

## WHERE THERE'S A WILL Part 1

By John G. Chetwin

During October 2002 I was considering a small garden O gauge railway around the fish pond. Having purchased a couple of Garden Railway magazines I formulated a few ideas and became enthusiastic. However a short time later having obtained the latest magazine I read an article called The Building of Victoria by Ray Corton and this changed my thinking completely.

His article gives a detailed account of the construction of a 5 inch locomotive using a Maxitrak un-painted kit. Having completed a Mechanical Engineering Apprenticeship 50 years ago and being an avid DIY slave this appealed as a worthwhile project.

My first thoughts focused on where in the garden could I building a track. The house and garden are situated on the side of a hill and despite being a large garden the slopes are too great. However behind the garden I have half an acre of woodland. This slopes even more but running across the land adjacent to a dry stone wall the ground is "sort of level".

January 2003 and time for a ten week Motorhome holiday in Spain & Portugal. On the way my wife and I visited Maxitrak with a list of queries. In their showroom the 5" and 7 1/4" locos were situated together. I quickly realised the 7 1/4 unit was far superior and an ideal size provided it could be carried up the sloping garden and over a dry stone wall. With sun, sea and time on my hands I designed a Sedan type chair (no canopy) which could be lifted, with the engine secured in position, by 2, 3 or 4 people.

On returning home I surveyed the land. With some track raised to a maximum of 18" and lots of ground levelling by hand (alas it's not possible to get equipment into the wood) I could have a track with maximum gradients of 1 in 60 for a distance of 150 feet. Two problems now arose. Nowhere to turn the train and not enough track length. To overcome turning I designed a trestle bridge situated at the top of the garden with a maximum track height of 8 feet and a 15 foot radius. This would reach over the wall to join track in a cutting I intended to dig also on a 15 foot radius with a depth of approx. 5 feet. A visit to see my local farmer sorted out length. We agreed a price on almost 1/2 acre of adjacent steep woodland which would add another 150 feet to the track length.

The weather in May was wonderful with wall to wall sunshine. Having ordered the loco; I chose the OPAL an 0-4-2 side tank model based on an engine produced by Hunslet. It was now time for some hard grafting on or in the cutting. I knew in advance the ground was riddled with sand rock and accordingly I armed myself with a large sledge-hammer a pick, shovel and wheelbarrow. This task took 3 weeks. Stones and rocks appeared every few inches. Some of the large rocks weighed 1/4 ton and more. They were removed by cutting into movable pieces using a large angle grinder, drills, steel wedges and lots of brute force. I can recommend this for the reduction of ones waistline. The depth finished at 54" due to two huge flat rocks running across the floor of the trench...

After due consideration I decided to lay a raised concrete base in the cutting to make removal of Holly leaves and soil deposited during winter months easier. On a very hot June day using an old cement mixer concrete was transferred into buckets. My son in law and I carrying two buckets each toiled for hours plodding up the slopes and over the dry stone wall. When we finished cold beer never tasted better.

The first sections of raised track was next on my long list of jobs. From one end of the cutting the track splits, one line heads along a 50 foot spur while the other continues in a loop to join the proposed trestle bridge. An adjustable wooden mould was produced to give me tapered concrete blocks of varying lengths with a 12mm bolt protruding out of the top surface (thread only showing). Concrete footings were laid at 72" intervals and the blocks cemented in position. Twin 5"x2" timber beams were assembled in the workshop using 5"x2" spacers while a common spacer was screwed down horizontally on every block. Each completed section was placed in position on a thin fillet of cement and duly screwed into position. For the track bed I used 18mm exterior quality plywood. All the timber was treated with a mixture of 3 parts creosote and 1 part engine oil. By the end of November a 30 foot section was completed.

With the track components and some loco parts now in my possession and winter closing in it was time to assemble and lay a few sections of track. The use of aluminium alloy rails and sleepers meant I could form the tight bends easily by bending around an old motorhome wheel and tyre. Assembly to the sleepers was also straight forward. I then screwed each length of track down in position for stability.

Moving indoors part of the conservatory was converted into a workshop/assembly area; ideal being light and warm. Having previously sprayed the chassis and wheels I used an old but sturdy table to begin work on the engine. By following the instructions carefully and making adjustments where necessary the wheels, cylinders, valve gear etc. were assembled to the chassis. These components were run-in using compressed air. Whenever I had a problem Andy Probyn of Maxitrak was and still is on hand to offer guidance. Time flies when you are having fun it's January 2004 already and time for another 10 weeks in Portugal and Spain.

During this "forced break" I redesigned the trestle bridge and considered my rolling stock needs. With gradients and curves in mind I designed a 4 passenger trolley and a 2 seater drivers trolley both to be fitted with bogies rather than fixed wheels.

On arrival home the garden was given a makeover to the satisfaction of my wife and so battle commenced. The spur was completed having "remembered" how I did it weeks ago. I now moved to the other end of the cutting where I intended to position a small engine shed/tunnel. It was to measure 8 feet by 6 feet, have double doors at both ends and straddle the track. This would provide summer storage for the loco and all year storage for rolling stock.

I began with construction of the base and because of a falling ground level this would be raised in a similar manner to the track. Concrete blocks and stilts would support 5"x2"

beams with a plywood floor. Three stilts were positioned down each side of the building. To produce these I poured concrete into pre-cut lengths of heavy duty 110 m/m plastic pipe placed on footings with the obligatory 12 m/m threading held in place. The blocks were positioned under the track area. In the workshop I constructed side and end frames using 2"x2 timber. With these screwed in position and rafters fitted I completed the job with plywood cladding. The result was a pleasing sturdy construction. A small section of raised track bed joined the concrete track base to the shed and more track was laid. I could now hang the doors with suitable cut-outs to clear the track. Removable battens were positioned at each end to keep out mice.

With summer holidays over I split my efforts into some engine additions during wet days and track construction on dry days. Work on the loco was slow due to the lack of finished track. By the end of the year another 34 feet of raised track was in position and I had reached a point where I could run at ground level. I also completed work on the passenger trolley having decided to sit the passengers in rather than on the truck. I gave it a coat of paint; it will receive the finishing touches at a later stage.

January 2005 through to May was taken up with holidays followed by work on new kitchen worktops, installation of a cooker and hob followed closely by gardening. This was my warm up for the major construction of the trestle bridge.

## WHERE THERE'S A WILL. Part 2

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May 2005 and time to begin work on the trestle bridge which I designed for strength and safety. Using 7 spans, it would carry the track on a 15 foot radius out of the woodland, over the top of the garden and back into the wood.

My first job was to modify the mould used to produce the shaped concrete blocks. I now required a horizontal 12mm clearance hole near the top of each block. My aim was to mount each trestle on 2 blocks set on footings and clamped with 1/8" x 3" x 8" M.S. straps. To position each span, I used up-to-date technology i.e. a peg in the ground, a rope marked at 15 feet and a plumb line.

Apart from one short trestle, the remainder ranged between 7 and 8 feet in height (excluding safety rails). The individual heights controlled the base length and the distance between spans was 66". I assembled each trestle in the workshop using 4" x 2" and 5" x 2" timber and 12mm bolts. With two cross members in position, the finished item proved to be extremely rigid. The heavy trestle was then shouldered up the slopes and placed in position using small wooden wedges and thin fillets of cement between the footings, blocks and trestle base. With the straps loosely bolted, position, height and levels were checked. Where necessary, I used the wedges to make adjustments. The trestle was held in a vertical position with a horizontal spar. Having tightened the clamp bolts, I poured concrete around the base of each block.

Beams were assembled in a similar way to the raised track, suitably positioned and screwed down together with an 18mm plywood top. Safety rails were added, 3 rails on the outside and 2 on the inside. The building of the bridge was a slow back breaking procedure but the end result was far in excess of my expectations. Having laid track on some of the bridge, it was now time to concentrate on the loco and two trolleys.

I had completed assembly work on bogies for both the passenger and drivers trolleys several months earlier. The chassis's were fabricated using angle iron and welded for strength. Machined 4 1/2" diameter wheels, axles and bearings were purchased from Maxitrak. I produced turning plates, drilled the chassis and assembled all the parts including suitable springs.

Both trolleys were constructed using plywood and wooden bearers under the base for strength. With fidgety grandchildren in mind, the 4-seater trolley is a sit-in design. Positioned in the top of the 2-seater driver's trolley are compartments for coal, firing tools, spanners etc. The centre compartment houses an extra water tank for steam injection to the boiler. Finally, I fitted cable operated brakes to both bogies which give very good results. To date, both trolleys have received a couple of coats of paint - the finishing touches will be pursued at a later date.

Attention now moved to the engine. Paint spraying presented a problem due to my limited experience. It was a case of trial and error with both paint viscosity and spray

patterns. I chose heat resistant paint for the boiler and cellulose for the main engine components. The eventual results were most satisfying (no orange peel). Having positioned the boiler, various components such as boiler fittings, control valves and steam pipes etc were fitted. The side tanks were assembled using aluminium castings and pre-formed 22 gauge brass sides. These, along with the cab, were placed in position on the loco and any necessary adjustments were made. On completion of components and assembled parts, they were sprayed, given a final polish then waxed prior to final fitting. At this stage, the results were looking pretty good. The building of the loco using a Maxitrak kit was an enjoyable and rewarding challenge and ideal with a limited amount of machinery and equipment available. Help was always at hand when required from the suppliers.

Having checked for leaks using a compressor, it was time to bench test the finished item under working conditions. I topped up with water, provided lubrication where required and jacked the wheels clear of the bench and “struck the match”. With the safety valves pre-set at 90psi, I waited impatiently for the gauge to rise. What a great feeling when I finally opened the steam valve and the loco kicked into life. To enable its safe passage to the higher domain, the sedan chair was completed. With the loco securely clamped and assistance from willing helpers, the journey was completed without a hitch. The first few driving experiences proved to be both exhilarating and challenging - check the water level, is the fire ok, did I close the drain cock, do the brakes work etc? Because of varying gradients, it took some time to master the layout; knowing when to apply extra steam and when to ease off. When more track is laid, longer stretches should improve the situation. Several minor snags cropped up, namely a loose eccentric rod and valve drive collar causing a timing upset. Loose gland nuts resulted in the loss of packing and of course the odd leak. Seasoned drivers will tell me this is par for the course.

With only one loop on the track layout completed, reversing back around the track created the possibility of derailment while pushing the rolling stock around relatively tight bends. After a visit to Switzerland where this is commonplace, I made notes of several methods in use, some being rather complicated. The one method I considered was in the form of large central buffers with curving front faces. When reversing, the contact points between buffers altered as curves were negotiated. However, on my return home, I asked Andy from Maxitrak for his views. The response was “long couplings, the longer the better”. Following our conversation, I decided on a compromise. Rather than use external couplers, I slotted the rear loco buffer beam and fitted a coupler inboard adjacent to the rear pony truck. I carried out the same task on the rolling stock with couplers adjacent to the appropriate bogies. While maintaining a normal gap between the units, this method is giving excellent results. A minor derailment on the passenger trolley was due to poor passenger loading and a similar experience with the driver’s trolley was cured by placing 4 building bricks in the rear compartment.

After only a few short weeks as a learner driver and with winter approaching, it was time to transport the engine back to the workshop and mothball the rolling stock in the engine shed. One final job before a well earned holiday in Portugal was to coat the trestle bridge, raise track and engine shed with a mixture of creosote and oil.

April 2006 found me refreshed and raring to go. After due consideration, I decided to cover the raised track and trestle bridge plywood beds with heavy duty green mineral felt. During the winter months I usually covered this area with Visqueen, therefore the necessity of this and creosoting the track bed would be removed. Track was lifted in sections and felt slid into position. With joints overlapping and sealed with cold setting roof adhesive, the edges were trimmed, folded over and held in position with clout nails. Although a lengthy operation, I feel it was worth the effort both from the aesthetic and labour saving view.

My next task was to complete track laying on the bridge and then join the end of the bridge with existing track leading out of the shed. A set of points was already in position for this purpose. Several months earlier, two sets were assembled using track kits and were quite easy to put together. The other set is in position at the head of the branch line. I now had a completed loop and with the engine already in service it was time to give the bridge a thorough testing. At first it seemed strange driving through the trees at a height of 8 feet but once the stability of the structure was proven, any qualms I had quickly disappeared.

It was time for experiments with track laying at ground level. My intention was to cut a 1 in 60 upward slope through undulating woodland. The peaty surface was removed along with petrified tree stumps, tree roots and fern roots, with the petrified remains causing havoc with the chain saw blade. Where necessary, sand stone edging was added using some of the many rocks from the cutting. I used more stone broken into small pieces for a track base and topped this with a layer of 30mm limestone followed by a top dressing of 10mm limestone. At each stage, I used a heavy flat piece of steel for tamping, checking the levels of each layer. To prevent the light aluminium track from creeping, I drove 12" long treated pegs into the ground between sleepers at 36" intervals. With an aluminium strip screwed down to clamp the nearest sleeper, movement was reduced to a minimum.

In between jobs and holidays and with more completed track, my driving skills improved with both grandchildren and adults thoroughly enjoying the experience. Some adults (female) admitted to closing their eyes when we were reversing over the bridge. With winter slowly approaching and approximately 250 feet of track laid, it was time to consider a second loop.

To be continued ...

















