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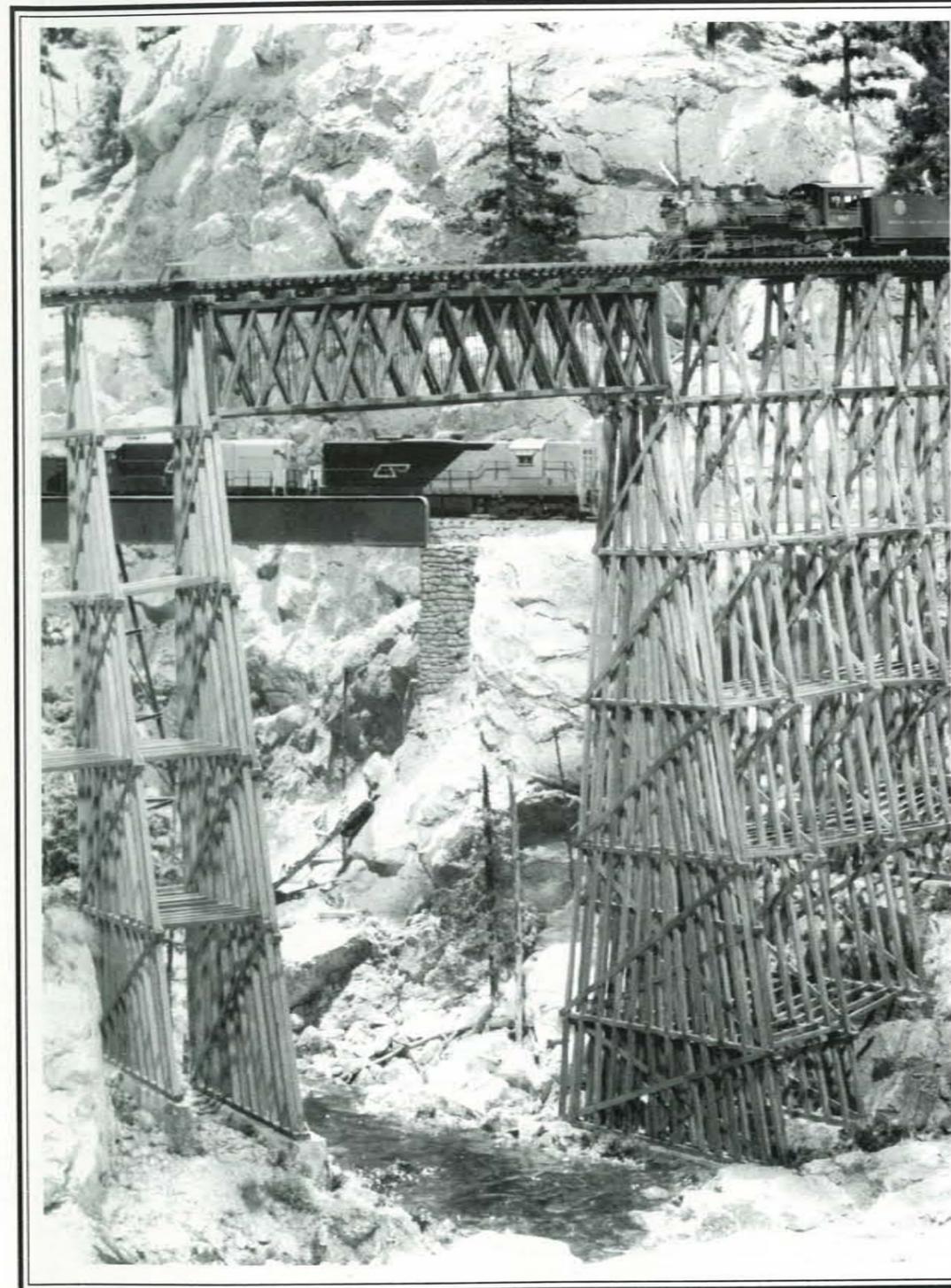


# MainLine

National Model Railroad Association Inc - Australasian Region

Oct-Nov-Dec 1998

Volume 15 Number 4



BRIDGE  
OVER TROUT  
CREEK  
PETE  
BELLOS

BUYING A  
LATHE  
ANDREW  
WELLS

MASTER  
BUILDER  
RICK  
SHOUP

FIRST-MAKE  
THE JIG  
GARY  
NORWOOD

MODELLER'S  
NOTES  
WITH BOB  
WARREN

KIT BASHED  
MODELS  
GEOFF  
HOAD

NMRA - SETTING THE STANDARDS IN RAILROAD MODELLING

Registered by Australia Post - Publication #PP241613/00080

# The Masters Master Builder - Scenery

Conducted by Rick Shoup, MMR

Visit: [www.nmra.org](http://www.nmra.org)

## Master Builder - Scenery

The scenery certificate is the most popular technical award. A scenic layout basically represents what most railroad modelers want. With this comes track planning, then the installation of trackage and the various components. This part of scenery overlaps the Civil award, which is not a big problem. The skill of scratchbuilding some of the Civil elements is the area more modelers are actively involved with today.

### SCENERY

The best benchwork in the world, coupled with the best electrical wiring and track laying, still leaves a void when it comes to a model railroad. Without scenery, trains may run beautifully but just don't look right. Scenery is not hard to do, but good-looking scenery may take extra effort some practice, and instruction. The articles in all the model magazines have given ideas for many years. The books and videos on scenery, found in the hobby shop, will give you a concentrated dose of what to do, and how to do it. The whole thing boils down to wanting to do the job.

Scenery construction does not take a great deal of time, unless you try to build a "Franklin and South Manchester" on your benchwork. Aside from the benchwork, no other phase of model railroading gives you so much to see and enjoy in so short a time. Scenery is the essence of model railroading.

### HOW TO GET STARTED

Well, it helps to have an idea of what type terrain you want to model. If you are following a particular prototype, that makes it easy. Just follow the real railroad's landscape. If you're freelancing, look at magazines, books, and videos, or places you have visited. Once you have the idea in mind, sketch it. Then collect the materials and tools you'll need. There are several ways to build scenery: hardshell, using plaster over screen or plaster-soaked paper towels (use best quality or the type with a woven thread) over crumpled paper and Styrofoam blocks, or 'softshell' using lightweight Styrofoam sculptured to your terrain. Check scenery articles published for other techniques. No matter what you do, you can't go wrong, since you can always patch it.

For your Achievement award you will have to construct a minimum size, as indicated in the regulations. Modules will also qualify.

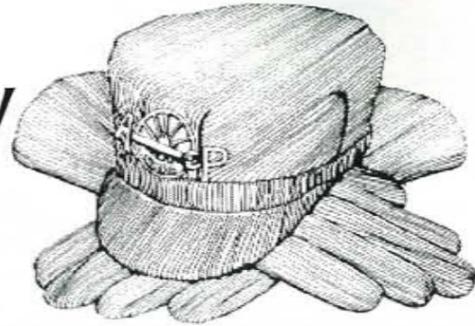
'Realistic effect' are the key words in the regulations. This standard is what separates scale modeling from toy train layouts. You are trying to achieve a realistic miniature model snapshot of reality. For example, in (1) Terrain, natural features include tree trunks that are grayish (not brown plastic), foliage with subtle shades (not hard colors), rocks that are partially buried (not sitting on the ground). Don't forget the weeds, tree stumps and natural debris. In (2), Structures, these must be dull and weathered, also, in the ground (not on top). Streets and roads should have normal features, i.e., sewers, manhole covers, shoulders and drainage ditches, cracks and patches, road wear marks and stains. For the Background (3), make sure there is a transition to the foreground or that it is hidden in some way. The backdrop should be in scale perspective. For Lighting (4), paint the inside of the structure so there are no light leaks. Also, conceal the lamp.

Add at least two unique mini-scenes, something creative, that are not seen on a traditional layout. Each element will be judged and scored. If you don't earn an Achievement Award, redo the areas that fall short on points. It would be a good idea to upgrade all elements for a little insurance. In addition to your craftsmanship, you must prepare a set of at least six photographs, including an overall shot if possible, and a written description of the way the scenery was constructed, as well as a description of what your scene represents. It is not necessary to write a book, just make your presentation clear. A topographical map would be helpful, but not necessary.

The pictures, with notes, must show your interpretation of the requirements. The sample should include an overview of the scene, including the background, but don't show above or the sides beyond the backdrop; a couple of closeup shots of the terrain and structures for scenic effect, and of course your unique mini scenes. You don't have to be the photographer; and you can substitute with video (VHS).

Be sure to read the requirements carefully and follow them completely.

This NMRA on the Web page is written, maintained, and hosted by:  
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## MainLine

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Australasian Division  
of the  
**NATIONAL MODEL  
RAILROAD ASSOCIATION**  
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Editor

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**Bob Carr**

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**Gary Norwood**

Advertising Manager  
**Peter Burrows**

SUBMISSIONS: MainLine welcomes articles, photographs, drawings, cartoons and other railroad modelling related material as contributions to the mutual enjoyment of the hobby by the membership. Material should have wide appeal and preferably be sent by email or post the editor. Articles may be submitted on 3.5" computer disks in any Windows based word processing format. Sharp photos, either B/W or Colour are welcome. Don't own a computer? That's fine - typewritten articles are also welcome.

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### New South Wales

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Loco Depot Heritage Museum, Valley Heights (02) 9651 3369
- 13 March 2:00 pm Saturday  
Andrew Wells 5 Ivy St, Chatswood (02) 9411 7471
- 18 April 2:00 pm Sunday  
Don Davis 5 Wake Place, Kings Park (02) 9671 4351
- 8 May 2:00 pm Saturday  
Gerry Hopkins 7 Booralie Rod Terrey Hills (02) 9450 1033

### Canberra

- 24 January 2:00 pm Sunday  
Malcolm Risby 1 Holden Crescent, Wanniasa (02) 6296 4629
- 20 February 2:00 pm Saturday  
Kerry McPherson 21 Crossley Close, Melba (02) 6258 1421
- 20 March 2:00 pm Saturday  
Tony Payne 24 Darmody Street, Weetangera (02) 6254 6985

### Victoria

- 14 February 11:30 am Sunday - BBQ  
Paul Richie 28 Ascot St South, Ballarat (03) 5332 1138
- 14 March 11:30 am Sunday - BBQ  
John Beaton 25 Victoria St, Baccus Marsh (03) 5367 3128
- 18 April 11:30 am Sunday - BBQ  
Ken Morecroft Lysaught Sporting Complex  
Denham Rd, Tyabb (03) 5998 7362
- 2 May 11:30 am Sunday - BBQ  
Laurie Green 20 Nambour Drive, Sunbury (03) 9744 5188

### On the Cover

This month we feature bridge building. Whether large or small, a trestle bridge will enhance any layout. This enormous bridge was built by Gary Norwood using the jig he designed.

# Editorial

This is the third edition of the new format *MainLine* and improvements have been made in each of them as more has been learned about this new field called publishing. But, for the magazine to grow with quality content, it needs to be managed "departmentally." It needs people who can commit to providing the content each three months for just one department. That task is not onerous, in fact, it can be a lot of fun and you will certainly meet many people as you chase that lead to track down a story. So if you ever wanted to get into magazine publishing on the ground floor but don't want the responsibility of putting all of one together, now is the time to act.

The departments that have received good comment include the series of **railfanning** articles, as well as the **how do you do that** articles. Each of these areas needs its own Editor who will chase up leads and ferret out articles from across the region, then apply some who-when-where-why-what and grammar skills to them and then forward them to me for final editing and compilation. The job can be quite exciting and you will get to make a valuable contribution to the region's flagship. If you think you might be interested but would like to know more, just call and we can discuss it, or you could email your interest and we can go from there.

Departments include:

Monthly Reports (gather and prepare reports produced by state contributors);

Operations (find authors/chase articles and edit for publication);

Railfan Trips (a quite popular department. Many people travel... find them, get articles, edit for publication);

How to Articles (from making trees, scratch building, kit bashing to... You name it. This area can really be developed as it is very popular);

Track and the R.O.W. (from making points to other track-related articles);

Motive Power & Rolling Stock (from making or tuning a loco to painting, decaling or making rolling stock - projects oriented);

Achievement Program (needs input of AP oriented articles); and

Module SIG: Needs Quarterly reports of progress in this popular field.

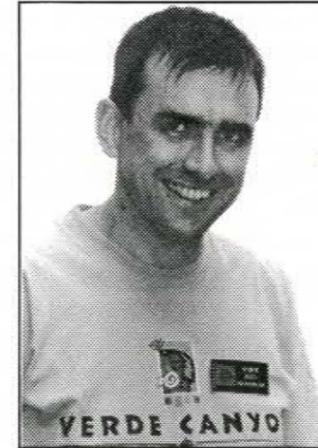
There are two ways you could get involved. If you have good writing skills (have to write reports, appraisals or proposals for your work) then you might just enjoy editing one of the departments each quarter. If you are not an experienced writer, but have an idea for an article, then you could become a valuable contributor to *Mainline*. Contact the Editor and discuss your idea for an article. There will always be help available to get your story ready for publication. And remember, every article you have published earns points toward an award in the NMRA achievement program. So, please consider it, then call me.

*Keith McCarron*

Valley Heights Loco Depot Heritage Museum  
UBD map 140 reference K5

Don't forget, you can call into The Signal Box Model Railways store at Faulcanbridge before the February meeting at Valley Heights. Meet new owner Kim and see the great range of bits and pieces he has to offer. Kim is at Shop 3/457 Great Western Highway Faulcanbridge. Call him on (02) 4751 2088  
Open Saturday 10.00 am - 2.00 pm

# President's Report



**A**t this time of the year we are inclined to look over the last year's events, firstly to give ourselves a score-card, and secondly as a basis for planning into the new year. So, how do you think that we, the Australasian Region of the NMRA, have done?

In terms of events, we've had a successful one-day convention, and we've had some good monthly meetings. Financially we are in a reasonably sound position. There has been excellent activity on the SIG front, with two modular groups and the operations group all progressing strongly. We've 'upped the ante' on the Mainline magazine.

However, on the less positive side we share a common problem with the NMRA worldwide - declining membership. This is serious on a number of fronts; financially it is difficult to provide services such as Mainline, credit card facilities for membership, major conventions without a solid income. From an information sharing stance we benefit from new members who bring new ideas and skills, or at least are prepared to question the current methods.

The Board of Directors has a mission to reverse the trend and we have started by increasing our involvement with the general public at exhibitions. The Gold Hill Central layout has proven to be a winner at both Newcastle and Liverpool - its small size and 'unsophisticated' level of detail seems to make it more accessible to non-modellers. From Liverpool we got two new members, but we also got two dozen names of people who might be interested in the future. This is the start of a mailing list that we see as an important long-term tool in getting non-members, firstly to attend a meeting or a convention and secondly, to join the association.

I am sure that most of you initially have a negative reaction to so-called 'junk mail' that arrives unsolicited, and are probably already thinking "I don't want the NMRA to be seen like that." However, direct mailing is so prevalent because it works. Some people will take up an offer on the first mailing, fewer on the second, almost none on the third and fourth. However by the time they have seen regular correspondence a fifth time they start to see the sender as a genuine entity and the number of positive responses rise.

We think that direct mailing (along with face-to-face interaction at exhibitions) will prove much more effective than the untargeted brochures and advertising that we have used in the past. However, we first need to build the mailing list. We need every one of you to think about someone who *might* be interested: someone who you won't go up to and invite along directly (you've already approached all those people, right?!) but someone who

- has children who could be interested
- models or collects some other prototype
- has previously been a member, and who might come to a convention
- didn't laugh when they found out your interest

Don't worry, the mailout won't do you in, but just maybe the recipient might ask you if this NMRA crowd is anything to do with you. Then you become our best salesperson!

So in summary I'm challenging every member to provide at least one name for our mailing list in time to meet the first mailout for the 1999 Convention. Please give the details to either Peter Burrows or me.

Yours in Modelling,

*Andrew Wells*

*I have, in the past, invited members to attend BOD meetings to see the decision making process in action. Minutes of BOD meetings are also available on request from the Secretary. Attend or read - be informed.*

# Regional Roundup

## September 1998

Geoff Truman hosted this meeting. The Daylesford branch was operating, but most stayed out in the sun. Trentham and Bullarto are the only two stations modelled with plans for Daylesford being underway.

Most members are planning their trip to Sydney for the convention next year. Luggage space for the drinking water may take precedence over models. (a bit harsh Ed.)

Peter MacDonald has completed his BGM Y class kit. His only criticism of the kit was it needs extra pick-ups on the tender. The loco is an 0.6.0 with a six wheel rigid tender and can lose contact when running through points etc.

Laurie (Green) has completed his entry into the 0 scale mini railway competition being run by the Sunbury Model Railway Club. Several members are entering their 500mm x 300mm x 300mm modules. Ian had a model of a saw sharpener's shack he had built out of veneer.

## October 1998

Steve Cullen hosted October's meeting. Steve's layout, Bellbird, was once again available to members for operation and a few took the opportunity. The name is taken from the ABC series. Steve models in On 2½ based on VR narrow gauge. The layout is an 8' x 10' L with a port and township on one leg and a mine and timber mill town on the other. Operation involves moving loaded trains with passenger car down to the port and returning empty ore cars and logs loaded on flats to the timber mill. Steve has built several removable loads of ore, timber and logs to suit the small wagons. Steve is currently building an hotel.

Steve is building an On 2½ Shay from the MDC standard gauge kit. It was almost finished needing painting and some detailing. Steve has used the Echo Mountain pickups and NWSL Rear sets to improve the running

qualities. It now moves smoothly around the layout albeit noisily but not as bad as some I have men.

I took my recently acquired Climax along for a run. There were 60 of these locomotives offered for sale in Sydney recently. It is the same length as Steve's shay and ran smoothly around the layout. Steve said it was too big for his layout and, besides, he couldn't afford it. He lasted till Wednesday before ordering his!

I must apologise to Gavin Hince. Steve and Gavin had swapped meetings earlier in the year. This meeting was to be hosted by Gavin and Louise soon after their return from their honeymoon.

## November 1998

Graham Meyer hosted November's meeting. It was a lovely warm sunny day, completely different to the Snow we had last time.

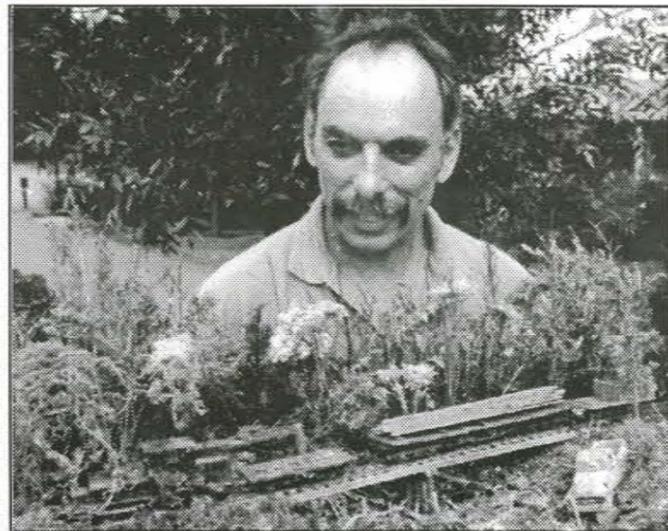
Ian Mitaxa arrived in style on Puffing Billy. We all walked off a beautiful lunch to see Ian off on the 2.30pm train back to Belgrave. Puffing Billy is now running through to Gembrook, and Lakeside has been rebuilt with two platform loops and a holding loop located on the Gembrook side of the level crossing. Na 6, resplendent in two-tone Apple Green, was simmering in the loop.

A rake of passenger vehicles and some freight wagons was also held there.

Our calendar of meetings for 1999 was organised and most of our meetings have been moved to the 2nd Sunday of the month. Advise host if you're going to attend.

# Victoria

by Geoff Truman



New VIC Member Mario Rapinett - with his first diorama.

# Canberra Meetings

by John Gillies

## November Meeting

Our last meeting for the year was held at Stephen O'Brien's with a display of some of his models and some brought along by other members. Stephen models the Norfolk and Western in the diesel age and had three very well detailed diesels, a number of freight cars and two bay window cabooses set up on lengths of track. Stephen gave a short clinic on how to detail freight cars with the addition of more prototypically correct ladders, grab irons and brake equipment. Before and after examples of Life Like triple hopper cars from their train set line readily demonstrated the significant level of improvement and realism that can be achieved by removing oversized and cast on items. Stephen offered more helpful tips and methods he used to modify Athearn 34' hoppers to represent specific Eastern US prototypes. I

gave a quick run down on scratchbuilding a Northern Pacific centrebeam bulkhead flat car from styrene while Tony Payne finished off the show and tell session with details of how he built a CP Rail SD40-2F body based on drawings in the July 1998 Model Railroader. Tony's model faithfully captures the prototype's Draper taper design using Athearn FP45 body shells and scratchbuilt components which will run on a modified Athearn SD40-2 chassis. A good exchange on the pros and cons of various modelling techniques and methods were discussed using the displayed models as reference points. Recent acquisitions were also on display, including two of Malcolm Risby's N scale Atlas SD60s with many of those present being amazed by the level of detail now available in N scale.

During afternoon tea Grant Cooper announced his impending departure to Tasmania following the sale of his property near Goulburn and his plans to publicise the NMRA and its benefits to local modellers down South. Grant will be missed by our group and we wish him and Margaret all the best for the future. Discussions on the end of year dinner and venues for meetings early in the new year rounded out the business part of the meeting. Thanks to Stephen for a most enjoyable afternoon.

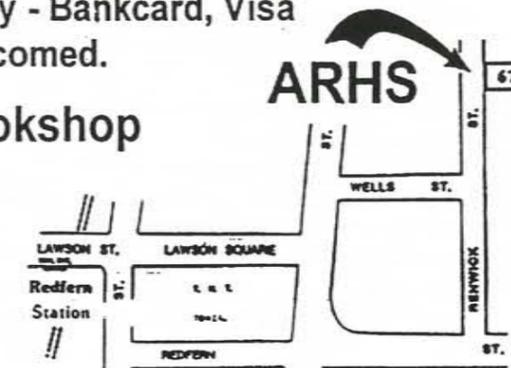
Thanks also to Peter Weller-Lewis and Steve Walker for hosting the October meetings while I was overseas on holidays.

Countdown to  
CONVENTION 99

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The ARHS Archives, at the same address, are open for research on the first, second and third Saturdays of each month, 10am to 3.30pm.

# RIO GOLARE SOUTHERN

## BRIDGES AND BUILDING DEPT Building Bridge 51A Over Trout Creek

Pete Bellos<sub>n3</sub>

**T**restles on a model railroad, whether standard or narrow gauge, can provide points of scenic interest with an air of complexity while actually being quite simple.

Many model trestles sometimes fail in realism by being unnecessarily heavy, impossibly light or even lacking adequate foundations. The easiest way to avoid such errors without being a structural engineer is to study and model an actual trestle and to adapt its features to your railroad's terrain.

Since my Rio Golare Southern is a narrow gauge line based more or less in the San Juan Mountains of southwestern Colorado, I've taken close looks at the many trestles of the Rio Grande Southern. For this article I've chosen the RGS's Bridge 51A located above Trout Lake. Despite it being a sole survivor, until the publication of Collman, McCoy and Graves *The R.G.S. Story, Vol. IV* (Sundance, 1994) there had been very little published showing it in service. Don Bergman's original *Rio Grande Southern: An Index to Published Photographs* listed only seven entries, most of which were poor for

modelling purposes. Though this bridge, set far back among the convolutions approaching Lizard Head Pass, was largely unrecorded during RGS times, it is now easily reached. The best way to find it is to leave Colorado Route 145 at Lizard Head Monument and make the pleasant scenic drive northerly on the right-of-way, following the grade along the mountainside to the trestle. I've been there a half dozen times by automobile and mini-van... but mostly when the weather and roadway have been reasonably dry. Past the trestle and across the stream that feeds Trout Lake, the right-of-way brings you to the much photographed water tank, and shortly returns to Route 145 a little below where you left it at the Monument.

The point of all this is that the photographs and measurements I've taken and worked with are of the structure as it now stands - nearly fifty years after abandonment and decades after it was last used as a vehicular road. Because of the time elapsed and the obvious effects of wear and weather, I have "normalised" my model by comparing it selectively with

published photographs, plans and specifications of other RGS trestles.  
**PLANNING THE TRESTLE**

A model railroad trestle, like the prototype, requires sound "engineering." Since it will bear the weight and stresses of trains in motion, it also requires a sound foundation as well. In planning a trestle for the Rio Golare Southern, I first locate it on the railroad's track structure and then fit a solid, well-supported base of at least 1/2" thick plywood. I then trace the railheads on paper using a soft sketching pencil and establish centre-line and abutment positions. This paper is now cemented to the baseboard (3M Spray Mount). I then tack a 16" wide spline on the centreline. (NOTE: All dimensions given are prototype). This establishes the future trestle's alignment on the railroad and creates a fixture for assembling the deck.

### PREPARING THE WOOD

The RGS's trestles were largely rough surfaced and untreated woods. I have found that a very satisfactory representation of such wear and weather can be achieved with artist's markers. I've used Design (no longer available), Prismacolor and Pantone brands. There are several advantages to markers. Colours are transparent, staining wood with serendipitous variations in shading according to the colour and porosity of the grain. Drying is almost instantaneous so additional tones and colour effects can be applied immediately. And as

they don't seal the wood, glue can still soak in to make strong joints. The colours listed here work for me on basswood. Other woods and other tastes may require some experimentation. Working with 3 or 4 full-length strips at a time, turning them as I go, my procedure is:

1. Wire brush your wood. I use a stainless steel "tooth brush" (available hardware stores and from auto parts stores).
2. Wipe away fuzz with medium grade steel wool.
3. Go over the wood fully with COOL GRAY 40%.
4. Add RAW WOOD to accent grain patterns.
5. Add random stripes of YELLOW BROWN.
6. Edge the YELLOW BROWN with DARK OILED WALNUT (This colour along with the darker RED-BROWNS, works well as fresh creosote.) Use COOL GRAY 20% to touch up exposed end-grain after cutting.

### BUILDING THE DECK

Refer to the drawing on page X for the layout of the deck stringers. You'll see that full-length stringers are staggered at each bent location, except over the creek. The standard stringers for my model (and most RGS trestles) were cut 28 feet long with 14-foot long single span end pieces. The span over the creek is 21 feet. The stringers are assembled and clamped along the centre spline on the baseboard using 24" x 48" pieces of 3/4" - 1" thick styrene at the joints.

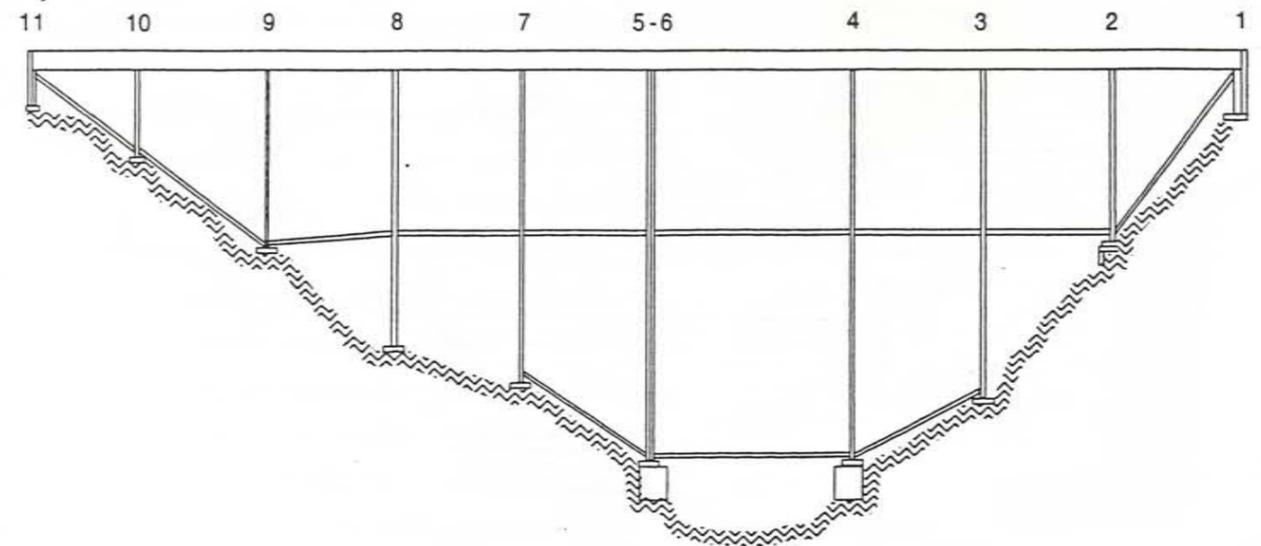
PLIOBOND is good for these joints.

After the stringers are completed, remove them from the spline and drill them for the nut/washer castings. The jig I made for this chore is shown on page X. Returning the stringer assemblies to the fixture:

1. Clamp filler strips to both sides and an edge strip to the inside of the curve. For a 33" radius, I used an 8" x 8" filler strip and a 2" x 32" edge strip. For other radii you may need other filler strip widths: the idea is to centre the ties on the stringers at the bent locations and to keep their edges aligned.
2. 8" x 8" x 8 foot ties (or 12" x 12" x 10 or 12 foot for standard gauge) are now applied on a 4" spacing, keeping them square with the edge strip. I use scraps of wood or styrene as spacers. A 4 foot longer tie is placed seventh from each end with the extra length on the engineer's side. These will hold the bridge number.
3. Rails and guardrails are spiked down leaving a car length or more of rail extending from each end. Micro Engineering's Micro Spikes do well.
4. 4" x 8" x 16 foot wood rails are added with bolt/washer castings every fourth tie. I paint these castings with Floquil RAIL BROWN before installing.
5. With the deck removed from the fixture, bolt/washer castings are inserted in the previously drilled holes.

### CAJA DEL GATO

### GOLARE



Bridge 51A Framing Plan - Not to Scale

Re-Printed courtesy of

MCoR NMRA

from

Heartland Express 98,  
National Convention  
Kansas City, MO

**THE BENTS**

Page 11 has drawings for all 11 bents, foundations and abutments of RGS trestle 51A as it now stands. To use these drawings, have them enlarged to full-scale size in a photocopier, then make a fixture like this:

1. Cut a piece of softwood or Homosote a bit larger than the largest bent.
2. Attach an equal size sheet of clear styrene (.015' works well) using a strip of masking or plastic packaging tape as a full-width hinge.
3. Position your copy of the plan for the largest bent under the styrene. Cement styrene blocks to hold a 12"x14" bent cap.
4. Drive pins or tack-cement additional styrene blocks to lay out the additional 12"x12" bent elements.
5. Add the 3" x 10" sway bracing to the "up" side.
6. Lift out and flop this assembly to add sway bracing on the "down" side.
7. Use a pinpoint to dab BURNT

SIENNA artists' acrylic straight from the tube. This represents the heads and crimped points of boat spikes used on the prototype. Spike positions are shown on the bent drawings.

8. As each bent is completed, remove the pins and slide the next plan under the styrene, aligning its cap with the cemented-on cap blocks. Note that bents #5 and #6 are doubled back-to-back as a single structure.

9. Add footings and abutments to bents as shown. Drawings on page 2 show the cribbing that supports bents #4 and #5/6 at the creek. ASSEMBLY

I cement the bents in place under the deck as they are completed, using filler blocks or shims to give each a solid base. The joints in the stringers guide alignment with the deck. A small level or square will be handy to keep things straight up and down.

With the bents and abutments completed and in place, the 6" x 8"

girls are fitted, notched and secured (see drawing on page 11). An inside callipers is invaluable for measuring these, especially on a curved trestle. FINISHING UP

There may be better materials for bent cap sheathing - for weather and fire protection - but the most readily available and economical is heavy-duty kitchen foil. It's easy to cut and to form as well.

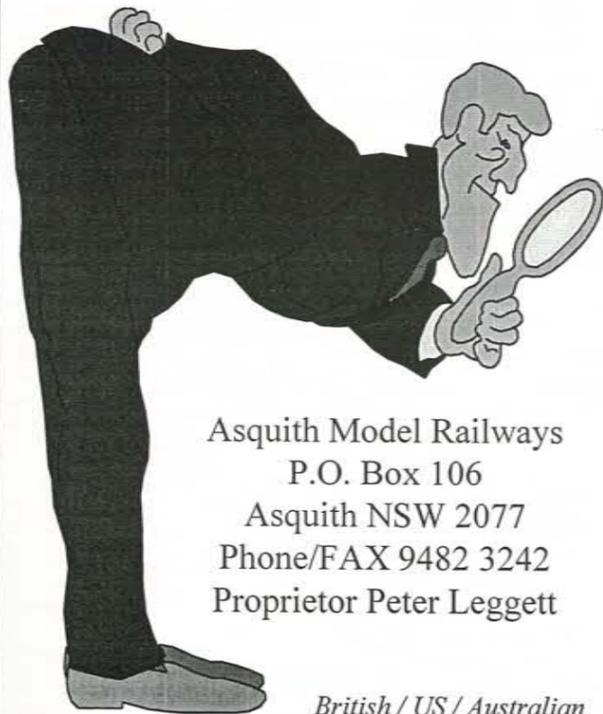
1. Measure the exposed length of each cap piece. Cut the foil to length: 6" longer and 4" wider.
2. Refer to the drawings on page 2. Form the foil, dull side up, over a piece of bent cap strip. Then transfer this to a trestle bent cap. Use a drop of ACC or contact cement to secure it, and wash it with a rusting agent.

The final step is to add the trestle number. For this I give a 2"x8"x16" a dry brush coat of white and apply the number using black Roman-style decals or dry transfers. These boards are not attached to the engineer's side of the extended ties of the deck - facing the abutment at each end.

**LOOKING FOR THOSE ELUSIVE DETAIL PARTS?**

**THEN LOOK NO FURTHER THAN  
Asquith Model Railways**

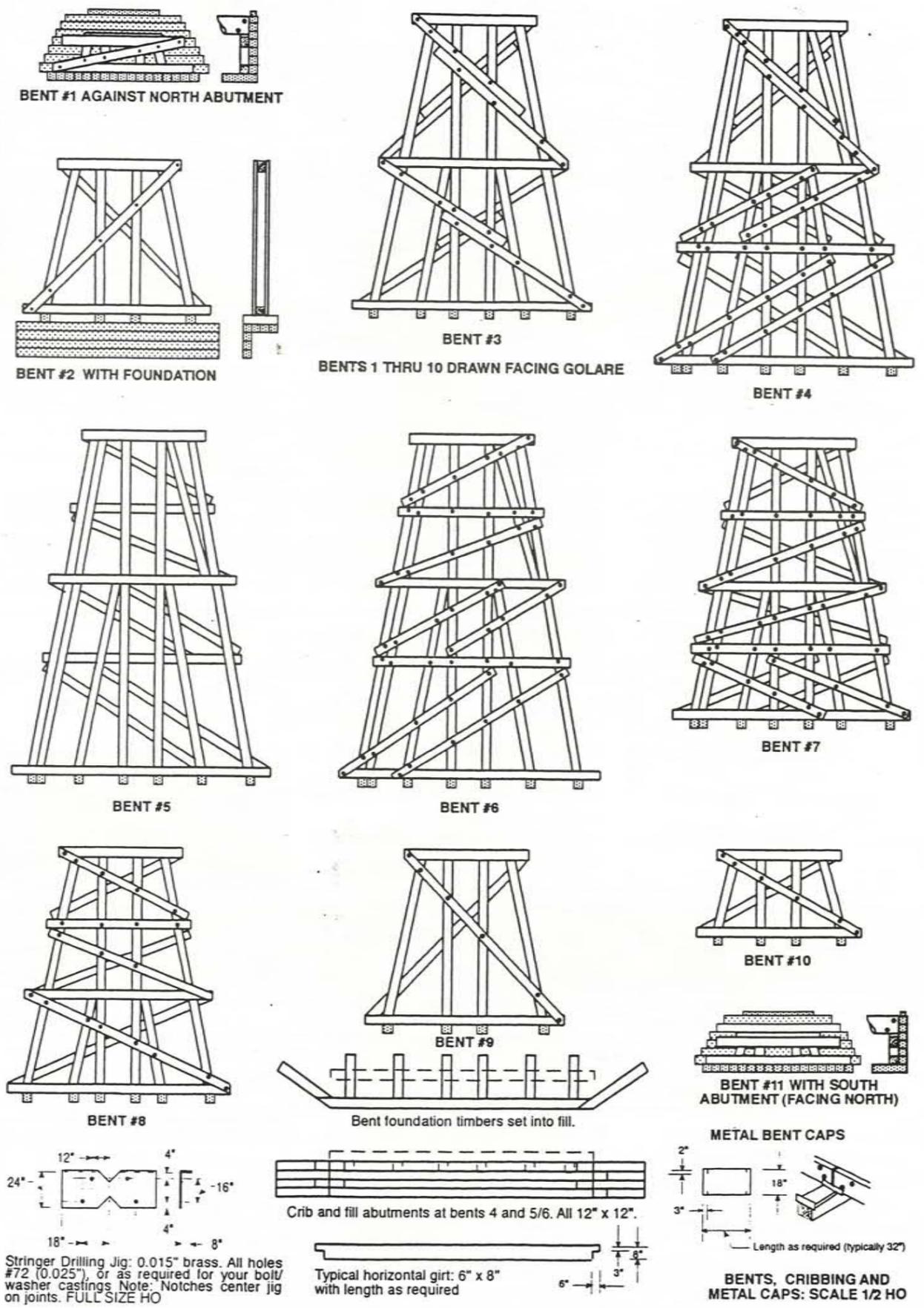
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Stringer Drilling Jig: 0.015" brass. All holes #72 (0.025"), or as required for your bolt/washer castings. Note: Notches center jig on joints. FULL SIZE HO

Crib and fill abutments at bents 4 and 5/6. All 12" x 12". Typical horizontal girt: 6" x 8" with length as required

METAL BENT CAPS  
Length as required (typically 32")  
BENTS, CRIBBING AND METAL CAPS: SCALE 1/2 HO

Code 70 rails  
Code 55 guard rails  
4" x 8" wooden guard rails:  
bolt every fourth tie.  
Stringers: 8" x 24" with  
1 1/2" spaces between.

Cross-section: stringers,  
ties, rails & guard rails

Stringer joint using scale 1" styrene  
NOT TO SCALE

Stringer Layout

### CONSTRUCTION MATERIALS

**BASSWOOD**  
Stringers 8" x 24"  
Ties 8" X 8" X 8 ft.  
Bents 12" x 12"  
Bent Caps 12" x 14"  
Sway Braces 3" x 10"  
Girts 6" x 8"  
Foundations 12" x 12"  
Abutments 12" x 12"

**METAL**  
Code 70 rail (for S scale)  
Code 55 rail (for S scale)  
Micro Engineering Micro and/or  
Small spikes;  
Heavy Duty aluminium foil

**PLASTIC**  
Stringer splices: Scale 1 " white  
styrene

Bent jig cover: .015" clear styrene  
Bent jig blocks: Nominal .040" x .  
125" white styrene  
Grandt #99 nut/washer castings  
(for S scale)  
Grandt #101 nut/washer castings  
(for S scale)

**LETTERING**  
12" to 14" black Roman decal or dry  
transfer.

**FLOQUIL PAINTS**  
Rail Brown  
White

**MARKERS** (Design, Prismacolor  
and/or Pantone)  
Cool Grey #2, (20% Cool Grey)  
Cool Grey #4, (40% Cool Grey)

Raw Wood (Sepia, Dark Brown,  
PM88)  
Yellow Brown (Burnt Ochre, 157T)  
Dark Oiled Walnut (Combine Dark  
Brown and Dark Reds).

**ARTISTS' ACRYLIC PAINT** (Tube)  
Burnt Sienna

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PETER T. BELLOS

**Now turn to Page 17 for  
"Making Accurate Jigs"  
by Gary Norwood**

# Modellers Notes

by  
**BOB WARREN**

## Some thoughts on decaling.

Even with the number of factory decorated equipment on today's market, there are those occasions when the only way to have an item uniquely lettered is to apply your own lettering, either by wet transfers (commonly referred to as decals) or dry transfers (rub on lettering).

Decal manufacturers provide application information with their sets, but as with spray painting, each of us develops our own method that seems to work well. However there are some basics that must be adhered to, to ensure a successful decal application.

First and foremost is the GLOSSY surface upon which the decal is to be applied. Less than a glossy surface will result in air bubbles - those areas under the decals

surface that appear dull. Air bubbles can be eliminated by pricking the bubble with a sharp instrument, such as a pin, and then applying additional decal softening solution.

Once all the decals are applied and one is satisfied, then comes the application of a protective coating. There are a variety of protective coatings available from a totally dull to semi-gloss appearance. The choice is yours.

Decals come in a variety of colours and the dish used to soak the decals can make it easy or difficult to see the decal as it soaks. One solution that works well is to paint the outside of your decal soaking dish a dark colour such as black and then make an insert of styrene. When soaking dark coloured decals place the insert into the dish prior to soaking. If the decals are of a light colour no insert is

required.

The major model railroad decal manufacturers produce solvent solutions, which they recommend for use with their decals. However there are occasions when the use of the other fellow's solution helps in difficult applications such as over ribs or other raised areas. As an example, applying Microscale stripping along the side of a locomotive shell, after settling the decal where it is to be located and some of the decal manufacturers solvent has evaporated, a small application of Champ's solvent softened the decal sufficiently that is readily conformed to the outline of raised areas on the shell without any bubbles. A readily made tool for breaking air bubbles is to take a sewing needle, break off the eye end and insert the remainder of the needle into a handle made of a length of wood (dowel). Make the handle long enough to work with comfortably. This bubble breaker is also useful in moving a decal around prior to the application of softening solvent.

B.W.

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# Sydney Meetings

by Steve Chapman

## October Meeting

Meeting at Peter Jenson's residence at Castle Hill, 10 October 1998.

Meeting started with a running session on Peters unfinished DCC controlled north coast free-lance layout. A few teething problems with DCC at first, then all ran smoothly for the rest of the day. His layout depicts a section on the north coast where he runs free-lance trains using whatever takes his fancy. He seems to prefer bigger U.S. co-co type Diesels as no steam was evident on his layout.

Approximately 55 people attended the formal part of the meeting, which started at 3.30pm with opening remarks from Andrew Wells. He reminded the gathering that new members are always welcome to any of the Sig. groups.

Michael Flack then handed out two golden spikes - one to Jack MacMicking for his garden layout, and a second spike to Steve Chapman for his On2 layout. Michael then delivered the news that there is only one more achievement award to hand out as no-one is working towards any of the awards in the Achievement Programme. This is a first in many a year.

Andrew then thanked all the people who helped out in the Liverpool exhibition. Also special thanks go to the volunteers who made the 'club layout' that was shown at Liverpool.

We signed up three new members and gave information to quite a few prospective members.

Andrew then told us about the hands-on approach the B.O.D. is taking to get people to do different hobby activities. As an example, the next meeting will feature a point, or turnout building mini workshop. David North then reinforced what Andrew just stated about new members at the Liverpool exhibition. He also told us a story about a friend who he has known for some time, but



No-fuss railway modelling at the Christmas BBQ meeting

didn't realise the he is also railroad modeller. The point is, if you know of anyone who might be interested in Model Railways, contact Peter Burrows so that the person can receive a free Mainline.

You will find Peters address on the last page of Mainline.

Next, Ian Henderson gave an update on progress of organising for the convention next year. He also asked the meeting for volunteers to run a clinic, or at least indicate what you would like to see in a clinic.

Peter Burrows asked for HO figures to populate our new layout. So if everyone gave one figure we would be doing very well indeed.

Library. Twelve new titles go on the video shelf this week. See your librarian, Piet Hammersma to borrow them.

Special thanks were also offered to the people who brought along items for some show and tell to the meeting. The more, the better.

By the way, I tape each main meeting, so if you would like to hear the last meeting tape, let me know and you can. I have three tapes which I tape each meeting. So they will last for about 6 mths. S.C.

Continued Page 13.

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# Queensland Meetings

by Glenn Stevens

The Division 1 combined Christmas B-B-Q and bi-monthly meeting was held on December 12 at the home of Glenn Stevens. The meeting, attended by seven members and two spouses, had an attendance lower than expected with four persons withdrawing on the day of the function. (It should be noted that Division 1 only has 29 members statewide with 19 in the South East (Sunshine Coast, Gold Coast, Toowoomba) corner, with normal attendance varying from 7 to 10 persons.

The meeting was informal with numerous discussions throughout the afternoon and evening. The host layout being modular, it was the centre of various discussions including:

- construction methods,
- mounting of Control panels
- pro's and con's of modular construction,
- track laying methods, particularly at the junction of two modules.

Ian Venables displayed a nearly finished scratch built B&O Class C-16a (an 0-4-0) and ended up giving a mini clinic on simulating rivets and stay bolts in brass sheet. As the result of this he has volunteered to give a clinic on

soldering techniques at a future meeting.

A plus for the day was the attendance of Graham Emery, Ian Wellings and Bob Benson, all recently joined members. Sydney members will remember Bob as a GN modeller who hosted numerous meetings when he lived in Sydney. The presence of new members led to an overview of the Achievement Programme, with the Golden Spike used as an introduction. This was followed by a briefing on the scoring system, with emphasis on structures and rolling stock. These topics were used as Grahame Davis had been awarded his MB-Structures, and Graham Emery was building VR coaches for his Spirit of Progress.

There was discussion concerning the Regional office keeping the 'outposts' informed of membership changes, as I had no idea that Graham (Emery) had joined the organisation. As a result, follow-up correspondence has been sent to the Regional Office, expanding on this topic.

A small formal discussion was held regarding the type and frequency of meetings. As Division Superintendent, I was concerned that I may have been organising meetings and gatherings that suited what I wanted to do, however I was informed in (very) polite terms to

keep heading in the direction the Division has been going. Following on from this, there was some discussion about the programme, with attendees adopting a five meeting calender for 1999, and in line with recent editorials and Presidents reports in Mainline, it was agreed that there will be more scheduled hands-on clinics at meetings.

The day was rounded off with a B-B-Q dinner prepared by my wife Sandra and Sue Davis. Special thanks to them both for their work while the men 'played' in the garage.

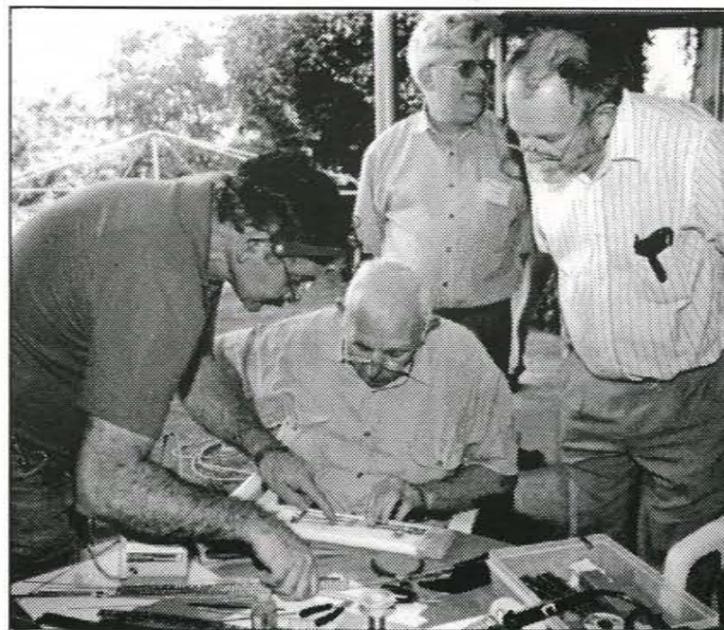
As mentioned, a third of Queensland members live outside the SE corner and contact is usually via notices from the Division Superintendent, however recently I met again with Lynn Zelmer from Rockhampton, who is a regular visitor to Brisbane, and for the first time with Graham Hodges from Cairns who was passing through on holidays. On both occasions we were able to meet for dinner, and it was good to catch up with them both. %

Continued from Page 12.

## December NSW Meeting

The December BBQ meeting is always popular and this year was no exception. About 60 members and their family gathered at the Quaker's Hill Primary School hall for a BBQ and social afternoon. One new member, Mario Rapinett, came all the way from Melbourne for the meeting (well - he was in town on business at the time). The Module SIG was advertised to be setting up their sizeable rig but some joint problems resulted in that idea being cancelled. Warren Wormald saved the day by bringing along his 5' x 8' layout. Several members had fun painting, laying plaster and driving trains during the day.

Three members showed that "pure railway modelling" is not dead. After all, what more do you need than a circle of track, an operating train and enthusiasm. There were no points to seize up and no electrical conflicts to sort out, just pure operation... just the way it used to be before we complicated the concept. (See photo page 12) %



Gerry Hopkins' Point making clinic at Bpb Carr's meeting was very popular

# Are You a Potential Category "K" Modeller?

*A Discussion Document for the Inclusion of an Additional Category for Kitbashed Models into the Regional Modelling Competition*

by Geoff Hoad



A heavily re-worked GP9 by Geoff Nott

There is deep-seated dissatisfaction within the Association concerning the current rules governing the judging parameters for kit-bashed models. Many modellers refuse to enter the current competition and the overall numbers for locomotives and rolling stock have declined. Moreover, the treatment afforded many past entrants has also discouraged membership and entry into the modelling competition.

Specifically these problems refer to:  
 a. The need to have a proportion of the model scratch-built  
 b. Entry without a scratch-built component is automatically penalised

c. When entry numbers are low, categories have been removed from competition

#### The Current Situation

A sounding out of members revealed that many would be prepared to enter a category that:

- Had no scratch-building component
- Would be run irrespective of the number of entrants
- Would award prizes on more than one basis (e.g., more than 1st, 2nd or 3rd)
- Did not have to be recognised by the Association for judging under NRMA standards and which was accordingly not eligible to receive NRMA awards
- Would include a "Put

Forward" category so that models of the requisite quality could be judged for points under the NRMA Judging System

#### How the System Would Work

At each convention, a separate Category "K" (for kitbash - how original) would be included. It would be open to any modellers who are current members of the region and would have two categories:

- Motive Power
- Rolling Stock

The category would have as its clear objectives three key aspects:

- It would be a venue for serious kit-bashing modellers to compete;
- It would also encourage and reward new entrants under various categories to support the overall objectives that the association has for members to participate, enjoy, learn and be recognised; and
- It would be a springboard to encourage competition in mainstream construction categories.

The objective here is quite different from the Display Category which, whilst encouraging modellers to "Show and Tell," does little to add value to their modelling capabilities. Nor does it afford any tangible recognition for their modelling efforts. This is not to say this category should be removed - quite the contrary - it has a meaningful place.

Each model would be judged on the following criteria, but would, in principle, follow the format set down in the current NMRA competition:

- Construction
- Paint
- Prototype
- Accuracy
- And others I haven't yet thought of...

There would also be different awards for modellers who entered and achieved a reasonable modelling standard to be awarded:

- First, Second or Third for the top three models entered in each category, which met the set standards

*Continued on Page 15.*

# NMRA Achievement Programme Golden Spike Awards

## Roll of Honour

1988  
 Gordon Farnsworth  
 Gerry Hopkins  
 Phil Knife  
 Laurie McLean  
 Geoff Nott  
 Franz Persson  
 Sowerby Smith

1989  
 Bill Cooper  
 Gordon Farnsworth

1990  
 John Saxon  
 Bruce Sneddon  
 Peter Weller-Lewis

1991  
 Bruce Ballment  
 Mike Bartlett  
 Fred Gill  
 Laurie Grow  
 Merv Smith

1992  
 Phil Badger  
 John Baker  
 Tony Cutcliffe  
 Michael Flack  
 Roger Hord  
 Graham Larmour  
 Ken Scales  
 Ray Walter  
 Warren Wormald

1993  
 Paul Hobbs  
 Bob Kpallwyn  
 Keith Oman  
 Trevor Walsh  
 Laurie Woodley

1994  
 Don Davis  
 Piet Hamersma  
 Gavin Hince  
 Bob Best  
 Keith Pratt

1995  
 Peter Gibbons  
 Ray Parr

1996  
 Peter Weller-Lewis  
 Michael Flack  
 Ray Walter  
 Victor Quince  
 Roger Hord M Knife  
 Peter Weller-Lewis  
 Jack MacMicking  
 Lawrence Nagy  
 David North  
 George Paxton  
 Richard Roth  
 Alan Garbut  
 George Berg  
 Peter Jensen  
 Bill Kerr  
 Ian Henderson

1996 Cont.  
 Bob Carr  
 Julian Israel  
 Lyndon Spence  
 Bruce Caslake  
 Ken Morecroft  
 Laurie Green  
 Geoff Truman  
 Gavin Hince  
 Peter MacDonald  
 John Humphrey

1997  
 Ron Wigglesworth  
 Graham Meyer  
 John Diamond  
 John Humphrey  
 Avon Aitchison  
 John Diamond  
 John Diamond Jnr  
 Grahame Davis

1998  
 Steve Pettit  
 Mark Fry  
 Bob Carr  
 Ted Freeman  
 Gerry Hopkins  
 Rob Nesbitt  
 Jack MacMicking  
 Gerry Hopkins  
 Mark Ward  
 Steve Chapman

*Continued from Page 14.*

Most Prototypical Model for both categories

- Best First Time Entry
- Judges Award
- Most Improved

Whilst there are many awards to be won, let us not forget a key principle of human reward is recognition, and a tangible award will certainly support these aims.

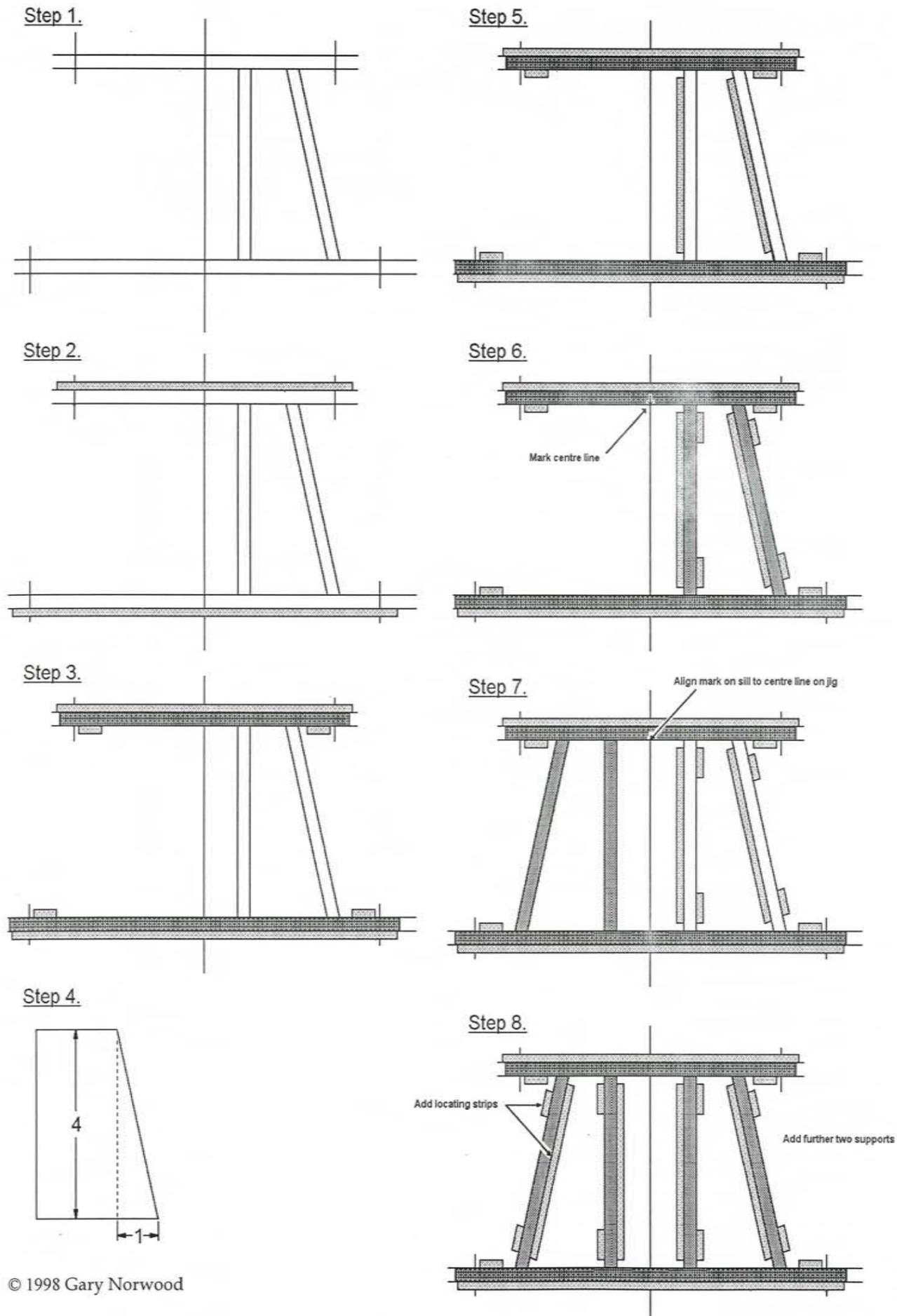
The Award System:

Would be able to recognise above-average models and recommend to their owners that they have them judged for points either at this or a later meeting  
 Awards at this level would have no recognition as regards the standard NMRA competition, so entries in this category would not be

subject to any restrictions from being entered into the NMRA competition at a later date

Would be clearly noted that this competition was a regional initiative with no formal sanction by the NMRA. %

*(Do you have a point of view? Write or e-mail your letter to the Editor)*



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# Want Accurate Trestle Bents? First - Make a JIG

Gary Norwood tells how

To produce wood trestle bents in any number requires the use of a jig to ensure that each bent is dimensionally the same.

The problem with making any jig is to ensure that the jig is symmetrical in relation to its centre line.

The test of this is to make an item in your jig, remove it from the jig, turn it over and see if it fits back into the jig. There is a ninety nine percent chance that it will not. This is due to small errors in marking out your jig.

The following procedure is my approach to making an accurate jig. The steps below relate to the drawings opposite. Let's begin:

Step 1. Mark out the basic shape of the finished trestle bent on styrene sheet. Include the centre line on this as well.

Step 2. Glue on styrene strip to locate the top and bottom sill. They must be parallel to each other.

Step 3. Add lengths of strip wood for top and bottom sills. Make these longer than required and trim to length later. Glue on short lengths of styrene strip to hold sills against top and bottom locating strips.

Step 4. Most wood trestles have angled outer members in each bent.

This angle is referred to as the 'batter angle'. It is usually 1:4 ratio.

Make a styrene gauge with this batter angle. This may seem dumb at this stage but it is important to keep this piece of plastic, as you will see.

Step 5. Glue on styrene strip to locate one angled member using batter angle gauge. Add second styrene strip for one vertical member. Add locating blocks for these as was done in step 3.

Step 6. Make vertical and angled outer timber pieces and fit into jig between top and bottom timbers. My preferred method is to cut these timbers too long and sand down until they are snug fit using North West Short Line sander. This will allow the ends of the vertical timbers to be sanded square.

This is where to use that dumb looking batter angle gauge that was made in step 4.

Use the batter angle gauge in the North West Short Line sander as an angled stop for sanding the angled pieces. The ends will be sanded to the correct angle to fit in the jig.

When these pieces fit between top and bottom sill timbers, remove, apply glue to both ends and fit back into jig until glue dries. Yes, we only have half the bent at this time.

Step 7. Important: accurately transfer the marked centreline of the jig onto the top sill so it will be visible when the half-finished trestle bent is turned over.

Remove the half-completed bent from the jig, turn it over and fit it back into the jig so that the centreline mark on the top sill lines up with the centreline mark on the jig.

Temporarily tape the bent to the jig so it will not move.

Step 8. Now the styrene strips can be glued to the jig using the timbers as guides to position them correctly.

When these dry add the two other vertical and angled timbers. Top and bottom sill timbers can then be finished to correct size.

You now have an accurate jig for producing trestle bents of just about any size.

Would anyone like to see clinic on this at one of our meetings?

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# Buying a Lathe & Mill

by Andrew Wells

For a number of years I viewed with awe those modellers who had access to a lathe and were able to produce precision items like turned wheel-sets.

Having had no exposure to 'metal-work' at school or home I basically felt that this was going to be something that was always outside of my reach. However, as I got further into building my NZ1 20 kits I found that my ability to scratch-build accurate masters was sadly lacking and I figured that the right tool for the job might help!

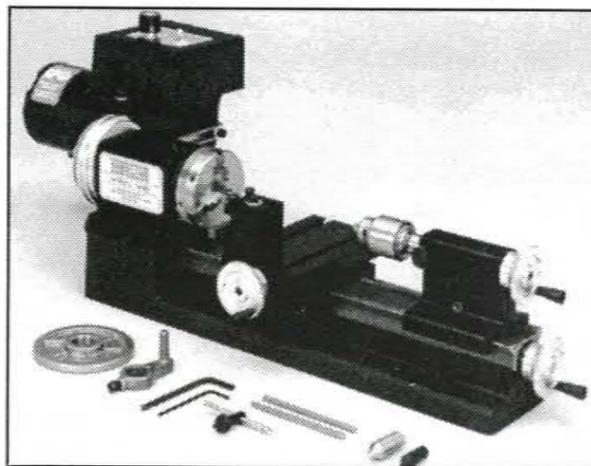
From reading articles on the metalworking internet newsgroup (rec. crafts. metalworking) I saw a common thread emerging about a small lathe from Sherline, which was both cost-effective and accurate. I made some enquiries and learnt that the Sherline range originated in Australia but is now produced in the USA.

To cut a long story short, I took the plunge and bought a Sherline Model 4500 Lathe and a number of accessories. The Model 4500 has 3.5" swing over the bed (i.e. you can turn items up to 3.5" in diameter) and an 8" capacity between centres (i.e. you can turn items up to 8" long). This is plenty big enough for my requirements. In fact, most of the parts I need are measured in tenths of an inch.

The whole unit is built of cast and machined aluminium and is both very rigid and beautifully finished. In comparison to the other 'hobby lathe' (the Unimat) that is

currently available, but uses pipes for the main bed, the Sherline is (in my humble opinion) a vastly superior machine. My lathe is calibrated in thousands of an inch, but they do also have available metric models.

Despite having never used a lathe or mill before, I am finding it



The Model 4000A lathe includes everything you need to get started.

very easy to use and the results are very pleasing. I probably tend to be a bit more tentative than a trained user, take lighter cuts and hence take much longer to do any particular job. That doesn't really worry me, however, as I find the quiet routine of turning, measuring and further turning, very therapeutic.

There is a wide range of accessories available for the Lathe and the Sherline Mill. I added a Vertical Milling Column to the lathe to allow small items to be milled, and this proved to be an excellent investment. With a total work area of two feet by two feet ('borrowed' on the kitchen counter in our rented apartment when I lived in Melbourne) I was able to turn out all the masters in brass for my NZIR Da locomotive kit with a mixture of turned and milled parts.

Since returning to Sydney and having a bit more space and money, I have invested in a separate XY table

to use with the Vertical Milling Column, so I now have a lathe and a separate mill. I still share the headstock/motor unit between the two, but in the future I might go the whole hog and purchase a second headstock. This ability to build up a stock of parts and tools that all interchange is probably the best feature of the Sherline range.

To give you an idea of the investment that I have made, I started with:

- Sherline Model 4500 Lathe (the basic model but with zero-adjustable hand-wheels), \$US450.00.
- 3.125" independent four-jaw chuck. I use this both for holding material to be turned and as a milling vise. The four-jaw chuck takes more effort to get centred than a "self-centring" three-jaw chuck, but it is more accurate and will hold a wider range of shapes. \$US120.00.
- Tailstock Chuck (to allow centre drilling of parts). \$US45.00.

So as a starter lathe setup, all up \$US615.00.

I then added on the minimum parts to allow milling:

- Vertical Milling Column. This converts the lathe into a vertical mill, and takes about 30 seconds to fit and unfit. \$US120.00.
- 3/8" mill holder. 3/8" mills are readily available (Suttons in Australia make a wide range) and are cheaper than the small 'hobby' mills. Don't be tempted to use a drill chuck to hold the milling cutters - it isn't designed for the sideways forces. \$US30.00.

So all up for less than \$US800.00 you can get a fully functional lathe and mill setup, capable of producing very accurate parts. Further, you can then expand the setup to give extra flexibility as you can afford it.

The range is available from a distributor both in Australia and in New Zealand, or direct from Sherline or a number of mail order tool

...Continued next page.

# A flexible soft-jaw Bench Vice\*

by Andrew Wells

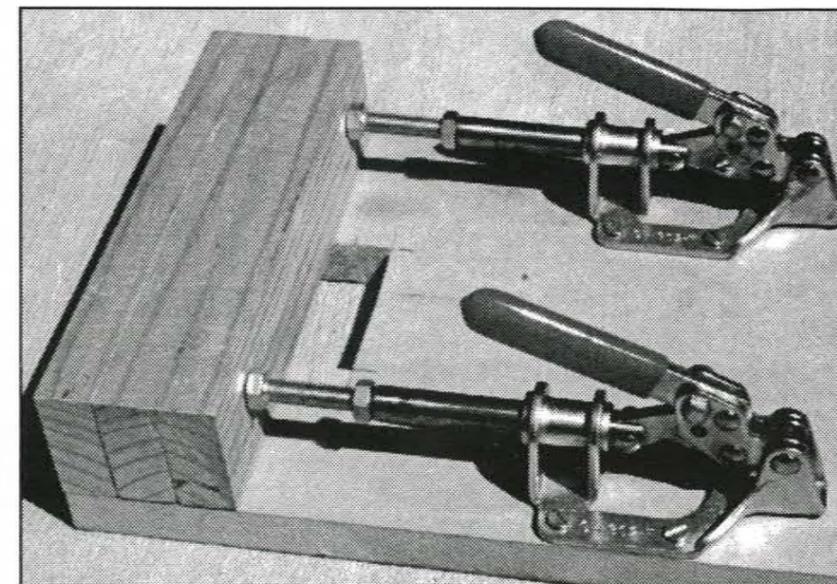
In building my brass etched NZR TT kits I need to make repeated bends along the six-inch length of some brass parts. Bending by hand gave uneven, twisted results so I tried clamping pieces of wood on each side and aligned with the bend line, then bending. This worked fine, but was tricky to set up with only one pair of hands.

So I thought about how to make a simple clamp that would be easy to set up. Basically what I wanted was a clamp with jaws about six inches wide, and soft enough not to scratch the brass.

What I came up with was the following:

The "Jaws" are 2" x 1" DAR Pine (although hardwood would probably be better) and the base is a bit of scrap 15mm MDF. The edge jaw is fixed to the base, but the others are loose so I can substitute other shapes for special jobs. The cut-out in the base allows me to clamp awkward objects.

The levers are made by "GOOD HAND." I got mine from Carba-Tec (they are in Melbourne,



Some ingenuity, scrap timber and you have a useful bench vice - Photo by Andrew Wells

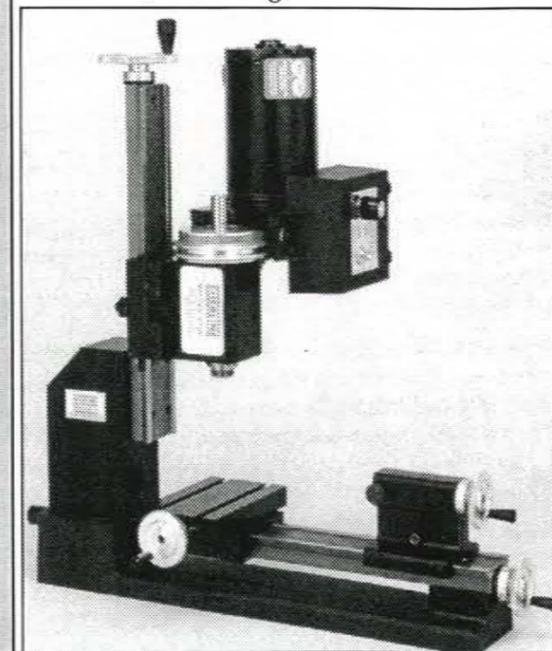
Sydney and Brisbane) for about \$25.00 each. They are adjustable over a range of about 40mm, so can be used for a range of set-ups. They apply significant force and have a locking action so your work is solidly held, but it only takes a minimum of force to actuate. % \*(Also US, 'Vise')

Continued from previous page... companies in the USA. If anyone is interested you can come and have a look at my set up and try it out for yourself. I am not financially involved with Sherline: I'm just very pleased with the equipment and thought that there might be others in the association with a similar hankering.%

NEXT ISSUE OUT March 29th  
GRAFFITI - That scourge of the prototype, has now struck the model railroad as well.  
Mark Ward tells this grimy story.

Scratch build a NORTHERN PACIFIC Thrall Centrebeam Bulkhead Flatcar. John Gillies shows how.

NEXT ISSUE OUT March 29th



# NEW VIDEO TAPES IN THE LIBRARY

Over the last few months a selection of new prototype and model railroad videotapes have been added to our library. The Board has purchased some and others have been very generously donated.

In addition we now offer a simple, convenient way of borrowing and returning tapes, specifically for our "out of town" members.

If you want to borrow a tape from the library, simply contact our librarian, Piet Hamersma (Ph 02 9622 1849) and he will mail the tape to you immediately (or if currently on loan, upon it's return). Be sure to confirm your current address with Piet.

Enclosed with the tape for your convenience, will be a reply paid envelope, for easy return of the tape. So, in addition to the increased range of tapes available, you can take advantage of free delivery and return of tapes.

This is just another service provided through your NMRA membership. Members attending Sydney monthly meetings will find that Piet has the library open for about 15 minutes during the afternoon, with a variety of tapes available for your selection. Let's have a look at the new tapes.



## PROTOTYPE TAPES PURCHASED BY THE REGION

UP LaGrande Subdivision - modern era - Green Frog Video  
SF Warbonnets over Raton - modern era - Spinnaker Home Video  
SP Tennessee Pass Vol 2 - modern era - Machines of Iron  
BN/BNSF Stevens Pass - modern era - Kalmbach Trains on Location  
Railroads in Kansas City - modern era - Mo-Kan Video

## MODEL RAILROAD TAPES PURCHASED BY THE REGION

New England Berkshire & Western - Rensselaer Soc - Allen Keller Video  
Franklin & Sth Manchester Vol 2 - George Sellios - Allen Keller Video  
B&O M&K Division - Don Cassler - Allen Keller Video  
L&N Henderson Division - Rick Rideout - Allen Keller Video  
Allegheny Midland - Tony Koester - Allen Keller Video  
Forks Creek & Central - Ron Morse MMR - Ron Morse Video  
NMRA Layout Tours Kansas City Convention 1998- - David North  
NMRA AR Mini Convention 1998, Various Clinics - Aust Region - NMRA



## MODELLING TAPES DONATED TO THE REGION LIBRARY

Finishing your Scenery - produced and donated by Dave Frary  
Painting Model Structures - produced and donated by Dave Frary  
Rocks & Basic Scenery made Easy - produced/donated by Dave Frary

## PROTOTYPE TAPES DONATED TO THE REGION LIBRARY

SF Arizona Mainline - Pentrex - donated by Region member Ken Edmier  
SF Mojave Mainline - Pentrex - donated by Region member Ken Edmier  
BN Crawford Hill - Pentrex - donated by Region member Ken Edmier



Maybe you'll find some ideas that you can incorporate in your own layout or you might just enjoy some time being a couch potato. Either way - happy viewing.

*David North*

**THIS IS JUST ANOTHER BENEFIT PROVIDED THROUGH YOUR NMRA MEMBERSHIP**

## Australian Region Directory

NMRA Inc. P.O. Box 714, Willoughby NSW 2068

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