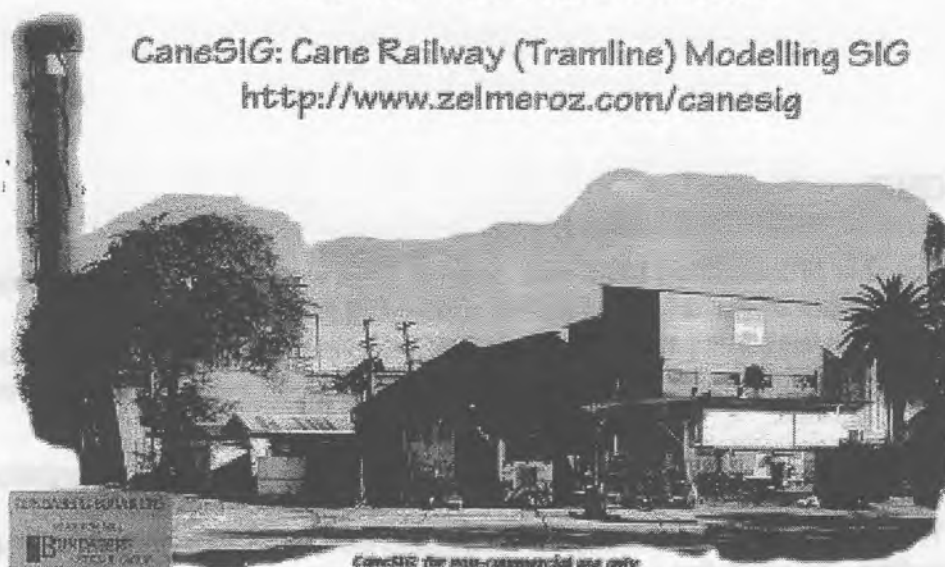


## From Field to Mill: Modelling Cane Railways

CaneSIG: Cane Railway (Tramline) Modelling SIG

<http://www.zelmeroz.com/canesig>

## From Field to Mill: Modelling Cane Railways

A C Lynn Zelmer (lynn@zelmeroz.com), CaneSIG Coordinator

## Introduction

As a young club modeller I was part of a sub-group promoting short lines and logging operations, particularly the West Coast variety. James Sabol's 1965 NMRA National Convention presentation, *From Timber to Tidewater: Some notes on Northwest logging*, and Lyle Spears' locomotive and equipment drawings of the same era, *Logs A' Rollin'*, followed by publication of the work of modellers such as Jack Work, provided much of our inspiration.

In short, my friends and I were more interested in scratch-building and operating logging and/or mixed trains than watching unit trains chase their tails around the layout behind several almost identical box-shaped diesels.

I'm the kind of modeller who used to love the 'Dollar Models' in *Model Railroader* magazine and once built a fleet of log buggies for considerably less than a Canadian dollar each, including bogies and [dummy] couplers. I tell you this because while some of my modelling techniques and materials are quite current, others were acquired from a time when a dollar was worth a lot more than it is today and many modeller were more interesting in creating an illusion of reality than an exact prototypical scene.

Given that background, was there ever any doubt that I'd model Queensland's cane railways (tramlines) rather than QR's unit coal (or even general freight) trains? Modelling cane railways means that I can have some very idiosyncratic equipment representing the diverse operations of an industry that often moved passengers and freight as well as cane, bulk sugar, molasses and maintenance equipment.

In the last decade I've photographed a variety of current cane railway operations from Nambour to Cairns and have discovered a network of modellers and others willing to share their information and resources. The cane modeller's special interest group web site (<http://www.zelmeroz.com/canesig>) is

one result, others include the dioramas and computer-based cane loco simulator I'm developing for the ANGRMS museum at Woodford.

Most of the models and techniques that I'll be presenting here are 1:87 scale (variously referred to as HOn30, 009 or HOe) but that's a matter of convenience more than anything as I had a 'hoard' of 1:87 components when I started modelling cane. Like many of you, my eyesight isn't quite what it used to be, and I'm gradually shifting to larger scale (On30) modelling.

Incidentally, some modellers do use 2' gauge when modelling cane operations, but the usual pattern is to represent the 2' gauge with HOn30 or On30 track, utilising N and HO gauge components (track and mechanisms in particular) respectively. Some dimensions are oversize but so are many of the available components. Scale size HOn30 wheelsets, for example, are not readily available or likely practical.

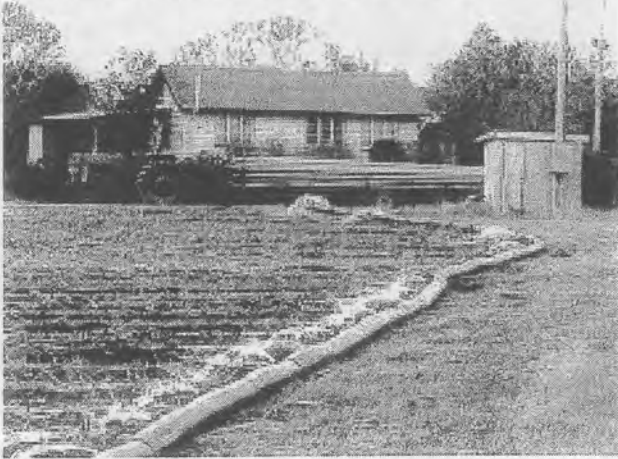
As a once competent modeller newly come back into the hobby after a long absence, an illusion of reality is what I'm after and I hope to show you how this can be accomplished.

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### Queensland's Sugar Industry

Queensland's cane railways (tramlines) annually transport in excess of 24,000,000 tonnes of cut sugar cane over 3,500 plus kms of mostly 2' (610 mm) gauge privately owned track. Raw sugar is one of Australia's largest export crops; road and rail transport is 30-40% of the total milling cost.

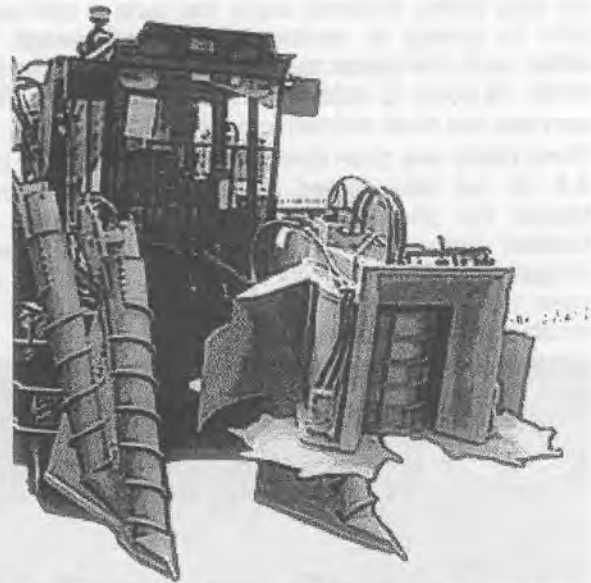


Flood irrigation from a pump/pipe system. Flowing surface water, whether flood, canal, weirs, etc., requires carefully graded fields and surplus water retrieval (perhaps a pond).



Spray irrigation; note wind drift and metal pipe from supply,

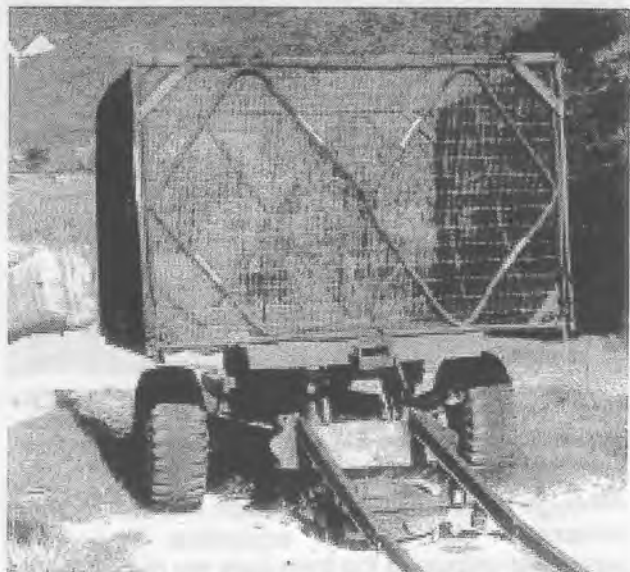
Sugar cane, a tropical grass with a fibrous stalk, requires sunny frost-free weather, fertile well-drained soils and either lots of rain or very good irrigation. A clump of about 12 stalks grows from each cut length of mature cane planted in well-spaced furrows to allow for mechanical cultivation. The cane is grown for 12 to 16 months before being harvested in the second half of the year.



The dual cutters on this harvester (above) raise up and down to cut the leafy tops off the cane. The roller mechanism guides the cane into the billet cutters. Leaves and other trash are blown out the back while the billets are dumped into a bin, usually moving along beside the harvester (below).



© Greg Stephenson



Single bin trailer with metal 'pan'. The trailer is backed into the ramp; the hinged rail ramp lifts so the bin can be transferred to/from the rails. Note the large metal springs near the hinge and the tire which prevents the ramp dropping too close to the ground for the guide pan.



### From Field to Mill: Modelling Cane Railways

Green cutting of cane removes the leafy tops as the stalks are cut near the ground and chopped into 25 cm long billets. In some areas the cane is still burnt prior to cutting to remove leaves and weeds. In either case, the billets must be transported to the mill within 24 hours to obtain the best quality sugar. Rail provides the most economical means to do this.

Cane billets are often directly loaded in the field into 4-6 ton rail bins carried on trucks or trailers, then hauled the short distance to the farm siding for transfer onto the tramline. Recent developments include self-propelled dumpsters carrying the cut cane from the field to waiting rail bins as well as much larger rail and truck bins.



Single bin trailer with loading ramp so that a special rail transfer facilities are not required. The trailer's ramp drops over the rails and the bin is rolled directly onto the rails.



Winching bins onto a 2 bin trailer at a farm transfer point. Note the large timber bumper on the tractor (next column), which is used to move the bins while on the rails. Hitting the bins too hard is a frequent cause of bin damage.

Although recent mill consolidation has led to more uniformity, each line's equipment has been somewhat unique as the tram lines are owned by the individual mills. For many years the tram lines were lightly built and poorly maintained with temporary track laid right into the fields. Today they rank among the world's heavy haul railways; trackwork

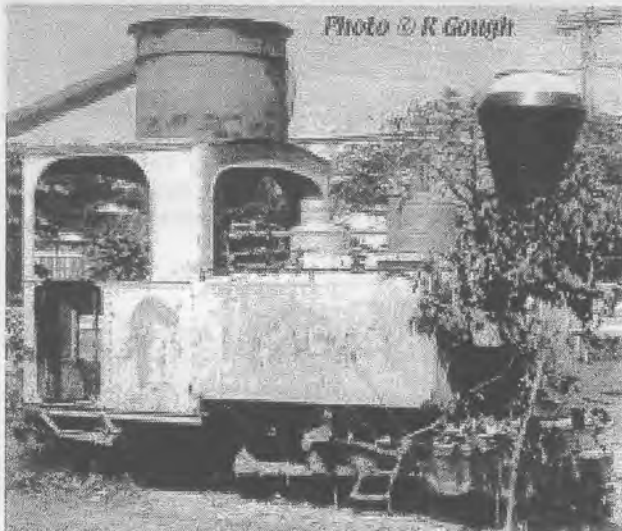
standards often equal or exceed those of traditional railways, and train lengths/tonnage and locomotive power have increased significantly.



Cane railways in Fiji operated much the same as their Queensland counterparts, notably those owned in common by CSR (Commonwealth Sugar Refineries). Other overseas lines (Cuba, Indonesia, etc.) may still use steam locomotives and/or wholestick handling.

#### Locomotives and Bins

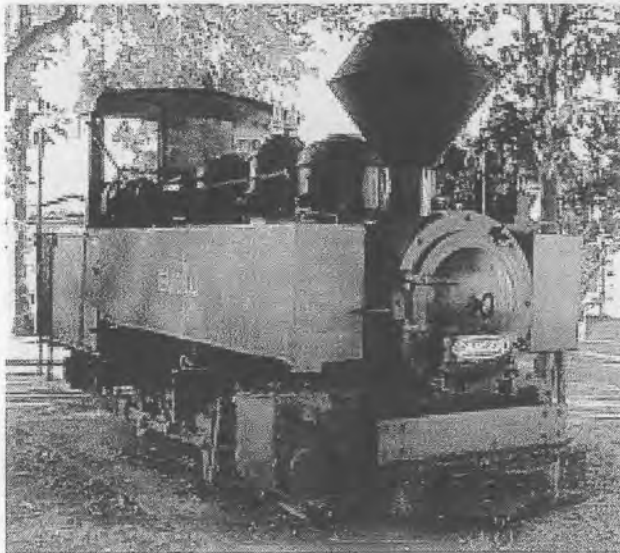
Given the nature of the industry it is not surprising to find that while some locomotives have been purpose built, others are standard industrial locomotives. Steam was phased out in the 1960s, recent acquisitions have often been rebuilt mainline locomotives (NSW or Queensland).



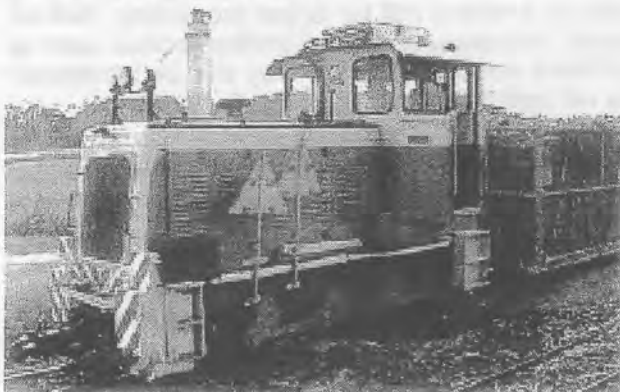
Retired Decauville loco in park, Giru Sugar Mill (above) and Morton Mill's 0-6-0T Eudlo (next page).

Diesel locomotives are generally brightly painted for safety reasons and, until recent mill consolidations, had individual mill colour schemes. The locomotives will be hung about with brooms, chains and rerailers, end-of-rake markers, chocks, and other equipment. As well, they will have at least one flashing roof light and a radio antenna.

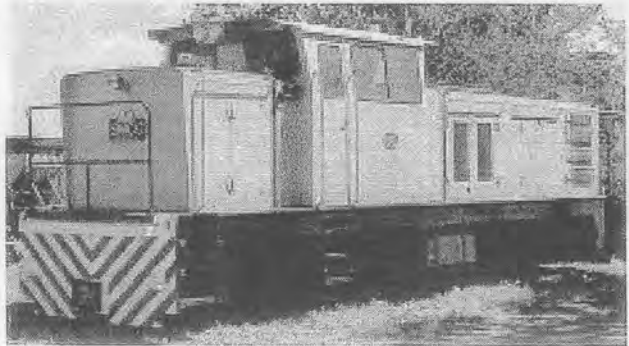
## From Field to Mill: Modelling Cane Railways



First generation Malcolm Moore locomotive, similar to those at the Australian Narrow Gauge Railway Museum (Woodford) and most recently used for maintenance work. Note the yellow flashing safety light on the roof.



St Helens (Farleigh Mill, Mackay), an 0-6-0. Note the end-of-rake markers and wooden wheel chocks on the side of the loco, plus the air conditioner and flashing lights on the roof.

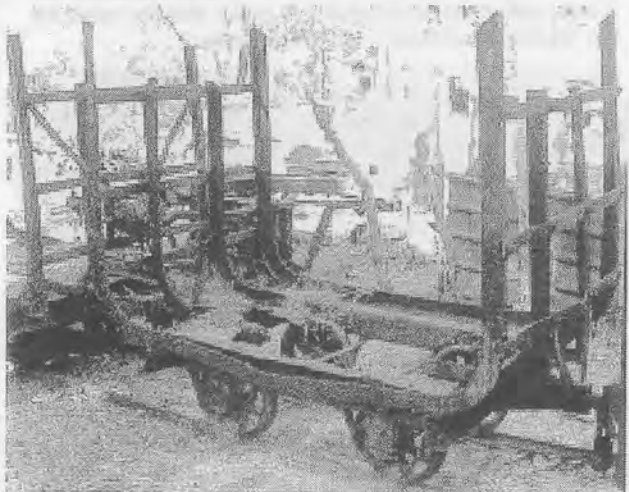


A newly delivered (early 1990s) EIMCO locomotive, the last of the purpose-built locomotives.

Cane bins do not have brakes, thus the locomotive(s), and perhaps a radio-controlled brake van at the rear of the rake, provide the necessary braking power. Some lines double-head their locomotives, others use radio-controlled slave locomotives in the centre of a long rake.



Mackay Sugar brake vans with flashing lights for visibility. Brake vans are essentially heavy weights with a small engine for powering the radio-controlled brakes.



CSR-type wholestick cane truck (ILLRS)

Bins were typically designed to transport either 4 or 6 tons of cut cane billets (the use of whole stalk cane ended in the 1960s). Each mill had its own construction design, although the use of different materials and periodic maintenance resulted in quite distinctive bins over time. Sides and ends are normally constructed to be folded down or replaced in a single piece; bin floors are commonly corrugated metal sheets.

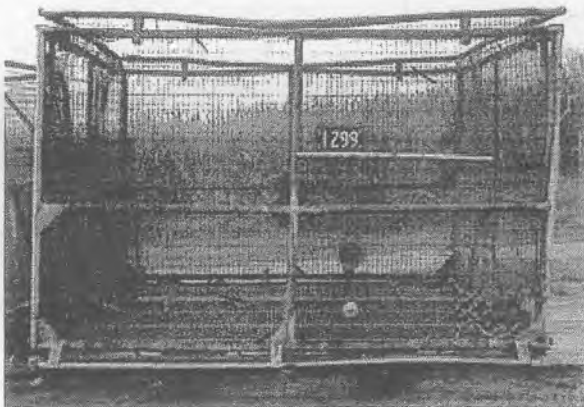


## From Field to Mill: Modelling Cane Railways

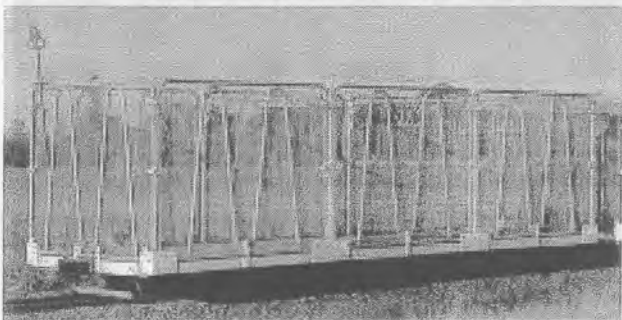
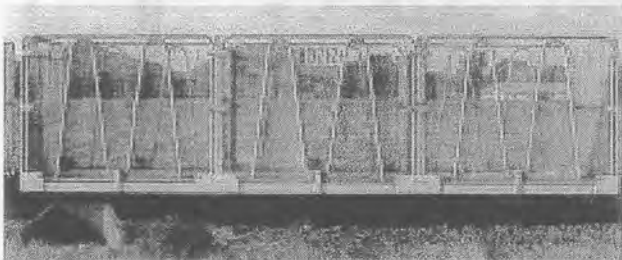


Three different four ton bins: now operating together they originally came from different mills. The boards on the top of the middle bin extend its capacity. Some bins had one solid side to make dumping easier.

A 6 ton bin is the same height and width as a 4 ton bin, just longer, so that three 4 ton bins will fit into a mill's rotary dumper in the same space as two 6 ton bins. Bins normally have safety reflectors or reflective paint on each side to make them more visible to motor vehicle drivers. The mills are now experimenting with 10 ton or larger bins which will never leave the track, thus will not sustain the same damage as the smaller bins trucked into the fields.



A older style 4 ton bin in rather sad repair. Note the extended top, welded corner braces and tubular frame.



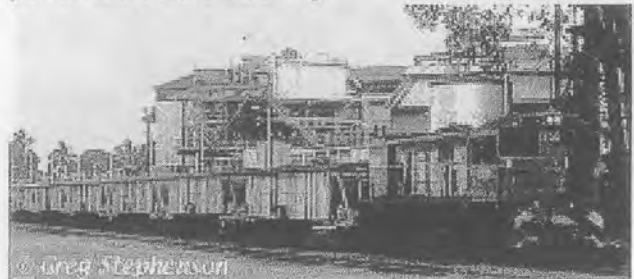
Pleystowe Mill's new extended bins, roughly ~15 ton load, on a well-graded main line leading to the mill. Note the concrete culvert under the upper bin. South Johnstone Mill canetainers being transferred from road to rail (top next column) for a short trip into the mill.



The cane lines both transport the sugar (cane billets, juice, refined sugar, molasses, mill mud, etc.) and provide a storage system for cut cane and empty bins during the crushing system.

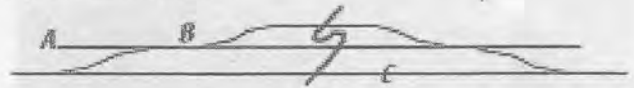
Harvesting contractors (or growers, if they cut their own cane) cut only enough cane to fill the daily quota of bins delivered by the mill. Cane ages very quickly after cutting, thus full bins should be moved to the mill within 6-12 hours, providing a smooth flow of cane for the milling process.

Cane deliveries are controlled with a system of bin tickets (consignment notes) identifying the source of the cane. This ticket accompanies the bin to the weigh scale and follows the cane into the mill where sugar content and other quality control tests are performed before crushing.



Sugar juice train at Gordonvale, Oct 1999.

Smaller mills may crush only, shipping the resulting juice to a central mill for further processing. Refined sugar, molasses, cane mud (milling residue used as fertiliser) and the cane fibre may also be transported by rail from the mill.



Simple farm siding (above), ~500 m long, in level country. Loaded bin delivery ramp A is roughly 450 mm above the through road C; B is roughly 300 mm above C, with the elevation falling off to the empty pick-up ramp at right.

The hinged rail units at the delivery points are ~2 m long, with a welded cross piece to maintain the gauge ~1 m from the hinge, and are propped on an old rubber tire.

The through road is lightly ballasted with gravel. The others are grass and trash covered, with standing water in the wet season. A shire-maintained gravel road parallels the siding, separated from C by a shallow drainage ditch.

More sophisticated farm sidings and pickup points are described in the next section.

## Engineering and Operations



This is one of my favourite locations in the Mackay area. The rough track and small yard with its delivery ramps exemplifies cane tramway operations of earlier years. The through line parallels the road to the left; that's a farm access (No Through Road) cutting across the centre of the picture.

**Marian Mill 1992:** In the 1992 crushing season the Marian Mill transport system operated 26 shifts/day (engine crews), with a net tonnage of 14-15,000 tons/day (approximately 24,000 gross tons) to supply a 5 days per week (23 hrs/day) crushing schedule. The Mill had approximately 270 kilometres of 2' gauge 'main line' track, a maximum grade of 1:37, and used both 4 and 6 ton link and pin connected bins. Bins were handled automatically within the mill and rotary dumped onto a conveyor belt to the mill.

Prior to 1981 45% of the cane came to the Marian Mill by road transport or QR (Queensland Rail); in 1992 only 20,000 tons came direct to the mill (from a few farms just east of the mill). Some of the farmers on the far ends of the system also delivered their cane to the rail system by road transport, however this cane was then transported to the mill via rail.

Burnt cane must be harvested reasonably quickly, usually the next day. Cane yields were approximately 30 tons per acre, and a single small farmer would perhaps be allowed to deliver 100 tons in a day, thus daily burnings were small.

The hilly sections north of the mill had grades to 1:37 [the worst grades were recently eliminated with a multi-million dollar cutting], the flatter route west through Cattle Creek had maximum grades of 1:80. Normally the maximum curvature on the mainline was 100-150 metres radius, although again, the sections to the north were through much hillier country and some non-mainline sections could be as

A tractor hauling a trailer will drive over the end of the ramp to the right, drop into the hollow beyond and back up to the rails for picking up or dropping off the bins. The track slopes down at this point so empties are likely collected here, letting gravity do most of the work.

tight as 130' (2 chains or approx 40 m). Speed (10 or 20 km/hr) and load restrictions were common.

A 40 ton (740 hp) EIMCO locomotive could haul approximately 75 cars up the grade on the northern line. A 24 ton loco can haul 300 4 ton bins on the flat (trailing 1500 tons). The newer, heavier, locomotives were acquired when the lines were extended after 1990—prior to 1968 the average haul was 13 km, by 1992) it was 21 km. The newer locomotives are also able to work with slave units (computer controlled, driverless locomotives), with the slave placed back in the train to assist with both braking and hauling.

Mackay Sugar now (2002) makes extensive use of GPS and related technology to keep track of its trains, is beginning to use superbins at some of its mills and is also likely looking at driver-only trains (eliminating the off-sider, who does all of the leg work during switching) to cut operating costs.

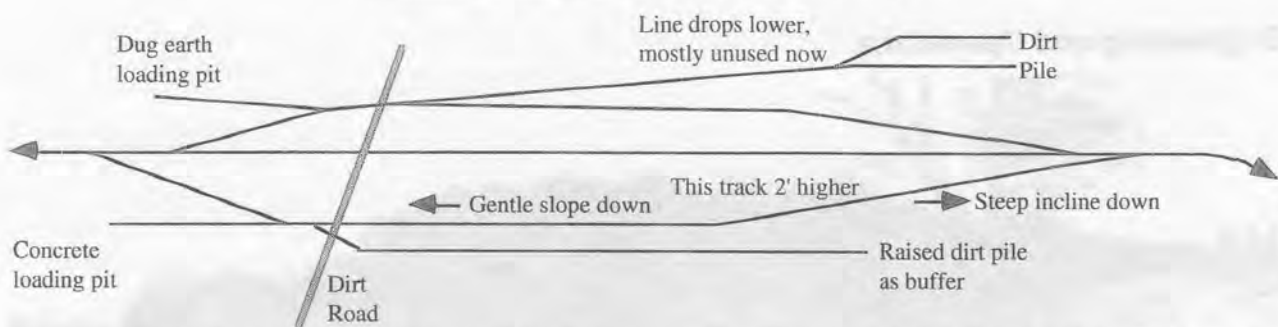
#### Variety and Local Ingenuity

Shire tramways carried cane as well as other traffic in some areas (eg Innisfail) and some continue to have passenger operations as part of encouraging tourism (eg Port Douglas). All maintained some means of carrying navvies and/or other personnel. Likewise, all required some means of dropping off and collecting bins, servicing locomotives and other equipment, crossing water courses, etc.

The charm of the cane railways, as I indicated above, is in the variety of ways that they accomplished their purposes.



# From Field to Mill: Modelling Cane Railways



This farm siding (above, not to scale) has storage for perhaps 25 bins on each of the working tracks (currently the central through track and the sloped track below it). A farm tractor

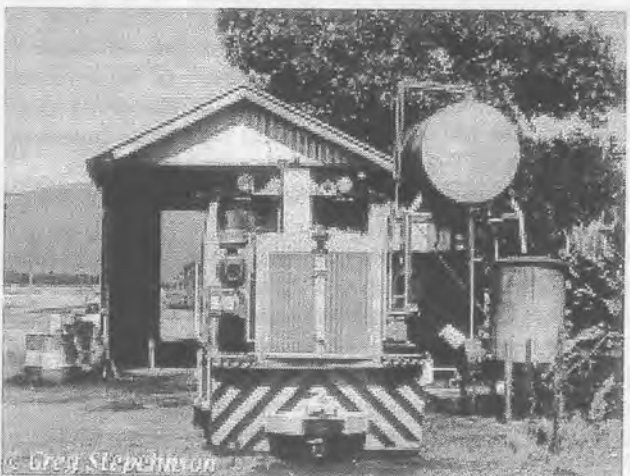
with a wooden bumper or an old tire on front would shift two bins at a time from their trailers, pushing them along the track as required.



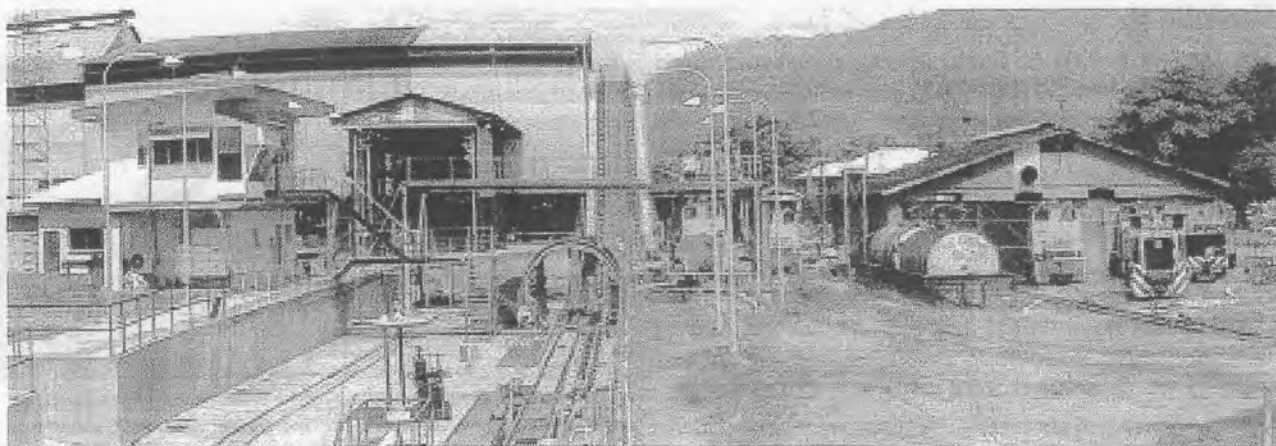
The Mill's locomotive depot above is similar in size to the facilities on page 1 and the next page. The small depot (below) is located some distance from the mill and is capable of doing routine servicing but not major repairs.



Cane line on ex-QR timber trestle (2 photos above) and on a cane railway-built bridge (below).

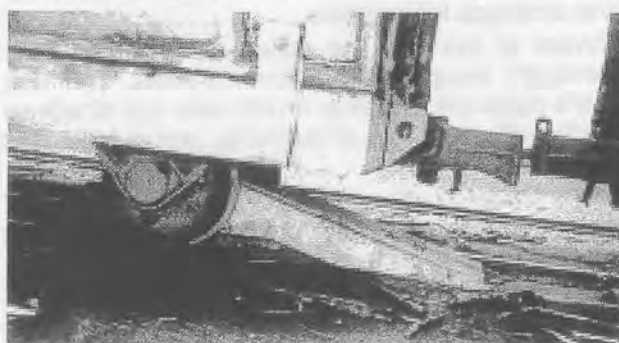
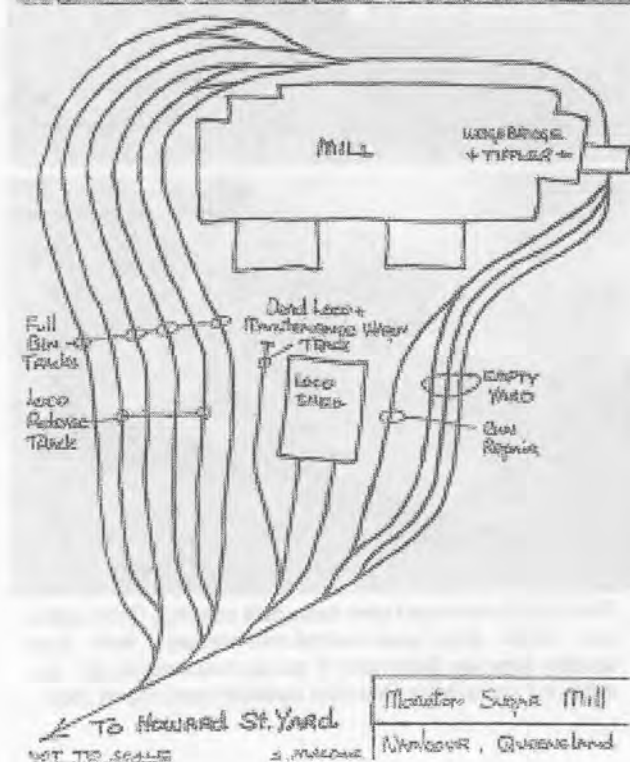


## From Field to Mill: Modelling Cane Railways



A mill in the early 1990s (top). Traffic officers in the elevated office (top left) schedule bin deliveries and oversee the weigh scale and rotary dump. Billets go up the conveyor belt to the crusher. The locomotive depot is top right.

Mackay Sugar's Broadside (above centre), a Clyde-built 0-6-0, heads out again after delivering another rake of loaded bins to its mill. Note that the mill yard tracks are almost buried in ballast, the cane trash everywhere, and the detail for modelling on the locomotive.



Mechanical ram (above) for pushing a rake of bins through the mill sits in a concrete trench and rises up to push on a bin axle, moving the rake from the full yard, through the weigh scale and dump, and out into the empty yard.

Mill map (left) courtesy S Malone (AMRA Journal 236, 1997).



## Modelling

The unique nature of each individually-owned cane railway lends itself to modelling in any scale from HO to G. A small selection of steam, diesel and petrol locomotives, cane bin and harvester kits are available commercially as well as typical structures and engineering works. However, most modellers will scratch-build at least some models.

Queensland modellers seem to mostly model in HOn30/009 (3.5 mm) or On30 (7 mm) using track components based on N and HO respectively. While I am beginning to switch to On30, most of my current experience is with HOn30 and my examples will reflect this.

Many HO modellers use 9mm gauge track (you can get track and turnouts with respectable HOn30 sleeper spacing). While this scales closer to 30", it adequately represents 2' gauge and allows the modeller to use N gauge mechanisms and other components, including wheelsets and couplers. 1/4" or 7mm modellers likewise can use HO components and track spacing, also roughly 30" to represent 2'.

Layout, trackwork, scenery and wiring will be the same for a cane layout as for any other layout in a similar scale. Obviously more scratch building will be required in some scales, however in HO commercial models of Queensland buildings and similar items can be used where appropriate. Cane fields themselves have been successfully modelled with fine broom straw, coir floor matting, both dyed or painted, and green carpet, with scale 'grasses' for individual plants. Tropical trees are commercially available in several scales.

The availability of small production run models is often problematic because of the part-time nature of the business, the use of low-yield rubber moulds and general commercial realities (ie low demand + variable quality + realistic prices = low sales and eventual closure).

Bob Dow's HOn30 cane bins kits provided craftsman-type kits that didn't totally depend upon scratch building or adapting UK 009 models. Plans for his freelanced locomotives, whole cane wagons, etc., are still available on the web.

Colonial Model Railways and Far North Hobbies similarly provided craftsman-level kits for Queensland prototype locomotives.

Chivers of the UK, the actual kit producer, may eventually resupply the Colonial models, and Bob Dow's plans are available on the web, but otherwise they've all gone out-of-business, along with The Turntable hobby shop.

Tom's Model Tractors provides a broad selection of cane bins, harvesters and related equipment but this is a one person business and supply is very slow.

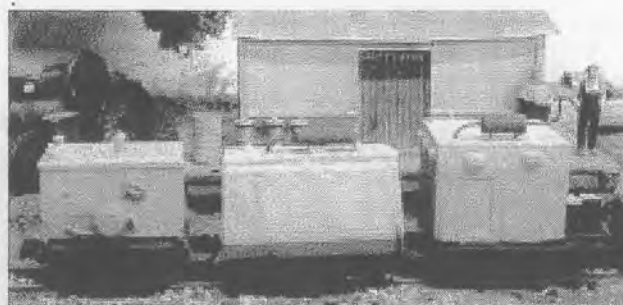
Horizon Hobbies (Warner, QLD) is the source for QOM (Queensland Outline Models) bulk sugar boxes and other Queensland prototype models.

Unfortunately, modellers may even have problems obtaining basic supplies: Bachmann mechanisms don't seem to be available any more, Micro-Trains bogies are in short supply worldwide (Mar 2002) and

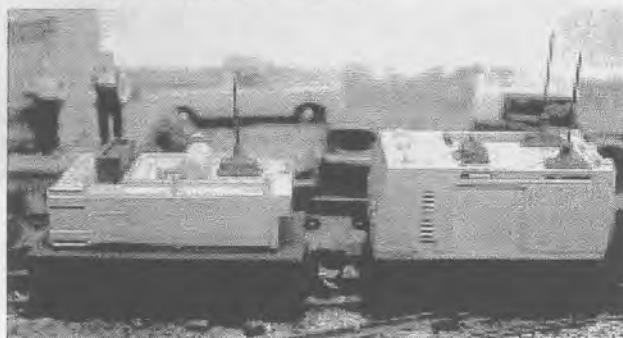
more than one Aussie distributor has simply gone out of business.



Inspired by a weed spraying train seen at Bingera Mill, Greg Stephenson fitted tanks from a Hasagawa 1:72 refuelling tanker to 4 wheel underframes (above).

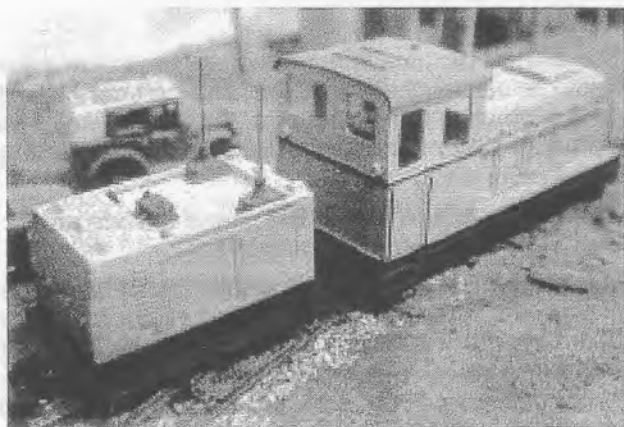


Greg used Hasagawa 1:72 ground equipment on 4 wheel chassis (above) to represent compressors and generators, etc., while a Hasagawa ground equipment kit provided bodies for 6 wheel underframes incorporating N gauge passenger bogies to model brake vans (below).

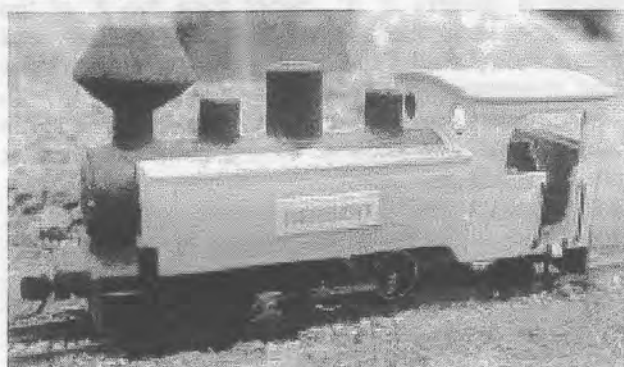


Two HOn30 freelanced cane locos built from Bob Dow's plans and notes (<http://www.ozemail.com/~ozbob>). Built from styrene, they use Bachmann N gauge mechanisms, and are sitting in front of Bob's Dowmont cane field-style engine shed.

## From Field to Mill: Modelling Cane Railways



Greg Stephenson freelanced this HOn30 bogie diesel using a OO scale 4 wheel diesel kit narrowed down to fit a LifeLike N gauge bogie diesel chassis.

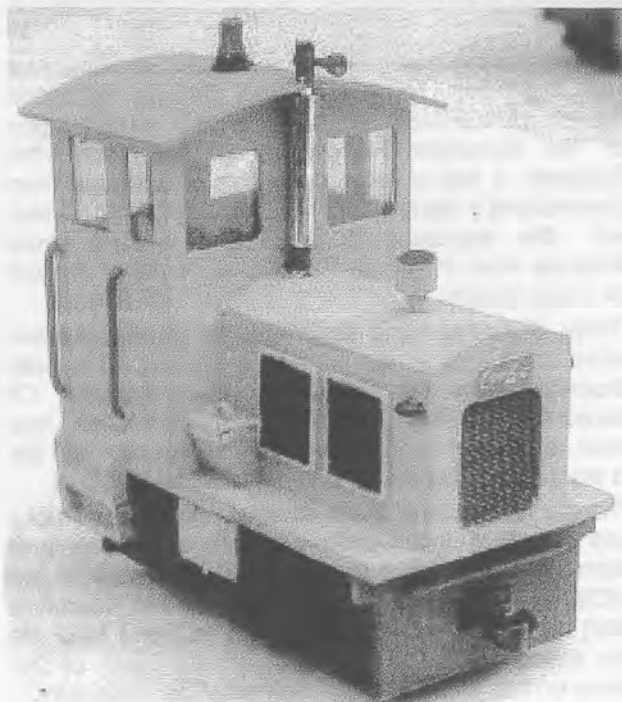
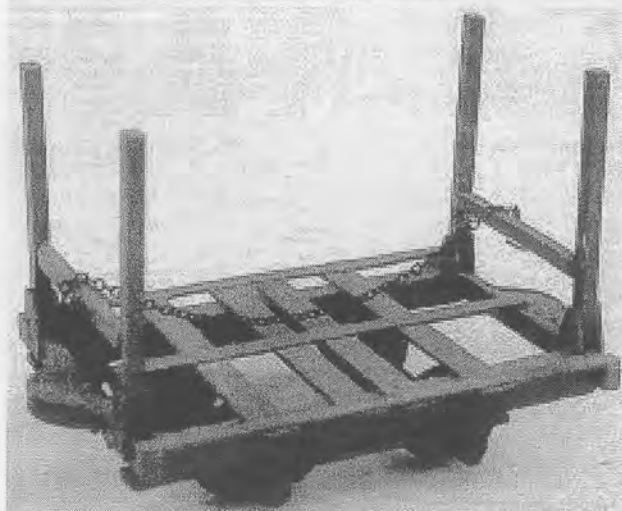
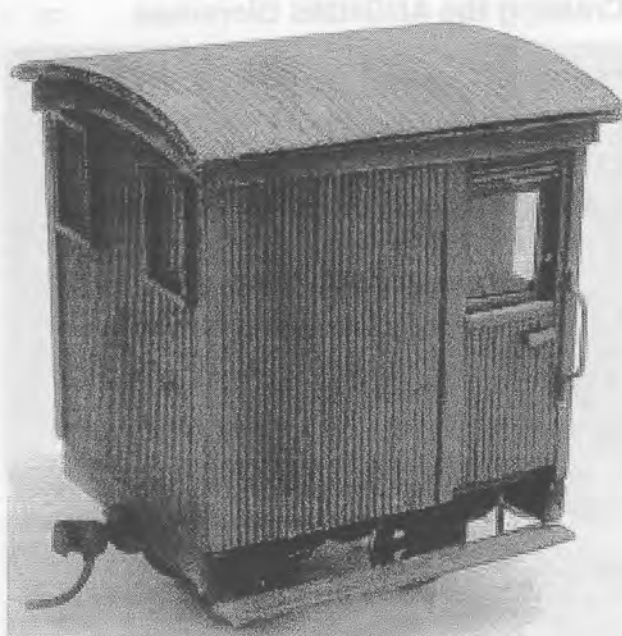


One of Bob Dow's freelanced 0-6-2T steam locomotives, built in styrene from his plans (<http://www.ozemail.com/~ozbob>) and mounted on a Bachmann 2-6-2 mechanism. While such a model suffers in comparison to the 7mm models here it provides a relatively easy and inexpensive steam loco representative of the cane era.



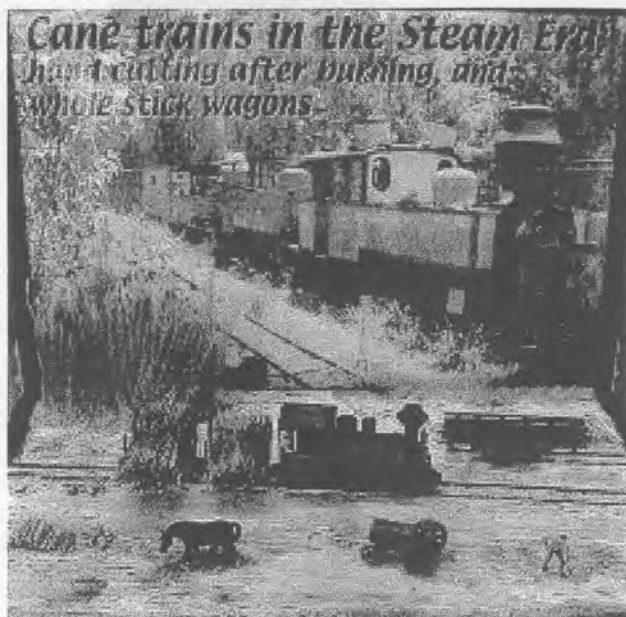
This brass model of Moreton Mill's Sandy by John Burgess (now owned by Bob Dow) shows the detail possible in 7mm.

Three of John Armstrong's 7mm models (right): a Mapleton Tramway van (top), wholestick cane truck (center) and a Comeng 0-4-0 (bottom).





## Creating the ANGRMS Dioramas



The Australian Narrow Gauge Railway Museum Society (ANGRMS), operates weekly steam trains on the Durundur Railway about an hour from Brisbane. It has a large collection of artefacts from Queensland's early sugar mill railways (tram lines) but the 'museum' is small and located some distance from the cane fields, thus lacks a context for many visitors.

These dioramas were developed to show representative cane railway equipment in context. This note describes how the dioramas were created. Of necessity a certain amount of 'artistic license' has been employed to compress the scenes and add life to what otherwise could have been static displays.

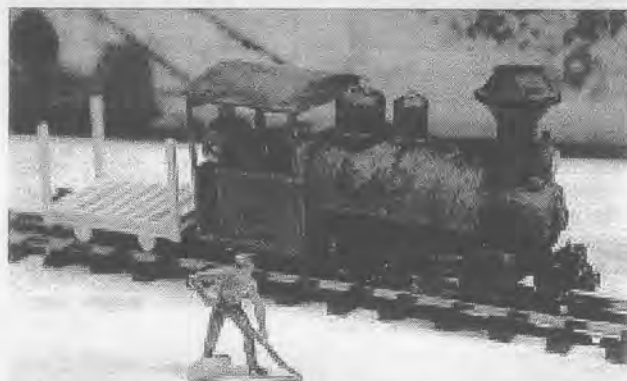
The steam diorama features wholestick cane trucks and a steam loco, complete with open cab and diamond stack, as it might have appeared in the 1930s-50s. Rows of mature cane, an old tractor, a draft horse and the portable track sections help set the scene while the backdrop shows some of the locos on the ANGRMS rip track awaiting restoration.

The second diorama is more modern, featuring cane fields, a mechanical harvester and several loaded cane bins behind a model of a Jenbach diesel. The diorama's backdrop shows a two stack sugar mill in the Mackay area.

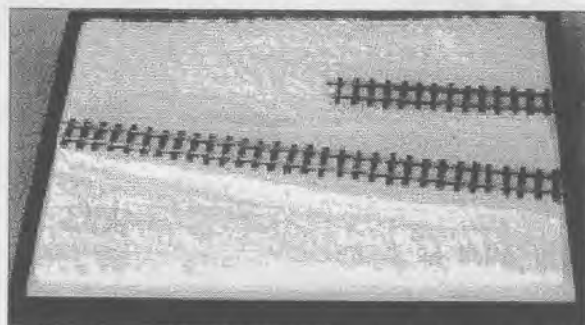
### Cane trains in the Steam Era: hand cutting after burning and whole stick wagons...

This diorama is A4 size with an A4 backdrop image and uses standard picture moulding with a foamcore board insert. The backdrop is screwed to the base with angle brackets and was manipulated in Photo-shop, printed on a photo-grade inkjet printer and laminated for protection.

The models are 'HO', ie 3.5 mm to the foot, running on 9 mm track. While this means that the track gauge is roughly 2' 6", rather than the 2' of the prototype, it is close enough to be realistic and allows modellers to use commercially available track and mechanisms. These are supplemented with scratch-built models—models constructed from brass, wood and styrene—where commercial items are not available.



A close up of the modified Baldwin steam loco and an unpainted wholestick cane truck. Its 'new' cab is the same size and basic shape as the original but is open to the tropical breezes. Models and workman were hand-painted with flat acrylic paints.



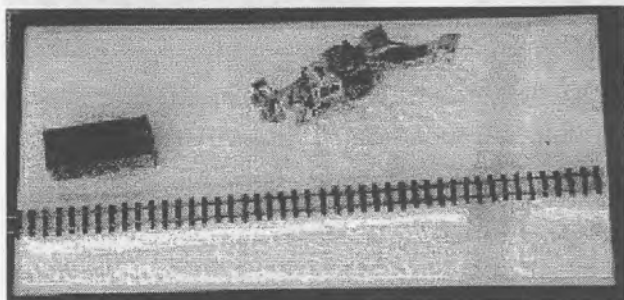
The scenery base is 15 mm expanded foam board glued to the foamcore board with white glue. It's been sculpted with a saw-edged bread knife to create a track profile with a noticeable height difference between the 'main line' and navy tracks.

The 'hard shell' surface is a mix of patching cement (plaster) and coloured (Todd River Sand) flexgrout. Water colours were then applied with a sponge while ground cover and other details were fixed with white glue or epoxy. The cane is a mixture of fine broom

### From Field to Mill: Modelling Cane Railways

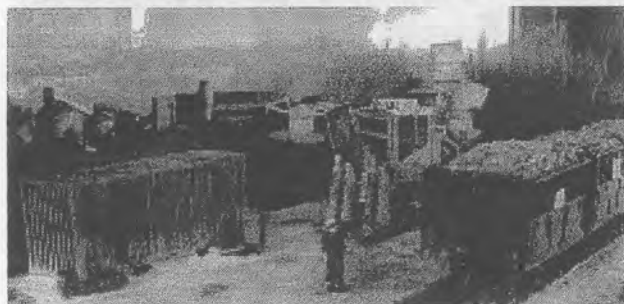
straws coloured with gloss acrylic paint for a 'growing' look.

**Queensland cane industry: mechanised harvesting, cut billets of cane transported by rail and truck to modern sugar mills for domestic and overseas consumption...**



The diesel diorama has the same depth as the A4 steam diorama but otherwise is A3 in size. The sizes were chosen for ease of printing the backdrops and shipping. Disassembled, the dioramas fit into photocopy paper cartons.

The 15mm foam base (above) has been sculpted to leave the track raised above the field to represent a modern cane railway track profile and cut down for a small stream bed. The hard shell plaster mix was brushed on and coloured as on the steam diorama.



The harvester, a hand-built commercial model, is located behind and lower down than the track to prevent it over-shadowing the realistically scaled but diminutive train. The tool shed is a HO container set on sleepers and weathered. The door on the far end is open but not enough to see inside. An old tire, a 'wheelie bin', weeds and the workman complete the mini-scene.

The locomotive, modelled after the first Australian-built diesel loco used in the cane fields, is scratch built from styrene with a 'N' gauge mechanism.

Piles of wooden sleepers, spilled cane billets and weeds litter the front of the diorama. The dry stream bed is the final resting place for a wrecked cane bin (an older 4 ton bin, unlike the 6 ton bins behind the loco), an old tire, etc. The hand-built bins were commercially available in Brisbane until recently.



The bridge is constructed of two 'steel I beams with welded spacers' (styrene shapes) set on wooden supports (narrow gauge sleepers). The prototype for this bridge is much longer and set on concrete piers with the rail welded to the I beams.

The cane rows for the steam diorama were modelled in situ. These cane rows were assembled on the workbench and set in place with white glue, wood putty and a liberal application of commercial 'ground cover' to represent weeds and field trash.

**Postscript:** Locomotives, cane trucks and bins were all operating models before being installed on the dioramas. They were then epoxied in place to allow their display case to be wheeled about without derailing the models.

All models were hand-built from scratch or kits by local modellers (Jenbach and cane bins by Bob Dow, the harvester by Tom Badger, and the remainder by the author). Additional modelling details can be found on the CaneSIG web site (<http://www.zelmeroz.com/canesig>).

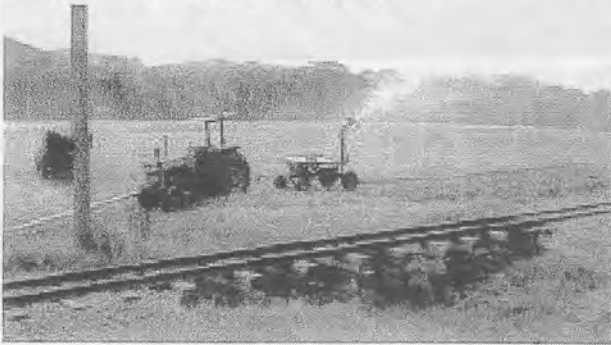
Further information on ANGRMS and the Durundur Railway can be found on the ANGRMS web site (<http://www.angrms.org.au>).



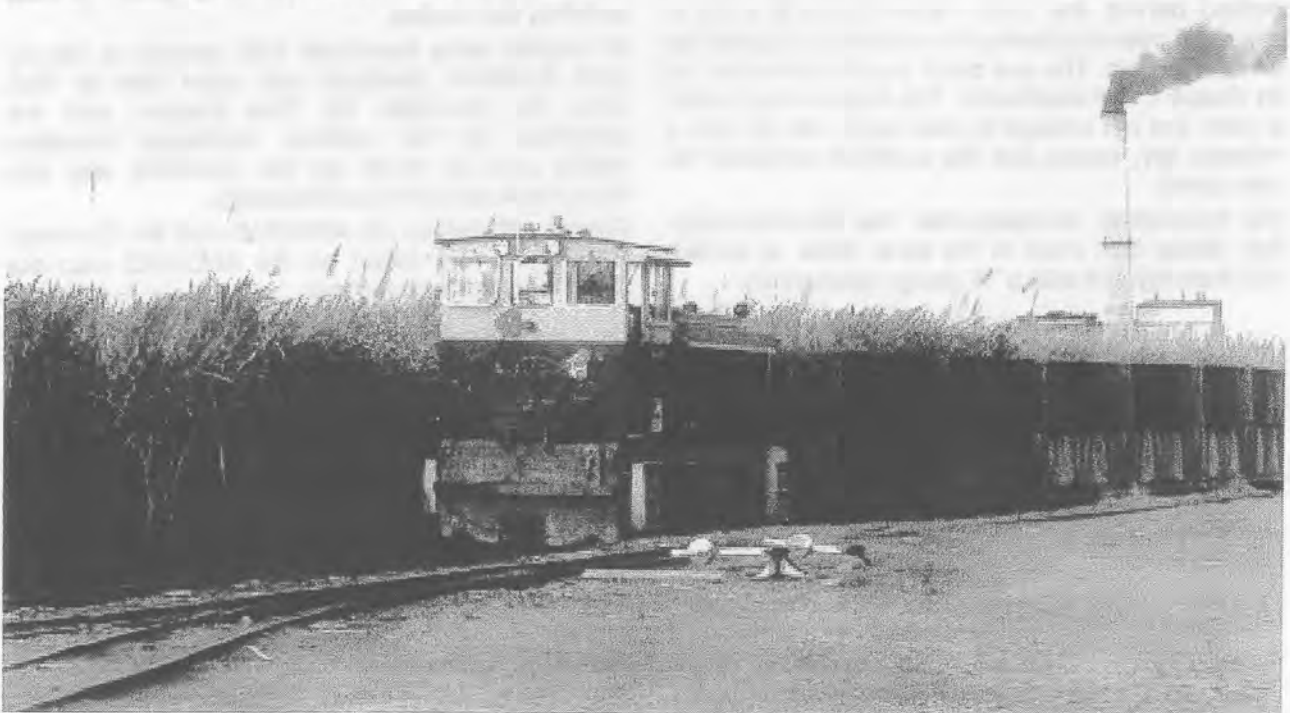
## Modelling Sugar Cane



Sugar cane, a tall, fibrous tropical grass similar to sorghum, grows to a height of 4.5 m, although 2 m is more common for the varieties currently grown in Australia. The irrigated (spray or trickle) crop takes up to 24 months to mature and is harvested in the second half of the calendar year.



The stalk is cut off near the base, separated from the leaves and other trash, and delivered to a mill for crushing. The efficiency of the transport system is important as cane quickly loses its quality once cut.



### From Field to Mill: Modelling Cane Railways

Hand cutting was the norm until after WW II and until recently, cane fields were typically burned prior to harvesting to get rid of snakes and other pests. Hand cutting removed the green tops in the field; the resulting stalks were loaded (by hand or field loader) for delivery to the mill. Mechanical harvesters cut and top the cane, then chop the stalks into billets roughly 25 cm long.

Cane fields often extend quite close to farm homes, equipment sheds, roads, etc. Cane railways normally ran adjacent to or through the cane fields, thus in early years the often unballasted permanent way seemed to be an integral part of the field. Temporary track laid right into the fields was important in hand cutting days to eliminate a long haul from the field to the track. Today, of course, trailer mounted bins and in-field transporters follow the harvester around the field as it is cutting the cane, and the rail system is generally of a much higher standard.

#### Burning the Cane

Cane deteriorates quickly once burned, thus only enough cane was burned for the next day's quota.



#### Modelling Mature Cane Fields

Late in the crushing season it is quite possible to see a range of cane fields from plowed ready for planting to mature crops ready for cutting and areas recently cut. Large cane fields should likely be represented on the backdrop as creating realistic cane fields is a time-consuming task. The small area on the diorama below, for example, required a full day to complete *in situ*. Method B is less fiddly, thus somewhat faster.

The modelling materials I've been using include fine millet straw tips from a quality broom, fine whisk straw (oriental hand broom) and jute from a floor mat or the lining of a hanging flower basket. Use new materials as all the fine tips break off when a broom is used.



**Method A, *In Situ*:** The base in the museum diorama below is sculpted expanded polystyrene on foam core board, covered with a thin layer of plaster (a mix of patching compound and coloured grout).

Broom straws were placed in holes punched through the surface (holes 5 mm apart in two rows spaced 15 mm apart). This provided the structure for the rows, with clumps of smaller diameter straws (whispy tips uppermost) set in white glue and clamped in the intervening spaces until they are secure. Almost any small clip, including old-fashioned hair clips, should work, although wooden clothes pegs are too bulky.



Care must be taken to ensure that the height and colour mix is relatively random, otherwise the finished row will look more like a fence than growing crop. I hold a clump of various sized pieces between my fingers, then roll the clump to distribute the colours before cutting the bottom of the clump square for placement.

Spread lots of glue at the base of the row and dip the clump in glue before placing it into the row. Use a toothpick to ensure that the glue is worked between the base of the straws and leave clamped for the glue to set thoroughly.



## From Field to Mill: Modelling Cane Railways



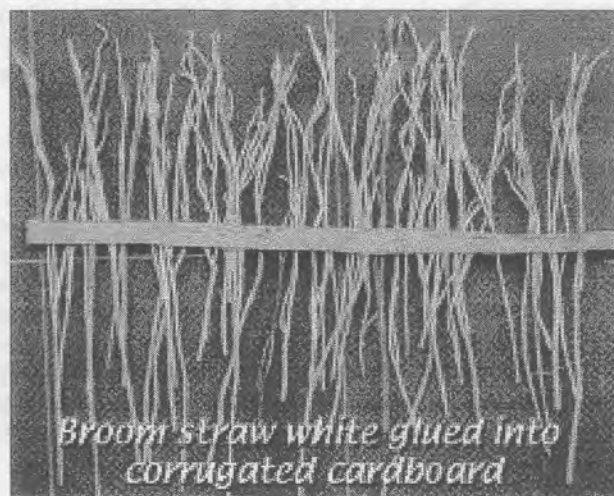
When the glue is set a base of plaster, putty or wood filler needs to be formed around and between the stalks to protect the row.



Finally, paint the stalks with a bright green paint or dye to model the green leaves. The mix of materials should ensure variety in colour; the broom straw, for example, does not accept colour readily. I've used a semi-gloss acrylic paint here with good result as a flat paint would not provide the colour intensity required for the green leaves.

This row scales out to 4.5 m height, appropriate for the taller cane varieties grown in the steam era. I also wanted the cane to tower over the equipment on the diorama and lead into the backdrop photo. There may still be a need for short grasses, weeds and other details along the base of the row and in the surrounding fields but they can be provided using conventional scenery techniques.

**Method B, Corrugated Cardboard:** The materials and basic techniques are very similar to the *in situ* method except that cane rows are assembled on the work bench for later installation.



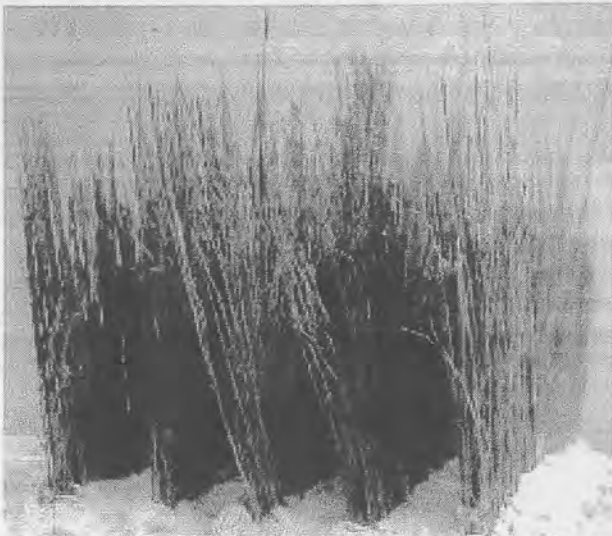
Extra long straws are slipped through the holes in a narrow strip of corrugated cardboard and then glued to hold in place. Once set, turn the strip over and glue from the opposite side for maximum strength.



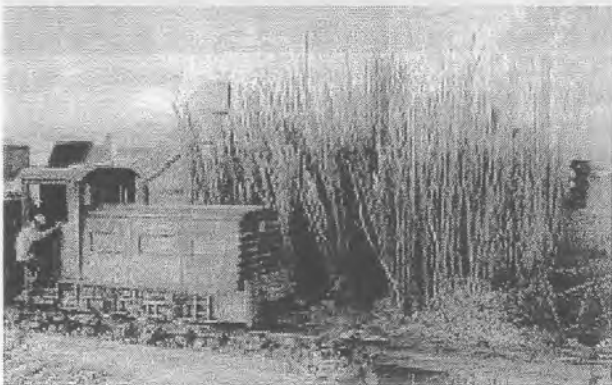
Press a layer of fine-tipped whisk straw into a bead of glue on the cardboard base. Hold the straws down with one finger while working the glue with a toothpick to embed the straw. Care must be taken to ensure a reasonable top profile and to avoid gluing the assembly to the workbench. Let the glue set and repeat the process for the other side.

Fill in any gaps with additional applications of glue and fine straw as necessary. Leave overnight to set, paint the cane, and trim the bottom edge, leaving some of the thicker straws longer for ease of installation. Punch holes in the scenery shell to accept the cane strip, glue in place and form a furrow with wood putty to provide stability and finish the base of the row.

## From Field to Mill: Modelling Cane Railways



Artistic sense is required when 'planting' the cane in order to achieve a representative result. The odd number of rows and angle of planting, for example, avoid a symmetrical appearance and increase the illusion of size.

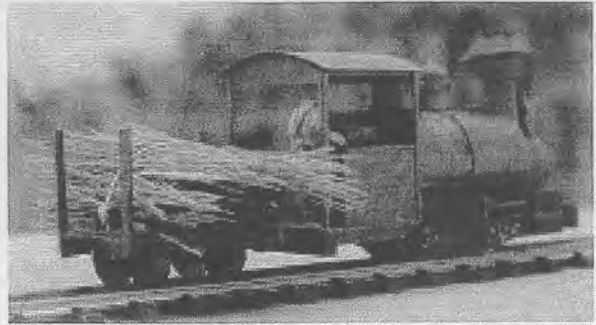


The finished diorama has ground cover around the base of the cane and a wrecked cane bin in the creek bed.. The backdrop and models distract from too close a look at deficiencies in the cane modelling.

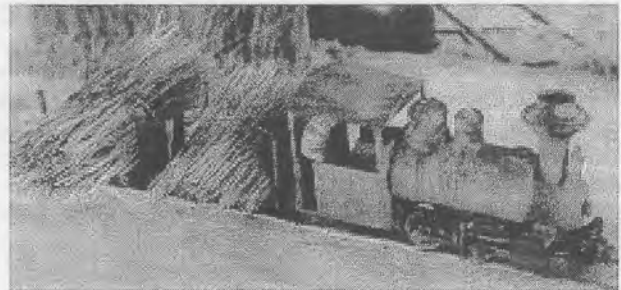
### Wholestick for Cane Wagons

Wholestick (stalk) cane trucks and river barges were used in Australia by the sugar mills from the earliest days until cut cane billets/bins were introduced in the 1970s. In Queensland the trucks were generally

loaded crosswise and tied down with wire rope so the cane ends dragged on the ground.



This truck has been loaded with finer stalks (no large broom straws). The bottom row was epoxied to the deck along with the thread representing the wire rope holding the cane in place. Add material as loose clumps pressed into puddles of white glue with a streak of white glue on the 'rope to hold the topmost layer in place. Dry brushing with flat black paint will disguise the glue and could represent burn marks.



### Cut Cane Billets

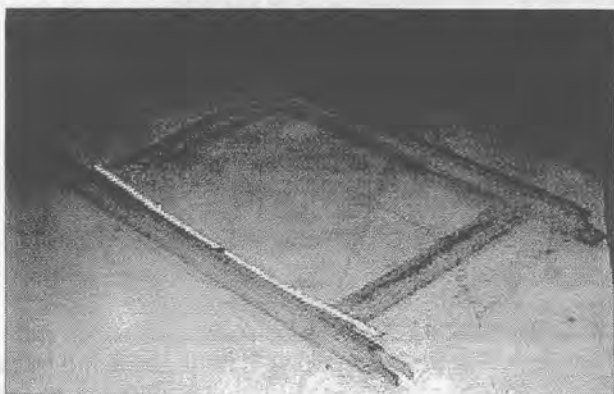
Billets are quite reasonably modelled with short (3.5-5 mm) lengths of fine broom or whisk straw. A jig is useful to get consistent lengths and care should be taken to 'capture' the billets as they are cut, otherwise they tend to fly around the room.



This bin contains a balsa filler box/block, covered with white glue and billets, to reduce the amount of billets required.

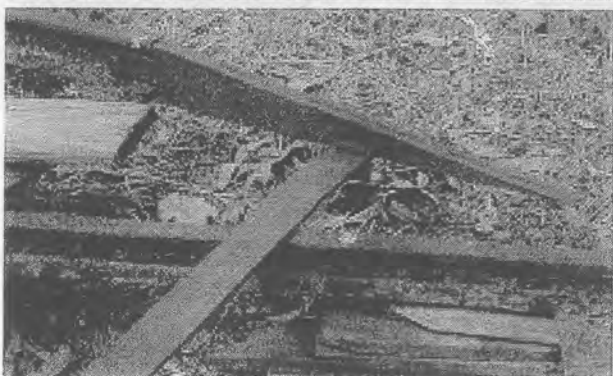


## Portable Cane Track



Portable sections enabled the mills to lay temporary track into a cane field to load and transport the cane from the field to the permanent way. The earliest systems, as shown in these photos, used pressed metal sleepers bolted or welded to short lengths of lightweight rail. Curved sections were similar and had a fixed radius.

The rail sections could be carried by 1-2 men and were bolted together to reach the day's cutting site. The unballasted tracks were not heavy enough to support a locomotive, so wagons/trucks were hauled by horses or pushed by hand (not a lot of concern for health and safety or proper manual handling in those days).



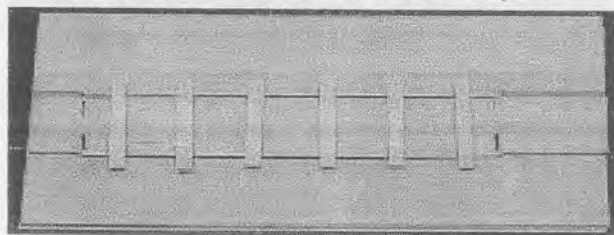
The two photos (above) are of a climbing turnout to move between the permanent way and temporary tracks without requiring a regular turnout. The incline end was placed on the permanent rails and bolted to the temporary field line so that a wagon/truck could be pushed up the incline and off into the cane field.

Eventually a British Standard was developed for a heavier weight of portable track to handle very light locomotives and heavier wagons/trucks.

## Modelling Rigid Portable Track Sections

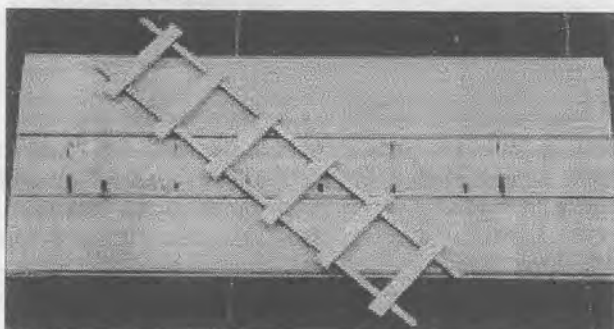
This was my first attempt at modelling portable track and represents the British Standard heavier track. However, it should be possible to model the lighter track using a smaller sleeper, trimming its ends along the outside edge of the rail.

Standard straight sections came in 15 and 18 foot lengths. The template, four lengths of cardboard glued to provide a gauge of 9 mm (009 track), holds the rail securely in place and straight. Marks indicate the ends of the rails and the centre of sleepers.

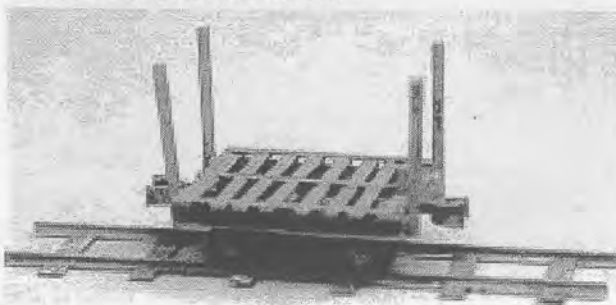


A better template would also hold the sleepers square and have a stop to maintain a consistent length of overhang.

Eighteen foot lengths of code 40 rail and 4 foot lengths of scale 2 x 8 are assembled with 5 minute epoxy. Weight the assembly and leave to set for at least 30 minutes before bending the template to release the track.

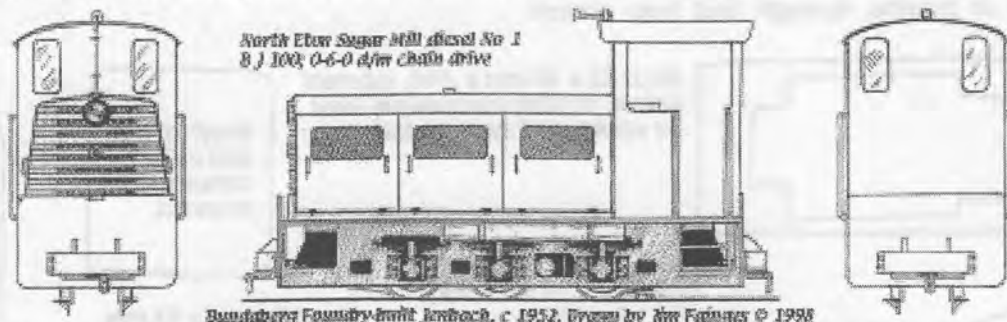


Paint the track and sleepers to resemble rusted metal to complete the model.

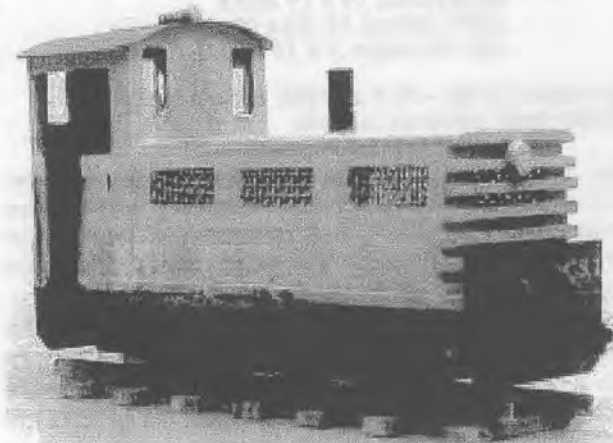


Reference: Link, Roy C (1994). *Industrial Narrow Gauge Catalogue and Handbook*, Link: Norwich, Norfolk, UK.

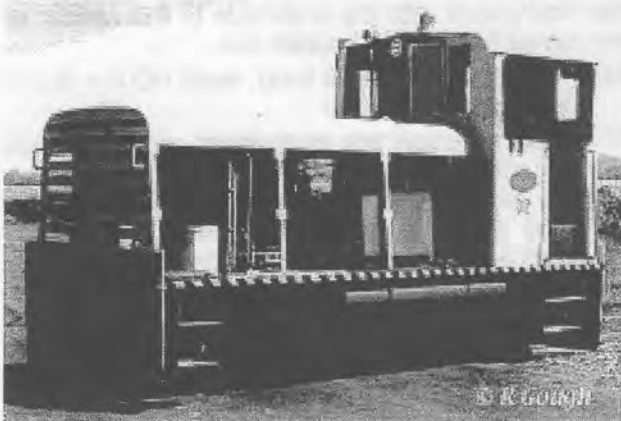
## Modelling the Bundaberg Jenbach 0-6-0 Diesel



The Bundaberg Jenbach (c1952) was the first Australian-built diesel used in the sugar industry. My first scratch-built HO<sub>n</sub>30 loco portrays it as built using a Bachmann N gauge Plymouth switcher mechanism. ANGRMS (Australian Narrow Gauge Railway Museum Society, Woodford QLD) has preserved a much rebuilt Jenbach (Netherdale).



Brisbane modeller and light rail enthusiast, Bob Dow, used to build this model for commercial sale and I purchased one at that time. However, that model is on an ANGRMS museum diorama and replacing it provided the inspiration for this note.



Bundaberg Jenbach D2 at Eton Sugar Mill c.1970 fitted with Gardner motor; as seen in Gough and Webber (p 18 top).

The model's basic construction has been outlined in Bob's notes for the 1998 Modelling the Railways of Queensland Convention ['Cane bins and other things', Convention Notes, pp 64-72] and on Bob's web site [<http://www.ozbob.net>].

This was a relatively quick scratch-building project, even though I also made several templates to assist in constructing future models, taking about a week to complete the model. I started with Bob's notes but also had Jim Fainges drawings in 3.5 and 7 mm scaling and used slightly different component sizes and techniques.

## General Notes

A variety of measures are used in this article. HO scale materials, for example, are indicated in material sizes (eg HO scale 2 x 10 for 2" x 10"), styrene sheet is indicated by supplier's thickness (eg .020"), and others are generally in millimetres.

I used a NWSL Chopper and Dupli-Cutter to ensure components were square and consistently sized. While building the deck, for example, the Dupli-Cutter ensured that the opening was centred.

However, don't assume that the Dupli-Cutter, or any other tool, is actually square. The need to reverse items for symmetrical cuts or to cut from the opposite side quickly demonstrates that inaccuracies occur. Cuts must be remeasured and checked 'by eye' instead of relying solely on a tool setting.

I prepared a set of 'standard measures' to speed up cutting and help insure consistency. These are marked 4 to 25 mm lengths of HO scale 4 x 10. Floor and other templates use .040" styrene sheet.

The Chopper uses a single-sided razor blade. I similarly used a single-sided blade for most of my cutting work. Use several light passes with the blade rather than a heavy cut, then bend and 'snap'.

Cut lines were scored for openings, then corner holes (#61 or #70 depending upon opening size and material thickness) were drilled and an 'X' cut all the way through the material from corner to corner. The stock was then clamped in a nylon-jawed vice to 'snap' out triangular pieces to create the opening. This is not a simple task in heavier material but greatly simplifies making rectangular openings.

Some angle cuts, the bottom of the buffer plates, for example, were cut by eye using a Xuron sprue cutter. Others, such as the four under-deck corner braces, were cut on the Chopper with angle guides.

Styrene components were dressed with needle files or fine sandpaper (wet and dry type) after cutting to remove cutting ridges and 'snap line' roughness. They were then test fitted against both the loco plan and mechanism, and adjusted if necessary, before fixing with styrene cement.



## From Field to Mill: Modelling Cane Railways

I've generally used the thinnest styrene components possible but have also braced the joins with styrene angle stock to provide strength and help ensure

squareness. The result is quite strong with a reasonable thickness for the roof edge, etc.



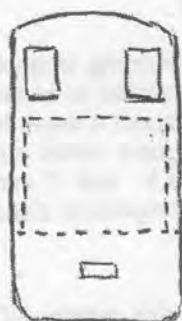
**Deck:** 21 x 60 mm x .040, internal cutout to clear mechanism. Must be square and symmetrical.



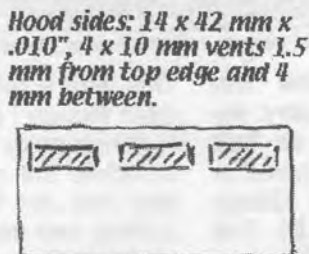
**Roof:** 20 x 24 mm x .010", corners rounded.



Styrene angle shaped for door frame; top notch locates side wall. Uncut side goes to back wall.



**Cab sides:** 16 x 25 mm x .020", window side and top edge 2 mm, below window 8 (w) x 14 (h) mm.



**Hood sides:** 14 x 42 mm x .010", 4 x 10 mm vents 1.5 mm from top edge and 4 mm between.

**Hood Top:** 18 x 43 mm x .040" and top edges rounded.



**Hood Front:** 14 x 19 mm x .020", cutout 11 (h) x 12 mm, cut side slope .5 x 14 mm.

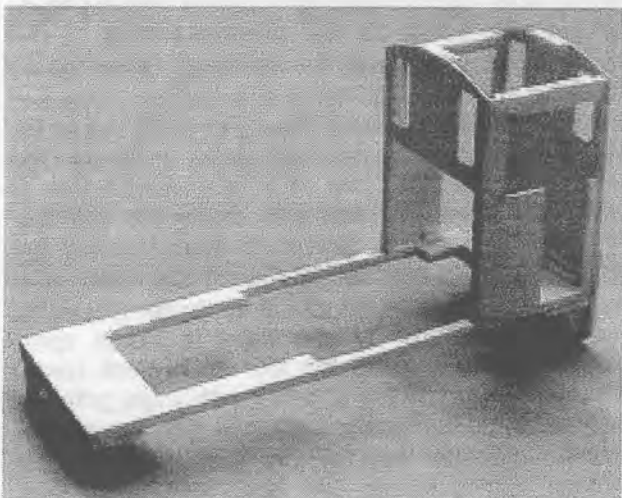
**Cab front/back:** 21 x 35 mm x .020", 2.5 x 5 mm cutout for coupler; front ~26.5 mm (h), with ~14 x 18 mm cutout for mechanism. Buffer plate (12.5 x 21 mm x .020") has same shape as bottom.

### Construction (sketch above not to scale)

**Deck/Frame:** 21 x 61 mm x .040" styrene sheet

The deck must fit around and sit level on the mechanism. Fortunately the Bachmann mechanism has a flat ledge at the right height, although its width means that the deck sides are very narrow around the widest part of the mechanism. This necessitates some adjustment to the hood profile and care in assembly.

Lay out the mechanism opening and drill corner holes. Use the Dupli-Cutter to work from both sides as well as top and bottom to 1) ensure the opening is square and centred, and 2) be able to score from both sides of the stock. Clamp the stock in a vice with the top of the jaws even with the scored line before snapping out each triangular piece from the opening.



The mechanism for my model was slightly different from the one used for the Dow plans. The wheel-base of the Bachmann mechanism is shorter than

the Jenback so I located the middle driver per the prototype plan. In retrospect the model's appearance might be improved if I had measured from the rear driver instead, although the motor would also have extended further into the cab.

Your mechanism may vary from mine; check the opening closely at this point to ensure that the deck fits around the mechanism, is level, is an acceptable height from the rail and is reasonably located (visually) front to rear.

**Under-Deck Spacer:** 5 x 21 mm x .040" styrene front and 7 x 21 mm rear

Cut the spacers to size and fix under the deck so that there is a 21 mm x .080" face front and rear for mounting the buffer plate. The deck should rest on the mechanism with the underside of this spacer at the correct height for a coupler box.

**Buffer Plate Brace (sand box):** scale HO 4 x 10 x 4 mm with clipped corner

The drawings show this component under the deck at each corner but not fastened to the buffer plate. From a modelling point-of-view, however, this has too good a brace potential to ignore. Fix in place recessed 1 mm from the side of the deck (spacer) and square with the end.

**Buffer Plate:** 12.5 x 21 mm x .020" styrene sheet

Cut to size and shape as shown. Mark the coupler box location and use Dupli-Cutter to help score cut lines for removing the excess material.

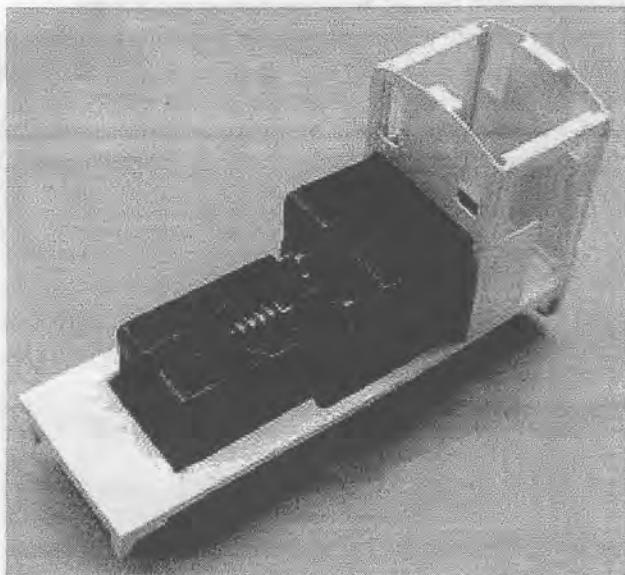
**Cab Front/Back:** 21 x 35 mm x .020" styrene sheet

Cut both front and back full length. Drill holes (#70) for window corners and mark coupler and roof curve. Use Dupli-Cutter to help score cut lines for windows and coupler box. Fixing a buffer plate to the cab back at this time will help ensure that all holes are aligned and bottom corner angles consistent.

## From Field to Mill: Modelling Cane Railways

Use the sprue cutter to remove excess stock prior to sanding for the roof curve. Tape front and back together to sand roof curve to final shape, reversing the pieces at least once to get a symmetrical shape.

Cut the cab front to length; measure the mechanism to determine the opening and cut to size. The width of the mechanism will likely mean that the lower side 'legs' will be no more than 1-1.5 mm wide. Fix 25 mm lengths of styrene angle to the back of the front cab wall, but inset from the edge by the thickness of the cab side (.020"), to provide a brace for the side wall. Trim the mechanism opening as required when fixed.



Fix 25 mm lengths of styrene angle to the front of the back cab wall to make the door frame. Shape with a razor blade and sprue cutter when fixed. Fix 4 mm lengths of 1.5 mm angle to the top inside centre of both front and back walls and lightly sand to the cab top profile when fixed.

**Cab Sides:** 16 x 25 mm x .020"

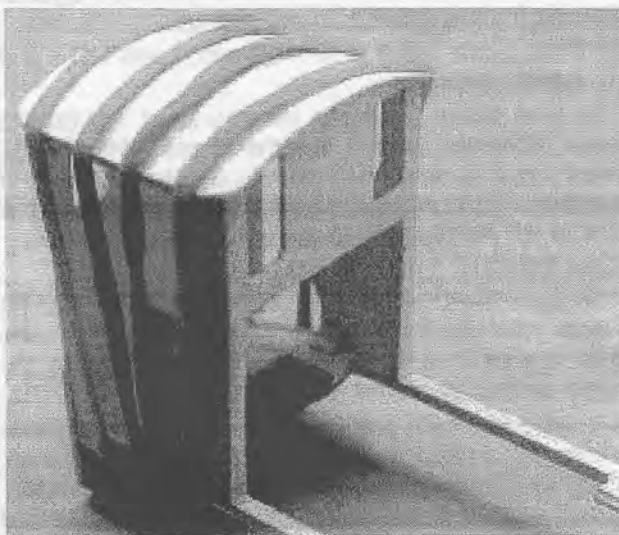
Cut to size as shown. The rear side of the door frame will be provided by the specially shaped angle fixed to the cab back and is not part of the cab side blank.

Fix 2 mm lengths of angle to the top and bottom of the cab sides for deck and roof bracing.

**Cab Roof:** 20 x 24 mm x .010" styrene sheet

Cut to size and round corners.

**Cab Assembly:** Fix the rear cab wall to the deck using the door frame angle to ensure the correct height. Fix the side walls to the cab front. Finally, mark the location of the cab front on the deck and fix in place, attaching the sides to the cab back at the same time. Attach the roof with care to ensure that it is both centred and square.



**Hood Top:** 18 x 43 mm x .040"

The Dow plans show a hood with vertical sides, likely necessary to fit two thicknesses of #50 mesh stainless steel screen with the Bachmann mechanism. I used a thinner screen from a plastic strainer, allowing the hood slides to be slightly slanted for a more prototypical appearance. Your choice of mesh will similarly affect the size and shape of the hood.

Cut the top to width and sand the top corners to the profile shown, then cut to length.

**Hood Front:** 14 x 19 mm x .020"; scale HO 4 x 4 stock; mesh screen

Use Chopper to cut side profile so that the top is 2 mm narrower than the bottom. This may take two or three attempts to get symmetrical but is worth the effort. Score and cut the 12 x 11 mm hole. [The hood appearance might still be improved by increasing the height of the front and sides by 1 mm.]

Cut 6 lengths of scale HO 4 x 4 about 2 mm longer than the width of the hood front and fix in place with a 1 mm space between each. Use the Chopper to trim the sides to the same angle as the front and .010" longer than the width on each side. The hood sides will then be able to fit flush with the hood front.

Frame inside the hood front with angle stock on all four sides. Cut the front grill screen to size and epoxy in place. Fix the front to the hood top, ensuring that it is square and centred.

**Hood Sides:** 14 x 42 mm x .010"

Mark and cut holes for vents. Score, but do not cut, lines for the side doors. Hopefully these will still be apparent after painting.

Frame inside along top and bottom with angle stock as far as the mechanism will allow, leaving a space at the front edge for the front angle framing. Cut the grill screen to size and epoxy in place. Test fit at every opportunity before fixing the hood sides to top and front.

The hood can now be fixed to the deck, taking care to ensure that the hood is centred over the hole in the cab front and there are no gaps between the deck and hood. Small lengths of scale HO 2 x 4 can



## From Field to Mill: Modelling Cane Railways

probably be fitted on the inside of the hood against the cab front to provide added strength.

**Buffers:** scale HO 8 x 10 x 12 mm; scale HO 4 x 8 cut into triangles

The front buffer plate can now be fitted. My buffers were fabricated from 2 lengths of scale HO 4 x 10 fixed together and shaped with a sprue cutter and sanding. Fix in place, ensuring that they are centred and level, then fix the triangular braces on the top.

**Side Tanks:** 2.5 mm OD x 24 mm styrene tube

The side tanks on the 2' gauge prototype loco fit under the deck. However, I feel that the side appearance is enhanced sufficiently to tolerate the slight projection on the HO<sub>N</sub>30 model.

Cut tube to length and plug ends with putty, styrene scrap, etc. I used 'Mr Putty' plastic filler. Fix in place, ensuring that the mechanism fitting is not obstructed. Small lengths of scale HO 2 x 4 can be fixed behind the tank on the front side to provide extra strength.

**Stack:** 2.5 mm OD x 7 mm styrene tube

Cut to length and fix in place. My stack is longer than shown on the drawings in order for exhaust to clear the top of the loco. Other lengths, shapes and covers would also likely be appropriate.

**Steps:** scale HO 2 x 4 in 4, 5 & 6 mm lengths

The steps have a 6 mm tread and are tucked under the deck, fitting around the under-deck spacer. Cut to size and fix as shown.

**Headlight:** 3 mm OD x 1 mm styrene tube

Plug one end of the styrene tube and cut to length when solvent has dried. Fix in place on the front of the loco only.

**Handrails:** steel staples

Fitting the handrails was actually one of the most difficult parts of building the loco. In particular, I had to work very carefully to avoid breaking the #74 drill in my pin vice and to get the top located correctly in the thin cab side. Drill #74 holes in deck and cab side as required to fit staple. Cut staple ends to length and epoxy in place.

**Horn:** Bachmann Diesel

Carefully slice one of the horns from the roof of the N gauge Bachmann diesel and fix in place.

**Couplers:** as appropriate

Cut coupler box to size and epoxy in place (or drill and screw) if using automatic couplers, otherwise epoxy knuckle couplers in place. Don't do, as I did, and get epoxy into the coupler box or your expensive working couplers become dummies.

**Painting and lettering:** Remove body from the mechanism and wash in soapy water. Allow to dry thoroughly before painting.

Cane locos tended to have minimal lettering, although many did have a name plate and a

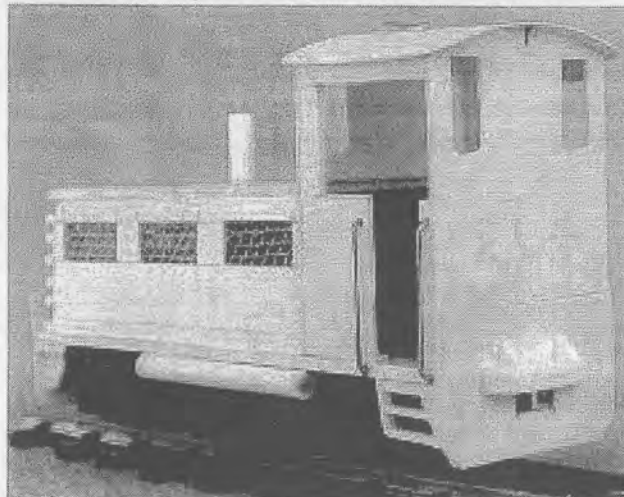
manufacturer's number plate. My loco has a number on either side of the cab (#1) and CS1 (Capricornia Sugar) on front and rear buffer plates.

Clean the mechanism sides with methyl hydrate or other cleaner and replace the body prior to weathering.

**Window Glazing:** .020" clear styrene sheet

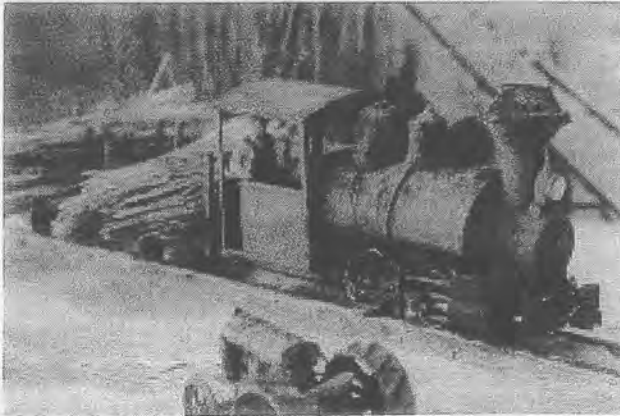
Cut to fit window area and epoxy in place after painting but before weathering.

**Postscript:** As implied in several places, I'll likely make some minor changes modelling my next Jenbach but overall I'm reasonably pleased with my first major scratch-building project in several decades and my full first locomotive in HO<sub>N</sub>30.

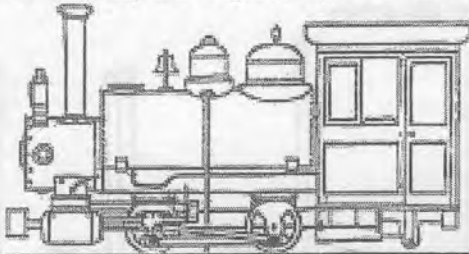


Prototype Jenbachs ran very hot in the Queensland tropics, resulting in the removal of the hood doors (see photo pg 18). It would be quite interesting to try modelling this loco with a smaller mechanism that enabled the doors to be left open.

## Modifying the Colonial Baldwin 0-4-0

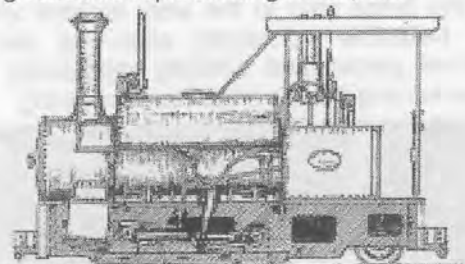


This model started as a Colonial Model Railways Baldwin saddle tank kit in HO<sub>n</sub>30 (3.5 mm to the foot with a 9 mm gauge). However, it looks a bit too American, primarily due to its closed cab and bell (see the assembly drawing below), for a cane loco.



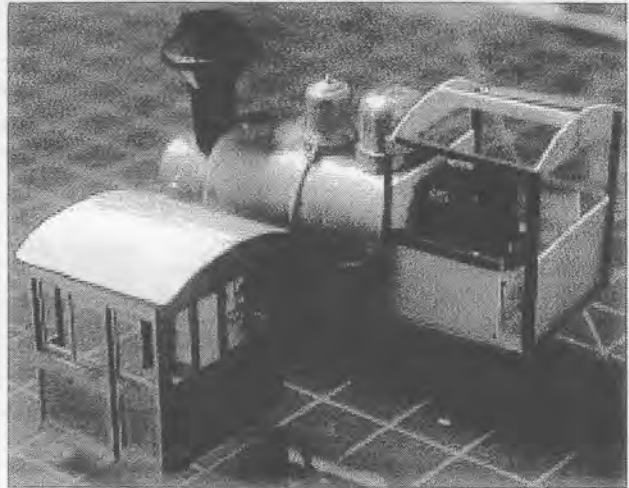
Leave off the bell and filling in the hole with putty. The diamond-style smoke stack from my parts box (likely from a Roundhouse Shay detailing kit) was inspired by a loco at Woodford and was epoxied in place. Stacks like this helped minimise cane fires.

The tropical-style cab was more difficult. Open cabs on cane locos such as Pleystowe Mill's Fowler 0-4-2 (below) provided the inspiration but appeared likely to be too fragile unless built in brass... and I was neither confident about my metal working skills nor wanting to tackle representing rivets, etc.



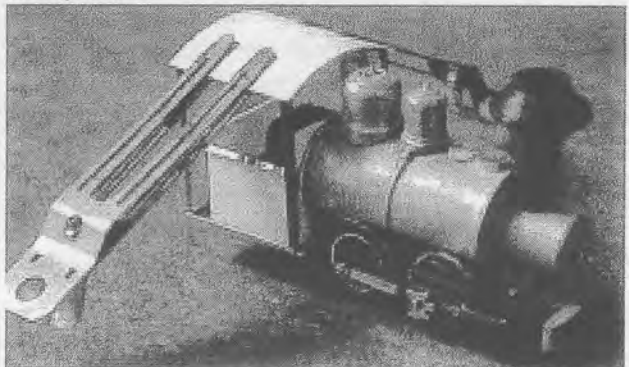
*Pleystowe Mill's John Fowler 0-4-2 saddle tank locomotive as rebuilt 1950s to end of service. Drawn by Jim Fainges © 1998*

Fortunately, while most of the steam locos used in the sugar industry had been delivered with riveted construction, repairs and modifications would likely have been welded. As the deadline for installing the dioramas fast approached I decided to use styrene for the uprights and 'welded' panels. The result was a cab the same size and shape as the original but with right angle stock corner posts (albeit oversize) for roof supports.



The black pieces in these photos are ~1 mm angle stock and are very flexible, even in short lengths. The 'door' end of the side panels and the tops of the front and back panels could also have had angle braces to be more realistic but that is only apparent in the construction photos and wouldn't have added significant strength to the model. On the other hand HO scale 2 x 8 bracing on the bottom of the side walls is critical to keeping them square and in place.

The white components, except for the HO scale 2 x 8 braces, are cut from .010" (roof and sides) or .020" (back and front) styrene sheet using the original cab as a pattern.



The cab was test fitted at every stage of construction and cab components assembled in place to ensure fit and squareness. Styrene cement applied with a small brush was used for fixing the styrene parts.

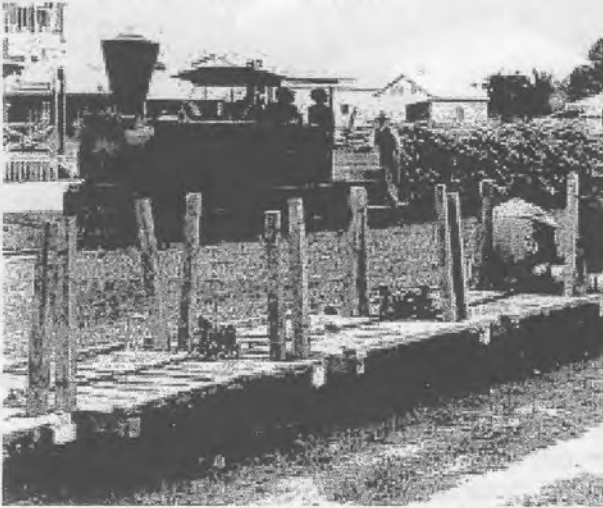
When the cab assembly was complete the model was disassembled to be washed and dried for painting. The cab was then epoxied in place and the model handpainted and weathered. A driver, minus his toes to fit him in place, and a tow rope wound around the front footplate completed the model. Tolerances were tight and the construction flimsy but the result is actually quite sturdy.

Australia's Colonial Model Railways went out of business in 2001 but Chivers Finelines (UK) made the kits and have indicated that they may supply them again in the future. Other kits in the series included a Fowler 0-4-0 and Bundaberg 0-6-2.



### Wholestick Cane Truck

Three to four ton wholestick (stalk) unbraked cane trucks were used in Australia by all the sugar cane railways (tramways) from the earliest days until cut cane billets/bins were introduced in the 1970s. Many were locally constructed, leading to variations (both wood and metal construction) from mill to mill.



In Queensland the cane was loaded loose and crosswise so that ends often dragged on the ground, and were tied down with wire. Trucks were coupled together with a variety of locally built and patent coupling systems, often of a hook and loop nature.

#### Bill of Materials

(Dimensions are mixed due to the nature of the materials)

Frame: 1 pce brass strip 15 x 23 mm x .020"

2 pcs styrene Channel 1.5 x 2.5 x 23 mm

1 pce styrene 'I' 1.5 x 1.5 x 15 mm

2 pcs styrene Channel 1.5 x 2.5 x 6 mm (vary length to fit coupler shank/box)

1 pr N gauge operating or dummy knuckle couplers

Deck: 2 pcs styrene HO scale 2" x 8" x 20 mm (one each end)

6 pcs styrene HO scale 2" x 6" x 20 mm

3 pcs styrene HO scale 1" x 4" x 23 mm

Axle boxes: 4 pcs styrene HO scale 4" x 10" x 5 mm, 2 bottom corners shaped and #61 hole drilled 0.5 mm deep 1 mm from shaped end; fit inside frame 4 mm from end

2 pcs styrene .010" x 1.5 x 15 mm shim if needed

Wheelsets: 2 sets N gauge wheelsets with pointed axles (length variations may necessitate shims behind axle boxes)

Stakes: 4 pcs 1 x 1 x 16 mm

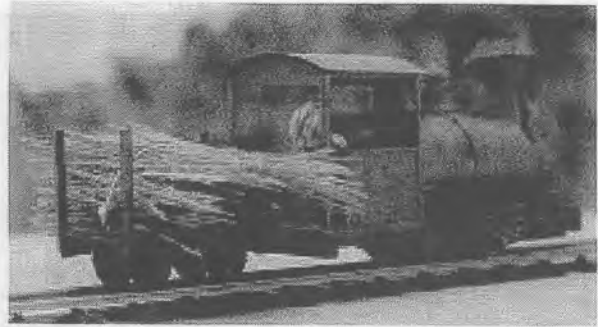
Winch: 1 pce styrene 1 x 1 x 3 mm

2 pcs styrene HO scale 2" x 6" x 3 mm

Fixative: Styrene solvent/cement and 5 minute epoxy.

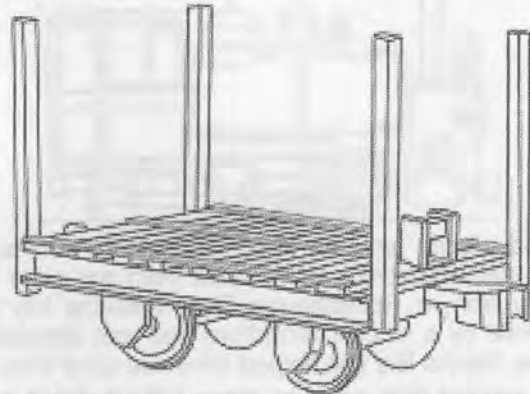
Paint: Flat acrylic

Wholestick cane load: Brown/black thread for wire rope and scale 10'-12' lengths of fine broom/whisk straw

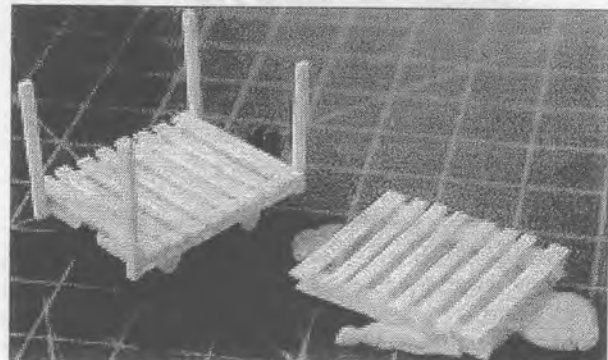


#### Assembly

This model represents a truck with a metal frame, wooden deck and wooden stakes. While an open frame truck (metal or wood) might have more interest, the brass strip eased construction. It provides a solid rectangular base, extra weight and hopefully makes the finished model slightly less fragile. Extra weight (see below) could still be added between the axles.

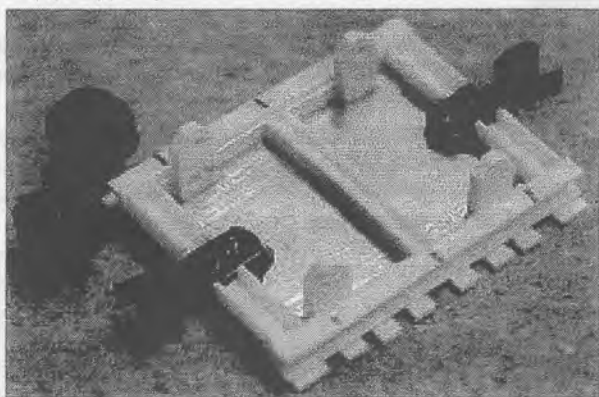


- Cut the components as indicated in the bill of materials (see box). The accuracy and squareness of the brass strip will determine the ease of assembly and appearance of the resulting model.
- Fix the brass strip to the work surface with 'blu tac' (reusable adhesive); align the two long channel pieces and similarly temporarily fix in place leaving the top edge clear for gluing.



- Coat the top edge of the channel with styrene solvent/cement and press the decking in place with a wide piece on each end (square with the channel and the brass strip) and the narrow pieces evenly spaced between. Apply a light

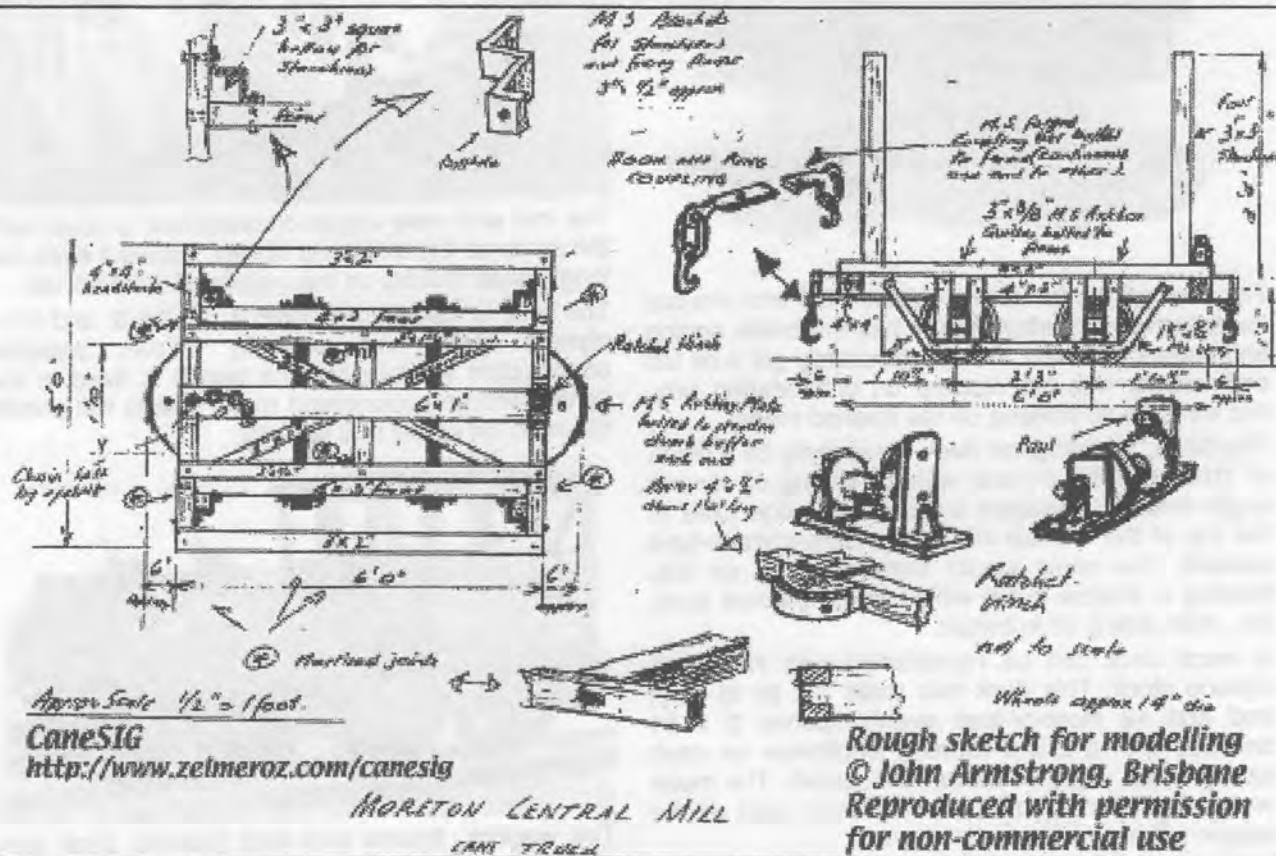
- Remove the blu tac, turn the deck upside down and fix (solvent/cement) the centre I beam in place (thus holding the brass strip tight against the deck) and leave to set. Alternatively, a 1.5 x 5 x 15 mm metal slug could be fixed (epoxy) in the centre to provide extra weight and hold the brass strip in place.
- Test fit the axle boxes and an axle set. Fix (solvent/cement) shims inside the side channels if required and fix (solvent/cement) the axle boxes 4 mm from each end, ensuring they are square to the frame and opposite each other. Leave to set, preferably overnight. The shims/axle boxes also help hold the brass strip in place.
- Test fit the end channel pieces and couplers. Fix (epoxy) in place and leave to set.



- Lightly file the ends where the stakes will be placed to ensure maximum surface area for gluing. Fix (solvent/cement) in place and leave to set.
- Assemble the winch and fix (solvent/cement) in place in the centre of one end.
- Add a fillet of epoxy to the inside of each stake for added strength and leave to set.
- Paint the model as desired and gently fit the wheelsets in place (the axle boxes will flex enough for the axle points to slide in place provided the solvent fixing them in place has set sufficiently).
- Fix (epoxy) a 150 mm length of thread to the deck, running out between the stakes on the end opposite the winch, and a layer of straw crosswise on the deck. Leave to set.
- Lay a full load of straw on the base layer, wrap the thread around the top of the load and thread under the winch. Fix (epoxy) the thread at the winch and cut off the loose end when set.

The truck's design was inspired by Bob Dow's earlier model and plans with a brass underfloor instead of his all-styrene construction with lead slugs added for weight (<http://www.ozemail.com/~ozbob>). The styrene shapes and sizes used were selected for strength and appearance, other suitable materials could equally well be used.

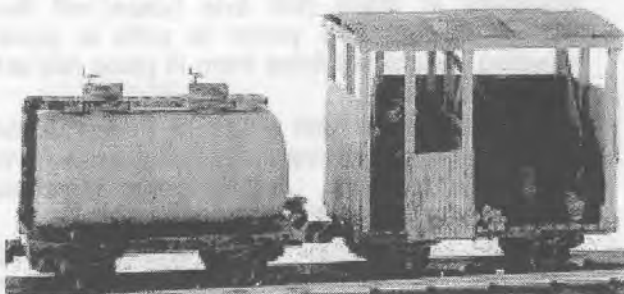
The underframe (left) has a shim fitted as well as an extra hole in the axle box. The sketches below have been reduced to fit, thus the indicated scale is incorrect.





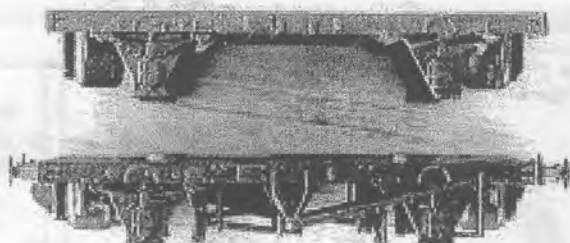
## Kitbashing Freelance Wagons/Bins

Scratch-building is fun and challenging but it can also be time consuming and doesn't always ensure the same operating quality as a commercial model. This note primarily describes the process of turning a standard N gauge wagon chassis (Peco, Roco, Egger, Jouff, etc.) into a HOn30 (1:87) cane truck or wagon, avoiding the complexity of modelling and positioning wheel bearings, etc.



**Chassis Kit:** I'm using a wood type solebar wagon chassis kit (Peco NR-123). With a 10' wheelbase in N scale, it makes a ~10 3" long HOn30 wagon with a ~6' 6" wheelbase and an N gauge Kato coupler in the pocket. This is too long for a wholestick cane truck but makes a four wheeled flat or maintenance of way wagon. Peco also has kits for longer wagons and other manufacturers have similar kits.

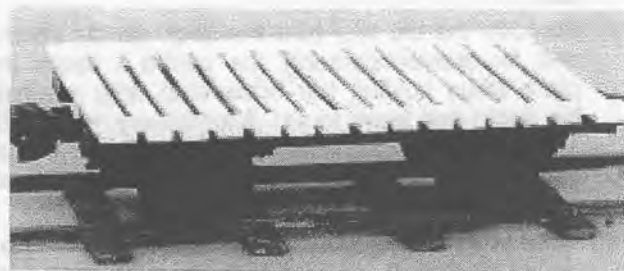
Cane trains depend upon the locomotive brakes for stopping, thus we need to remove the cast-on brake rigging. As well, the N gauge buffers are too small for a HOn30 model and must be removed.



The 'before' model above shows the Peco chassis as delivered; the 'after' model has the brake rigging and buffers removed. While I apparently got a bit too enthusiastic with the nippers on one bearing box, this won't be so obvious on the finished model.

**The Deck:** The simplest deck would likely be a piece of .010" or .020" styrene with an edging of styrene angle stock to represent a welded-on edge fixed to the top of the chassis with a standard styrene-type cement. The angle would likely be fixed on top, forming a shallow basin which would prevent tools, etc., from falling off in transit.

A wood deck can be represented with HO scale styrene stock. This deck has scale 2 x 8s at each end and 13 more-or-less evenly spaced 2 x 6s between with a 2 x 6 running lengthwise on each side (a 1 x 6 might be more prototypical). The metal weight from the Peco kit has not been used as the wagon will have a load.

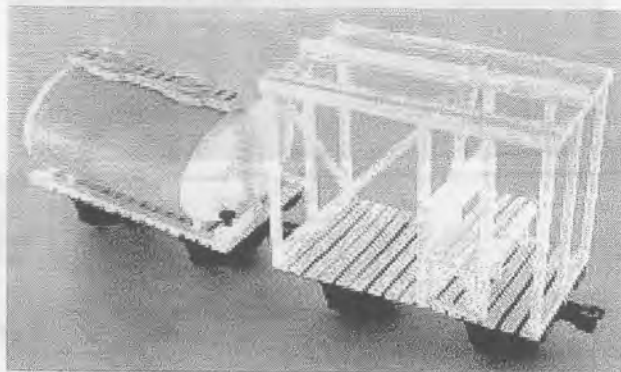


**Loads:** The wagons can be used in almost any kind of cane railway service, including carrying cane. The two wagons below have been freelanced but are generally based on photos of actual equipment.

The molasses tanker was kitbashed from half of a Cooper Craft (OO) lorry tanker. The ends are capped with .080" styrene sheet glued, trimmed and sanded to shape, leaving the kit ends for a second tanker.

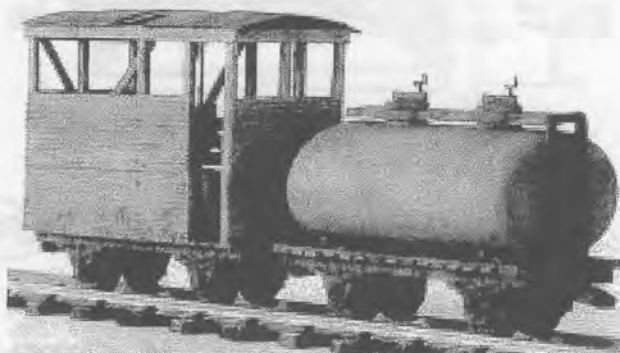
The hatch detailing is from the tanker kit. The drain pipe was formed from styrene rod and tube shapes with a N scale buffer as the valve.

The cradle is four wedges cut from scale 4 x 10 and glued to the deck. Wrap a piece of fine sandpaper around the assembled tank body as a sanding block to form the curved shape.



The tool and crew wagon chassis/deck is essentially the same as the molasses tanker, except it lacks the longitudinal timbers on the outside of the deck top.

The body is framed with scale 2 x 4, 2 x 6 and 4 x 4 styrene stock and generally follows accepted construction techniques. The bench is fixed to the centre wall and corrugated metal sheets will sheath the walls for safety and security.



The wagons, figures and load (barrels, track jack, coal hod, etc.) were hand painted with acrylic paints

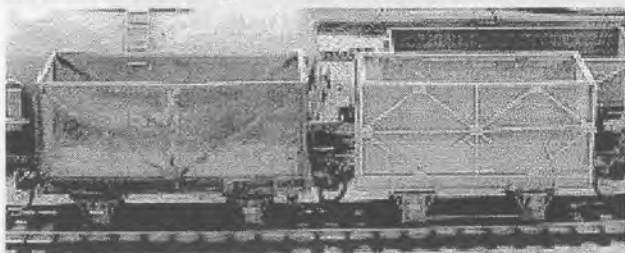
## From Field to Mill: Modelling Cane Railways

(base coat of light gray), then weathered using dry brush and wash techniques.

### Representative Cane Bins

Most of my HOn30 cane bins are Bob Dow's ready-to-run or kit models which are no longer available. Others are on order from Tom Badger as these notes are being written but they haven't yet arrived.

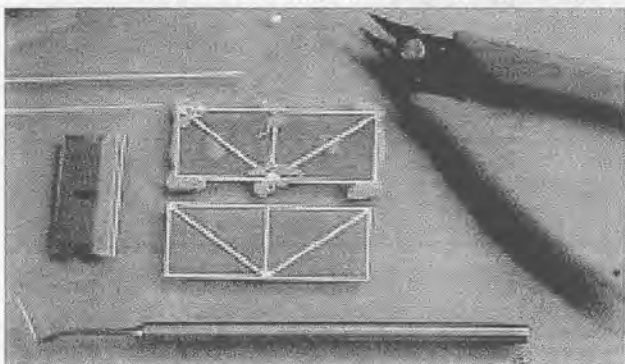
The two bins which follow are the result of a challenge by my local hobby shop proprietor to build a representative cane train for novice modellers from standard HO components. They served the purpose and similar techniques can be used for more prototypical bins on a scratchbuilt underframe similar to my whole stick truck or on a commercial chassis as used on the wagons on the previous page.



One bin uses a Camco 4 wheel NSWGR CW Cattle Wagon as its base, the other a Silvermaz 4 wheel NSW CCH Coal Hopper. I could have used almost any HO 4 wheel wagon frames, or scratchbuilt a frame similar to the wholestick trucks, but I had some otherwise surplus kits in my cupboard.

The first step with both bins was to discard unneeded components, carefully cutting to save end sills, etc. Flash was removed as required, wheel bearings installed, the underframe assembled and glued, and Kadee couplers installed.

While cane bins don't normally have brakes, I decided to install the supplied brake fittings as these wagons will be operating on a standard gauge railway. The standard gauge wheelsets result in the models sitting roughly 30" off the track rather than a more realistic ground-hugging narrow gauge height.

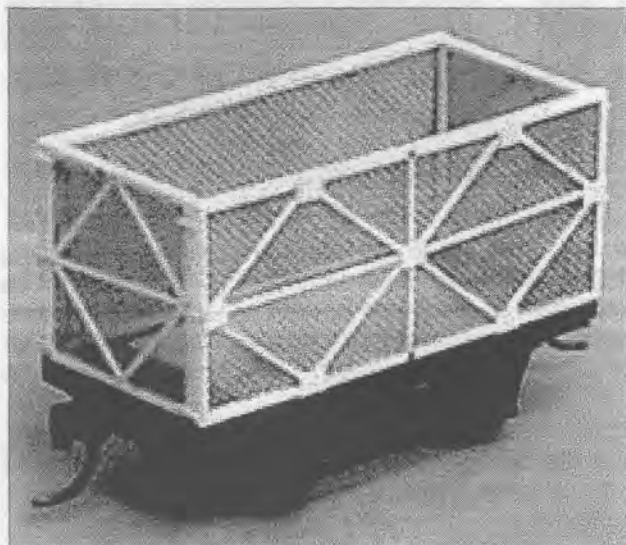


The bin is constructed from styrene shapes and stainless steel mesh (40 mesh size). The two sides and ends are constructed alike, a rectangular frame made from 3" x 6" channel (shallow 'U' shape) encloses the mesh, with scale 2x4s for the braces (vertical and diagonal), 1x8s for the reinforcing plates and 1x2s for the end latches.

The larger bin (18' x 8', 6' 6" high) has two different ends, representing the common cane railway

practice of repairing a damaged bin with whatever parts are at hand, even if they don't quite match.

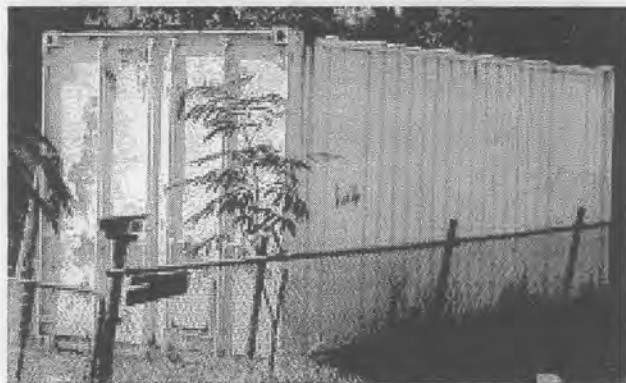
The construction of the cane bin for the second wagon was similar, albeit shorter and to a different mill's pattern. The main bracing uses scale 2x2s, with 1x8s for the reinforcing plates and 1x2s for the end latches.



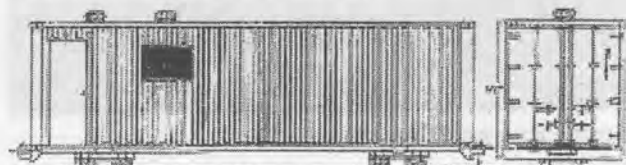
For comparison purposes, the bin on a Moreton Mill 4 ton bin is 9' long, 8' wide and 4' 6" high with the top of it's chassis 1' 4" above the rail.

### Maintenance Van

This model started as a standard TES 20' container and is roughly modelled after a 30' Moreton Mill maintenance van.



Prototype for a similar 20' container now used as a backyard shed. Note that the flat area on the side is not door width, thus the need to extend into the ribs.



Moreton Mill 30' Maintenance Van, © Jim Fainges

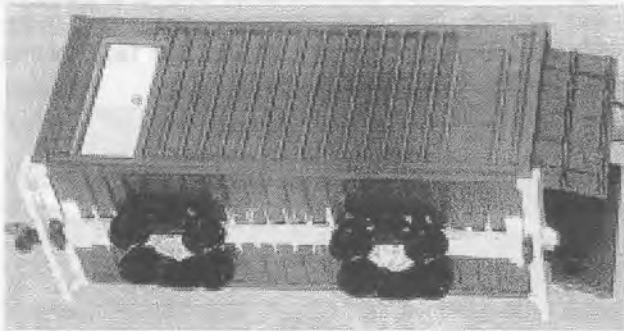
The interlocking pins from the bottom corners of the container were removed, the bottom frame sanded flat and buffer/drawbar components added using styrene shapes fitted around the couplers.

While it isn't clear from the photos, the underframe is a scale 4 x 12 x 65 mm (to run the full length from coupler to coupler) with additional lengths of 4 x 12 x



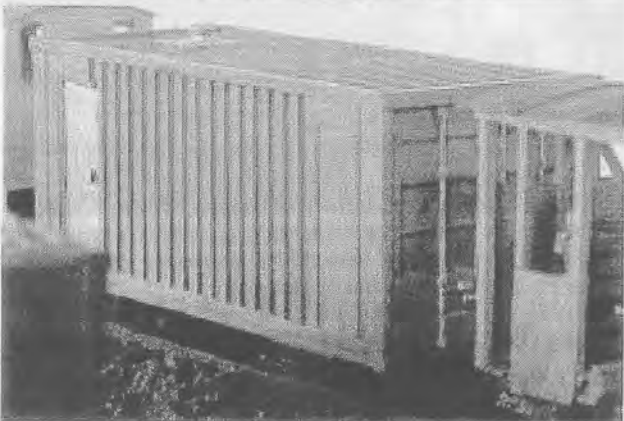
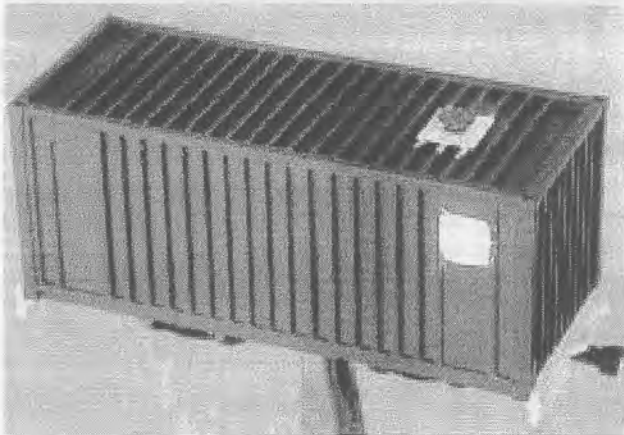
### From Field to Mill: Modelling Cane Railways

20 mm at each end to form the bolster. The bogies are located 18mm from the end in the construction photos but were relocated to 12 mm from the end to improve operation..



A hole was cut in the body and the side door and frame fabricated from styrene angle and sheet. The roof vent is an 8 mm square of .010" styrene and with a 'sculpted' buffer for the rain cap. The side vent is scale 1 x 2s cemented horizontally between the vertical ridges of the side.

The finished model has been painted (primer red, flat aluminium, etc.) and weathered (messy repaint with a lighter colour, dirt and rust).



#### Sugar Box and Underframe

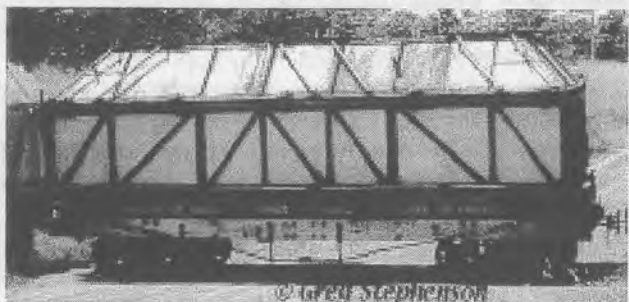
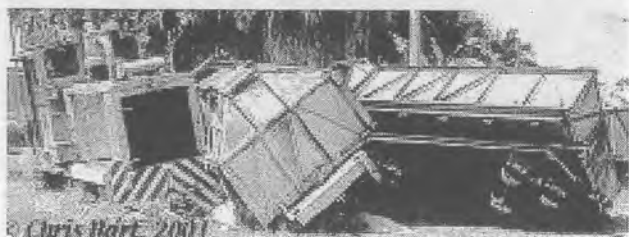
While this convention presentation concentrates on field to mill, the reality is that the sugar must also be transported from the mill to market. In Australia and other nearby sugar growing countries this often means a short rail or truck movement to a nearby wharf and then by sea to export markets.

In the earliest days sugar was bagged and moved to the wharf by horse or steam power, either in a low-

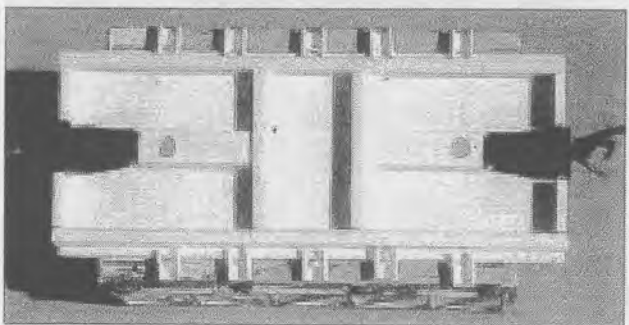
sided wagon or flat. This model represents an early bulk shipping wagon and utilises a Queensland Outline Miniatures (QOM) casting of a CSR Victoria Sugar Mill sugar box on a scratchbuilt timber underframe. The sugar is loaded from the top and one side of the box opens for tipping/dumping.



A sugar train at the wharf (above) and a mishap (below) which shows the steel underframe.



This wagon (above) is similar to the prototype for my model and has painted braces and fittings, likely indicating that they are of untreated iron, rather than the rust resistant materials used on newer wagons.



QOM's notes indicate that Victoria Mill used a 2' gauge 15' x 4' 8" timber underframe with bar frame bogies. I've widened my model to 5' 4" with a 6' wide deck to accommodate 2' 6" gauge archbar bogies (Micro-Trains 1011) and my modelling needs. I decided not to model the truss rods as on the photo above, however they would be required if I was modelling a three hatch box on a 20' timber frame.

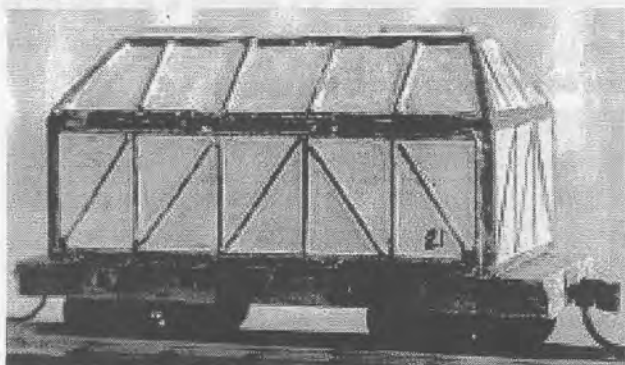
The deck of my underframe is Evergreen scribed styrene (21 x 52 mm, .040" with .050" spacing) and

## From Field to Mill: Modelling Cane Railways

simplifies the construction. The deck scribing has been continued along the edges (notched with a blade) for a timbered deck. The frame sides are scale 6 x 10 x 15' scale feet (52 mm) long. They are separated by two scale 6 x 10 x 16 mm.

The underframe ends are scale 4 x 10 x ~5 mm (cut to fit the coupler boxes). The centre beam/bolster is scale 8 x 12 x 12 mm with the bogie holes located by eye (11 mm from end) after the couplers were screwed in place.

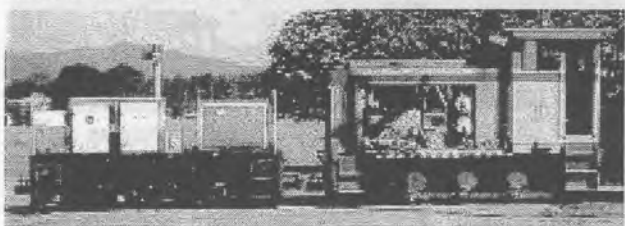
The box was repaired (missing brace sections added), painted (gray undercoat, white wash and rust-brown bracing/fittings) prior to attaching to the deck with epoxy. The under-box braces are styrene channel shapes cut to fit along the deck and epoxied in place.



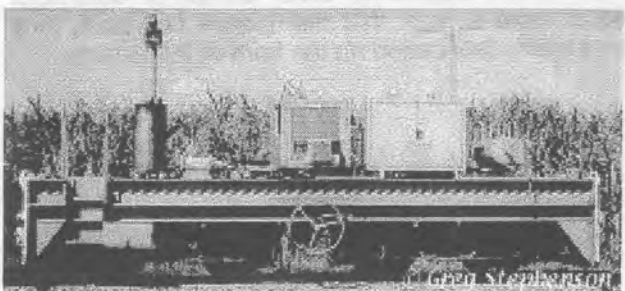
I now have several photos of steel underframe sugar boxes and my next model will likely be steel rather than timber. Among other things I'll do differently is epoxy a piece of .005" styrene sheet to the bottom of the sugar box to eliminate the need to epoxy other components.

### Brake Van

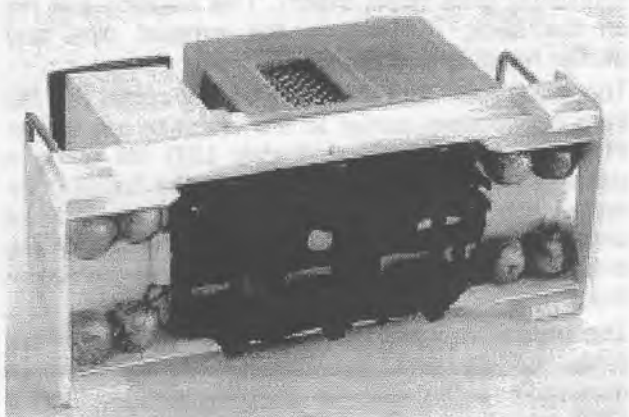
Prototype brake vans vary considerably. What they have in common is a heavy weight, often the result of being built on an old locomotive frame, and radio controlled brakes operated from the locomotive. A yellow flashing light is also common and can be hidden inside even an HOn30 model.



Compare the brake van (above), built on an ex-locomotive frame similar to the locomotive pulling it, with the bogie brake van (below), also using an old locomotive frame.

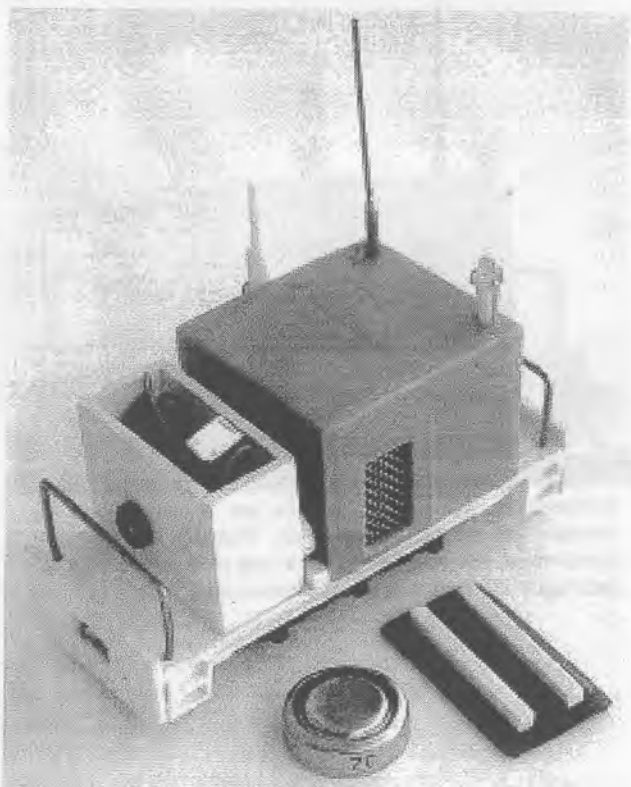


The model here represents a brake van constructed on the frame of a scrapped 0-6-0 diesel locomotive and features a flashing light using a Circuitron N scale (FLN1/1023) yellow strobe flasher. See also Greg Stephenson's brake vans earlier in this paper.



The weight-providing B-B shot is obvious; not so obvious are the three screws holding the deck structures in place.

The basic construction is the same as for the Jenbach locomotive frame with a sheet styrene deck and end buffer plates. The underbody is a Micro-Trains six-wheel passenger bogie, shimmed with styrene to make the correct height for mounting the couplers. Styrene channel, etc., is used to block the view under the floor and achieve a heavy locomotive frame appearance. Steps on each corner add to the ex-locomotive appearance, as do the handrails formed from brass wire. Eight 'B-Bs' from the scrap box were epoxied under the deck to balance the off-centre weighting of the flashing light circuit and battery.



The larger equipment housing contains the flasher circuit and is adapted from the compressor in a



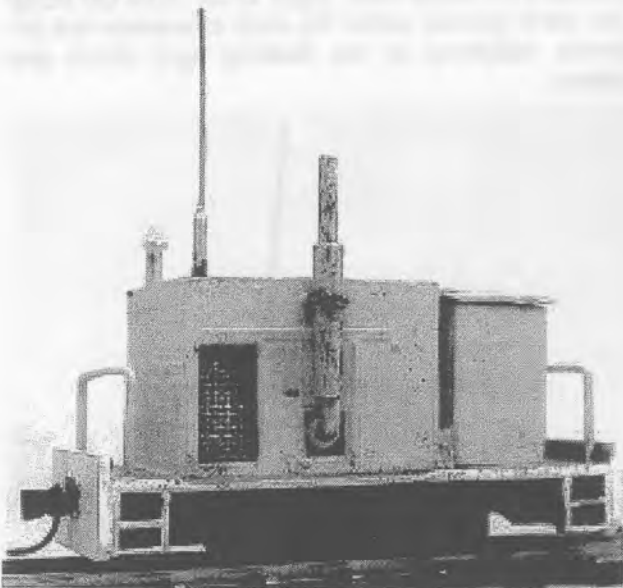
## From Field to Mill: Modelling Cane Railways

Hasegawa 1:72 scale aerospace ground equipment set. Hoses and related details were discarded and an exhaust pipe with muffler (styrene tube and rod, rod bent to shape with a #62 hole drilled in end to represent pipe) added as well as cutouts for the ventilation grills (steel mesh). This housing just fits on the deck, resulting in the exhaust pipe and muffler hanging over the side.

The metal tube containing the flasher circuit just fits from one bottom corner to the opposite top corner inside the housing. The flasher LED fits along a piece of styrene rod extending into the housing for added strength. The radio antenna is a piece of brass wire soldered into a brass tube and likewise extends into the housing to minimise the potential for breaking.

The smaller structure houses the 1.5 volt #386 silver oxide battery and 'switch'. It's styrene with a removable 'corrugated iron sheeting' roof cut from a NSW wagon roof left-over from a kitbashing project. The blob on the rear is the nut and cutoff bolt which serves as one terminal post for the battery. The other wire to the battery is soldered to a nickel silver track joiner which is pushed into the space between the battery and housing to activate the circuit. The removable roof holds the battery and wires in place for operation.

Bracing between the two equipment housings interlocks to hold them in relative position when screwed from below to the base (floor) with Micro-Trains coupler screws.



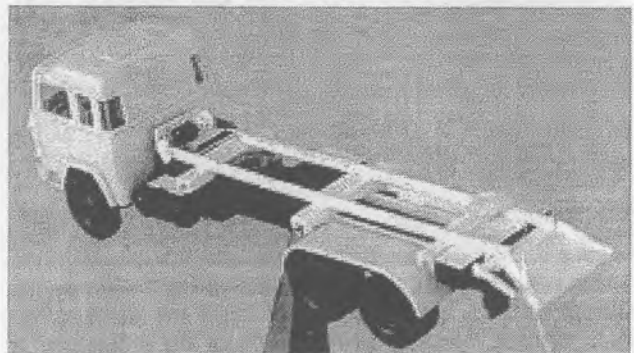
Components that appear oversize are a compromise for strength, rather than appearance. Probably the greatest compromise, however, involves the use of N scale couplers, resulting in too large a distance between units.

In reality the brake van is likely too heavy to operate well at the end of a long rake of lightweight bins. However its flashing light will guarantee interest and demonstrates that it is (just barely) possible to include an operating flashing light on a HO<sub>N</sub>30 brake van.

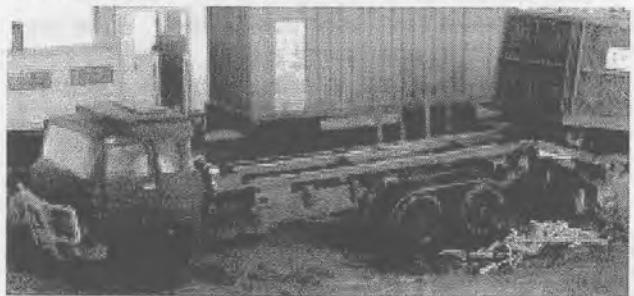
### Bin Transporter

Bins are transported from field to track transfer point (or all the way to the mill in some areas) on everything from single bin trailers (like those used to haul a small boat) hauled by a tractor or ute to purpose built transport trucks.

This model represents a medium-sized truck with a winch and rails for hauling two bins. It would likely be long enough for six ton bins except for the oversized couplers on our models. It's actually a HO left-hand drive unit, although the steering wheel isn't readily visible, and had a long box with 'canvas' top. The box was discarded and fittings removed.



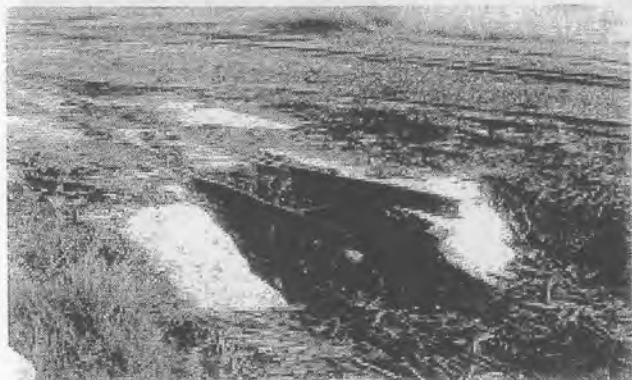
The fittings on this model are totally freelanced as I didn't even have a suitable photo to work from. However, I've seen several such trucks while travelling in cane areas and have photos of several cane trailers.



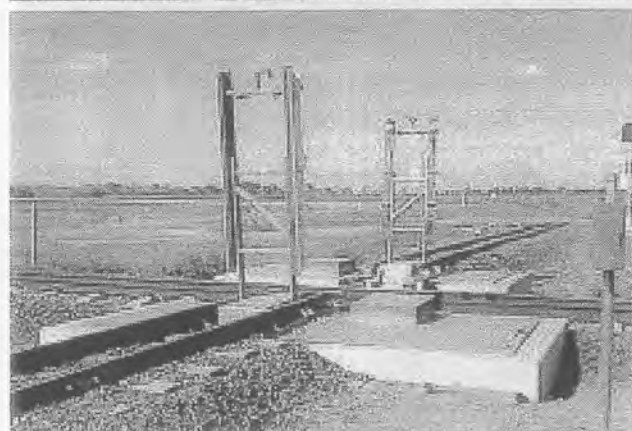
The winch is fabricated from styrene shapes and a piece of sprue sculpted to shape. The winch cable is a single strand of 'metallic' embroidery thread. The 'rails' and 'pan' are fabricated from styrene sheet and shapes.

The model was ready for painting when I realised that no self-respecting cane farmer or contractor would have a truck that didn't have bull bars, thus the styrene fabrication on the front of the vehicle.

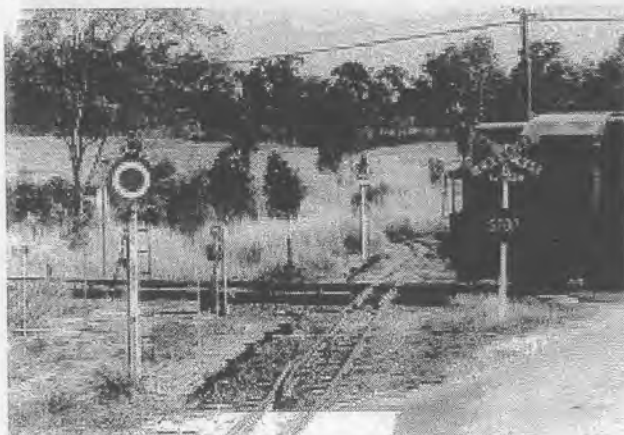
## Modelling Challenges: Prototype Drawings/Photos



A concrete transfer ramp (above) and two views of a simple timber transfer ramp (below). A tractor pulls a trailer with bins over the ramp above, and parallel to the track below (wheel marks in the dirt pile), then backs into place. A guide pan on the back of the trailer lifts the hinged rail section into place.



This drawbridge-type cane railway crossing of a high speed QR line near Mackay is remote controlled from Townsville. The cane tracks jog on both sides of the crossing and are fully protected by derails to prevent accidental movements. The bridge rails are roughly 2 m long.



QR North Coast line (above) level crossing with the 2' gauge using automated signals and remote controlled derails.



An off-sider holds the crossing as the cane loco crosses a lighter traffic QR line (above). Note the derail and signal differences; crossing either line requires clearance from the QR controller (Townsville).



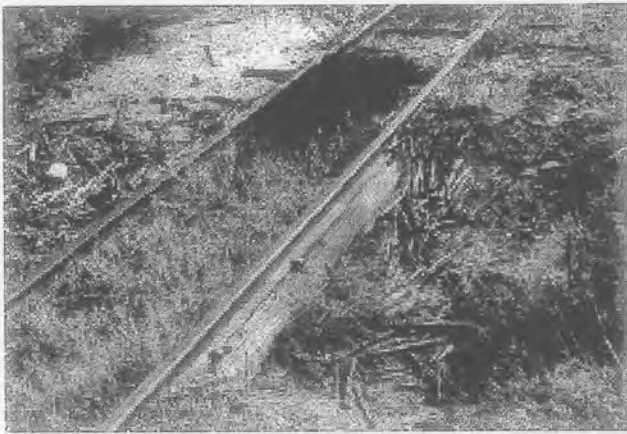
The cane railway underpass (above) eliminates the crossing but requires a lowered roof on locomotive cabs.



Fence and guard so cattle don't stray along the line.



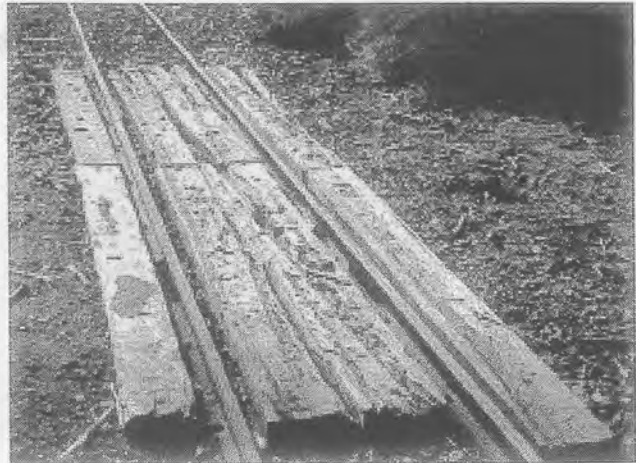
## From Field to Mill: Modelling Cane Railways



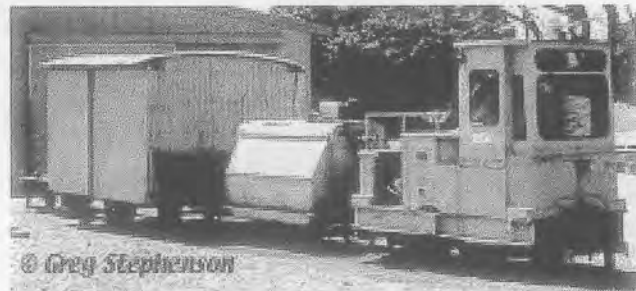
Low spot filled in with de-barked logs but no sleepers (above) and a proper dressed timber crossing with sleepers (below).



Steel girder on concrete risers (above and below); the gauge is maintained with welded braces, rather than sleepers. This was the inspiration for the small bridge on one of the ANGRMS dioramas.



A rural grade crossing (above), the diagonal ruts through the timbers on the top crossing are the result of a derailment.



Wooden tool box on a wholestick cane truck chassis (ILLRS).



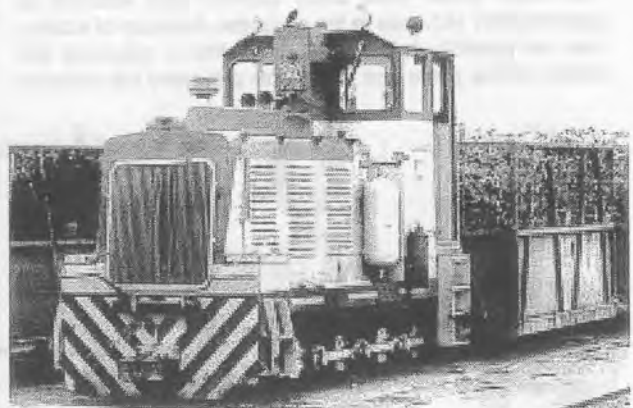
## From Field to Mill: Modelling Cane Railways



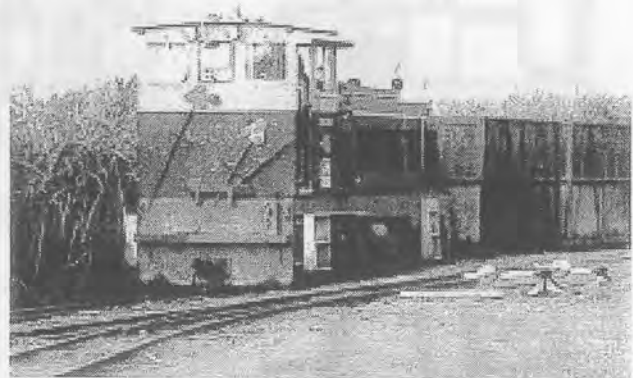
Aluminium sheathed tool shed on a cane bin chassis. The white object propped against the door frame is a metre stick.



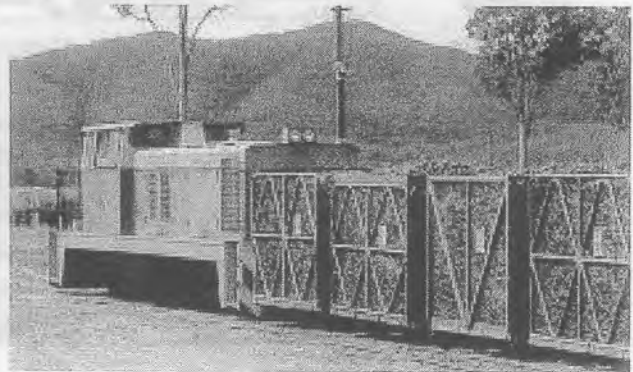
Ballast spreader for towing, not pushing (above) and heavier unit (below)



Mackay Sugar's Clyde-built Broadsound 0-6-0 loco. Note the end-of-rake markers, wooden chocks, fire extinguishers, air cleaner, horns, lights, etc.



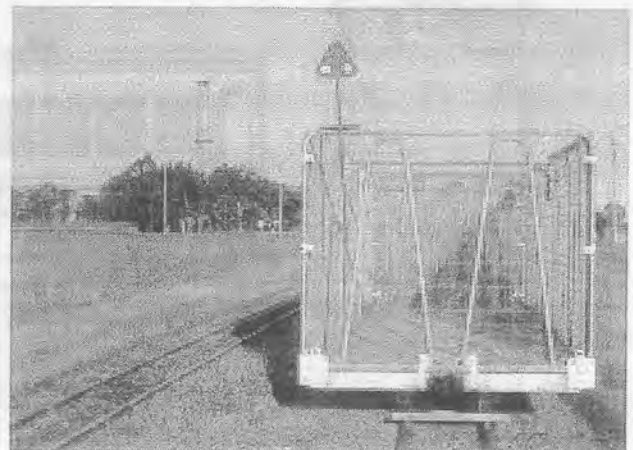
Mackay Sugar bogie locomotive, note the end-of-rake markers, jacks, lights, etc.



Mackay Sugar's #19 Narpi (Eimco)



An end-of-rake marker can be almost anything that can be seen from the loco, now likely a safety marker (right).

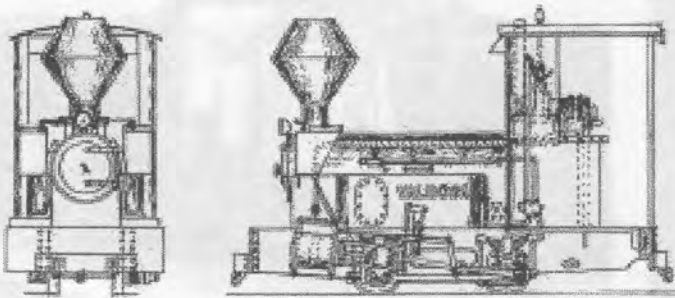




## From Field to Mill: Modelling Cane Railways

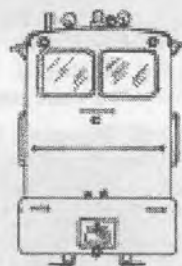
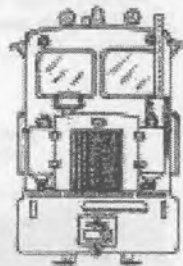
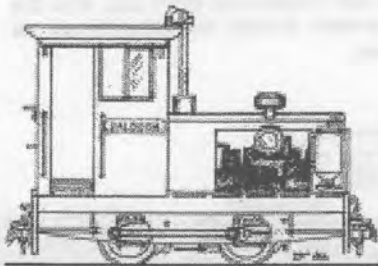
The plans below have been scanned and reduced to approximately HO scale in the computer. Accuracy of scaling was not possible due to time constraints in preparing this paper and the same time constraints prevented the inclusion

of dimensions. Additional drawings by Jim Fainges can be found in low resolution form on the CaneSIG web site. A high resolution printed set of the drawings is planned for later in 2002 or 2003 if sufficient demand exists.



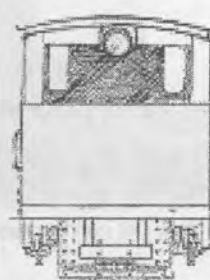
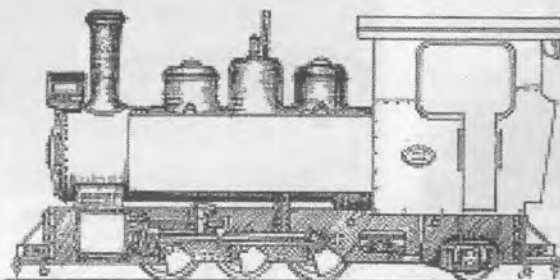
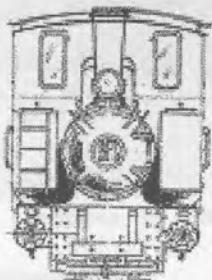
**Drawings © Jim Fainges**  
~3.5 mm = 1' 0"; ie ~1:87

**Moreton Central Sugar Mill's 0-4-0T 'Valdora'**  
built by Dick Kerr



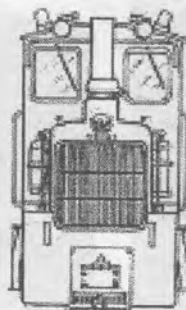
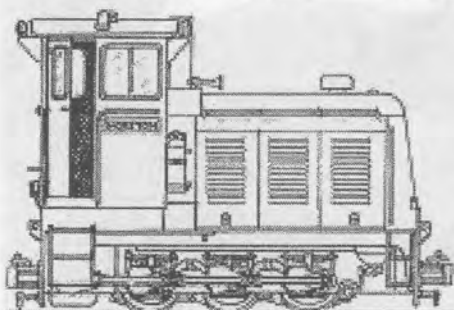
**Moreton Sugar Mill (Nambour) 'Valdora'**  
Baldwin built 8 ton diesel

*Valdora and Maroochy are known as 'the twins' and often operate together.*



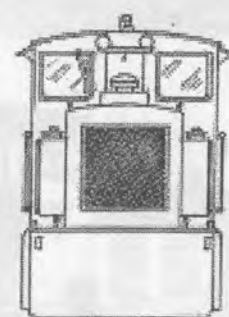
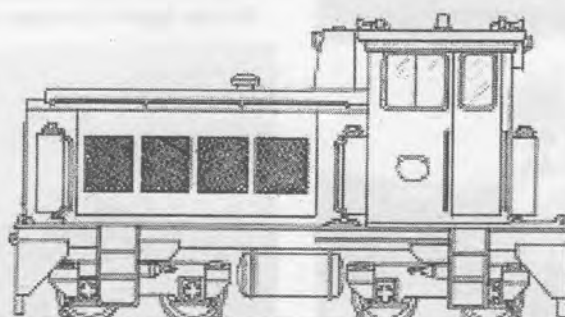
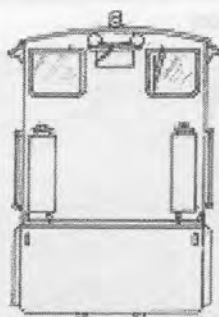
**Bundaberg Fowler 0-6-2T**

*ANGRMS Bundy #5 is a loco like this.*



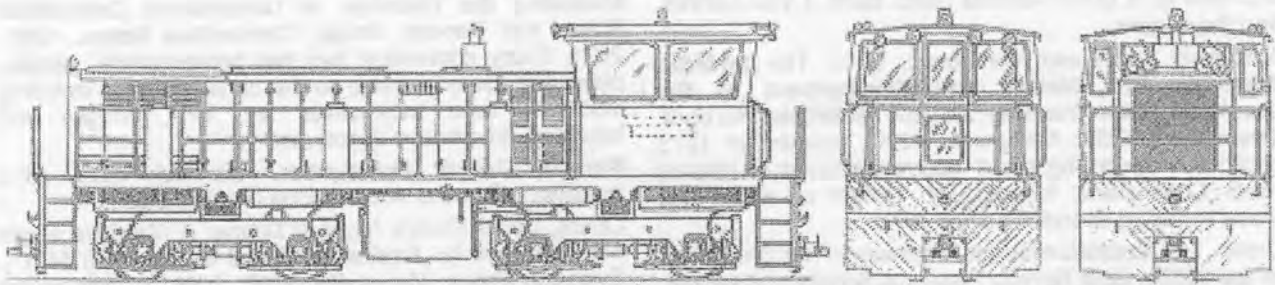
**Drawings © Jim Fainges**  
~3.5 mm = 1' 0"; ie ~1:87

**Moreton Sugar Mill 'Moreton'**  
Clyde diesel 0-6-0

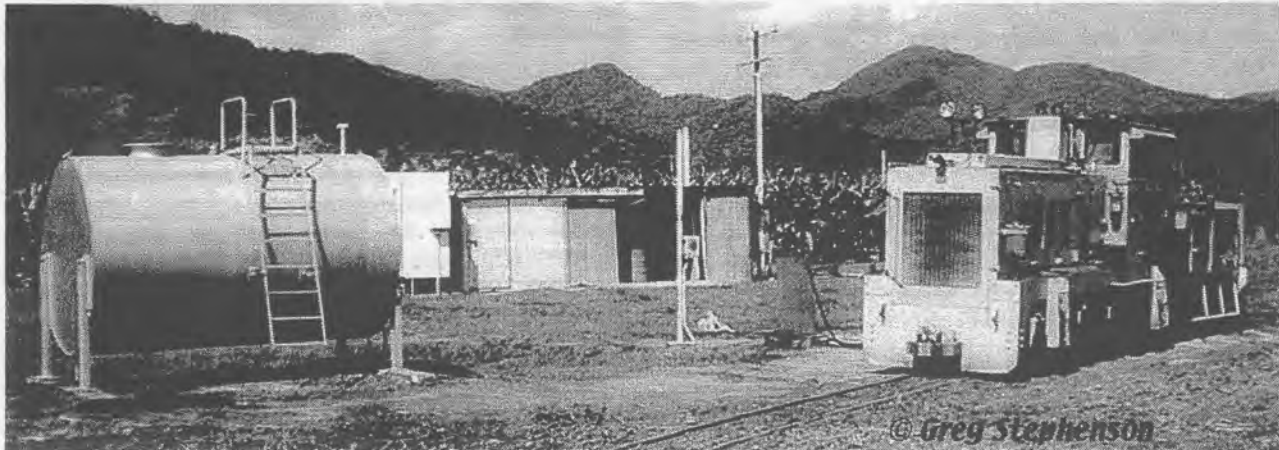


**Moreton Sugar Mill's 'Coolum', 18 ton EM Baldwin bogie diesel**

## From Field to Mill: Modelling Cane Railways



**Farleigh Mill 73 class D11 conversion from NSWG standard gauge by Bundaberg Foundry**



### Resources

#### **CaneSIG: The Cane Railway (Tramline) Modelling Special Interest Group**

CaneSIG was initiated as a non-commercial on-line special interest group for modellers of cane railways in July 2000. While resources on the site are still limited, it is becoming an important information repository on all aspects of cane railway modelling.

CaneSIG: <http://www.zelmeroz.com/canesig>.

#### **ANGRMS (Australian Narrow Gauge Railway Museum Society)**

The society operates the Durundur Railway with almost 1 km of track at Woodford, Queensland. Most of the museum's artefacts came from Queensland's sugar cane railways.

There are additional collections of cane railway equipment in the Sugar Industry Museum near Innisfail, the Illawarra Light Railway Museum Society, amusement parks, etc.

ANGRMS: <http://www.angrms.org.au>

#### **LRRSA (Light Railway Research Society of Australia)**

Light Railways is the society's bi-monthly publication and contains many articles on cane railways past and present.

LRRSE: <http://www.lrrsa.org.au>

#### **Noel Butlin (ANU), University of Queensland, Queensland State and the National Archives**

Archives collect business and other historical records in the same way that libraries collect books, ending up with everything from photographs to annual reports to correspondence. Each archive

specialises in a particular industry, geographic area or function so you need to 1) know what you want, and 2) check out the archive's coverage, before making a visit.

Photocopies and copies of photographs can be obtained for a reasonable fee but publication of the material (even in a modeller's newsletter) normally requires an additional fee.

#### **Hobby Suppliers**

Living in Rockhampton I'm restricted to one local hobby shop, supplemented by mail order (usually through the hobby shop) and occasional visits to a capital city. You'll undoubtedly find different scratch-building and other products than I use, and may have access to swap meets and the like for kitbashing materials.

As noted elsewhere, a number of Aussie suppliers have recently disappeared, some through sickness and other through the changing economic climate. Look on the CaneSIG web site for a current listing of manufacturers and distributors.

#### **Selected References**

These references from the author's growing collection have been selected because of their potential utility to modellers of Queensland cane. Please let me know (author, title, publisher and source) about other appropriate materials.

A wide variety of industry material and histories (Australian mills and overseas—Fiji, Cuba, etc.) are available in book and video format. Look for reference materials in your nearest university



## From Field to Mill: Modelling Cane Railways

archives or a good second hand store if you cannot find them new.

Armstrong, John and Verhoeven, G H. **The Innisfail Tramway: The history and development of the Geraldton Shire Tramway and the Mourilyan Harbour Tramway**. LRRSA: Melbourne; 2000. Revision of 1973 publication describing the 2' gauge tramways in tropical North Queensland, including an update on sugar mill (cane tramway) operations since 1977.

Crellin, I.R. **Australian Sugar Tramways: The Challenge of the 1980s**. Light Railway Research Society of Australia: Melbourne; 1979. The October 1979 issue of Light Railways (# 60). A good review of cane railways at the end of the 1970s.

Crow, Lindsay and Sargent, John (Eds). **Queensland Canefields Steam Era: A photographic profile -- 1955-1980**. Train Hobby Publications: Studfield, VIC; 1999.

THP Mini Series Railway Profile (A South of the Border Publication). Steam locomotive photos and captions from QLD cane railways.

Dickinson, Rob. **Sweet Dreams: A tribute to the sugar mill railways of Java**. Images of Rail: East Bridgford, UK; pre-2001. Narrow gauge railways serving the sugar mills of Java (Indonesia). Photos, captions and some maps. 300+ images, 16 video clips. [Note: CD-ROM, WinTel only]

Dyer, Peter and Peter Hodge. **Cane Train: The Sugar-cane Railways of Fiji**. New Zealand Railway and Locomotive Society: Wellington, NZ; 1988. The classic, now out-of-print but worth locating: Photos, plans, maps and description of the various cane railways in Fiji. Very similar to Queensland cane operations, especially as equipment moved from one to the other and same [CSR] ownership.

Gough, Bob and Webber, Brian. **Queensland Sugar Cane Railways Album**. Authors: Yeronga, QLD; 1999. Colour and B/W photos and captions from the QLD cane railways.

Jehan, David (comp). **Illawarra Light Railway Museum Society Limited Museum Guide**. ILRMSL: Albion Park Rail, NSW; 2000. Photos, plans and descriptions of the museum, locomotives and some rolling stock. Includes a variety of cane railway locos.

Kerr, Bill. **They're All Crazy: 100 years of mechanical cane harvesting**. Canegrowers: Brisbane, QLD; 1995. Video traces mechanisation from 1888 to present, includes rare footage of Kanakas cutting cane as well as harvesters.

Kerr, Bill, and Blyth, Ken [Comp]. **They're All Half Crazy: 100 years of mechanised cane harvesting**. Canegrowers: Brisbane; 1993. Book to accompany video of similar title [cane harvesting]

Link, Roy C. **Industrial Narrow Gauge Handbook: Catalogue and Handbook**. Roy C Link: UK; 1994-. Catalogue and Handbook for Link's industrial narrow gauge kits, 7mm scale, 14mm gauge (2 ft): track & turnouts, rolling stock, locomotives, equipment & plant, prototype. Current details UK-based but locos also used for cane railways.

**Modelling the Railways of Queensland Convention Notes and Narrow Gauge Convention Notes**. 1995-2001. Every convention has had presentations, photos, plans and ideas of value to the cane modeller including modelling cane locomotives and bins, bridges and trackwork, locomotive depots, etc.

**Narrow Gauge Downunder**, biannual. Has cane modelling feature or short articles in most issues.

Oberg, Leon. *Kevin's Night of Drama: A Nambour Sugar Mill Adventure* [in **Australian Diesel Scene 4**, pp 44-57]. Everleigh Press: Mantraville NSW; 2000. A look at the modern operations on Nambour's Moreton Sugar Mill tram system through the eyes of a long time driver. Illustrated with a map and photos of current and historical diesel operations.

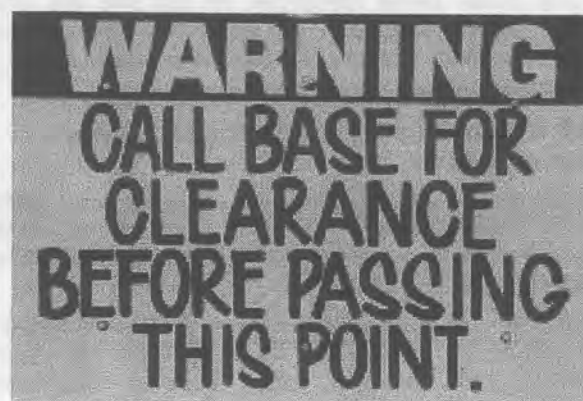
Roberts, Andrew K. **Wheels in Motion**. Roberts, Andrew K: Eton, Qld; 1998. Short descriptions of 23 Qld sugar mills which have their cane delivered by rail in 1998. Motive power, people, histories.

Roberts, Andrew K and Ellul, Andrew B (cartoonist). **One for the Road**. Roberts, Andrew K: Eton, Qld; 1999. Human side of the cane transport component of Queensland's Sugar Mills, portrayed through photographs, anecdotes and cartoons. Includes 28 pages of mostly recent colour photos.

Zetlin, Larry (Prod). **Bundy's Last Great Adventure**. Gulliver Media Australia: Brisbane; 2001. Video (VHS PAL) of ANGRMS' Bundy No 5 as it travelled from Woodford to FNQ, stopping at many of Qld's sugar mills on the way.

### Acknowledgments

These notes are dedicated to the many modellers and historians who have assisted me in beginning to understand cane railways and their modelling, particularly those who have contributed so selflessly to the resources on the CaneSIG web site.



All photographs and other images are by the author unless otherwise indicated.

A colour version of these and other related modelling notes will be available for downloading (individual pdf files) from the CanesIG web site following MRQC 2002.

