



NTRAK

NEWSLETTER

SUPPLEMENT
Jan/Feb, 1981

You will find a great deal of information in this supplement. There are two more Locomotive Test reports, eight articles in the Clinic section, including two for the Nn3 modelers. There is a Master List of all N scale locomotives that have been produced in quantity. The list contains a surprising assortment of engine types.

There is a Master List for the cars and engines that were sold by MRC in the late '60s and early '70s. We are continuing our Master Lists for N scale and hope to cover all of the makes as well as updating the past lists.

On page 13 of last year's Jan/Feb issue there is a picture of two of the three special run Kadee cars that Pastor Kelly Killinger had made as a fund raising project for a Youth Ranch that he is affiliated with. Some of the first series of special run Kadee 40' box cars are still available for a tax deductible donation of \$20 for the set of three. The second three cars in the series are planned for later this year. All cars are serialized by sets. Owners of the first set will be offered the same serial number in each of the new sets as they become available. This is a chance to add to your collection of Special Run Kadee cars and at the same time to make a donation to a worthwhile youth program. Pastor Killinger, 11922 MacDuff, Garden Grove, CA 92641.

In the same J/F'79 issue there was a photo of another special run Kadee car that Bill Doovas hoped to have available. This was a blue car lettered "Kendall" and used in a pen and pencil holder set as a gift to hospital buyers of large amounts of Kendall's medical supplies.

A second run of the cars was made with larger lettering. This was the last special run by Kadee. Bill did manage to get some of these cars, but is holding them until he knows whether Kadee will do any more special run cars. Bill has sent out a letter to all who had inquired about these and other special run hoppers that Bill was selling. He has hopes of offering more special run cars and if you would like to get the questionnaire that he sent out, send him a LSASE. Bill Doovas, PO Box 457, San Gabriel, CA 91776.

Interest has been expressed in some standards for "N Trolley"! Harry Steinfeld, 1320 Addison St #B-323, Berkeley, CA 94702 would like to hear from any of you who are interested in N scale traction. The idea is to establish wire heights, minimum radius and track locations between modules.

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The NTRAK Newsletter is published six times a year and covers N scale modeling news, products and events. The subscription is US\$ 5.00 per year.

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In the last issue I ran a comment by Peter Postel on urging Athearn to build N scale engines and rolling stock. Jim Conway of ConCor has written some comments in reply.

It is true that Athearn seems to have some of the cheapest items on the market, and that N scale does seem to be more expensive than HO. However, Peter ignores some basic points, and being a good friend of Irv Athearn I think I can make the following points on a firm basis.

All of Athearn's cars and engines are kits, not assembled items. Our experience, as well as the experience of Atlas, with kits is that the majority of N scalers prefer "Ready to Run". This adds quite a bit of labor to the cost. Also, we use metal wheels and axles which are more expensive. Experiments with plastic wheels have not been satisfactory. Kadee has used part plastic, part diecast wheels, but again their assembly method is much more complicated than an Athearn HO wheelset, so costs are higher. If Athearn had to make N scale, assembled, and with high quality wheels, his cost would not be any lower than ours.

By the way, there are four companies making N rolling stock in the USA now: Atlas, ConCor, Kadee and Model Die Casting.

Locomotives are another story. Athearn makes only diesels, having given up on steam many years ago as too complicated. So we have to restrict our discussion to diesels.

Athearn sells maybe a quarter of a million HO diesels a year, giving him a tremendous advantage in buying motors, and other parts common to all models, at cheaper prices. A company has to get its investment back within a year. Therefore, all development and tooling costs have to be included in the original base selling price, amortized against the first years expected production. HO sells about 7 to 1 over N scale and cost of tooling a given engine would be quite similar for either HO or N, but 7 times the base cost must be added to an N scale model to recover

tooling over a similar HO project. The lack of previously tooled N scale "common parts" such as wheels, trucks, wipers, U joints, etc will add to the cost. Also, if you look at prices, the newest model (FM Trainmaster, tooled in 1978) sells for \$22.50 vs about \$15 for older diesels. Current tooling costs would bring a new HO locomotive closer to \$30.

It basically comes down to volume. If N scale sold the volume HO does, prices would be lower.

Now the argument that if N makers dropped their prices, they would get additional sales. Most likely this is true, but converting people to model N scale takes time and more than likely the manufacturer who dropped his prices below his costs to entice more people into N scale would be out of business long before the number of N modelers became enough to warrant the lower prices. It is the old "chicken or the egg" story in a way.

JIM'S CORNER

I had a phone call from the owner of Rocky Mountain Models last fall. He was over from Germany visiting his cousin in Aspen. He said some items in his proposed line of American N and Nn3 brass kits were in stock. He was to send me price and ordering information, but I hadn't gotten it at press time. He expects to be showing at the Nuremberg Toy Fair in January and hopefully will line up an American distributor by that time. If I get any definite word, I'll pass it on.

Columbia Car & Foundry recently sent out a letter saying that work on an improved die for their doodlebug kit was about complete and orders would be shipped in December. I hope that they get things straightend out. The best advice on their kit is: If you see it in a shop and like it, then buy it, but don't order by mail.

There are a number of questions that keep coming up about how we do things on NTRAK modules. The most often asked is: Which coupler is "standard" on NTRAK, Kadee or Rapido type? We don't have a standard for couplers. You will find both types in use on most layouts. The Rapido couplers work very well for passenger trains, unit trains, and very long (100 car +) trains. The Kadee couplers are preferred for switching and many of the NTRAKers use only Kadee trucks and couplers. The Kadee wheels stay in gauge and don't cause the cars to vibrate as off center wheels found in most other makes will do.

Another common question is: Can I use Atlas (or Rapido, or ...) turnouts? The answer to this is both yes and no. The main consideration here are the three "community property" tracks that are common to all the modules and are used by everyone. We want these to be as trouble free as possible. These tracks are the main reason for the whole layout ... showing high density mainline traffic in action. If the trains consistently derail at one bad turnout, then that will have to be repaired or replaced. We have in the past removed a turnout and fitted flex track in the gap, just to make things run smoothly. We have had very good luck with Peco and Shinohara turnouts, so they are the recommended brands. Some samples of these still need adjusting, but they cause the least trouble. Atlas turnouts have caused a great many problems and often we have spiked the points in place. Another source of trouble have been slip switches and 15 degree crossings. We would prefer not to have these on the three common tracks. Hand laid track is often rather fragile and ambitious track cleaning crews have been known to ruin several feet of hand laid track without realizing it. All brands of flextrack have worked well, but there is a

difference in rail height between brands.

On the rear portion of your module you are free to use any type of track and turnout that you wish. If there are problems, they only effect your running there and the rest of the layout can continue to operate.

Sidings on the mainlines are OK and they can use #6 or even #4 turnouts. However, if they are part of a crossover track that passenger cars or long trains might use to shift from one main to another or to the branchline, then #8 or Peco long turnouts are needed. The straight portion of the turnout should be the through track.

Electrical problems with modules at times have been traced to the use of telephone wire that had been stapled in place with bare staples. Telephone wire is too small for our track wiring in the first place and the insulation is quite thin making it easy for the staples to cut through and cause a short circuit. Since the track wiring carries the power on to the next module and in some cases all around the layout, we need the heavier wire (#18) called for in the manual.

Can I use Homosote board? Sure. It isn't mentioned in the manual because its main value seems to be for spiking hand laid track. It does need to be well supported, as it tends to sag with time.

Most material and construction methods can be used to make a module. The thing to keep in mind is that these are to be portable. They will have to be carried up stairs and be bounced in a trailer at times. The construction shown in the manual works well and foam scenery is far lighter than plaster and much more flexible. Cork roadbed fastened with white glue and flextrack glued with water base contact cement stays in place with some flexibility and is easy to salvage if need be. (See N/D '78 Newsletter on laying flextrack.)

MARTIAN NEWS

By Ray Witmer
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The Jena Pass Railroad

The JENA PASS Railroad, or the Jaypee as it is more commonly known, is my fantasy world's version of the VIRGINIAN. I have always been fascinated by long strings of hoppers loaded with coal creaking slowly past a grade crossing. I date my conversion to model railroader vs train runner from my arrival in Norfolk, VA in 1972. There I saw those black snakes almost daily. A friend, Jim Alley, was a N&W buff and helped my interest grow by running 20 N&W and 5 VGN hoppers behind his Y6b. Believe it or not, I had never heard of the Virginian before that. I bought and devoured a copy of Reid's The VIRGINIAN Railway. My fantasy took off like a rocket and followed the path described below.

The Jaypee was formed as a coal hauler in the VA/MD/WVa area at about the turn of the century and worked away dropping loads of bituminous coal off with either the C&O or the N&W. After several years, the two giants financed the tunneling and grade improvement that let the Jaypee function as a bridge from northern Virginia to south western Pennsylvania. I put the mainline on a map and noted a strong similarity to the WESTERN MARYLAND's right of way, so I decided that the already mentioned trio of prototypes bought the Jaypee effective 1 January, 1960 and operated it from that point on as a joint holding company. Only engines and rolling stock devoted to her old right of way wore Jaypee livery since then, which accounts for the scarcity of JP equipment seen on the rails these days.

I model the JENA PASS in the mid 50s. My steam is "hand me down" Y6b locomotives discarded by the N&W and VGN. My diesels are exclusively Alco and home road owned. The only

exception is a brace of GP9s leased from the N&W.

Anybody out there interested in trading private road name lettering? I have had custom decals made in both HO and N scale in white for freight cars and extended lettering in both black and white for N scale passenger. They are in the same "Apex" style lettering as the heading for this article.



THROTTLES FOR N SCALE

By Jim FitzGerald

This will be more of a discussion of throttles rather than a hard recommendation for one particular unit. The one thing that stood out in the results of our ongoing Locomotive Test program is that throttles make as much or more difference in an engine's performance as the engine itself.

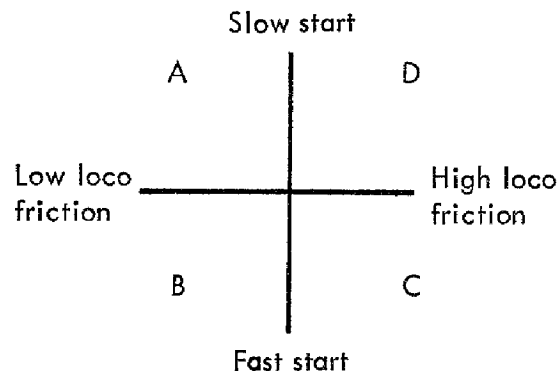
Smooth starts and slow speed running are all but impossible with the train set type power packs. The ones designed for N scale are far better than the ones for HO, when used for N scale. The N scale engines draw so little current that the variable resistor type controls sold with train sets have little effect. A big improvement is to add on a transistorized or SCR (Silicone Controlled Rectifier) type controller. Intrakit has a good SCR type unit and advertises in the our Newsletter. The Ottawa Valley NTRAK club uses the Intrakit throttles for their layouts. Cama, MRC Cab Control 55, Mann Made, and Troller all will give far better slow speed control of any of your locomotives, when compared to the train set type pack. There is a list of addresses at the end of this article for info and ordering these throttles.

There is a two transistor throttle that you can build detailed in Peter Thorne's book Electronic Projects for Model Railroaders published by Kalmbach. He gives step by step instructions and it is a good first time electronics project. The cost is low and it will greatly improve your train control and enjoyment.

While proper lubrication and breaking in are important, some engines have far more friction built into them than others. The wipers cause drag, the bearing type, the gearing, idler wheels, valve gear, etc all contribute. The motors are another big factor. They can be three pole, five pole, or "can" type. The motor bearings vary, magnet strength can vary, the number of turns on the armature, etc all make for motors that run poorly or well. The torque available may be marginal for the mechanism. Our engines run on direct current and will run on battery power, but not too well. Our throttles are powered by household AC with the voltage reduced by a transformer and the AC rectified into DC pulses that may or may not be smoothed out with capacitors acting as filters. Leaving the pulses in gives the motor a momentary amount of higher voltage and this will overcome some of the friction and allow slower starting. It also causes extra heating of the motor. The SCR and some other throttles use a "spike" of voltage to overcome friction. Full 12 volts is "on" for a fraction of a second and then "off". This pulsed DC is very good at starting engines slowly. In the case of engines with high friction and marginal strength motors, it can also cause the motors to overheat and burn out. Some throttles combine pulses for starting with smoother DC for running. The design of throttles can get very complicated and controversial.

The NTRAK controllers that we use for the big layouts are a three transistor unit running from a regulated power supply. Because of the regulation, the supply has large filter capacitors and puts out very smooth DC and hence no pulse. They work reasonably well for switching, but you can't get as low a speed as you can with a pulse type throttle. We had to add pulse on the low speed mode of the ATC versions of the NTRAK throttles to get reliable re-starting. I plan to build some manual throttles with pulse added at starting speeds only, when time allows.

Dave Petty made a comparison survey with 9 of his well running steam and diesel engines. He compared the Cama SCR throttle, Troller TRH 200, Troller Transcab 200, and Mann-Made. The Cama had been selected previously over a couple of plan built units and a Fyffe throttle. The Troller TRH 200 was used with both AC and DC power. He tested for slow speed running, smoothness of acceleration, and running quality at normal speeds. The Cama and Mann-Made units came out on top with the edge going to the Mann-Made throttle. Both are of the SCR pulse type. Dave does mostly switching and all of his engines have been selected for good operating characteristics and then have been tinkered with more. For him the SCR type throttles work fine, but a person doing a lot of constant running of long trains with poorly designed and maintained engines can experience motor heating and most likely motor burn out as well.



Peter Postel has come up with an interesting way to look at the problem of both the engine and the throttle. His chart has a horizontal line going from low engine friction to high engine friction and a vertical line going from fast starting motor-gear combinations to slow starting combinations. The four quadrants are labeled A, B, C, & D and represent combinations of engine characteristics. The following is quoted from Peter's copyrighted article in his Brooklyn Loco Works newsletter.

"... The locomotive that we would all like to buy is represented by AREA A. The friction is very low (meaning low heat, long life

operation) and the loco also starts up smoothly. For this type of loco (Minitrix U28C, ConCor PA-1 are examples) pulse power is unnecessary. An engine represented in AREA B would tend to be a jack-rabbit in starting because of its low friction and fast starting characteristics. Many Atlas GP-9's fit into this category. In my estimation, this is the only area where pulse-power is both useful and safe. The spikes of power will slow down the fast starting loco at low speeds and the low friction design will keep overheating to a minimum. AREA C represents an interesting case. Although the motor (too fast) and reduction gearing are poor, high friction in the mechanism may result in adequate slow speed operation. Many N scale steam locos fit into this area. Here pulse power may not be needed, and the high friction may make its use potentially dangerous. AREA D represents the extreme danger area. Because of gearing or motor design, it starts out slowly, but the high friction of the mechanism may cause insufficient speed in operation. This often results in the motor running hot. Even though the motor may try to turn over, the high friction may cause a different type of "jack-rabbit" start. The motor struggles to overcome friction, then suddenly jumps into action when sufficient additional power is added. The potential for heat build up here is obvious. While pulse power may be tempting here, this is the most dangerous application of pulse with its resulting extra heat. Some specimens of the Rivarossi Big Boy and SW-1500 fit into this category. The use of pulse power here does not cure the uneven starting problem - it simply covers it up. Unfortunately, this is often at the expense of a burned out motor.

"A much better approach is to work on the locomotive itself. Your goal is always to bring the loco closer to area "A". Each type of loco will require a different approach. Type "B" engines will often benefit from a repowering job. While the addition of a more responsive, slower starting motor won't cut down on excessive top

speeds, it will markedly improve slow speed operation. An example of a modification of this type is the addition of the 5-pole Atlas E-7 motor to the basically sound mechanism of the GP-9/GP-30 loco. For those with even more ambition, the Sagami motor can be fitted into the narrow hood resulting in an extremely smooth running diesel. The key to improving "C" and "D" type engines is the reduction of friction. Highly recommended is Labelle #134 Powdered Teflon. Small amounts can be added to light oils for bearings and universal joints. On gears, Labelle #106 Grease comes with Teflon already added.

"For N scale locos, I have found the MRC add on unit Cab Control 55 to be the best power source. It's pure pleasure to run a good loco with this pack -- responsiveness is excellent. No, it won't turn your lemon loco into a creampuff -- but then neither will pulse power. If you have a good running engine, why chance overheating with pulse? If your loco is a lemon (other than type "B") pulse power benefits in the short run may well end up in burning out your motor over the long haul."

Those are Peter's ideas on the problem. He sells and services N scale engines and sells spare parts, so he has a first hand knowledge of the problems of motors that have "self destructed".

The Frank's N'gineers NTRAK club has used the MRC 55 units, that Peter recommends, for some time now and with good results. They have worked well for both switching and long train running.

There is a danger in using a big 2-1/2 to 5 amp power pack on the average N layout. Unless you are using meters, know what to look for, and are watching the meters closely, you can keep turning up the power on a balky engine and fry the motor. The simple addition of an automotive back up lamp in the circuit will act as a "current limiter" and at least reduce the danger. (See page 17 of the N/D '79 issue).

I'll welcome any reports or comments from readers on their experiences with various throttles for N scale.

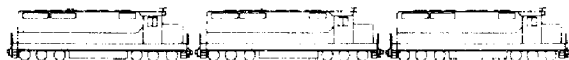
Addresses for throttles mentioned in the above article.

Mann-Made Products, PO Box 27009, Cincinnati, OH 45227 has six different models as well as other electronic "goodies" for model railroads. LSASE for catalog sheets.

Cama Train, PO Box 09063, Chicago, IL 60609. SCR throttles in four styles. SASE for details.

Intrakit, 2457 Sudbury Av, Ottawa, Ont, Canada K2C 1L6, Canada. SCR throttle kits in several styles. Write for info.

MRC and Troller are available at most hobby shops.



N Scale Engines All Time Master List

Listed by engine type and model manufacturer are the American prototype models that have been made in N scale. Not all models are currently being made but may still be found.

Semi-custom engines made by Jamco, Rocky Mt, and others are not listed. Some importers as Life Like, Park, and others sold engines made by others, but under their own label. Not all of these are included.

p = powered, d = dummy, # = 2 different mechanisms used in same shell.

Alco PA-1	pd# ConCor
Alco PB-1	pd# ConCor
Alco C-636	pd ConCor
Alco FA-1	p Atlas
Alco FA-2	p Rapido
Alco FA-2	p MRC
Alco FA-2	p Model Pwr
Alco RSC-2	p Atlas
Alco RSD-15 hi hood	p MRC
Alco RSD-15 lo nose	p MRC
Alco RSD-15 lo nose	p Model Pwr
Alco C-420	p MRC
Alco C-420	p Model Pwr
EMD SW1500 cow	pd Atlas/Rvr
EMD SW1500 calf	pd Atlas/Rvr
EMD F3A	pd# ConCor
EMD F3B	pd# ConCor

EMD F7A	p AHM/Lima
EMD F9A	p Atlas
EMD F9A	pd Bachmann
EMD F9B	d Bachmann
EMD F9A	pd Rapido
EMD F9B	d Rapido
EMD F9A	pd Minitrix
EMD F9B	pd Minitrix
EMD E-7	p Atlas
EMD E-8	p Atlas/Rvr
EMD GP7	p Rapido
EMD GP9	p Rapido
EMD GP9	p Atlas
EMD GP30	p Rapido
EMD GP30	p Atlas
EMD GP30	p MRC
EMD GP30	p AHM/Lima
EMD GP40	p Atlas
EMD GP40	p Model Pwr
EMD GP40	pd Bachmann
EMD SD45	p Atlas
EMD SD45	pd ConCor
EMD SD45	p Model Pwr
EMD FP45	p AHM/Lima
GE Center cab sw	p ConCor
GE U28C	p Minitrix
GE U30CG	p Minitrix
GE U36B	p Bachmann
GE U50	p ConCor
GE Gas turbine	p ConCor
FM H-12-44 switcher	p Minitrix
FM C-Liner	pd Atlas/Rvr
Bal Switcher	p Rapido
Dav Switcher	p Atlas
Ply WDT switcher	p Model Pwr
Ply MDT switcher	p AHM/Lima
Ply 6 wh switcher	p Bachmann
Ply switcher	p Atlas

Electric type & self propelled

Budd Metroliner	pd Bachmann
GE GG1	p Rapido
JNR EF-70	p ConCor
JNR EF-57	p ConCor
JNR EF-65	p ConCor
UA Turbotrain	pd Bachmann

Steam type locomotives by wheel arrangement.

t = with tender

0-4-0 Dockside	Rivarossi
0-4-0 Dockside	Bachmann
0-4-0 Switcher	t Atlas
0-4-0 Switcher	t Rivarossi
4-4-0 American	t Bachmann
0-6-0 Lil donkey	Minitrix

0-6-0T	Tank switcher		Model Pwr
0-6-0	Switcher		Atlas
0-6-0	Saddle Tank		Atlas
0-6-0	Dockside		MRC
0-6-0	Old timer	t	Rapido
0-6-0	Switcher	t	Rapido
0-6-0	Switcher	t	Bachmann
2-6-0	Old timer	t	Minitrix
2-6-0	Switcher	t	Minitrix
2-6-2	Prairie	t	Bachmann
2-6-4T	Q1B switcher		AHM
4-6-2	Pacific	t	Minitrix
4-6-2	Pacific	t	Atlas/Rvr
4-6-2	Pacific	t	Rapido
4-6-4	Hudson	t	Rapido
4-6-4	J-3A Hudson	t	ConCor
4-6-4	Shrouded Hudson	t	ConCor
4-6-4	Bullet nose H.	t	ConCor
4-6-4	Shovel nose H.	t	ConCor
0-8-0	Switcher	t	Atlas/Rvr
2-8-0	Consolidation	t	Bachmann
2-8-2	Mikado	t	Rivarossi
2-8-4	Berkshire	t	MRC
2-8-4	Berkshire	t	Rivarossi
4-8-2	Hvy Pacific	t	Rivarossi
4-8-4	Northern	t	Bachmann
2-10-0	Decapod	t	Minitrix
2-8-8-2	Mallet	t	MRC
2-8-8-2	Mallet	t	ConC/Rivr
4-8-8-4	Big Boy	t	ConCor

LOCOMOTIVE TEST REPORT

Bachmann USRA 0-6-0 Switcher

By Rick Spano

Testing by Konrad Richter and Rick Spano

Alco and Baldwin built 255 USRA 0-6-0 switchers. The engines were originally built for: ACL, B&O, CB&Q, CGW, CNJ, GM&O, GT, GTW, MEC, NYC, Omaha OSL, PRR, P&WV, RI, SAL, SLSF, T&P, TRRA, UP, and Washington Terminal. MP and NKP later had copies built. This is quite an impressive list of roads which employed this switcher. In later years many wound up on short lines. Switchers of this design were in operation as early as 1918; they sold for \$36,000. These are some of its vital statistics: 51" diameter drivers, 21" dia. cylinders with 28" stroke, 190 pounds per square inch pressure, 165,000 pound weight and 39,100 pounds tractive effort.

Bachmann has done a fine job in producing this model. Fidelity to detail on both the plastic tender

and boiler shells, and overall proportions are excellent. All key dimensions are within plus or minus 2% and most fall within 1% variation. There are two noticeable deviations from the prototype which are easily corrected, i.e., a recess or depression is located where a number plate belongs, and the fire box and ancillary piping should follow the contour of the boiler straight back beneath the cab. Instead, part of the fire box follows the contour of the cab. The photos show a comparison of the deviation and a correction.

A small disc of card stock or styrene cemented where the number plate should be will correct the first deviation. The second is corrected by carefully cutting with a razor saw along the bottom edge of the cab. Now with the saw blade parallel to and flush against the fire box, cut up until the bottom of the cab is reached. The plastic piece removed will contain the rear portion of the fire box, some piping, and the bottom portion of the cab hand rail. Remove the front and rear portions of this piece and file or sand the back of this piece smooth. Cement this piece to the front portion of the fire box and rear of the cab with Plastruct cement or Microweld.

The main rods, side rods, eccentric rods, and cross heads are of stamped nickel plated brass and are riveted together. The cross head guides and link bearings are one integral stamped steel piece. Valve gear is completely missing, but could be fabricated from hard brass wire or steel wire with some care. As with most N scale switchers, the rodding is grossly over scale in thickness. Careful and judicious filing can minimize this fault, but would leave a very delicate mechanism that would not withstand rough handling. Almost all of the hand railing on the engine and tender consist of wire. An exception is the molded-on railing at the rear of the cab.

The chassis consists of a single copper coated zinc casting which constitutes most of the weight of the engine. A zinc slug in the smoke box contributes a little more weight. The mass (weight) of the

engine is 45.3 grams and the tender is 15.2 grams for a total of 60.5 grams. Five of the engine's six plated brass wheels have electrical pick up to the grounded chassis, via the axles. The two extreme wheels on the right side transfer pick up via an "E" shaped phosphor bronze strip which is riveted to a "C" shaped plastic insulating strip. A single brass screw holds the plastic insulator strip in place. This insulator strip, along with a "U" shaped slot in the rear of the chassis, holds the three pole motor in place. The motor's appearance belies the fact that it is well engineered and well made. It withstands the abuse of an SCR throttle under all possible operating conditions without failure. A silver colored brush holder is grounded to the motor frame via a small rectangular shaped phosphor bronze strip. The motor in turn is grounded to the chassis of the locomotive via its mounting. The motor is easily removed for servicing. Remove the brass screw holding the plastic insulator strip. The bronze strip attached to this insulator both holds the motor in place and makes electrical contact to the lower brush holder. At the upper left hand corner of the insulator strip is a hole which fits over a locator pin. Carefully pry the insulator strip off of the pin and remove the strip. The motor will easily slide away from the chassis now. Use a small amount of plastic compatible oil to lubricate the armature shaft at each bearing at about every 10 to 20 running hours. The commutator should be cleaned with a plastic compatible contact cleaner. Electrical supply houses carry these; the spray can type is preferred. When replacing the motor be sure that the yellow colored field magnet is up and the red colored field magnet is down.

The drivers are held in place by a retainer plate. The plate is fastened by two black brass screws. Press fit pins hold the main and connecting rods in place. Once the wheels are removed, the idler gear can be removed. The worm gear is fastened by a brass press fit pin. If for some reason the wheels have been removed, replacement is

facilitated by removal of the motor. This simplifies quartering and aligning wheels with the rods.

This locomotive, like the prototype, tends to waddle down the track. If the waddling seems severe, check to see that the wheels are properly quartered. For example: if the drive pin of the first drive wheel should be at 12 o'clock, the drive pin of the third wheel should also be at 12 o'clock, and the drive pins on the opposite side of the engine should be at either 3 o'clock or at 9 o'clock. Quartering can be accomplished by turning the culprit wheel with your thumb or a padded flat nose miniature (jewelers) pliers. A combination of inspection and running will determine when proper alignment has been achieved. "Jack Rabbit" starts and excessive wheel slippage will tend to cause the press fit drive wheels to slip on their axles, which will cause the problem.

Despite the waddling the engine tracks a little better than the Trix 0-6-0 switcher and its electrical pick up is equivalent to the Trix switcher. Both engines tend to stall at insulated frogs at scale speeds of less than 20 mph. This electrical pick up problem can be virtually eliminated by adding tender pick up.

Performance Analysis

Four locos were tested. Three were well run in and the fourth was new. An NTRAK throttle with an unfiltered DC supply was used for the tests. In addition, the new loco was also tested with an SCR (Silicone Control Rectifier) type throttle that produces a strong pulse. All results were the same except that a 1.3 scale mph speed was possible with the SCR as opposed to 13 mph with the NTRAK throttle.

Speed at 10 volts ranged from 95 to 164 with 125 the average. While typical of many N scale models, it is none the less very fast for a switcher! The engines drew from between .15 and .25 amps at 10 volts under full slip conditions. If your engine draws more than .25 amps, check for binding and lubrication problems.

The slow speed range with the NTRAK throttle went from a low of 13

mph to a high of 23 mph; this was due to the differences in quartering which was explained earlier. Unfortunately the tractive effort part of the performance analysis was conducted prior to the slow speed measurements. The tractive effort test caused mis-quartering of some of the engines.

In conclusion this switcher is well designed and executed. It should run serviceably for many years. It tracks well and with an average 11 gram (.4 oz) tractive effort, will pull 14 to 15 average cars on straight level track. It also affords the modeler the opportunity at loco conversions such as moguls, saddle tanks, logging engines, etc.

The engine comes with Rapido type couplers, but the #1104 Kadee conversion coupler can be installed easily.



Locomotive Test Report Rivarossi 0-4-0 with tender

By David Petty

This model of the 0-4-0 locomotive built by Baldwin Locomotive Works around 1912 should be at home on any era pike depicting 1912 or later.

The model consists of a cast metal shell which provides maximum weight for the small locomotive. The frame is plastic and electrical pickup is from spring wipers on each side of the frame in contact with all four wheels at the rims. Electrical pickup from the right side goes from the wiper, which is placed in contact with the plate that holds the wheels in place, to a contact which connects directly to one pole of the motor. The wiper on the other side is in contact with the metal locomotive shell, then a wiper on the motor completes the connection by pressing on the shell. A small amount of dirt or corrosion at any one of these points will interrupt the flow of electricity, so if you have the locomotive apart watch for dirt at these points.

Additional electrical pickup comes from 4 of the 8 tender wheels, two wheels from one side of the

front truck and two from the other side of the rear truck. The locomotive connects to the tender by a plastic draw bar insulating two pieces of metal which route the power, in a round about fashion, through 13 or so connection points to the tender wheels. This drawbar connection is rather rigid and when the locomotive is being run on unevenly laid rail joints, such as can occur when using turnouts from one manufacture and track from another, an occasional stalling problem exists. When run on well laid track, I have not experienced any stalling problems.

There is a Kadee conversion available, but it is not an easy one as the pilot must be cut, correctly of course, a hole properly drilled and a screw fitted - all in a rather small space. "Measure twice and cut once" is a good rule to follow when completing this conversion. The rear truck conversion is rather easy - replace the rear truck with the Kadee truck, replace the wheels and wiper in the Kadee truck and run. Only one problem here, the Kadee truck distance between the wheels is shorter than the replaced truck and the bolster hole is spaced differently. These cause the wiper not to contact the axles in the proper place which results in less contact area for the connection. Occasionally I have experienced loss of power from this on uneven track. Visually the difference is difficult to spot, but obvious once you notice it. Perhaps there is a prototype for it somewhere, however.

Currently I own three of these locomotives and all three seem to have a slight, but noticeable jerk in their movement at slow speed. This is not something that is likely to bother most modelers, based on comments of other modelers when I run my locomotives on public display. I have become over sensitive about locomotive performance and look for flaws. I find this slight jerk mildly objectionable. When I see some extra money rolling up hill, I plan to purchase a can motor and see how it affects the locomotive's slow speed operation. If I ever have the chance to do so, I will write about the experience.

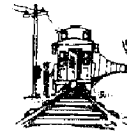
For a small locomotive, pulling power is good. On flat straight track I could pull 10 Kadee cars; on a 2-1/2% grade this dropped to 5 hoppers.

The following table shows the test results of all three of my locomotives. Locomotives #1 and #2 have been run only a little; on the order of 2 hours in switch engine service. Locomotive #3 has seen considerable service.

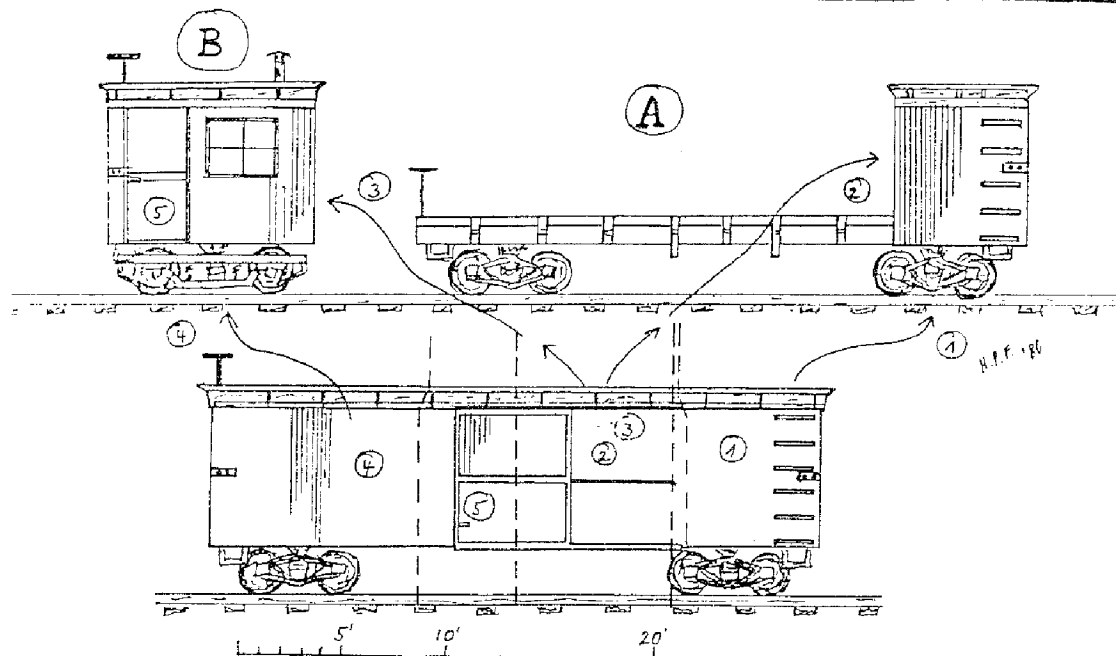
Test Results: Rivarossi 0-4-0

	Locomotive		
	#1	#2	#3
Max amps, full slip	.28	.18	.15
Amps at 10V, no load	.24	.15	.14
Speed at 10V	68	88	109
Starting low speed	1	4	0.2
Volts	2	2.8	1.5
Amps	.08	.1	.06

Conclusion. This is a well made locomotive which should give good service. I have had no electrical pickup problems on well laid track with clean rail and clean wheels, but I feel a bit uneasy about the large number of potential trouble spots in the tender to motor electrical pathway, especially as the locomotive becomes well used and the parts wear. If trouble develops, however, a wire from each pickup directly to the motor should solve the problem. This should make a fine switch engine that most modelers will enjoy using.



NTRAK NARROW GAUGE



Kitbash a Work Train in Nn3

[A] Flatcar with Tool Compartment

By Helmut Fleischhauer

Now that Nelson Gray's line of fine Nn3 cars has been expanded, modeling Nn3 has become easier for the Narrow Gauge fraternity. Here are three cars made from Nelson's kits and some bits and pieces from the scrapbox. (Nelson Gray, 900 E Brighton Av, Syracuse, NY 13205)

For this project you will need an Nn3 flatcar and boxcar kit. Cut the boxcar superstructure to get part 1A. Note the angle of the roof overhang. Smooth the cut and remove a similar length from the flatcar top. Both parts may now be cemented to the metal flatcar frame. Part 2 is now cut from the boxcar side to make the front wall of the tool compartment. Cut and sand part 2 to

fit and cement in place. Before adding trucks, couplers, and brake wheel, the car should be painted. I airbrushed the model light gray, brake wheel and trucks are black. Some boxes, ties, and bits and pieces are added for a load and the car is ready for work. This car is the narrow gauge version of a similar car shown in Model Railroader some time back.

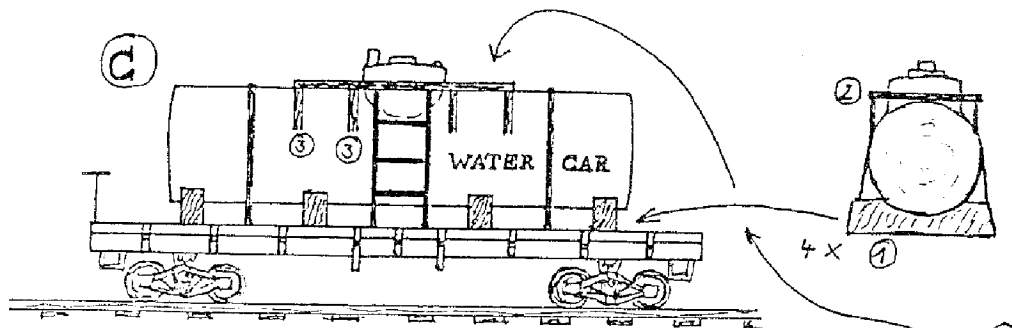
[B] Multipurpose Car (Caboose, "One Holer", ...)

In addition to the rest of the boxcar from project A, a passenger truck, a piece of brass tubing, clear plastic, thread, and some stripwood are all you need.

Cut part 4 from the remaining

boxcar as indicated. Again make the angle cut for the roof end. The boxcar metal frame is cut as well. Part 3 (like part 2, but from far side) will make the front wall. Before cementing parts together, cut out windows. Part 5 will make an optional side door. The window frame is made from stripwood or quartered matches. The window cross is thread cemented in place. When the car is used as a "relief car" the window panes (clear plastic) are made dull with sandpaper.

Now the car can be cemented together and the brass tubing added as a vent or stack. After painting, the passenger truck is either screwed or glued tight in place. Couplers and a brake wheel complete the job.



[C] Tank Car

This addition to the work train requires a flatcar kit and a Nelson Gray Z tankcar kit. You will also need some scribed wood, brass wire, and thin shim brass. First assemble the flatcar without alterations. Now cut all details from the tank and sand smooth. The supplied weights are not cemented inside the tank car. Cut four pieces of wood for saddles, as shown in the drawing and cement on the flatcar. Part 2, the 6'x12' platform, is made from scribed wood with a cutout for the tank dome. Cement the platform on the tank and cement the tank on the flatcar saddles. Square wood is added to support the platform. Parts 3 are tie down straps made of shim brass. The ladder is either soldered or epoxied from thin brass wire and cemented in place. I painted the flatcar brown and the tank black. Slight weathering was applied to represent water spillage. Adding trucks, couplers, and brake wheel complete this addition to the work train.

An Nn3 Bachmann 4-4-0 Conversion

By Garth Hamilton

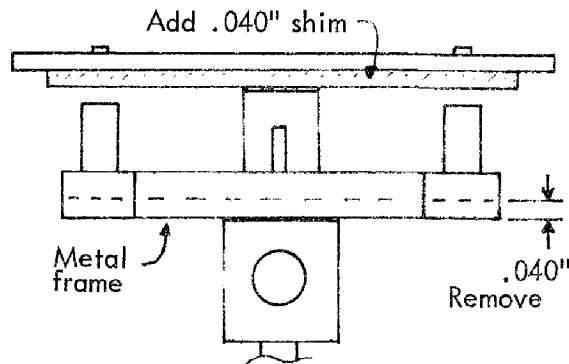
The proportions of the Bachmann 4-4-0 American locomotive call out for a narrow gauge conversion. It turns out to be a fairly simple job that took me about three hours time.

First disassemble the rods and driver mechanism. File the sides of the base plate that holds the drivers in place until half of the words "Bachmann" and "Hong Kong" are gone. Use a very sharp knife (I used a scalpel) and trim the plastic back flush with the metal plate to give clearance for the drivers. This process will open up small windows into the compartment containing the worm gear, but will cause no other problems. Now squeeze the drivers in

on their axles to gauge, being careful to maintain the quartering positions. I used .205" as the inside distance between flanges and .245" as the distance outside the flanges. Then file the ends of the axles back flush, with the wheels in their new position.

Next spread the steam chests gently and remove the assembly completely from the locomotive. Using a screw driver, gently spread the slot between the steam chests and remove the pilot truck. Use a file to make the pilot frame as narrow as the altered base plate. Regauge the wheels, cut off the excess axle length, and reassemble. I didn't try to pull the steam chests in closer because if you run on any sharp radius curves, you will need all the movement for the pilot truck that you can get. The rods should be bent to align with the steam chests.

Now for the tender. At first I thought this would be the tough part of the job, but as I took the first truck apart I realized what was needed. The axles are a diecast metal frame on each side that hold



the wheels. File away half the thickness of these frames as shown in the drawing. Now add a similar thickness of plastic shim to the insides of the plastic truck frame and file out enough of the center part to clear the wheels. This regauges the wheels and works just fine.

I am able to pull five Nelson Gray Nn3 cars with this conversion with no problems. That many cars is quite typical of narrow gauge operations of the period.



NTRAK EXCHANGE YARD

EXCHANGE YARDMASTER: Terry Fenstad, NATO AWACS, PO Box 596, APO NY 09011.
or Kampstraat #13, 6454 BG Jabeek, The Netherlands.

SOME THOUGHTS: Collecting? How does a person get started? These are just two of the many questions I have been asked since starting the Exchange Yard.

Collecting is just one more area of the vast world open to model railroaders. There are many different methods of collecting; each depends on the personal interests of the individual ... be it cars of one railroad, one manufacturer, or perhaps beer reefer cars.

One method is to collect the special run cars. To keep up with all the different cars you must regularly read the trade topic and ad sections of the major magazines (and NTRAK Newsletter). Other modelers are an excellent source of information and placing ads in trade

publications will give some results. There is news elsewhere in this issue of several special run cars and an update of the special run master list will be printed soon. (If you can't wait, send a SASE to Jim FitzG for the list.)

There has been a trend the past few years for individuals to issue their own private lettered cars. Finding out about these presents a problem, so keep up your correspondence with other modelers in different parts of the country.

Collecting can be very interesting and a great way to acquire rolling stock. I hope you will enjoy it as much as I have.

AUCTION: We have a high bid of \$25 for the N Gauge Int brass Calif Zephyr diner car kit (IN-112). We have a high bid of \$20 for the Atlas outside braced boxcar lettered for

Chicago & Ill Midland on just one side. Additional bids will be accepted through Feb 10th. Bidders will be kept informed of the progress of the bids. Send bids to Jim FitzGerald. Proceeds go to help the Newsletter and NTRAK.

Suggestion. When using the Exchange Yard; send a full description of what you wish to buy or sell, acknowledge all responses, be sure that the sell or swap is fully understood before sending the merchandise, use UPS when possible and over protect with padding. For rare or high value items, specify UPS - COD, with right to inspect. Send only money to pay for shipment.

NOTE: There is now a charge for placing ads. Please see the note at the end of the ads.

DEALER ADS

European NTRAKers- Nn3 kits by N W Gray in stock, N scale autos: Pacific N Scale & Tel's Novel T, Big Boys in stock. IRC for list. Helmut Fleischhauer, Grevenbroicher Str. 28, 4150 Krefeld, W Germany.

(M/A)

INTRAKIT HH-1 hand held SCR controller for realistic slow speed operation in "N" \$25.95. SCR-2 tested kit for fixed installation \$19.25 Post paid. VISA accepted. INTRAKIT, 2457 Sudbury Ave, OTTAWA, Ont, K2C 1L6 Canada.

(J/A81)

MOPAC EAGLES COLLECTOR SET - \$124.98. ALTON LIMITED - \$117.49. AMERICAN RAILROADS SET \$77.49. ROUNDHOUSE RAILGONS - 12/\$39.49. ConCor CHRISTMAS TANKCAR -\$5.99. Add \$2.35 - UPS. LSSAE for Newsletter/Catalog. BROOKLYN LOCOMOTIVE WORKS, 2045 E 37th St, Brooklyn, NY 11234.

(J/F)

Nn3 KITS - Quality molded plastic Box car, Gondola, and Flat car kits; 2 styles of Arch bar trucks \$1.60; passenger truck \$1.80; dummy couplers and detail parts. American Z kits and Marklin Z. Send SASE for full list. NELSON GRAY, 900 E Brighton Av, Syracuse, NY 13205.

(N/D81)

HAVE- Complete stock of MRC Mallet and Berkshire parts, sub-assemblies and engines. SSAE for new illustrated list. Over 32,000 parts at reasonable prices. Over 100 new - not used - Berks, complete without tender and small valve gear \$25, buy 4 and get one free. Assembled and unassembled Mallets. Motors \$12, tenders \$10 pp. Satisfaction guaranteed. Send your list for possible trades. Alan Miller, Rt2, Cove Park, Jacksonboro, TN 37757

(J/F)

NEW CATALOG - Dry Transfer Lettering, wood ties, PC ties, straight brass wire, window glass, chain, brass & nylon screen, sheet metal, plastics, and hand tools. Catalog #3, \$1.50. CLOVER HOUSE, Box 62-J, Sebastopol, CA 95472.

(J/A81)

MICROSTEAM the track powered steam sound system that fits in an "N" 40' boxcar. Complete system MS-100 \$35.00 Post paid. VISA accepted. INTRAKIT, 2457 Suidbury Ave, OTTAWA, Ont K2C 1L6, Canada.

(J/A81)

SPECIALTY SERVICE apologizes for the delay on backordered FLEETLINE items due to many changes at Fleetline. NEW ITEMS- Specialty Service, the British Importer, has Langley vehicle, 4 accessories, tiny signs, embossed styrene, List 50c, catalogs: Peco \$3, Farish RTR \$2. Send \$5 for list and \$7 worth of samples. Specialty Service, RR#1, Box 28, Kinsac, NS, Canada B4C 2S6.

(J/F)

MEMBERS ADS

Sale- Minitrix F-9 boxed w/track \$17; #4912 & 4904 Trix track 10 c; #4951 switches \$2.50. Atlas 0-6-0 Ind Switcher and ore cars \$15. Rapido/Revell old freights #7483 (apples) and #2588 (St L I M & S), both for \$5.50. All new or nearly. Tony Feil, 71 Walnut Dr, Spring Lake Hts, NJ 07762.

(J/F)

Wanted- Atlas or AHM Hooker single dome tank cars. Also Bachmann CP Rail or Canadian Pacific center flow or covered hoppers. Tom McKenna, 248 Talbot Cr, Newmarket, Ont, Canada L3Y 1A3

(M/A)

Wanted- Rapido & Revell/Rapido Catalogs 1966 to 1976, Rapido #0418, 30' C&NW covered hoppers, Atlas RSC-2, MRC RSD-15. Would like above in mint condition. Mike Corcoran, 3614 Berry Av, Apt 1-A, Drexel Hill, PA 19026. (215) 622-4125

(J/F)

Wanted- HO Kraus Maffei, running or not. Helmut Fleischhauer, Grevenbroicher Str.28, 4150 Krefeld, W Germany.

(M/A)

Sale- All new, all Santa Fe, C-636 w/ Trix chassis \$39 ea; E-8 w E-7 chassis \$25 ea; E-7 Pass repaint \$29 ea; Atlas FA-1 freight repaint \$29 ea; Trix F-M switcher freight repaint \$29 ea; C-420 with Bachmann chassis freight repaint \$19 ea; Rapido GP-30 freight repaint \$29 ea; Rapido GP-9 freight repaint \$29 ea; Rapido Industrial Switcher \$12; Trix F-9B dummy \$9; Trix U-28 Bonnet repaint \$39 ea. Jim Henson, 2446 NW 49 St, Okla. City, OK 73112 (405) 842-4343 (405) 525-6100.

(J/F)

Trade/Sale- RSC-2 NYC, RSC-2 Monon, RSC-2 E&L, ConCor C636; will trade all four rare engines (new in original box) for a UP turbine w/tender + a UP U50. Minitrix F7 A+B+A sets (1 powered, 2 plastic wheel dummies, new in original box) 1 set ea B&O, CP, and CN. \$50/set. Trade Minitrix F7 A+A powered & dummy for Berkshire, any road (may be used but good condition). Detlef Peter, Strasse der Republik 5, D-6227 Oestrich Winkel 1, W Germany.

(M/A)

Wanted- Up to 3 Atlas-Rivarossi E-8 C&NW body shells. Will buy or trade for Trix U-28 shells. Have 2 ATSF, 1 L&N complete; 2 ConRail and 1 ATSF w/o airhorn. Tom Cornelissen, Dorpstraat 48, 6365 BH Schinnen, The Netherlands.

(M/A)

Buy Trade- MRC 7050 PRR hopper; Atlas 2242 PRR hopper; AHM 4362 hopper. Any Xmas or special run car. Barry Wingard, PO Box 51, Jerome, PA 15937.

(M/A)

Sale- Special Run Kadее Cars. "Crossroads Ranch", "The Gospel Train", & "Youth Awakening", 40' Kadее box cars. All cars are serialized by sets and sold only in sets of 3. You will be offered the same number in each new set as they become available. Donation: \$20 includes postage and tax deductible receipt. Pastor Kelly Killinger, 11922 Mac Duff, Garden Grove, CA 92641

(M/J)

Trade only- Bachmann 40' collector cars for other collector cars or RSC-2. Bill Wood, 1005 Poplar Ave, Glenolden, PA 19036.

(J/F)

SALE- Used N scale Empire, lots of extras. Very reasonable. \$1 for air mail list. Sorry, will not split up. Ranier Spohr, Vollenberg 19, D-5757 Wickede-Wiehagen, W Germany.

(M/A)

Wanted- Atlas and Bachmann train sets in original packings. MRC "Pro Sets" in original package. All Mfgs catalogs. Will buy or trade. SELL/TRADE- Have 1979 Bev-Bel green cars. Dallas Mallerich III, 10045 Waterford Dr, Ellicott City, MD 21043.

(J/F)

Sale/Trade- (Steam/Kadее) So Pacific Daylight ConCor Bullet nosed Hudson body and tender shell and corrugated dome passenger car, new/unused. ConCor Pennsy silver corrugated passenger cars, 2 Pullmans, coach, dome and observation, new/unused. Bachmann N&W 4-8-4 Northern, new/unused. Ted Stier, Suffolk Ln, Carlisle, MA 01741

(J/F)

Sale/Trade- Bi-Centennial, BevBel, Xmas, and other collectables in mint condition. Also books and magazines. Bob Kirsh, 265 Engle St, Tenafly, NJ 07670 (201) 871-4616

(M/A)

Sale- Superdetailing to the "Nth" degree. Throttle rods, sand pipes, water injector pipes. Over 40 brass detail parts on each steam locomotive. Now available, the Super Berkshire. Send LSASE and \$1.50 for sample. Jeffery Siegel, 1 Paerdegat 6 St, Brooklyn, NY 11236.

(M/A)

Wanted- Atlas Helium Tank cars. Either #3034 Atomic E.C. or other, number and name unknown. Also Kadее roofwalks. Also Mt St Helens Ash for diorama. Tom Lanphier, c/o Golf Road Greenfields, Reading, PA 19601.

(J/F)

Trade- 1 Kadее 30th Anniv, 1 BevBel Christmas 1978, 1 ConCor 15th Anniv; for 1 ConCor Slot & Wing Car 40', 1 ConCor NMRA San Diego 40', 1 ConCor NMRA 1976 Chicago 40'. Andrew Bell, PO Box 521 Sta M, Calgary, Alberta Canada T2P 2J2.

(M/A)

Sale- Many Kadее, ConCor and other freight & passenger cars. Also many steam and diesel locos, structures, kits, etc. SSAE list. Bob Vensel, 1315 Worley Av NW, Canton, OH 44703.

(J/F)

Trade only- 100+ new Kadее freight cars for new Kadее dimensional data cars. Various types and roadnames. Older roadnames and discontinued cars, Bi-centennial, and anniversary. Kadее couplers only. SSAE for list. Robert P Seufert, 2 Walton Way, Coram, NY 11727.

(J/F)

Want- Buy or trade- Kadее cars w/KD cplrs: #20039 N&W, 54619 & 54613; #20047 NYC 180189 & 180197; #20062 Sou 23487 & 23482; Have Atlas PRR 2 bay hopper, MRC PRR 2 bay hopper,

(J/F)

Want- Buy or trade- Kadее cars w/KD cplrs: #20039 N&W, 54619 & 54613; #20047 NYC 180189 & 180197; #20062 Sou 23487 & 23482; Have Atlas PRR 2 bay hopper, MRC PRR 2 bay hopper, AHM PRR 4 bay hopper. John J White, 4217 I St, Philadelphia, PA 19124.

(M/A)

Wanted- ConCor Limited Edition Set, Alton Limited in original box, excellent or mint condition only. State price and include SSAE with reply. Lee Zeis, Rt 7, Box 159, Johnson Rd, Greer, SC 29651 (803) 877-1230

(J/F)

Sale- Reducing some inventory, mostly ConCor, Atlas, some Lifelike, Kadее, MRC locos, special run cars. SSAE for list. John Dillavou, 1270 S Grape St, Denver, CO 80222 (303) 756-7965 (6-9 PM MST only).

(J/F)

Buy/Trade- Atlas bay window caboose, yellow or tuscan. Atlas 8 wheel transfer caboose #45653 tuscan; #47812 yellow. Terry Fenstad.

(J/F)

PLEASE NOTE: Letters such as (N/D) between each ad are how we keep track of the ads and are not part of the address. Some of the ads are requesting items available through your local or mailorder hobby house. I suggest you check with them before you place the ad. It could save you money and time.

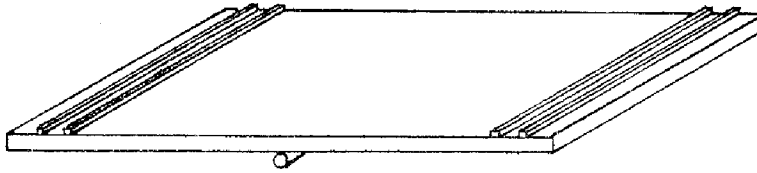
If you want an item published in this column, I must have it by the 5th of the month prior to publication. (By Feb 5th to be published in the Mar/Apr issue.)

RATES FOR ADS:

Private subscribers- 2 issues, \$1 for up to 30 words, addl. words 10 cents ea. One ad per issue.

Dealers- 1 issue, \$1 for up to 30 words, addl. words, 10 cents ea.

Do not count name & address; phone number counts as one word. Please send payment (no cash), payable to NTRAK (US funds please).



The Q D & C Car Scale

By Bob Thomas

Cars of a uniform weight have been proven more reliable by NMRA tests. While NMRA has yet to work out a car weight formula for N scale, the BS Lines club did quite a bit of testing several years ago and came up with a formula that is an odd mixture of fractions, metric and English units. ($5/8$ gram per scale foot of car length.) The Kadee 40' and 50' box cars are very close to this weight. The Kadee flats and gondolas are a bit light and the hoppers are quite a bit light. Most other makes of cars are quite light and their operation can be improved with additional weight and properly gauged wheels.

Lacking a weighing scale, I came up with this "teeter-totter" balance for N scale cars. A scrap of plywood or Masonite about 6" wide and 8" to 12" long has a piece of tubing Epoxied in the center for the balance point. If you don't plan to check passenger cars, the board need only be 4" wide. Stripwood "tracks" can be glued equidistant from the balance point. Adjust for balance, without any cars on it, by removing material from the heavy end. Now you are ready to check the weight on your cars by comparing them with 40' or 50' Kadee boxcars. Two 40' cars can be used to balance an 80' passenger car. Fish sinkers, curtain weights, or lead sheet can be used for weight and held in place with "Goo". Childrens modeling clay also works.

Oh yeah, Q D & C is Quick Dirty & Cheap!

Building an SD40T-2

By Dave Freehling
(With SD40-2 and SD45T-2 notes by
Jim FitzGerald)

Photos on pg 11 of the main section.

I wanted to model one of Rio Grande's distinctive "Tunnel Motor" versions of the SD40-2. Southern Pacific also uses similar engines to overcome the heating problems in tunnels and snow sheds on long up grades. In most EMD diesels the cooling air is drawn in from the top of the hood. In a confined tunnel the hot exhaust is sucked back in and cooling problems cause the units to automatically shut down, putting

more of a load on the other units and soon the train can be stalled. The "T" version was designed to bring the cooling air in through vents on the lower part of the hood and exhaust through the top. Some internal equipment had to be shifted and so the rear portion of the hood takes up the long "rear porch" of the SD40-2. The RG uses a short front hood, so the "front porch" is retained. The SP uses the longer "snoot" type front hood to house "Locotrol" radio units to control slave mid train helpers. The similar SD45T-2 is used by Southern Pacific and their subsidiary Cotton Belt. (There are very few long snow sheds or tunnels in Texas, but for tax reasons some of the "Tunnel motors" belong to Cotton Belt.) The

standard and UP "snoot" versions of the SD40-2 could be made by using many of the ideas in this article. Sources for drawings for the engines are shown below. By comparing the drawings you will see that all are similar to the SD45 that is available in N scale.

Railroad Model Craftsman.

SD40T-2 on page 29, May '75.

SD45T-2 on page 43, May '73.

SD45 on page 31, Jan '68.

Model Railroader.

SD40-2 on page 61, July '76.

SD45 on page 32, Oct '67.

SD45T-2 on page 62, July '72.

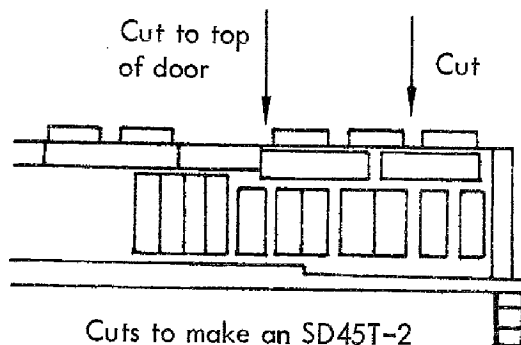
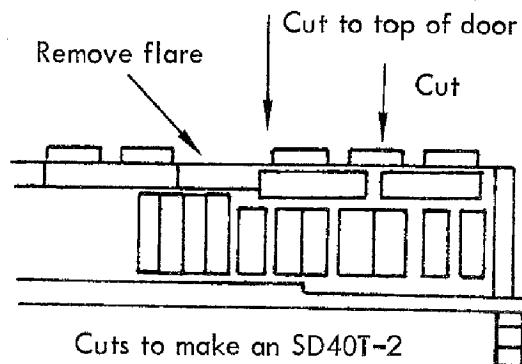
Kalmbach Pub, Cyclopedia Vol 2, Diesel Locomotives

SD40-2, SD45, and SD45T-2

The main parts needed are an SD45 shell (Available from Brooklyn Loco Works, 2045 E 37th St, Brooklyn, NY 11234) and a Trix/Model Power U30CG. I used some body shell parts from the U30, but a U28C chassis is the same. You may want to re-read the article page 17 of the J/A '80 issue on fitting shells to the Trix chassis.

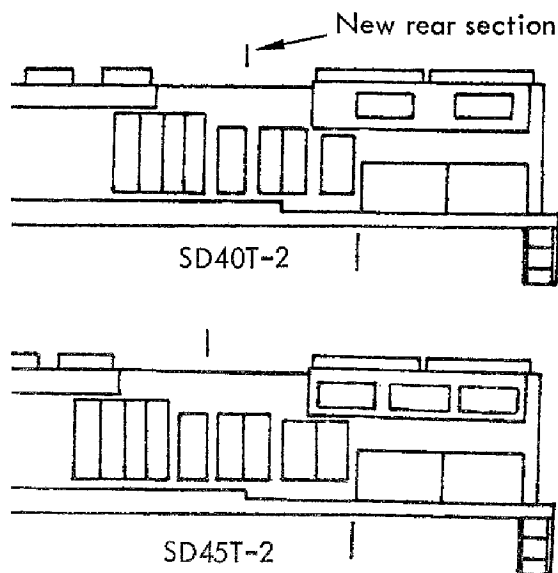
To get the effect of the long front porch and to get the proper truck spacing, the front truck must be reversed. This will bring you very close to the 45'-5" spacing from center axle to center axle of the prototype. The front coupler must now be body mounted and the electrical contact changed. A small flexible wire can be used or the wiper system reworked. The wheel pickup needs to be reversed to the other side of the truck and the metal wheels turned end for end. I have retained the GE side frames on my model. The wheel spacing on the Trix trucks is very close to those used on the Dash 2 locomotives. The wide part of the Trix chassis must be cut down and the ends trimmed some as outlined in the J/A article. (For an SD40-2 with long porches both front and rear, both trucks must be reversed and the chassis shortened. The UP "snoot" version can be built with just the rear truck reversed.

My own engine was made to fit a chassis modified for a previous project, so my shell is a bit shorter than it should be, but still gives the "Tunnel Motor" look.

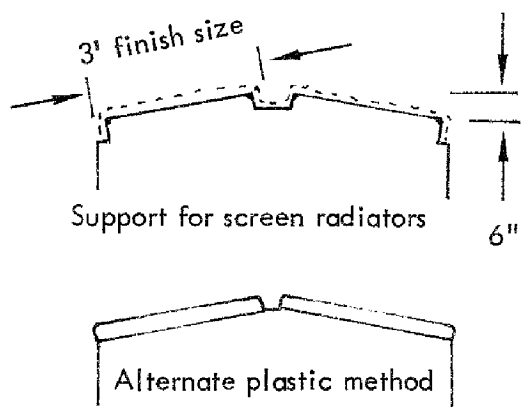


Remove the handrails and stanchions from the sides of the SD45 shell. Using a fine tooth Xacto saw cut straight down (vertically) from just behind the middle of the next to rear fan. Be sure to leave the door edges on the sides to hide the joint of the new rear section. A scrap of wood sanded to just fit inside the shell beside the cut will lessen the danger of breaking the shell during cutting. Make another cut just ahead of the remaining full fan. Leave the row of rivets and use them to disguise the joint at this point. The cut should go to just above the door tops and a second cut made horizontally above the door tops will remove the rest of the three rear fans. With a file square up the cuts and carefully remove the upper flare as shown in the drawing.

The walkway and step part of the rear section that was cut off can be sawn from the rest of the rear hood. If you are modeling the SP SD40T-2, cut through the low hood in an area free of detail so that about 3' can be added to the hood later. If you model the Rio Grande SD40T-2, the hood is the right length. Cut the front walkway and steps from the shell in one piece, being careful not to damage the low hood. A jewelers saw may be useful here. For the SP SD45T-2, the hood and front porch are both OK.



Now to build the new rear fan section. Styrene sheet .030" works fine for the sides and .060" is used for the end and roof forms. The length will depend on the engine you are modeling. The distance from the rear of the cab to the end of the long hood is 49-1/2" on the SD40T-2 and 52" on the SD45T-2, as compared to 45" on the stock SD45. For the lower fan screening I used sections cut from the sides of a U30 shell. Find portions free of doors and joints and cut 4 pieces 4'x6' with the corrugations running the 4' direction. Campbell's fine corrugated metal could be used here instead.



For the roof screen I used Kemtron #70 fine brass mesh. The prototype is four individual sections, but I bent two pieces down the center and fitted them to the roof forms as shown. By leaving a small gap you get the look of the four sections. I fastened the screen with a thin bead of "Goo". In your scrap box you may find some plastic that could be used for these roof

screens. You will need 4 pcs 3'x7-1/2". HO roofwalks have a similar look. The prototype is welded from rectangular stock as shown in the RMC article.

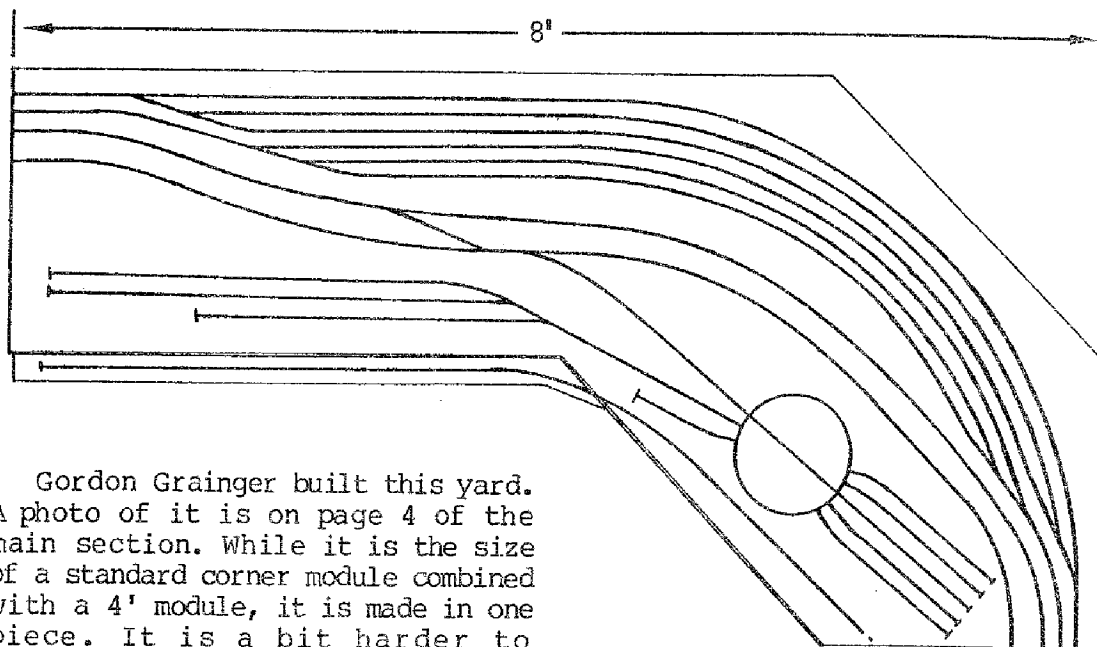
The rear walk and steps are fitted in place and the gap filled with scraps of styrene. The exterior sheet metal and doors are modeled by using thin styrene window material (I used Evergreen's). This exterior cover should butt the overlapped end piece and cover the overhanging edge of the screen form. The side cut outs should reveal only the corrugation. The rear of the loco is flat, rather than pointed as on the SD45. File the end piece corners round and add details. I used round "lugs" from roof walks for marker lights; a square shape with two holes added for lenses for the light; and ladder rungs of brass wire. The SD40T-2 has two small doors just below the radiators while the SD45T-2 has three of these doors. They may be indicated by carefully scribing their outline in the styrene.

Depending on whether you are modeling SP or RG SD40T-2, you now need to extend the hood or build the front porch. This is just a matter of fitting styrene scraps carefully in place. In either case the front rail is 11-1/2" from the front of the cab. For the SP SD45T-2, no change is needed in the front as it is the same as the SD45 in that area.

I used the stock stanchions and substituted .015" brass wire for the handrails. I filed a notch for the wire on the top of each stanchion and then cut the plastic handrail away. A touch of fresh (the skin removed) "Goo" was used to hold the wire in place at each stanchion. The ends were anchored in holes drilled into the cab or frame. When all was in place, a touch of Plastruct Weld Cement at each point reactivated the "Goo" and dried it faster and harder.

Detail Associates snow plow, cab shades, and horn were added and a Kadee coupler body mounted so that it extends through the plow. The standard Kadee #1104 can be used on the unmodified rear truck.

Microscale has decals for both RG and SP.



Gordon Grainger built this yard. A photo of it is on page 4 of the main section. While it is the size of a standard corner module combined with a 4' module, it is made in one piece. It is a bit harder to transport, but it greatly simplifies connecting so many tracks together. Gordon usually car tops the unit. It can be used at home as one end of a point to point layout and at the meets as a through yard or long passing sidings. The fourth track going on to other modules is a

feature that Gordon uses on several of his modules. This allows operation between modules without fouling the branchline. A hidden set-up track is behind the skyboard and runs through a tunnel on the corner module.

Quality Craft Pennsy Caboose

By Donald Andrychuck

The directions with the kit are quite complete, but here are a few points that I found while assembling this etched brass kit. You might also want to read Jim Kelly's notes on the kit on page 40 of the May '80 Model Railroader.

This was my first attempt at a kit of this complexity. Quality Craft also makes a "Wagon-top" boxcar in this same series and I understand this is easier to assemble and might have been better as my "first time" project.

The directions say that you may solder the sheet brass parts together, but I feel this is strictly for a "pro". I have used ACC on several models, but as this was my first attempt at something this intricate, I wanted a slower setting glue ... so I settled on Walther's "Goo". Believe me I was glad that I did. Also, with this adhesive, I omitted the use of sanding sealer on the wooden parts.

It is best to double check the location of the folds as you assemble, rather than strictly following the plans for measurements. For instance, instruction #5 calls for 1/16", but that wasn't right for my model. I also had to do quite a bit of cutting and fitting to get the cupola to work out right.

I found the slow setting "Goo" worked well for the ladders and other detail parts. Even so these proved a bit nerving and clearing the area of children and pets might be wise!

I formed my own antenna brackets as I felt the cast ones might not hold well for layout use. I didn't find any notes on where to place the marker lamps and while Jim Kelly noted that they should be on the roof, I set them on the side, where I preferred them. After all, it is my caboose and that is where I liked them.

I brush painted the model with Floquil paint and clear flat finish. I now realize that an investment in a sprayer would be better for future models of this sort.

I realize that an experienced person may spot many areas for improvement. I feel justified in being pleased with completing this model. I both learned from and enjoyed the project. I can now see improvements for future assemblies.

As an afterthought it should be noted that unless you have great experience at this craft, this model is not assembled in one or two evenings. I personally have spent many hours over the past summer on this model, when I felt I was in the proper mood.



Freelancing a Logging Loco

By Rick Spano

(See photos in main section.)

The Bachmann 0-6-0 switcher affords the modeler a variety of opportunities for modification and outright "Parts Bashing". I've wanted a heavy saddle tank engine for logging and quarrying service for some time, but none has been available. One day it dawned on me that Bachmann supplied the parts for the job.

The Bachmann 0-4-0 "little Joe" shell with smoke box removed and the Bachmann 0-6-0 switcher chassis formed the basis for such a venture. Carefully scribe away the perimeter of the 0-4-0 smoke box front with an X-acto knife. Then file the opening smooth and symmetrical with a suitable round file.

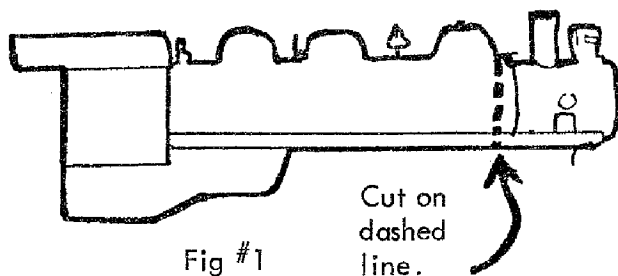


Fig #1

Remove the smoke box of the 0-6-0 by cutting the boiler shell about $1/16$ " behind the rear of the smoke box. Carefully file the portion of the boiler just beyond the rear of the 0-6-0 smoke box, so that it fits snugly into the hole left by the removal of the 0-4-0's smoke box. Do not cement the smoke box in place at this time.

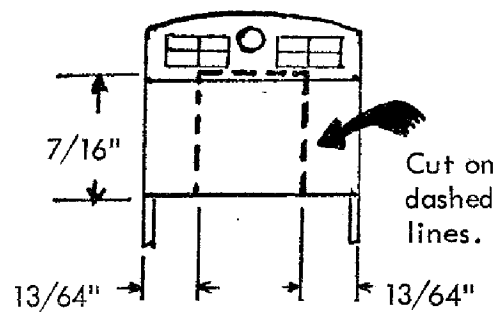
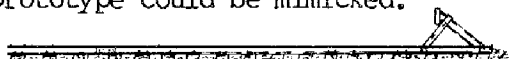


Fig #2

Make two vertical cuts that are $7/16$ " long in the rear of the 0-4-0 cab. Each cut should be $13/64$ " in from the sides of the cab. Scribe horizontally several times, with an X-acto knife, between the tops of the two cuts. Bend along the scribe line and remove the piece so that the cab will fit over the motor and chassis of the 0-6-0. Some filing may be needed to get a good fit. Refit the 0-6-0 smoke box in the 0-4-0 shell; place on the 0-6-0 chassis; adjust the smoke box so that the steam pipes are aligned. Remove shell and cement the smoke box to boiler with plastic solvent. A small notch may have to be made under the running boards to fit over the link bearing (link support).

Kadee's #1104 coupler conversion fits in the front pocket of this engine. The pin used to connect to the tender will couple with a Rapido type coupler, although this precludes automatic coupling and uncoupling. With some careful cutting and milling of the slot under the rear of the chassis, a coupler pocket from a Kadee freight truck could be cemented there. Fitting the pocket from a Kadee caboose is another possibility. Frequently logging roads used eight or four wheel tenders in conjunction with their saddle tankers when relatively long distances had to be traveled to bring logs to the mill, so you could use a tender if you wish.

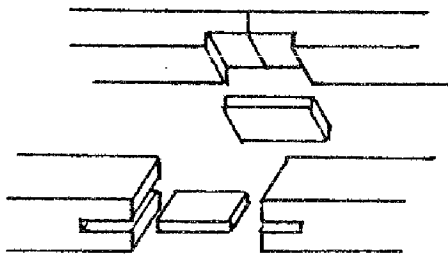
No attempt to change the position of the sand boxes or steam dome was made, therefore no particular prototype was matched. By carefully filing off such accouterments, filling in the holes, and replacing the sand boxes and domes appropriately, a particular prototype could be mimicked.





In the August 1980 Railroad Model Craftsman an article by Michael Dodd details a method of building curved sub base roadbed by using segments of straight lumber butted together. The article goes into the math involved and has details on using the system on your layout. Brent Seager has sent along some tables that he generated with a computer program to use this method with N scale. Shown below are dimensions for single track roadbed made from 1-3/4" wide lumber, double track made from 3-1/4" material and three track from 4-3/4" wide material. The dimensions are based on 1-1/2" track centers and the radius is to the center of 1-1/4", 2-3/4", or 4-1/4" roadbed path for 1, 2, or 3 tracks respectively.

At the center on the inside of the curve and at the ends on the outside there is extra material that can be used to support the scenery. If you want more material, then there are charts at the end of the article that provide a minimum of 1/2" at all points for the scenery.



If the splice is made flush with the bottom, then there is no interference problem with supports. Dodd suggests particle board. Another possibility would be to make careful saw cuts and insert 1/8" Masonite splines. In either case they should be glued.

For single track, the cork roadbed (standard 1-1/4" width) is laid so that it touches the outer edge in the middle of a segment and the inner edge at the ends of the segment. A larger radius segment could be used for the transition at the beginning and ends of a long curve.

For the standard NTRAK corner module with 37", 38-1/2", and 40" radius tracks, the pathway is based on a 38-1/2" radius and the segments

are 4-3/4" wide, have a 9.51 degree angle at each end, are 13.61" on the long side and 12.02" on the short side. If only a double track main is used and a much smaller radius for the branchline, then the center radius between the double tracks would be 39-1/4". The segments would be 3-1/4" wide, have a 9.32 degree angle on the ends, be 13.30" on the long side and 12.23" on the short side.

For the smaller corners based on a 3' square and with track radius of 25", 26-1/2" and 28" the segments would be 4-3/4" wide, 11.63 degree angle, 11.78" on the long side and 9.82" on the short side. A two track main would use 3-1/4" wide segments, 11.28 degree angle, 11.42" on the long side and 10.12" on the short side.

For your home layout and other radius curves on your modules, the following charts should be useful.

Single track, 1-3/4" wide material. The radius given is to the center of the track.

Radius (inch)	Angle deg	Long Edge	Short Edge
9.0	19.90	6.97	5.70
9.5	19.32	7.10	5.87
10.0	18.80	7.23	6.04
10.5	18.31	7.36	6.20
11.0	17.86	7.49	6.36
11.5	17.44	7.62	6.52
12.0	17.05	7.74	6.67
12.5	16.69	7.87	6.82
13.0	16.34	7.99	6.96
13.5	16.02	8.11	7.11
14.0	15.72	8.23	7.25
14.5	15.43	8.35	7.38
15.0	15.16	8.46	7.52
15.5	14.90	8.58	7.65
16.0	14.65	8.69	7.78
16.5	14.42	8.81	7.91
17.0	14.20	8.92	8.03
17.5	13.98	9.03	8.15
18.0	13.78	9.13	8.28
18.5	13.58	9.24	8.40
19.0	13.40	9.35	8.51
19.5	13.22	9.45	8.63
20.0	13.04	9.56	8.75
20.5	12.88	9.66	8.86
21.0	12.72	9.76	8.97
21.5	12.57	9.86	9.08
22.0	12.42	9.96	9.19
22.5	12.27	10.06	9.30
23.0	12.14	10.16	9.41
23.5	12.00	10.26	9.51

Single track, 1-3/4" wide material.
The radius given is to the center of the track.

Radius (inch)	Angle deg	Long Edge	Short Edge
24.0	11.87	10.35	9.62
24.5	11.75	10.45	9.72
25.0	11.63	10.54	9.82
25.5	11.51	10.64	9.92
26.0	11.39	10.73	10.02
26.5	11.28	10.82	10.12
27.0	11.17	10.91	10.22
27.5	11.07	11.00	10.32
28.0	10.97	11.09	10.42
28.5	10.87	11.18	10.51
29.0	10.77	11.27	10.61
29.5	10.68	11.36	10.70
30.0	10.59	11.45	10.79
30.5	10.50	11.53	10.89
31.0	10.41	11.62	10.98
31.5	10.33	11.71	11.07
32.0	10.24	11.79	11.16
32.5	10.16	11.87	11.25
33.0	10.08	11.96	11.34
33.5	10.01	12.04	11.42
34.0	9.93	12.12	11.51
34.5	9.86	12.21	11.60
35.0	9.78	12.29	11.68
35.5	9.71	12.37	11.77
36.0	9.64	12.45	11.85
36.5	9.58	12.53	11.94
37.0	9.51	12.61	12.02
37.5	9.45	12.69	12.10
38.0	9.38	12.76	12.19
38.5	9.32	12.84	12.27
39.0	9.26	12.92	12.35
39.5	9.20	13.00	12.43
40.0	9.14	13.07	12.51
40.5	9.08	13.15	12.59
41.0	9.03	13.22	12.67
41.5	8.97	13.30	12.75
42.0	8.92	13.37	12.83
42.5	8.86	13.45	12.90
43.0	8.81	13.52	12.98
43.5	8.76	13.60	13.06
44.0	8.71	13.67	13.13
44.5	8.66	13.74	13.21
45.0	8.61	13.82	13.29
45.5	8.56	13.89	13.36
46.0	8.51	13.96	13.44
46.5	8.47	14.03	13.51
47.0	8.42	14.10	13.58
47.5	8.38	14.17	13.66
48.0	8.33	14.24	13.73
48.5	8.29	14.31	13.80
49.0	8.24	14.38	13.87
49.5	8.20	14.45	13.95
50.0	8.16	14.52	14.02
50.5	8.12	14.59	14.09
51.0	8.08	14.66	14.16

Double track, 3-1/4" wide material.
The radius given is for the center of the space between the two tracks.

Radius (inch)	Angle deg	Long Edge	Short Edge
10.0	19.60	8.10	5.79
11.0	18.55	8.30	6.12
12.0	17.65	8.51	6.44
13.0	16.87	8.72	6.75
14.0	16.18	8.92	7.04
15.0	15.57	9.13	7.31
16.0	15.03	9.33	7.58
17.0	14.53	9.53	7.84
18.0	14.09	9.72	8.09
19.0	13.68	9.92	8.34
20.0	13.31	10.11	8.57
21.0	12.96	10.30	8.80
22.0	12.64	10.49	9.03
23.0	12.34	10.67	9.25
24.0	12.07	10.85	9.46
25.0	11.81	11.03	9.67
26.0	11.57	11.20	9.87
27.0	11.34	11.38	10.07
28.0	11.12	11.55	10.27
29.0	10.92	11.72	10.46
30.0	10.72	11.88	10.65
31.0	10.54	12.05	10.84
32.0	10.37	12.21	11.02
33.0	10.20	12.37	11.20
34.0	10.04	12.53	11.38
35.0	9.89	12.69	11.55
36.0	9.75	12.84	11.73
37.0	9.61	13.00	11.90
38.0	9.48	13.15	12.06
39.0	9.35	13.30	12.23
40.0	9.23	13.45	12.39
41.0	9.11	13.59	12.55
42.0	9.00	13.74	12.71
43.0	8.89	13.88	12.86
44.0	8.78	14.02	13.02
45.0	8.68	14.16	13.17
46.0	8.58	14.30	13.32
47.0	8.49	14.44	13.47
48.0	8.40	14.58	13.62
49.0	8.31	14.72	13.77
50.0	8.22	14.85	13.91
51.0	8.14	14.98	14.05

Triple track, 4-3/4" wide material.
The radius given is for the center track.

Radius (inch)	Angle deg	Long Edge	Short Edge
15.0	16.02	9.83	7.11
16.0	15.43	10.00	7.38
17.0	14.90	10.18	7.65
18.0	14.42	10.35	7.91

19.0	13.98	10.52	8.15
20.0	13.58	10.69	8.40
21.0	13.22	10.86	8.63
22.0	12.88	11.03	8.86
23.0	12.57	11.20	9.08
24.0	12.27	11.37	9.30
25.0	12.00	11.53	9.51
26.0	11.75	11.70	9.72
27.0	11.51	11.86	9.92
28.0	11.28	12.02	10.12
29.0	11.07	12.18	10.32
30.0	10.87	12.34	10.51
31.0	10.68	12.49	10.70
32.0	10.50	12.65	10.89
33.0	10.33	12.80	11.07
34.0	10.16	12.95	11.25
35.0	10.01	13.10	11.42
36.0	9.86	13.25	11.60
37.0	9.71	13.39	11.77
38.0	9.58	13.54	11.94
39.0	9.45	13.68	12.10
40.0	9.32	13.83	12.27
41.0	9.20	13.97	12.43
42.0	9.08	14.11	12.59
43.0	8.97	14.25	12.75
44.0	8.86	14.38	12.90
45.0	8.76	14.52	13.06
46.0	8.66	14.66	13.21
47.0	8.56	14.79	13.36
48.0	8.47	14.92	13.51
49.0	8.38	15.06	13.66
50.0	8.29	15.19	13.80
51.0	8.20	15.32	13.95

Single track, 2-3/4" wide material,
with scenery shelf.

Radius (inch)	Angle deg	Long Edge	Short Edge
15.0	15.16	8.74	7.25
20.0	13.04	9.79	8.51
25.0	11.63	10.75	9.62
30.0	10.59	11.63	10.61
35.0	9.78	12.46	11.51
40.0	9.14	13.23	12.35
45.0	8.61	13.97	13.13

Double track, 4-1/4" wide material,
with scenery shelf.

Radius (inch)	Angle deg	Long Edge	Short Edge
15.0	15.57	9.40	7.04
20.0	13.31	10.35	8.34
25.0	11.81	11.24	9.46
30.0	10.72	12.07	10.46
35.0	9.89	12.86	11.38
40.0	9.23	13.61	12.23
45.0	8.68	14.32	13.02

Triple track, 5-3/4" wide material,
with scenery shelf.

Radius (inch)	Angle deg	Long Edge	Short Edge
15.0	16.02	10.12	6.82
20.0	13.58	10.93	8.15
25.0	12.00	11.75	9.30
30.0	10.87	12.53	10.32
35.0	10.01	13.28	11.25
40.0	9.32	13.99	12.10
45.0	8.76	14.68	12.90

By using wider boards it is possible to have a 1/2" minimum space on either side of the roadbed path for a scenery shelf. The following charts give a few sizes.

MRC N Scale List, NTRAK Newsletter

Prepared by:

Ken Peck, 810 White St, Port Huron, MI 48060

With help from: Tom Brown, Brian DeVries, Bill Leflet, Tom McKenna, Dave Rider, Cliff Sabol, John Sulfridge, Jim Wilson, and Barry Wingard.

ENGINES

2-8-4 Berkshire Steam Loco

MRC #	Description	Other Features
6901	Nickle Plate Road	Blk, Wht ltr, #759
"	" " "	Blk, Yel ltr, "
6902	Chesapeake & Ohio	Blk, Yel ltr, #2675
6903	Santa Fe	Blk, Wht ltr, #3790

2-8-8-2 Mallet Steam Loco

MRC #	Description	Other Features
6905	Norfolk & Western	Blk, Wht ltr, #2172
6906	Santa Fe	Blk, Wht ltr, #2199
6907	Pennsylvania	Blk, Wht ltr, #373

(Note. N&W shown in ad with #2197.)

Alco FA-2 Diesel Loco		
MRC #	Description	Other Features
6951	Santa Fe	Red/Silv, Blk ltr, no #
6952	Pennsylvania	Tusc w/Yel stripes, Yel ltr, no #
6953	Chesapeake & Ohio	Blu/Grey/Yl, Blu ltr, #7094

(Note. Above also mismarked as FA-1 in same roads and colors. #6961, 6962, & 6963.)

Alco RSD-15 Diesel, High Hood		
MRC #	Description	Other Features
6965	Pennsylvania	Grn, Yel ltr, Rd keystone, #8615
6966	Burlington	Red/Grey, Wht ltr, #7013
6968	Baltimore & Ohio	Blu/Gry/Blk, Yel ltr, #7123

Alco RSD-15 Diesel, Low Hood		
MRC #	Description	Other Features
6967	Burlington Northern	Grn/Wht/Blk, Wht ltr, #2076
6970	Santa Fe	Blu/Yel, Yel ltr, #817

0-6-0 Saddle Tank Steam Loco
(Note. Test marketed in sets only.)

MRC #	Description	Other Features
6975	Santa Fe	Blk, Wht ltr, #147
6976	Pennsylvania	Blk, Wht ltr
6977	Baltimore & Ohio	Blk, Wht ltr
6978	Southern Pacific	Blk, Wht ltr, #3012

Alco 420 Diesel Loco		
MRC #	Description	Other Features
6985	Santa Fe	Red/Sil, Blk ltr, #970
6986	Penn Central	Blk, Wht ltr, #8023
6987	Union Pacific	Yel/Grey, Red ltr, #1401
6988	Southern Pacific	Grey/Red, Wht ltr, #7251
	(Note. 1971 ConCor catalog shows #7281.)	
6989	Canadian National	Blk/Red, Wht ltr, #3220
6990	Seaboard Coast Line	Blk, Yel stripes, Wht ltr, #1212

EMD GP-30 Diesel Loco (mfg by Lima)		
MRC #	Description	Other Features
7600	Union Pacific	Yel/Grey, Red ltr, #4115
7601	Santa Fe	Yel/Blu, Yel ltr, #5426
"	"	" " " , #1211
7602	Penn Central	
7603	New York Central	#2535
?	Pennsylvania	Tus/Yel, Yel ltr, w/sets #7440 & 7450
?	Burlington	Red/Gry, Wht ltr, (shown in MRC catalog.)

EMD FP-45 Diesel Loco (mfg by Lima)		
MRC #	Description	Other Features
7610	Santa Fe	Blu/Yel, Yel ltr, #3927
7611	Union Pacific	Yel/Gry, Red ltr, #3542
7612	Penn Central	
7613	Great Northern	

FREIGHT CARS

Hopper, 3 Bay, outside braced, 40' (mfg by Minitrix)		
MRC #	Description	Other Features
7001	Delaware & Hudson	Blk, Wht ltr, #1639
7002	Elgin Joliet & Eastern	Gry, Blk ltr, no #
7003	Boston & Maine	Blu, Wht ltr, #5001

7004	D M & N	Blk, Wht ltr, #2106
*	Virginian	
*	Peabody	Yel, Gn ltr, no #
*	Great Northern	Red, Wht ltr, #6071

(* Note: Stamped MRC on cars & later melted to remove. Some still legible.)

Refrigerator, wood sheathed, 40' (mfg by Minitrix)

MRC #	Description	Other Features
7005	Ralston Purina Co	Red/Wh checkerboard, Blu ltr, #4554
7006	Peerless Beer	Yel/Red, Blk ltr, #NX3062
*	Old Dutch Cleanser	Yel, Red ltr, #7471, Cudahy
*	Baby Ruth	Red, Yel ltr, no #
*	Miller Beer	Wht, Red ltr, #80100
*	Dairymen's League	Wht, Blu ltr, #7190
*	Domino Sugar	Wht, Blu ltr, #609

(* Note: Stamped MRC on cars & later melted to remove. Some still legible.)

Box Car, wood, 40' (mfg by Minitrix)

MRC #	Description	Other Features
7010	Frisco	Brn, Wht ltr, Blk logo, #120053
"	"	" " " " #128053
		(might be #126053)
7011	West India Fruit	Blk, Wht ltr, #210
7013	Santa Fe	Brn, Wht ltr, #82005
?	Boston & Maine	Blu, Wht ltr, #70056
?	Penn Central	Grn, Wht ltr, #157012

Ore Car, 30' (mfg by Minitrix)

MRC #	Description	Other Features
7015	D M & N	Dk Red, Wht ltr, #21071
7016	Clinchfield	

Auto transport, 85' (Minitrix type)
Listed on box liners, not know to be made.
(Note: These MRC #s are also used below.)

MRC #	Description	Other Features
7025	Canadian Pacific	
7026	Frisco	

Hi-Cube Box, 86' (Minitrix type)
Listed on box liners, not know to be made.
(Note: These MRC #s are also used below.)

MRC #	Description	Other Features
7030	Southern Pacific	
7031	Louisville & Nashville	

Box Car, Plug Door, 50'

MRC #	Description	Other Features
7020	Hamm's Brewing	Catalog only
7021	Borg Warner	Wht, Red/Blk ltr, #42022
7022	A-1 Steak	Sil/Red/Blk, Blk ltr, #41296
	(A-1 Steak car also shown on box liner as #7020)	
7023	Nestle	Blu/Wht, Red Wht ltr, #41870 & 41879,
7024	Abbott Labs	Or/Yel/Wht, Wht ltr, Note #1, #100034
"	"	" Blk, ltr, Note #2, "
7025	Johnson Wax	Blk/Red/Wht, Blk ltr, Note #1, #49105
"	"	" " " , Note #2, "
7026	Dresser Magcobar	Lt Or/Wht, Cream stripe, Blk ltr,
"	"	Note #1, #14064
		Dk Or/Cream Wht, Wht stripe, "
		Note #2, "
7040	Baltimore & Ohio	Blu/Sil, Yel ltr, #421214

7041	Burlington	Lt Red, Wht ltr, #50700, heavy Blk lines around logo, early production.
"	"	Dk Red, " , #50700, small Blk lines around logo, late production.
7042	Santa Fe	Red/Blk Rf & ends, Wht/Yel ltr, #15827
"	"	Brn car , Wht ltr, #15827, no Yel ltr: "Super" & "A Smoother Ride"
7043	Missouri Pacific	Gry/Blu/Yel, Blk ltr, #120170
7044	Union Pacific	Yel/Sil, Sil drs, Red/Blu ltr, #472074
"	"	" Yel drs, " "
7045	Atlantic Coast Line	Blk, Yel ltr, #35063
?	Illinois Central	Shown in catalog only.
?	Swift	" " " "

Note #1 Instructions on middle of door, large type, no "Are Interior Doors Secure?"

Note #2 Instructions at top of door, small type, w/"Are Interior Doors Secure?"

Box Car, 50', Double Door		
MRC #	Description	Other Features
7030	Union Pacific	Yel/Silv Rf & ends, Blu ltr, #310820
7031	Western Pacific	Sil, Blk ltr, #1953, Orange "feather"
7032	Santa Fe	Grn/Blk, Yel ltr, #4157, "Express"
7033	Detroit, Toledo & I	Brn, Wht ltr, #25007, str pts Wht/Blk
"	"	" " " , str pts Wht/Red
"	"	Gry, Blk ltr, " , str pts Blk/Red
7034	Canadian National	Brn, Wht ltr, #561729, Med Gn mpl leaf
"	"	" " " , Dk Gn mpl leaf
7035	Pennsylvania	Brn, Wht ltr, #73891
"	"	" " " , #73892

Hopper Car, Two Bay, 36'		
MRC #	Description	Other Features
7050	Pennsylvania	Red, Wht ltr, #675347
"	Union Pacific	Sil, Blk ltr, #1021
"	"	Gry, Red ltr, "
7051	Peabody	Yel, Grn ltr, #6631
7052	Southern	Sil, Rd ltr, #1702
7053	Kaiser Aluminum	Blk, Wht ltr, #26361, "Alum Ore"
7054	Boston & Maine	Blk, Wht ltr, #568287

Tank Car, 3 Dome		
MRC #	Description	Other Features
7065	Shell	Or, Blk ltr, #1105, Red "Shell" decal
7066	Hooker Chemical	Or/Blk/Wht, Blk ltr, #69584
"	"	Or/Blk, Red/Blk ltr, "
7067	Union Carbide	Wh/Red, Red ltr, #1081
7068	Goodyear	Yel/Blu, Blu ltr, #2586
7069	Gulf Oil	Sil/Blk, Red ltr, #15592

Stock Car, 40'		
MRC #	Description	Other Features
7070	Union Pacific	Yel/Sil, Red ltr, #294739
7071	Armour	Dk Brn, Yel ltr, #216
7072	Canadian National	Brn/Wht, Wht ltr, #173538
7073	Chicago & NW	Grn/Yel, Wht ltr, #14373
7074	Missouri, Kansas, Tex	Yel/Brn, Blk ltr, #502, "MKT"

Gondola, 50', (mfg by Lima)		
MRC #	Description	Other Features
7640	Burlington	Red/Blk/Wht, Wht ltr, #E 3166
7645	Pennsylvania	Brn, Yel ltr, #357745, w/ coal load

3 cars below shown in catalog only.

?	New Haven	Blk/Wht, Brn/Wht ltr, #1906
?	Canadian Natl	Red, Wht ltr
?	Southern	Gry, Red ltr, #2207, w/ coal load

Flat car, 50', (mfg by Lima)

MRC #	Description	Other Features
7650	Great Northern	Brn, Yel ltr, #41538
7655	Southern	Red, Wht ltr, #?, w/ 2 autos
7660	Santa Fe	Red, Wht ltr, #933253, w/2 cables
7665	Pennsylvania	Red, Wht ltr, #3520, w/2 containers

Note: Shown in catalog only are Pennsy w/o load, Pennsy w/2 cables, Santa Fe w/2 containers & Santa Fe w/2 autos. All shown in Brn w/ Yel ltr.

Refrigerator Car, steel

MRC #	Description	Other Features
8010	Carnation Milk (40')	Wht/Blk rf & end, Red/Blk ltr, #25001
8011	Thermice (46')	Sil, Red/Wht ltr, #8903 (Lima/AHM mfg)

Box Car, Wood

MRC #	Description	Other Features
8020	Boston & Maine (40')	Blue, Wht ltr, Blk drs, #7703
8021	Denver Rio G West (50')	Or, Blk ltr, #60649, (Lima mfg)

Box Car, Steel, 40'

MRC #	Description	Other Features
8030	New Haven	Blk, Red/Wht ltr, shown in '71 ConCor catalog. Later made for Atlas.
"	State of Maine	Blu/Wht/Red, Blk/Wht ltr, #2087

Box Car, Steel, 50', plug door

MRC #	Description	Other Features
8031	Milwaukee	Brn, Wht ltr, #2636
"	"	" " " , #2096
8032	Illinois Central	Or, Wht/Blk ltr, #11143
8033	Burlington	Red, Blk/Wht ltr, #57170

Special, unlisted cars made for MRC by Lenseni.

Stamped MRC on car. Later made for Atlas.

Box Car, outside braced, 40'

* #	Description	Other Features
2255	C B & A	Brn, Wht ltr, #28008
2256	M & W R	Yel/Brn/Blk, Blk ltr, #1293
2257	C & L M	Yel, Blk ltr, #3045
2258	Great Northern	Brn, Wht ltr, #31406

(Note * # are Lenseni insert #'s.)

Stamed MRC on car. Later made for Life Like

Box Car, steel, 40'

MRC #	Description	Other Features
?	T P & W	Gn, Yel/Brn ltr, #640
?	Great Northern	Gn/Wht, Red/Wht ltr, #27799
?	Johnson Wax (refrig 40')	Red/Wht/Blk, Blk/Red ltr, #49000

CABOOSE

Caboose, wood side, old style (mfg Minitrix)

MRC #	Description	Other Features
7020	Santa Fe	Brn, Wht ltr, #1951
7021	Pennsylvania	Brn, Wht ltr, #478120

Caboose, Cupola Style

MRC #	Description	Other Features
7080	Santa Fe	Red, Wht ltr, #1997

7081	Pennsylvania	Red/Blk, Wht ltr, #983749
"	"	" , #983748
7082	Chesapeake & Ohio	Yel/Blk, Blu ltr, #634
7083	Burlington	Gry, Wht ltr, #12345, Red logo, Blk trim
7084	Union Pacific	Yel, Red ltr, #3821
7085	Penn Central	Grn, Wht ltr, #23336
7086	Baltimore & Ohio	Red, Yel ltr, #C 1897
7087	Southern Pacific	Red, Wht ltr, 1054
7088	Seaboard Coast Line	Or/Blk, Blk ltr, #0799
7089	Canadian National	Or/Blk, Blk ltr, #78388, Grn/Wht logo
7090	New York Central	Shown in catalog
7091	Great Northern	" " "
7092	Illinois Central	Brn, Wht ltr, #9837 (AHM)

PASSENGER CARS

MRC #	Description	Other Features
	Streamlined Coach, 80' (mfg by Rowa)	
6910	Chesapeake & Ohio	Blu/Sil/Yel, Gry rf, Blu Ltr, #1618
"	"	" , " , #7678
6911	Santa Fe	Silv, Gry rf, Blk Ltr, #4557
"	"	" , " , #4657
	Same four cars as above but Illuminated, #6915 & 6916	
	Streamlined Observation, 80' (mfg by Rowa)	
MRC #	Description	Other Features
6920	Chesapeake & Ohio	Blu/Sil/Yel, Gry rf, Blu Ltr, #2503, Allegheny Club
6921	Santa Fe	Silv, Gry rf, Blk Ltr, #550, Vista Valley
	Same two cars as above but Illuminated, #6925 & 6926	
	Streamlined Vista Dome, 80' (mfg by Rowa)	
MRC #	Description	Other Features
6930	Chesapeake & Ohio	Blu/Sil/Yel, Gry rf, Blu Ltr, #850, The Chessie
6931	Santa Fe	Silv, Gry rf, Blk Ltr, #530, (no name)
	Same two cars as above but Illuminated, #6935 & 6936	
	Streamlined Sleeper, 80' (mfg by Rowa)	
MRC #	Description	Other Features
6940	Chesapeake & Ohio	Blu/Sil/Yel, Gry rf, Blu Ltr, #2606, City of Newport News
6941	Santa Fe	Silv, Gry rf, Blk Ltr, #704, Pine Beach
	Same two cars as above but Illuminated, #6945 & 6946	
	Heavyweight Coach, 80' (mfg by Lima)	
MRC #	Description	Other Features
7620	Santa Fe	Gn, Blk rf, Yel ltr, #1835
7621	Pennsylvania	Tus, Blk rf, Yel ltr, #2760
	Heavyweight Combine, 80' (mfg by Lima)	
MRC #	Description	Other Features
7625	Santa Fe	Gn, Blk rf, Yel ltr, #1842
7626	Pennsylvania	Tus, Blk rf, Yel ltr
	Heavyweight Observation, 80' (mfg by Lima)	
MRC #	Description	Other Features
7630	Santa Fe	Gn, Blk rf, Yel ltr, #3275, Cafe Observation
7631	Pennsylvania	Tus, Blk rf, Yel ltr, #3820