite the door. In total the original configuration incorporated 12 straight modules and two of the original corner modules. Custom built sections were then added which resulted in the HO section becoming a continuous oval folded over itself. There was a removable duck under at the door of the rondavel which completed the circuits. In addition a short end to end Hon3 section was included.

There was a number of benefits from having permanent premises: firstly the obvious one of not having to transport and erect the modules only to dismantle them 48 hours later; secondly a greater level of scenery development was possible; thirdly it enabled participants to operate rather than run trains of which more later. Because of the layout configuration, some of the control panels which previously had been on the inside (rear) of the modules had to be moved to the front.

The original configuration in Kloof did not last that long. A member who owned one of the 3 module sets in the middle of the room returned to the UK taking his modules with him and the owner of the set along the rear of the room decided to remove his. While this caused disruption it also provided an opportunity for a major rebuild which primarily featured the installation of long hidden HO storage loops and a considerable extension to the HOn3 section. This started at a terminus with a turntable to the right of the door and after passing through a tunnel ran along the back of the two central 3 module sets and then turned again to run around the perimeter of the room before ending at a terminus with a turntable on the left hand side of the door. In the section down the middle a logging area serviced by a switchback was featured while along the back a mine was reached from a point off the HOn3 mainline.

Although never fully scenicked (albeit the lines were operational) this was the final configuration before the entire layout was dismantled. ***View of central and rear sections of layout from front door. HOn3 track just above brewery building. Note wall batons on far wall to support backdrops (never installed)***



View of layout along the far wall facing the door. Note hidden HO storage lines below HOn3 mainline and Hon3 branchline to mine at top rear. HO line at front.



Returning to a point raised earlier, the permanent erection of the modules enabled more realistic operation of the layout. Originally there were five main yards namely Bakersfield, Colby, Buttress Bend, Glenwood and Twin Forks. The electrics were so structured that each individual could operate either A or B mainline or local. Local was defined as any tracks either behind or in front of A and B lines (subsequently re-designated as Eastbound and Westbound respectively) which were electrically isolated from the two mainlines by plastic rail joiners.

Normally the individual yard operator drove his train from local onto the relevant mainline from where a designated mainline engineer drove it to its destination using a mainline cab. Once the train arrived on the module of the recipient the latter took control and drove it off mainline into the local yard.

Operating the DMR

The operating system used by the DMR was based on principles used in various forms by model railroaders since the 1930's. Many articles have appeared over the years in model railroad magazines and books on the subject. The primary sources for the DMR system were Volume III of the Model Railroading Handbook by Robert Schleicher published by the Chilton Book Company, Radnor, Pennsylvania and an article which appeared in the February 1978 edition of Railroad Model Craftsman.

System Requirements

The six basic requirements for operating the system are:

- Car cards
- Waybills
- Card racks/boxes
- Fast Clock
- Timetable
- Binder Clip

Car Cards (top left in photo below)

The first step towards establishing the operating system was for each individual to compile a list of all his rolling stock and identify each piece with a numbered sticker which had a shape or colour unique to him. A car card was required for each piece of rolling stock. This car card comprised a file card which identified the car type e.g. reefer, flat, tank, etc, the yard from which it originated (its 'home' yard) and its number

which equated to the number on the sticker attached to the side or roof of the car. In order to prolong the life of the car card it was inserted in a plastic envelope. Car cards 'followed' the actual cars they represented around the layout being transferred from the module from where they originated to each destination by the engineer responsible for the train concerned. When the car was 'spotted' on an industrial spur or in the yard the relevant car was placed in the appropriate compartment of the storage rack to be described later.

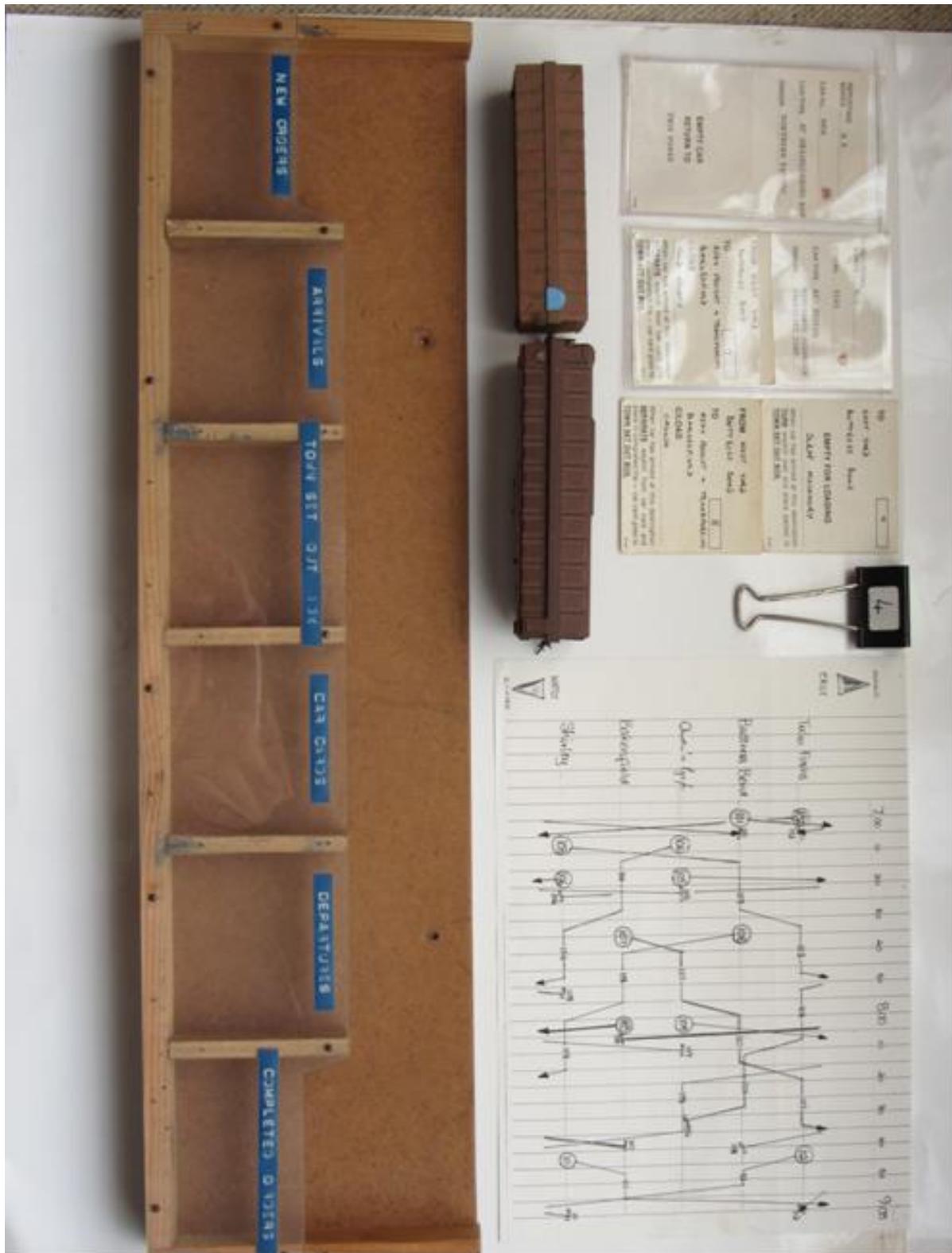
The plastic envelope also had a pocket in which a waybill was inserted. A car card with a waybill attached, depending on which way round the waybill is, represents either an empty car en route to a destination for loading or a loaded car. A car card without a waybill represents an empty car available for loading.

Waybills (immediately left of binder clip in photo below)

The next step was for each individual to compile a list of industries on his module. A further list was required of the types of products each industry might have shipped and received and what type of car was required for the shipping process. It was then necessary to marry a source industry on one module to various destination industries. For example Perry Shibel Pickle and Cannery Company at Twin Forks sent canned goods to Ajax Freight and Transfer Co, Bakersfield and bottled pickles to East Yard Interchange Buttruss Bend.

Where a problem was experienced with a source or destination of a particular commodity for example oil or distillate products and there is no oil refinery on any of the modules then it was assumed that the refinery was located somewhere off the railroad so the tank cars originated on an interchange or fiddle yard track. Thus the Rio Grande Interchange which was located under one of the termini of the narrow gauge section adjacent to Twin Forks was used as a source of oil and distillate products with destinations such as Colby and Bakersfield.

Principal Components of DMR Operating System (Fast clock omitted)



The following information was indicated on the front of the waybill:

- To (name of the shipper)
- Empty for loading (name of the material or product to be shipped)

The front of the waybill is used to route an empty car to an industry, mine or supplier for loading. At the bottom of this side of the waybill the following words were printed:

“When car has arrived at this destination turn waybill over and place packet in Town Set Out Box”.

The reverse of the waybill provided routing instructions once the car has been loaded and thus has the following information printed on it:

- From (the names of the yard and shipping industry or in some cases interchange from which the load originated)
- To (the names of the yard and receiving industry)
- Carload of (whatever the industry shipped)

At the bottom of this side of the waybill the following words were printed:

“When car has arrived at this destination separate waybill from car card and place in completed file car card goes to Town Set Out Box”.

Card Racks/Boxes (example above)

The racks/boxes were used to store waybills and car cards and were split into 6 sections as follows:

- New orders
- Town Set Out Box
- Available Cars
- Arrivals
- Departures
- Completed Orders

New orders This is the section from which the yard operator obtained business from the railroad. He drew a waybill from the new orders file and then searched his available cars file for a suitable piece of empty rolling stock in which the load referred to on the waybill was placed.

Available Cars As the name suggests this section contained the list of empty cars available for generating revenue.

Town Set Out Box This section was used to indicate the position of cars in a yard when they were located at an industry for loading or unloading purposes.

Arrivals As the name suggested when a train arrived at the yard concerned the engineer who had been driving it on the mainline handed over the car cards which made up the train to the yard operator who placed the car cards in the ‘arrivals’ section.

Departures Not surprisingly the departures section held the car cards of made up trains which were ready to depart.

Completed Orders This section held the waybills when delivery had been effected to the receiving industry and the car unloaded. At the end of the operating cycle the waybills from the completed orders rack were returned to the module from where they originated.

Fast Clock

DMR used a 4:1 fast clock. In other words a ten hour operating schedule was emulated in two and a half hours real time.

Timetable (top right in above photo)

DMR derived a number of timetables over the years on a trial and error basis. Not surprisingly it was discovered that a change to generate greater or less traffic for one yard had a ripple effect on all other yards. The original timetable used by DMR provided for three scheduled freights and 4 passenger trains in two and a half hours of real time operating.

Binder Clip/Train Number

Also in the photo above is the binder clip which held the car cards which constituted a train. As mentioned above the yard operator who made up the train would hand the clip to the mainline engineer who would drive the train to its destination and hand over the train electrically and “administratively” via the binder clip containing the car cards to the recipient yard operator. The number on the clip identified the train number as per the timetable – in this instance train no 4.

Also shown in the above photo are two goods wagons with identifying stickers on their roofs. These were the same numbers as appeared on the associated car cards.

The HOn3 layout was operated independently. It required at least 4 operators whereas the HO section needed six. Only the HO layout was operated “properly”.

The original Durban Modular Railroaders Module Electrical Specifications are also set out in the Specifications part of the website. As can be seen, each module was a block which could be isolated from its neighbour via gaps in the rails. The use of double pole double throw switches enabled the module operator to control the main lines or “local”. In practice, however, the module operator used to make up a train headed either east or west and upon being duly instructed by the

despatcher would drive the train onto the relevant mainline from where the mainline operators using dedicated cabs would drive the train to its destination(s). The system worked extremely well. The only problems arose when module operators forgot to set their switches correctly. In the event of a short circuit a car 12v light bulb was used to absorb the electrical overload.

Furthermore, even when the modules were in portable form electrical set up was quick. Each module had its own normally permanently attached control panel with the aforementioned double pole double throw switches to control the track electrics, push to make switches for point operation and a socket into which throttles made by module owners could be plugged (initially Silicon Controlled Rectifier - SCR hand held throttles - refer <http://home.cogeco.ca/~rpaisley4/SCRCircuits.html> for a circuit diagram). Thus what took the time was erecting and joining the modules – short pieces of track being used for the latter operation. Banana plugs attached to wires soldered to the tracks were used to improve electrical conductivity so joining even 20 modules in this manner was a quick operation.

At this stage it needs to be recalled that DMR changed its nature from a portable to a fixed layout in about 1987 some 6 years after its formation. As described above operating sessions were prototypically based with a timetable and a fast clock. Preparation on a Sunday evening took only a few minutes so trains were running soon after the necessary number of operators had arrived.

To conclude, two things contributed to the demise of DMR. The end came when the house was sold forcing the layout to be dismantled but even before that interest had dwindled to the point there was just a handful of members left. Part of the explanation for that was members devoting attention to their own layouts but the main reason was the failure of the attempt to convert the layout from block wiring to DCC. Hours of work were invested in trying to rewire and correct faults. On numerous occasions it was felt the problems had been solved only to discover more problems when an operating session was attempted. Herein lies a cautionary tale. Members travelled a fair distance to operating sessions only to find short circuits preventing trains from running. Understandably, this was a cause of considerable frustration.

Proponents of DCC would have us believe that wiring for that system is (considerably?) simpler than for block control. This may be true when a layout is being constructed from scratch and the right points for example can be used. However DMR' experience trying to convert the wiring from block control to DCC was a nightmare.

It is also the case that a mistake may have been made in choosing Digitrax for the operating system. Although technically sound it is far from being as user friendly as some alternatives.

For those interested in pursuing this subject further, DCC versus block wiring is debated in two editions of the North Star Chronicles namely Volume 1 numbers 10 and 11, October and November 2013 respectively. Access to these can be gained from the relevant section of the website.