



August 2015

Nn3 Overview
by Tom Knapp MMR#101


1



August 2015

Nn3 Overview
by Tom Knapp MMR#101

2



**N-Scale
Narrow Gauge**


An Overview

August 2015

Nn3 Overview
by Tom Knapp MMR#101

3

This slide features a photograph of a black steam locomotive pulling a freight car across a wooden trestle bridge. The locomotive has the number '472' on its side. The background shows some yellow foliage. The title 'N-Scale Narrow Gauge' is in large red font, followed by a dashed line and 'An Overview' also in red. The footer contains the date 'August 2015', the title 'Nn3 Overview by Tom Knapp MMR#101', and the page number '3'.

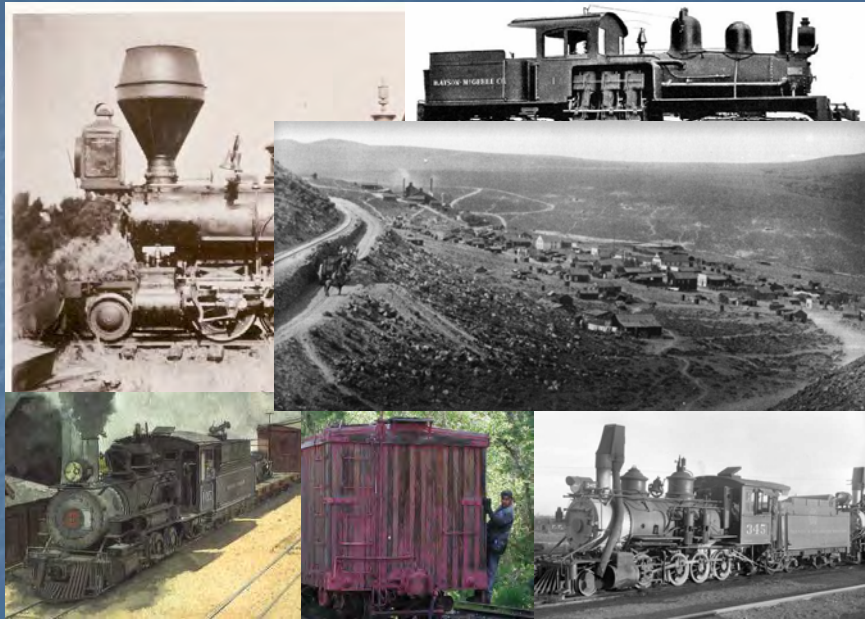


August 2015

Nn3 Overview
by Tom Knapp MMR#101

4

This slide shows a Samsung flip phone with a Cingular logo on the screen. A large red prohibition sign (a circle with a diagonal line) is overlaid on the phone. The phone is positioned in the center, with the left side of the background image from the previous slide visible on the left and the right side on the right. The footer contains the date 'August 2015', the title 'Nn3 Overview by Tom Knapp MMR#101', and the page number '4'.



August 2015

Nn3 Overview
by Tom Knapp MMR#101

5



August 2015

Nn3 Overview
by Tom Knapp MMR#101

6



August 2015

Nn3 Overview
by Tom Knapp MMR#101

7



August 2015

Nn3 Overview
by Tom Knapp MMR#101

8



August 2015

Nn3 Overview
by Tom Knapp MMR#101

9



August 2015

Nn3 Overview
by Tom Knapp MMR#101

10



August 2015

Nn3 Overview
by Tom Knapp MMR#101

11



August 2015

Nn3 Overview
by Tom Knapp MMR#101

12



August 2015

Nn3 Overview
by Tom Knapp MMR#101

13



August 2015

Nn3 Overview
by Tom Knapp MMR#101

14



August 2015

Nn3 Overview
by Tom Knapp MMR#101

15



August 2015

Nn3 Overview
by Tom Knapp MMR#101

16



August 2015

Nn3 Overview
by Tom Knapp MMR#101

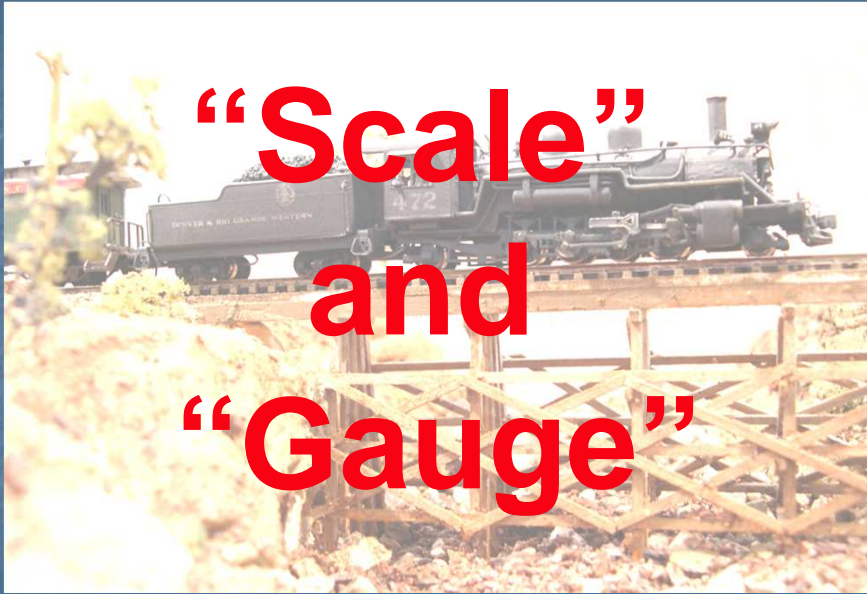
17



August 2015

Nn3 Overview
by Tom Knapp MMR#101

18



“Scale” and “Gauge”

Nn3 Overview
by Tom Knapp MMR#101

August 2015 19



HO Scale (1:87)
N Scale (1:160*)

Both are “Standard Gauge” – rails spaced a “scale” 4’-8-1/2” apart – but different “scale”

Both locomotives are N “scale”, but run on different track “gauge”

Standard Gauge

standard gauge
3 foot gauge
Narrow Gauge

* In Europe & N. America

Nn3 Overview
by Tom Knapp MMR#101

August 2015 20



August 2015

Nn3 Overview
by Tom Knapp MMR#101

21



August 2015

Nn3 Overview
by Tom Knapp MMR#101

22

Nn3 Milestones:

- 1951 2MM Scale Narrow Gauge Layout "Vale of Penwal" by Griffiths & Wallace (2 foot gauge)
- 1960s Karl Weiss builds "proto" Nn3 layout, 3 foot / 5.7mm gauge
- 1972 Marklin introduces Z scale (1:220, 6.5mm gauge)
- 1974 First Nn3 NTRAK Modules at NMRA National Convention; first Nn3 contest winners at NMRA National Convention
- 1975 Nelson Gray produces injection molded styrene Nn3 freight cars, caboose, trucks and wheelsets, 6.5mm gauge
- 1975 Robert Sloan introduces metal castings and brass etchings for converting Marklin Z scale locomotives to Nn3 locomotives
- 1977 First brass R-T-R Nn3 locomotive – Rocky Mountain Model's "Sho-Wa-No"
- 1981 Publication of first edition of The Nn3 Manual (now in 5th edition)
- 1982 NMRA adopts standards for Nn3
- 1987 Marshall Thompson acquires Sloan Line & establishes Republic Locomotive Works; continues development of more locomotive conversions
- 1989 Micro Trains acquires Nelson Gray Nn3 and Z Scale lines & continues development
- 1999 Formation of an international internet group which will become The Nn3 Alliance
- 2000 First National Nn3 modular layout, at NMRA National Convention, San Jose, CA
- 2001 Availability of DCC decoders which will fit most Nn3 locomotives
- 2003 Nn3 Alliance publishes "The Nn3 Handbook" which becomes the reference standard for N Narrow Gauge

August 2015

Nn3 Overview
by Tom Knapp MMR#101

23

"Vale of Penwal" layout in 2MM Scale narrow gauge (1951):

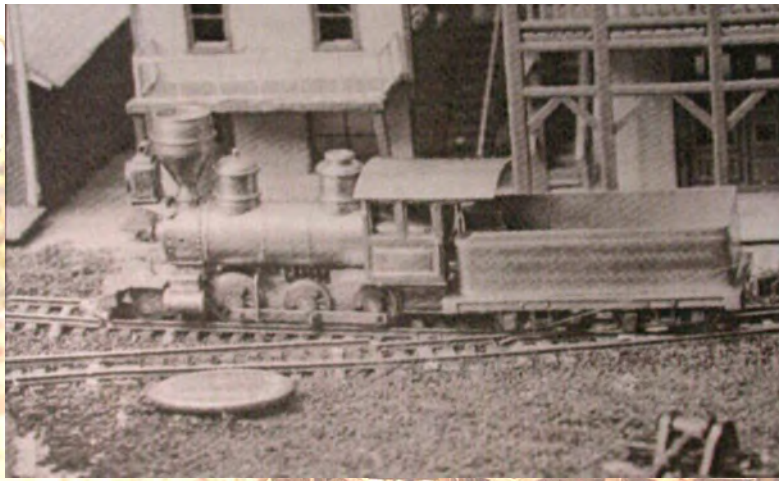


Nn3 Milestones

August 2015

Nn3 Overview
by Tom Knapp MMR#101

24



All brass scratch-built N scale locomotive running on 5.7mm gauge (36") track, by K. Weiss, built during the late 1960's.

Nn3 Milestones

August 2015

Nn3 Overview
by Tom Knapp MMR#101

25

1972

märklin



Nn3 Milestones

August 2015

Nn3 Overview
by Tom Knapp MMR#101

26



Not necessarily the first Nn3 steam locomotive, but the first to win in model competition at an NMRA National Convention: First Place, Steam Locomotives, 1974, San Diego, CA.

Nn3 Milestones

August 2015

Nn3 Overview
by Tom Knapp MMR#101

27



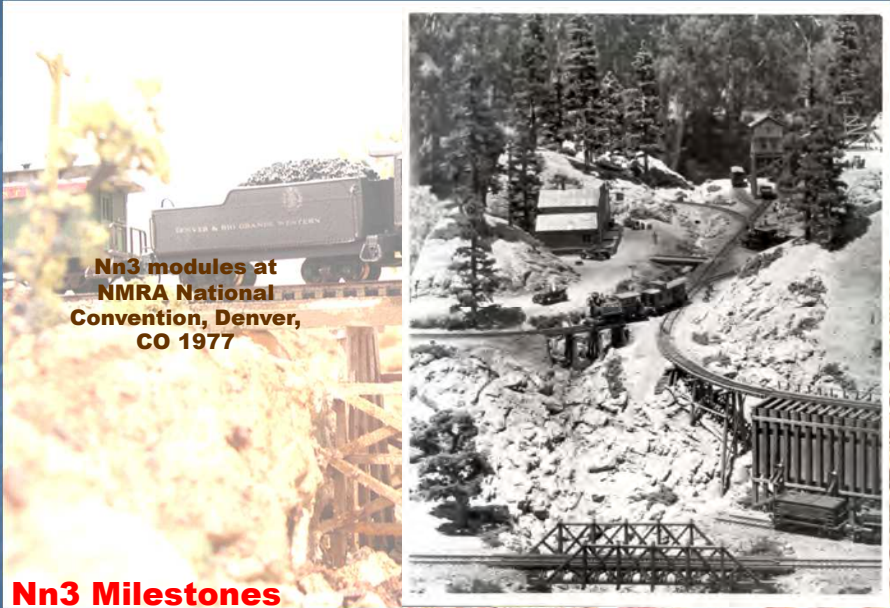
First appearance of NTRAK Nn3 modules at an NMRA National Convention, San Diego, CA 1974

Nn3 Milestones

August 2015

Nn3 Overview
by Tom Knapp MMR#101

28



**Nn3 modules at
NMRA National
Convention, Denver,
CO 1977**

Nn3 Milestones

Nn3 Overview
by Tom Knapp MMR#101

August 2015 29



Z-scale standard gauge
Nn3 (3 Foot Gauge)
Nm (Meter Gauge)
N6.5 } **6.5mm**

Nn2 (2 Foot Gauge)
Zm (Z Meter Gauge) } **4.5mm**

T-scale standard gauge
Nn18 (18" Gauge) } **3.0mm**

Nn3 Milestones

Nn3 Overview
by Tom Knapp MMR#101

August 2015 30

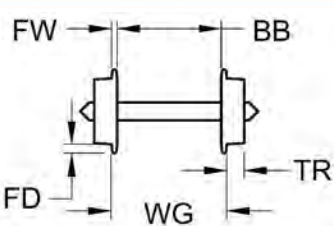


table 1

	WG wheel gauge	BB back to back	FD flange depth	FW flange width	TR wheel tread
STANDARD					
Nn3 / Nm / N6.5	0.24" 6.10 mm	0.210" 5.33 mm	0.02" 0.51 mm	0.016" - 0.018" 0.46 mm	0.041" 1.04 mm
Nn2 / N4.5	0.161" 4.09 mm	0.131" 3.33 mm	0.02" 0.51 mm	0.016" - 0.018" 0.46 mm	0.041" 1.04 mm
FINESCALE					
Nn3 / Nm / N6.5	0.24" 6.10 mm	0.207" 5.26 mm	0.017" 0.40 mm	0.012" - 0.013" 0.31 - 0.33 mm	0.027" 0.69 mm
Nn2 / N4.5	0.161" 4.09 mm	0.128" 3.25 mm	0.017" 0.40 mm	0.012" - 0.013" 0.31 - 0.33 mm	0.027" 0.69 mm
PROTO:					
Nn3	TBD ¹	TBD ¹	TBD ¹	TBD ¹	TBD ¹
Nn2	TBD ¹	TBD ¹	TBD ¹	TBD ¹	TBD ¹

¹ standards still under development at time of printing; check www.nn3.org for updates. TBD = To Be Determined

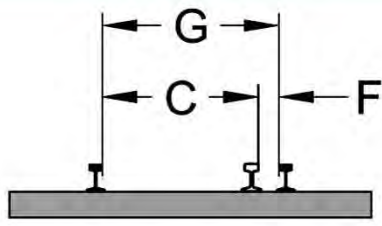
Nn3 Milestones

Nn3 Overview

August 2015

by Tom Knapp MMR#101

31



	G track gauge	F flange way	C check gauge
STANDARD			
Nn3 / Nm / N6.5	0.256" (6.5 mm)	0.030" (0.76 mm)	0.226" (5.74 mm)
Nn2 / N4.5	0.177" (4.5 mm)	0.030" (0.76 mm)	0.147" (3.74 mm)
FINESCALE			
Nn3 / Nm / N6.5	0.256" (6.5 mm)	0.025" (0.64 mm)	0.229" (5.82 mm)
Nn2 / N4.5	0.177" (4.5 mm)	0.025" (0.64 mm)	0.150" (3.82 mm)
PROTO			
Nm	0.2475" (6.25 mm)	TBD ¹	TBD ¹
Nn3	0.225" (5.72 mm)	TBD ¹	TBD ¹
Nn2	0.150" (3.81 mm)	TBD ¹	TBD ¹

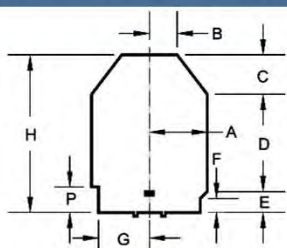
Nn3 Milestones

Nn3 Overview

August 2015

by Tom Knapp MMR#101

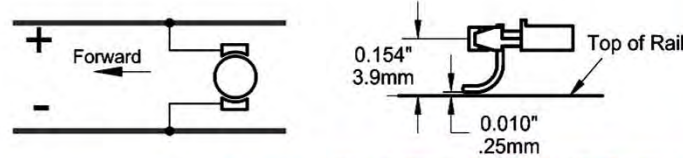
32



	A	B	C	D	E	F	G	H	P
Nn3/Nm/N6.5	.469"	.225"	.319"	.788"	.169"	.113"	.413"	1.275"	.206"
	11.91mm	5.72mm	8.10mm	20.02mm	4.29mm	2.87mm	10.49mm	32.39mm	5.23mm
Nn2 / N4.5	.449"	.225"	.319"	.788"	.141"	.113"	.338"	1.200"	.172"
	11.40mm	5.72mm	8.10mm	20.02mm	3.58mm	2.87mm	8.59mm	30.48mm	4.37mm

Motor Wiring
Motors should be wired so when the rail on the engineer's side of the locomotive (right side) is positive, the locomotive moves forward.

Couplers
Any coupler is permitted. Micro Trains Nn3/Z couplers are Standard for interchange and for use on Nn3 modular layouts.



Nn3 Milestones

Nn3 Overview
by Tom Knapp MMR#101

August 2015

33



Nn3 Overview
by Tom Knapp MMR#101

August 2015

34

- **Locomotives**
- **Rolling Stock**
- **Trackwork**
- **Clubs and e-Groups**
- **Modules**



August 2015

Nn3 Overview
by Tom Knapp MMR#101

35


Nn3 Locomotives



August 2015

Nn3 Overview
by Tom Knapp MMR#101

36



Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 37



Nn3 Locomotives can be generally categorized into the following:

- 1. Scratch Built**
- 2. Semi-Scratch-built** (scratch-built superstructure on commercial chassis, Marklin or other)
- 3. Parts-Built**
- 4. Conversion Kits** (for converting a non-Nn3 locomotive to Nn3)
- 5. Kit**
 - a. Including Marklin-based chassis
 - b. Including proprietary chassis
- 6. Ready to run (R-T-R)**
 - a. R-T-R on Marklin chassis
 - b. R-T-R on proprietary chassis

Locomotives

Nn3 Overview
by Tom Knapp MMR#101

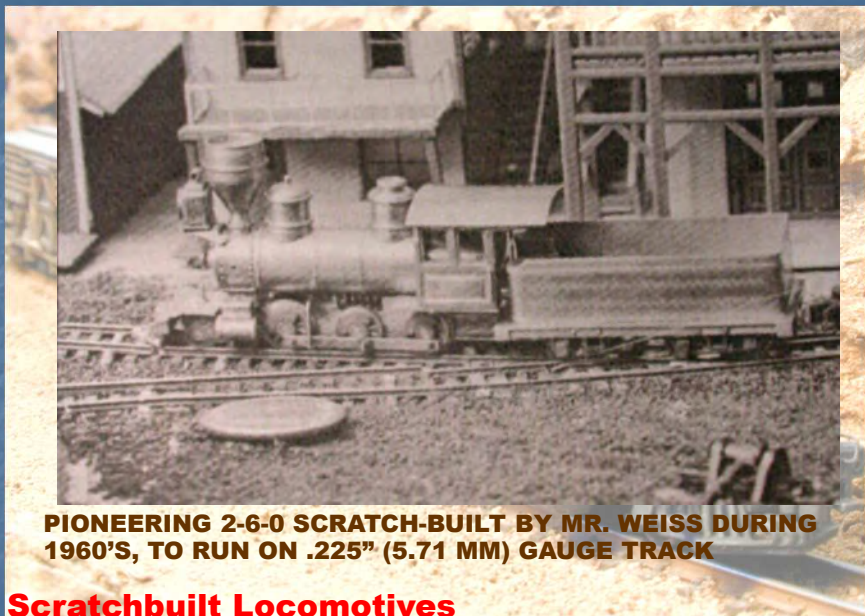
August 2015 38



August 2015

Nn3 Overview
by Tom Knapp MMR#101

39



August 2015

Nn3 Overview
by Tom Knapp MMR#101

40



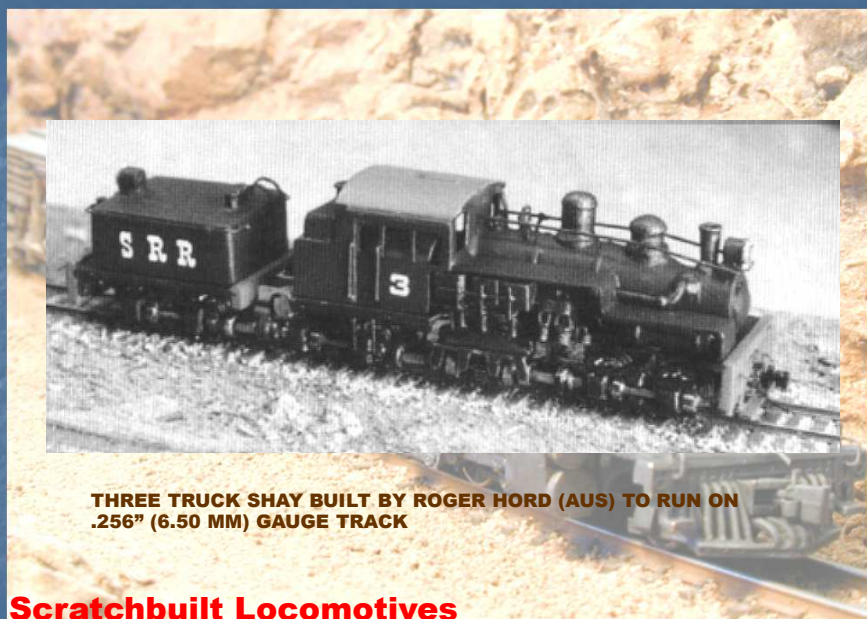
Scratchbuilt Locomotives

Nn3 Overview

August 2015

by Tom Knapp MMR#101

41



Scratchbuilt Locomotives

Nn3 Overview

August 2015

by Tom Knapp MMR#101

42



August 2015

Nn3 Overview
by Tom Knapp MMR#101

43



August 2015

Nn3 Overview
by Tom Knapp MMR#101

44

Partial Marklin Mini Club Steam Loco Chassis Roster

Marklin No.	Wheel arrangement	driver diameter	wheelbase
8800	0-6-0	0.195	0.6060
8801, 8803, 8895	2-6-0	0.274	0.7205
8802	track cleaner		
8804, 8864, 8865	A-1-A	0.195	0.6890
8805	0-6-0	0.195	0.6060
8806	4-6-4		
8807, 8881, 8882	2-8-2		
8816, 8817	4 whl rail bus		
8827	2-8-2		
8884	2-10-0		
8885	4-6-2		
8888, 8889	4-6-2		
8891, 8892, 8893	4-6-2		
8895	2-6-0		
8896	2-8-2		
88690	B0-B0		
8899	4-6-0		

Detailed Specifications
with Erection
Diagrams are in The
Nn3 Handbook

Chassis Components

August 2015

Nn3 Overview
by Tom Knapp MMR#101

45

Marklin "Unitized" Chassis



8804 / 8864 / 8865



8801 / 8803 / 8895



8800 / 8805

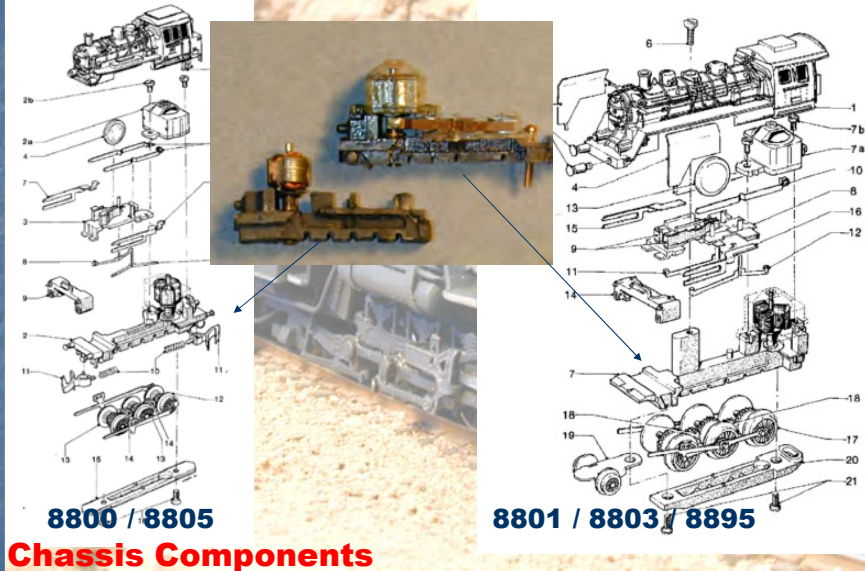
Chassis Components

August 2015

Nn3 Overview
by Tom Knapp MMR#101

46

Marklin "Unitized" Chassis

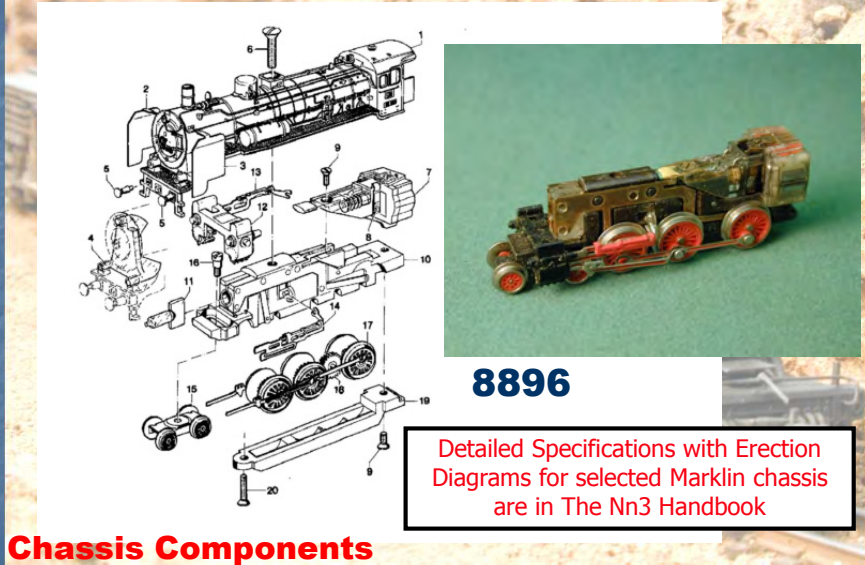


August 2015

Nn3 Overview
by Tom Knapp MMR#101

47

Marklin Non-Unitized Chassis

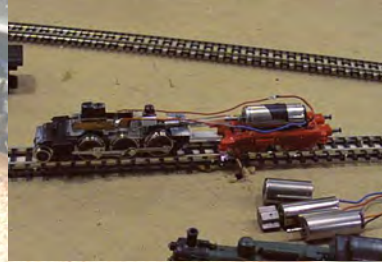


August 2015

Nn3 Overview
by Tom Knapp MMR#101

48

Alternative Motors



Chassis Components

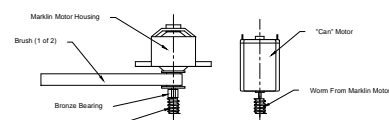
Nn3 Overview

by Tom Knapp MMR#101

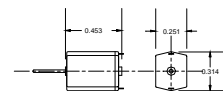
August 2015

49

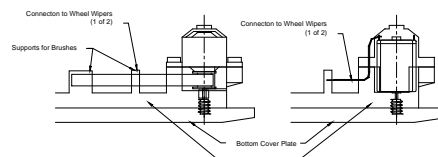
Re-motoring Unitized Chassis Locos



Comparison of Marklin and Can Motors



"Can" Motor Dimensions (Inches)



Comparison of Motor Installations

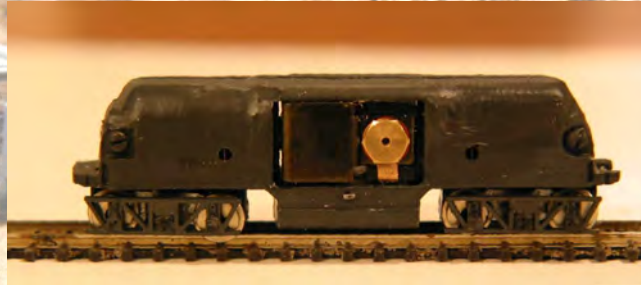
Chassis Components

Nn3 Overview

by Tom Knapp MMR#101

August 2015

50



**Micro Trains Z-Scale F-7 Chassis
(used in RLW geared loco, doodle-
bug and box-cab diesel kits)**

Chassis Components

August 2015

Nn3 Overview
by Tom Knapp MMR#101

51



**Tenshodo Z-Scale Japanese D51
Mikado Locomotive - available in
various prototypical
configurations**

Chassis Components

August 2015

Nn3 Overview
by Tom Knapp MMR#101

52



**Tenshodo Z-Scale Japanese D51
Mikado Locomotive - 2-8-2 chassis**

Chassis Components

Nn3 Overview

August 2015

by Tom Knapp MMR#101

53



**Tenshodo Z-Scale Japanese C62
Locomotive - 4-6-4 chassis**

Chassis Components

Nn3 Overview

August 2015

by Tom Knapp MMR#101

54



Chassis Components

Nn3 Overview
by Tom Knapp MMR#101

August 2015

55

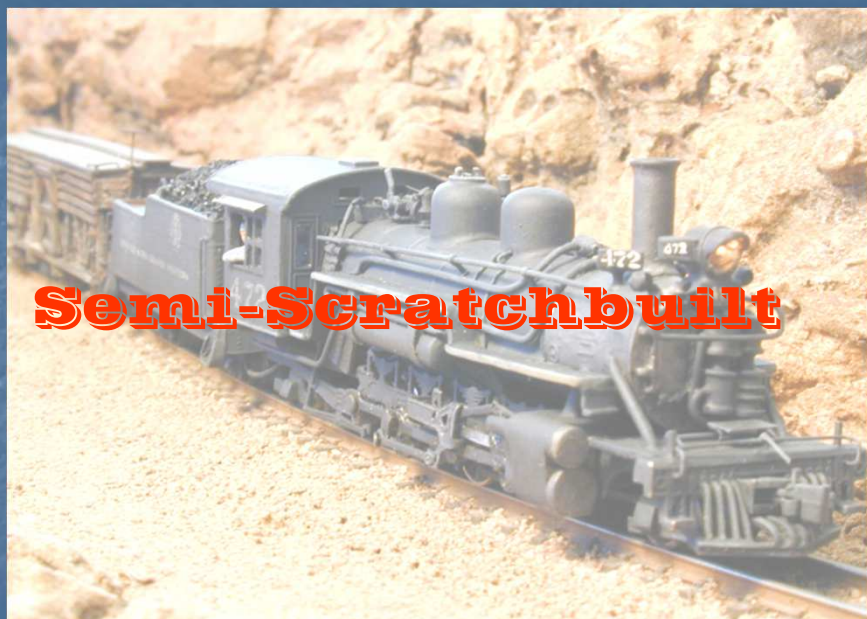


Chassis Components

Nn3 Overview
by Tom Knapp MMR#101

August 2015

56



August 2015

Nn3 Overview
by Tom Knapp MMR#101

57



K-37 #491 SCRATCH-BUILT BY AUTHOR DURING 1980'S, TO RUN ON .256" (6.50 MM) GAUGE TRACK (was used as pattern for RLW kit)

Semi-Scratch-Built Locomotives

August 2015

Nn3 Overview
by Tom Knapp MMR#101

58



K-37 #491 SCRATCH-BUILT BY AUTHOR DURING 1980'S, TO RUN ON .256" (6.50 MM) GAUGE TRACK (was used as pattern for RLW kit)

Semi-Scratch-Built Locomotives

Nn3 Overview

August 2015

by Tom Knapp MMR#101

59



SCRATCH-BUILT UINTAH MALLET SUPERSTRUCTURE, ON TWO MARKLIN 0-6-0 CHASSIS, BY TED BRANDON

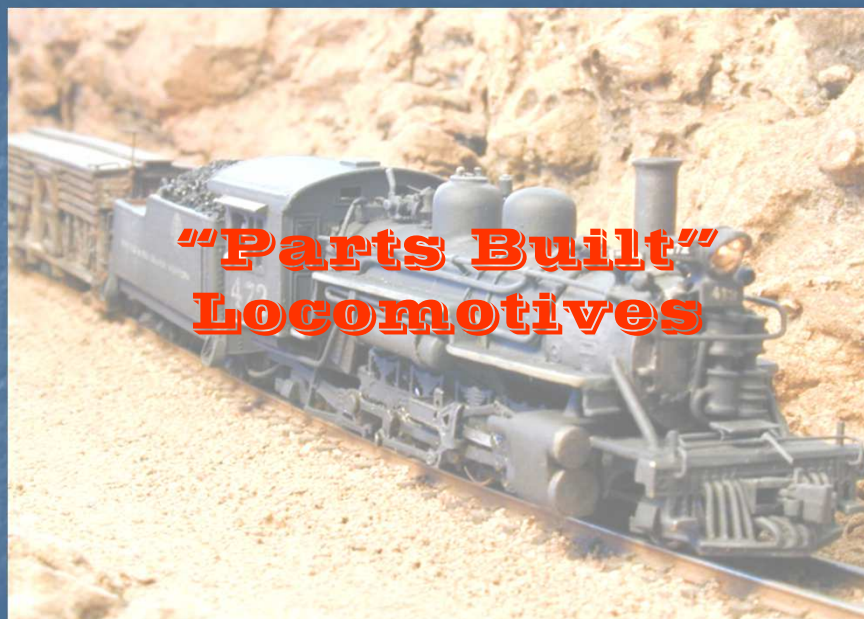
Semi-Scratch-Built Locomotives

Nn3 Overview

August 2015

by Tom Knapp MMR#101

60



August 2015

Nn3 Overview
by Tom Knapp MMR#101

61



Boilers, cabs, domes, cylinders, air tanks, tenders – all locomotive components are available separately from RLW, Detail Assoc. and Aspen, enabling a modeler to “parts-bash” their own locomotive, as shown here.

Parts-Built Locomotives

August 2015

Nn3 Overview
by Tom Knapp MMR#101

62



Kit & R-T-R Locomotives

August 2015

Nn3 Overview
by Tom Knapp MMR#101

63



The first kit for a Marklin-based Nn3 locomotive was produced by Robert Sloan in the late 1970's. This kit is still produced by RLW.

Locomotives

August 2015

Nn3 Overview
by Tom Knapp MMR#101

64



Rocky Mountain Model's "Show-Wa-No", with original 4-wheel tender, the first R-T-R Nn3 locomotive (1984)

Locomotives

Nn3 Overview

August 2015

by Tom Knapp MMR#101

65

Key	Type	Description	RTR	KIT	Mech Mfr	Mech Model
AM	0-6-0T	Class 48 Tank Engine	X	E	Märklin	8800, 88051
RLW	0-6-0T	Class 48 Tank Engine		E	Märklin	8800, 88051
RLW		Davenport Switcher		E	Märklin	8800, 88051
GR	2-6-0	C&S #9, Mogul		M	Märklin	8895/8803
GR	4-6-0	SP #8/#9		M	Märklin	8899
MT	2-6-0	C&S #5, #6, #7 or #10	X		Märklin	8895
RLW	2-6-0	1880's Baldwin Mogul		M	Märklin	8895
AM	2-8-0	DRG #74	X	M	Märklin	8896
RLW	2-8-0	C-16		H	Märklin	8896
RLW	2-8-0	C-21		H	Märklin	8896
RLW	2-8-0	SP #1		H	Märklin	8896
RLW	4-6-0	RGS #20		M	Märklin	8895
RLW	4-6-0	RGS #22		M	Märklin	8895
LOK	2-8-2	DRG&W K-27	X		Märklin	8896
RLW	2-8-2	DRG&W K-27		H	Märklin	8896
AM	2-8-2	DRG&W K-28	X	H	AM	Faulhaber
AM	2-8-2	DRG&W K-36	X	H	AM	Faulhaber
RLW	2-8-2	DRG&W K-37		H	Märklin	8896, 8827
RLW	2-8-2	EBT Heavy Mikado		H	Märklin	8827
AM	Goose	RGS Goose #4	X	H	AM	Faulhaber
AM	Goose	RGS Goose #3	X	H	AM	Faulhaber
RLW	Goose	RGS Goose #2		H	Märklin	8804, 8864, 8865, 88051
RLW	Goose	RGS Goose #3-#7		H	Märklin	8804, 8864, 8865, 88051
RLW	Climax	Climax A type		M	MT	14005
RLW	Shay	WSLC Shay		H	MT	14005
RLW	Mack	SN Mack "A" Rail Bus		H	Märklin	8804, 8864, 8865
RLW	Diesel	WP&Y D		M	Märklin	8854
RLW	Diesel	SP "Little Giant" 50 Ton GE Diesel 1		E	MT	14005

Kit and R-T-R Locomotives

Nn3 Overview

August 2015

by Tom Knapp MMR#101

66

Kit & R-T-R Locomotive Manufacturers

- Micro Trains
- Marklin
- Tex-N-Rails (LOK14)
- Republic Locomotive Works
- Aspen Model
- T R Knapp Model Engineering
- Toma Model Works
- Searails
- Image Replicas
- PECO
- NMRS Northampton

Kit & R-T-R Locomotives

* European prototypes are also offered by several manufacturers.

August 2015

Nn3 Overview
by Tom Knapp MMR#101

67

Micro Trains



Brass superstructure on Marklin chassis; not listed by MT, but some shops still have these, and they are often on e-Bay

R-T-R Locomotives

August 2015

Nn3 Overview
by Tom Knapp MMR#101

68

Marklin



Brass superstructure on Marklin chassis; marketed as part of Marklin's Mini-Club Z-scale line, but model scales out to N-narrow gauge; the original #268 was a 2-8-0. (Re-painted and fitted with MT couplers at right.)



R-T-R Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 69

LOK14

Tex-N-Rails



Brass superstructure on proprietary chassis.

R-T-R Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 70



R-T-R Locomotives

Nn3 Overview

August 2015

by Tom Knapp MMR#101

71



GE 25 ton four-wheel industrial diesel switcher – all brass

(Also available factory painted.)

R-T-R Locomotives

Nn3 Overview

August 2015

by Tom Knapp MMR#101

72

Searails



GE 25 ton four-wheel industrial diesel switcher – all brass
(DCC and LED lighting added by T Knapp)

R-T-R Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 73

Searails



EMD 40 industrial diesel switcher – all brass
(Marketed as Z Scale standard gauge but dimensions make it suitable for Nn3)

R-T-R Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 74

Searails



R-T-R, brass investment castings, powered motor car plus trailer
 (Pre-production prototype show; final models will be available factory painted; SUMMER 2014.)

R-T-R Locomotives

Nn3 Overview
 by Tom Knapp MMR#101

August 2015 75

Searails



Porter 0-4-0T, R-T-R, brass investment castings
 (Painted pre-production prototype show)

R-T-R Locomotives

Nn3 Overview
 by Tom Knapp MMR#101

August 2015 76

Searails



Wood box-cab "Critter", R-T-R, brass investment castings
(Painted pre-production prototype show)

R-T-R Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 77

Searails



Steel-cab cab "Critter", R-T-R, brass investment castings
(Painted pre-production prototype show)

R-T-R Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 78

Toma Model Works



R-T-R brass four wheel diesel switcher

R-T-R Locomotives (also available as kit)

Nn3 Overview
by Tom Knapp MMR#101

August 2015 79



Aspen Model

Available through R S Laserkit in USA


Kit & R-T-R Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 80



Aspen Model






Kit & R-T-R Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 81



Aspen Model





Kit & R-T-R Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 82



Aspen Model

Kit & R-T-R Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 83



**T. R. Knapp
Model Engineering**
Available through RLW

Kit & R-T-R Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 84

T R Knapp Model Engineering



SOLD OUT

West Side Lumber Company 3-Truck Shay No. 15, all brass
(new re-tooled version Summer 2015)

Kit Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 85

T R Knapp Model Engineering
(available through R-L-W)



"Critter No. 1" Gas Mechanical, brass

Kit Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 86

T R Knapp Model Engineering
(available through R-L-W)



Porter 0-4-0 Saddle tank loco, brass and etched SS

Kit Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 87

T R Knapp Model Engineering
(available through R-L-W)



“Captain Goodall” Steam Dummy, brass and white metal (Spring 2016)

Kit Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 88



**TOMA MODEL
WORKS**
Kenji Toma, Japan

Kit & R-T-R Locomotives

August 2015

Nn3 Overview
by Tom Knapp MMR#101

89



Toma Model Works

Kit Locomotives

August 2015

Nn3 Overview
by Tom Knapp MMR#101

90

Toma Model Works




Kit Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 91

Toma Model Works



Kit Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 92



August 2015

Nn3 Overview
by Tom Knapp MMR#101

93



August 2015

Nn3 Overview
by Tom Knapp MMR#101

94

Image Replicas / Showcase Miniatures-US



Class A 16-Ton T-Boiler Shay, Open Cab version

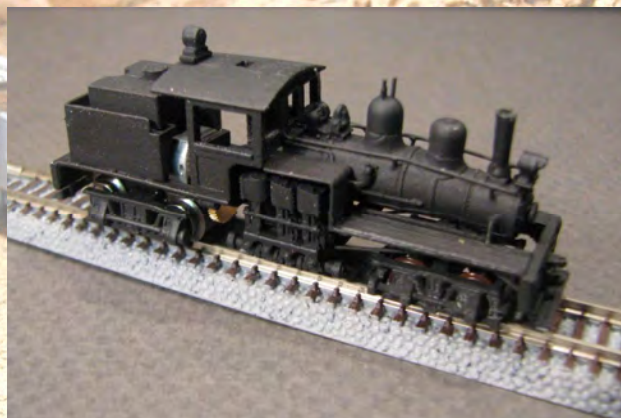
Kit Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015

95

Image Replicas / Showcase Miniatures-US




Class B 26-Ton Shay (oil fired version show; also avail. as coal and wood burning)

Kit Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015

96



Republic Locomotive Works

Kit Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 97



RLW

RLW offers an extensive line of Nn3 locomotive kits designed to fit Marklin or Micro Trains mechanisms. They also sell an extensive line of locomotive components and detail parts.

Kit Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 98



RLW

Kit Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015

99



RLW

Kit Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015

100

RLW

Kit Locomotives

Nn3 Overview

by Tom Knapp MMR#101

August 2015

101

RLW

Shay locomotives
fit the Micro Trains
F-7 chassis.

Kit Locomotives

Nn3 Overview

by Tom Knapp MMR#101

August 2015

102

RLW



Kit Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 103

RLW



Kit Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 104



RLW

Kit Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 105



Other

Kit Locomotives

Nn3 Overview
by Tom Knapp MMR#101

August 2015 106



Pairhands Models





Kit Locomotives


Nn3 Overview
by Tom Knapp MMR#101

August 2015

107



Pairhands Models



Kit Railbus

Nn3 Overview
by Tom Knapp MMR#101

August 2015

108



County Rolling Stock
(www.NTASTICShop.co.uk)

White Metal loco kits by Peco and NMRS

August 2015

Nn3 Overview
by Tom Knapp MMR#101

109



DCC

August 2015

Nn3 Overview
by Tom Knapp MMR#101

110



Several decoders are available which fit into typical Nn3 locomotives, the preferred unit being the smallest Lenz decoders.

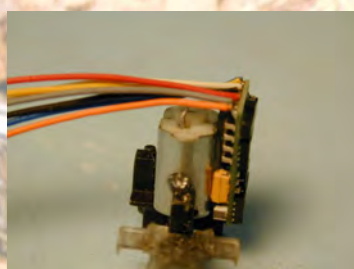
DCC

Nn3 Overview

August 2015

by Tom Knapp MMR#101

111



For saddle-tank locomotives or small diesels, the decoder can be mounted in the cab. This is preferred for even tender locomotives as the wires between the locomotive and tender cause problems for light weight Nn3 locomotives.

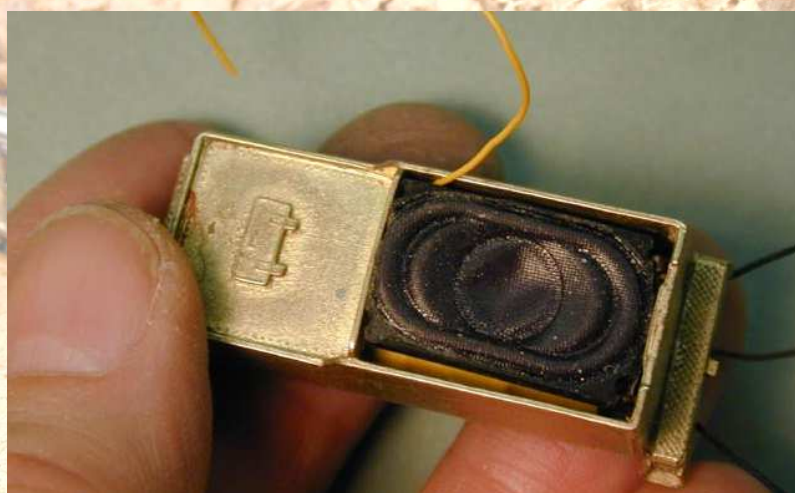
DCC

Nn3 Overview

August 2015

by Tom Knapp MMR#101

112



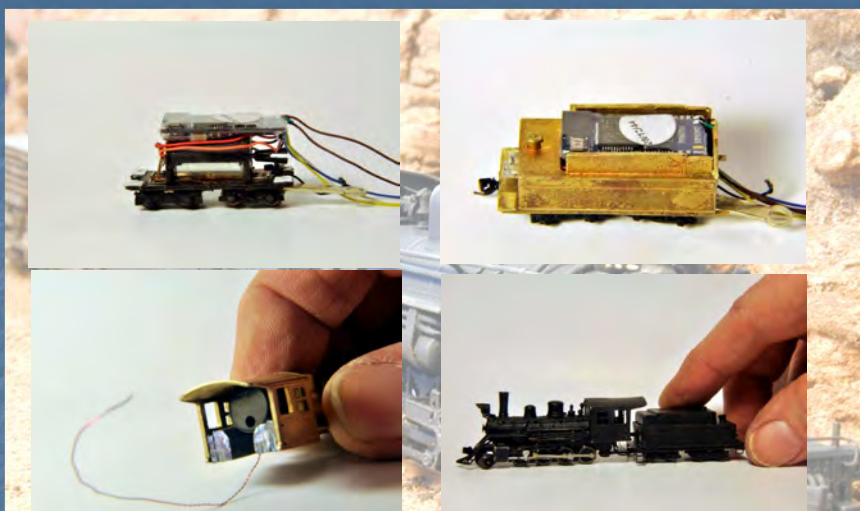
Larger steam locomotives have sufficient space (and weight) to accommodate decoders and speakers in the tender.

DCC

August 2015

Nn3 Overview
by Tom Knapp MMR#101

113



Even medium-sized locomotives can incorporate sound using LokSound decoders and special Motorola speakers.

DCC

August 2015

Nn3 Overview
by Tom Knapp MMR#101

114



August 2015

Nn3 Overview
by Tom Knapp MMR#101

115



Early freight car kits were solid cast-epoxy or wood "craftsman" kits (i.e., a drawing and a bundle of wood.)

Early trucks were cast-epoxy using Marklin wheelsets (left.) Later, Nelson Gray produced injection molded trucks and wheelsets (center.) At right is current Micro Trains trucks.



Rolling Stock

August 2015

Nn3 Overview
by Tom Knapp MMR#101

116



Nelson Gray produced a box car, flat car, tank car, gondola, and this kit for a caboose.

Nelson Gray couplers were scale size and considerably smaller than the later MT Z/Nn3 coupler.



Rolling Stock

Nn3 Overview

August 2015

by Tom Knapp MMR#101

117

Micro Trains Line



Micro-Trains Line is the largest purveyor of R-T-R Nn3 freight equipment. The original tooling for these models was made by Nelson Gray in the 1970's-80's.

Rolling Stock – R-T-R

Nn3 Overview

August 2015

by Tom Knapp MMR#101

118

Micro Trains Line



Rolling Stock – R-T-R

Nn3 Overview

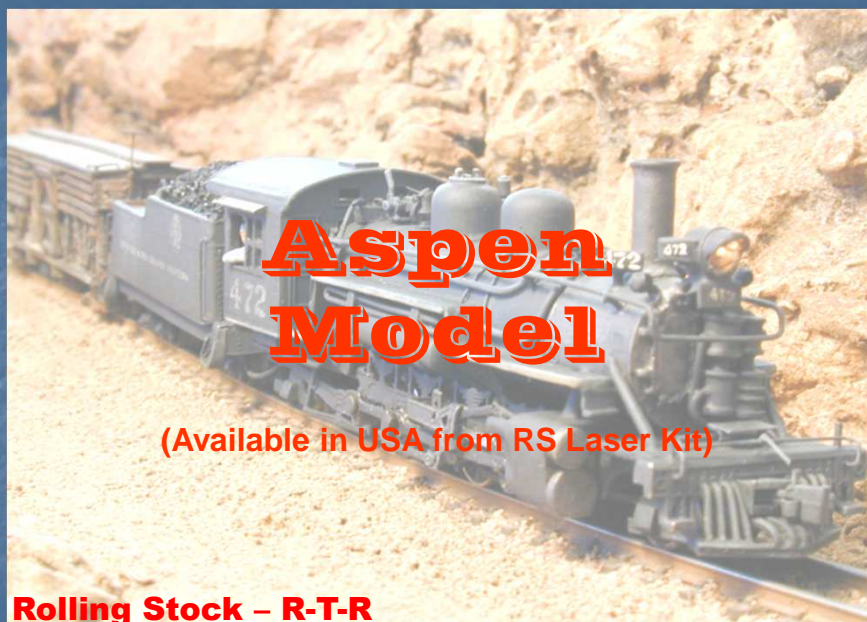
by Tom Knapp MMR#101

August 2015

119

Aspen Model

(Available in USA from RS Laser Kit)



Rolling Stock – R-T-R

Nn3 Overview

by Tom Knapp MMR#101

August 2015

120

Aspen Model



Rolling Stock – R-T-R

August 2015
Nn3 Overview
by Tom Knapp MMR#101
121

Aspen Model



Rolling Stock – R-T-R

August 2015
Nn3 Overview
by Tom Knapp MMR#101
122

Aspen Model




Rolling Stock – R-T-R

Nn3 Overview
by Tom Knapp MMR#101

August 2015 123

Republic Locomotive Works



Rolling Stock – kit

Nn3 Overview
by Tom Knapp MMR#101

August 2015 124

Republic Locomotive Works



August 2015

Nn3 Overview
by Tom Knapp MMR#101

125

Republic Locomotive Works



August 2015

Nn3 Overview
by Tom Knapp MMR#101

126

Republic Locomotive Works



Rolling Stock – kit

Nn3 Overview

August 2015

by Tom Knapp MMR#101

127

Republic Locomotive Works



Rolling Stock – kit

Nn3 Overview

August 2015

by Tom Knapp MMR#101

128

Republic Locomotive Works



Rolling Stock – kit

Nn3 Overview

by Tom Knapp MMR#101

August 2015

129

Republic Locomotive Works



Rolling Stock – kit

Nn3 Overview

by Tom Knapp MMR#101

August 2015

130

Republic Locomotive Works



Rolling Stock – kit

Nn3 Overview

by Tom Knapp MMR#101

August 2015

131

**TOMA MODEL
WORKS**
Kenji Toma, Japan



Rolling Stock – kit

Nn3 Overview

by Tom Knapp MMR#101

August 2015

132

Toma Model Works

Rolling Stock – kit

August 2015 Nn3 Overview
by Tom Knapp MMR#101 133

Country Rolling Stock (www.NTasticShop.co.uk)

3D printed kits by
Country Rolling Stock

Etched kits by NMRA and
other mfgs.

Rolling Stock – Kit

August 2015 Nn3 Overview
by Tom Knapp MMR#101 134

Ride Trains (Roy Stevens)
 (www.shapeways.com/shops/rtrains)








Acrylic 3D Print kits

Rolling Stock – Kit

August 2015
Nn3 Overview
by Tom Knapp MMR#101
135

T. R. Knapp Model Engineering


Pacific Coast 900-series
tank car kit (summer
2013)

Resin kit for a Carter
Brothers stock car

Available from Republic
Locomotive Works

Rolling Stock – Kit

August 2015
Nn3 Overview
by Tom Knapp MMR#101
136




**Nn3
Trackwork**

August 2015

Nn3 Overview
by Tom Knapp MMR#101

137



**1. A review & comparison of
available products**

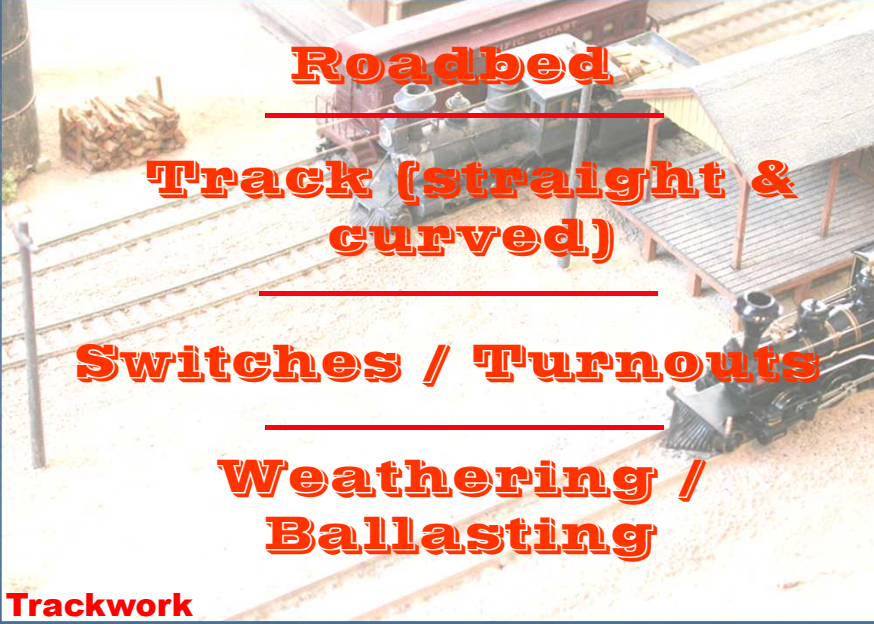
**2. A brief discussion of
techniques**

Trackwork

August 2015

Nn3 Overview
by Tom Knapp MMR#101

138



Roadbed

Track (straight & curved)

Switches / Turnouts

Weathering / Ballasting

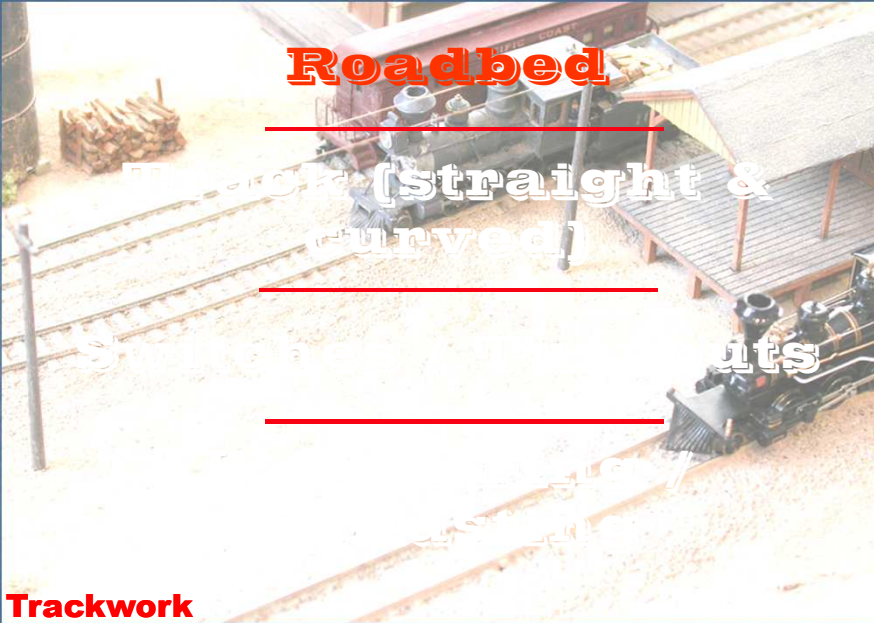
Trackwork

August 2015

Nn3 Overview
by Tom Knapp MMR#101

139

This slide features a photograph of a model train layout. The layout includes a roadbed, tracks (both straight and curved), switches/turnouts, and weathering/ballasting. The text is overlaid in red, bold, sans-serif font. The background image shows a detailed model of a train yard with a steam locomotive, a passenger car, and various track structures.



Roadbed

Track (straight & curved)

Switches / Turnouts

Weathering / Ballasting

Trackwork

August 2015

Nn3 Overview
by Tom Knapp MMR#101

140

This slide is identical to the one above, featuring the same photograph of a model train layout. The text is overlaid in red, bold, sans-serif font. The background image shows a detailed model of a train yard with a steam locomotive, a passenger car, and various track structures.

Most Nn3 modelers use 1/8" hardboard or plywood as roadbed, cut to follow the track plan in a large a continuous piece as possible, to ensure a smooth flat surface.



Roadbed



Nn3 Overview
by Tom Knapp MMR#101

August 2015

141

It is recommended that roadbed be tapered down slightly at module interface locations




Roadbed

Nn3 Overview
by Tom Knapp MMR#101

August 2015

142




Commercial tapered Homasote roadbed is available from California Homabed. This is softer and less rigid than hardboard or plywood, but is suitable for commercial track.

Roadbed

August 2015

Nn3 Overview
by Tom Knapp MMR#101

143



Track (straight & curved)

Trackwork

August 2015

Nn3 Overview
by Tom Knapp MMR#101

144

Nn3 Track can be generally categorized into the following:

- 1. Pre-Fabricated Sectional**
- 2. Pre-Fabricated Flexible (Flex)**
- 3. Hand Laid**

Track

August 2015

Nn3 Overview
by Tom Knapp MMR#101

145



Marklin

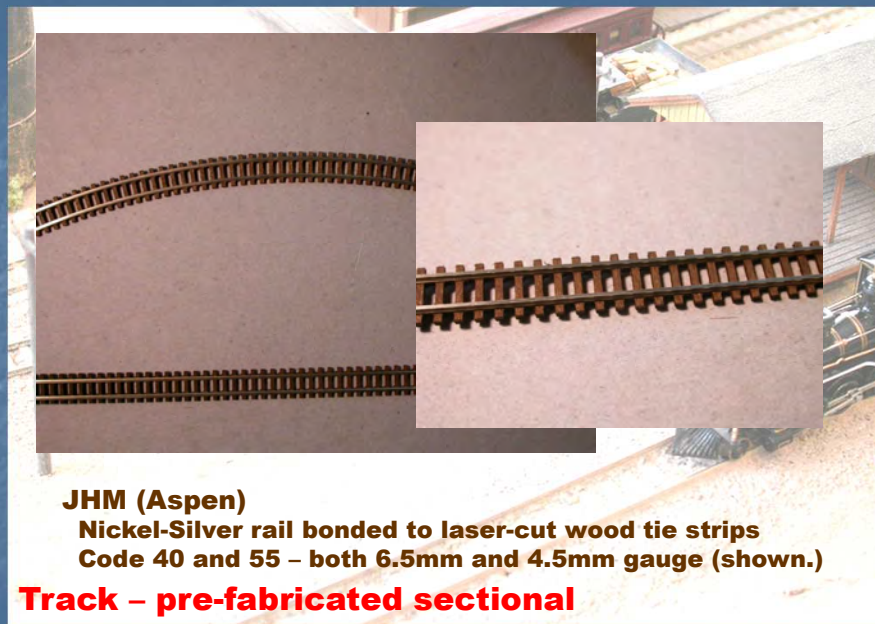
Nickel-Silver rail in molded plastic ties strips (Code 60+)

Track – pre-fabricated sectional

August 2015

Nn3 Overview
by Tom Knapp MMR#101

146



JHM (Aspen)

Nickel-Silver rail bonded to laser-cut wood tie strips

Code 40 and 55 – both 6.5mm and 4.5mm gauge (shown.)

Track – pre-fabricated sectional

August 2015

Nn3 Overview
by Tom Knapp MMR#101

147



Micro Trains Line

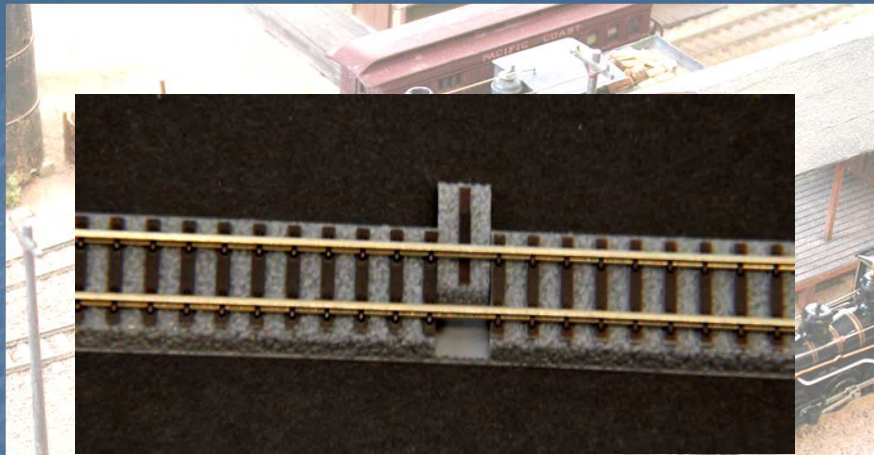
Nickel-Silver, molded plastic ties strips (Code 60+), ballast section

Track – pre-fabricated sectional

August 2015

Nn3 Overview
by Tom Knapp MMR#101

148



ROKUHAN (Japan) – Available through ZTrack Magazine's Shop
Nickel-Silver, molded plastic ties strips (Code 60+), ballast section

Track – pre-fabricated sectional

August 2015

Nn3 Overview
 by Tom Knapp MMR#101

149



Track

August 2015

Nn3 Overview
 by Tom Knapp MMR#101

150



Micro Trains

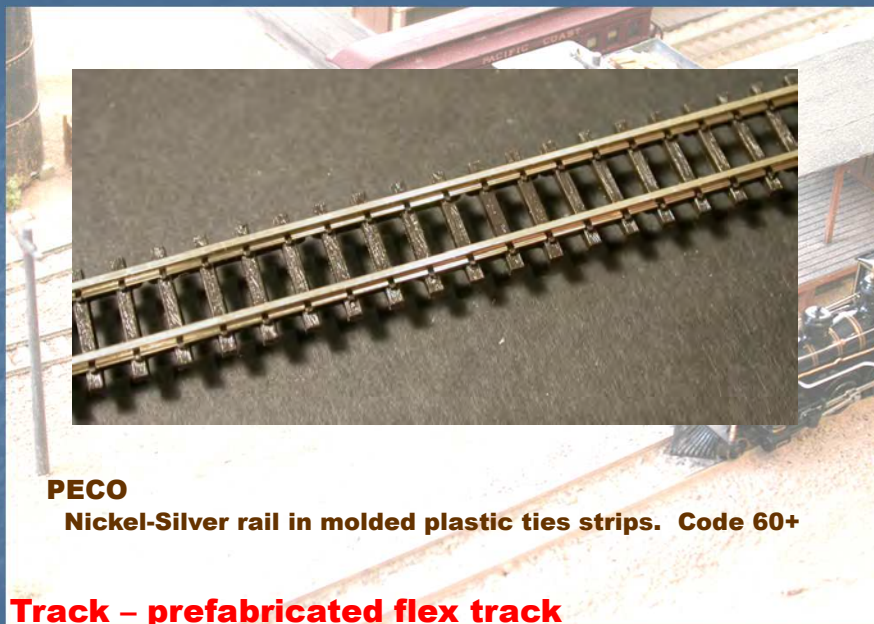
Nickel-Silver rail in molded plastic ties strips, Code 60+

Track – prefabricated flex track

August 2015

Nn3 Overview
by Tom Knapp MMR#101

151



PECO

Nickel-Silver rail in molded plastic ties strips. Code 60+

Track – prefabricated flex track

August 2015

Nn3 Overview
by Tom Knapp MMR#101

152



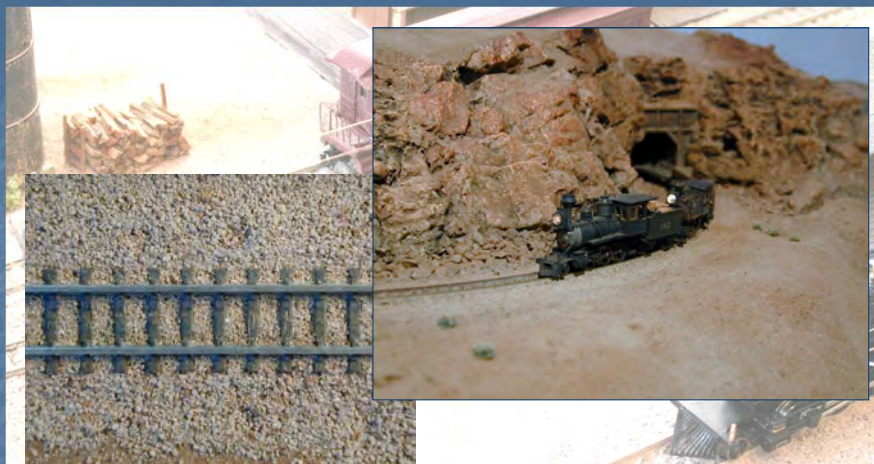
Sectional track and flex track can be glued in place with Carpenter's Glue, Liquid Nails, or ACC. ACC and an accelerator are good for gluing flex track in a curve.

Track – prefabricated

August 2015

Nn3 Overview
by Tom Knapp MMR#101

153



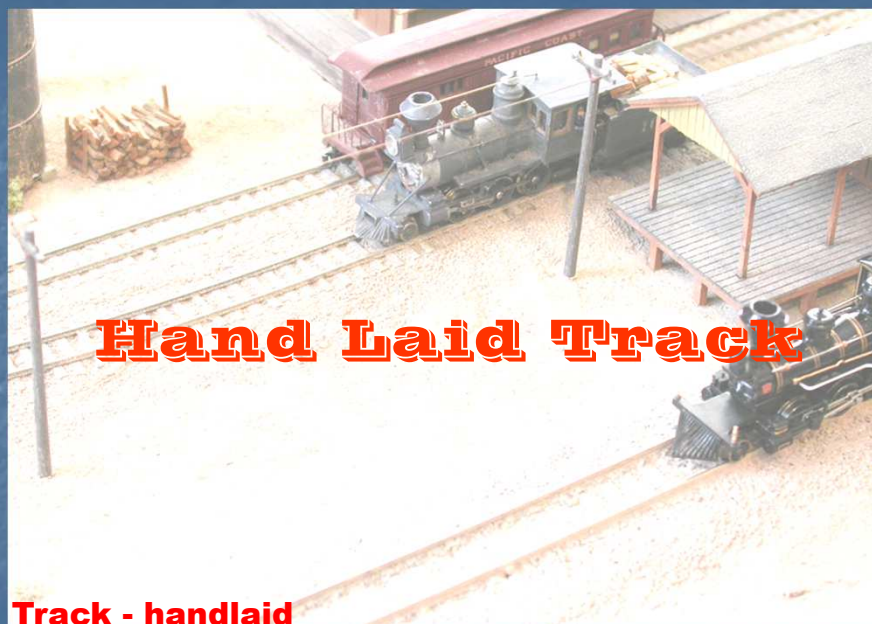
PECO Rail, installed and ballasted

Track – prefabricated

August 2015

Nn3 Overview
by Tom Knapp MMR#101

154



Track - handlaid

Nn3 Overview
by Tom Knapp MMR#101

August 2015

155

Nn3 Track is typically “hand-laid” the following ways:

1. Nickel-Silver rail bonded to wood ties using Pliobond glue and heat
2. Nickel-Silver rail soldered to printed-circuit-board (PC board) ties located at intervals (usually every 5th or 6th ties) amongst wood ties
3. Nickel-Silver rail soldered to printed-circuit-board (PC board) ties, no wood ties. Sometimes this is prepared in a jig, then transferred to the layout, becoming “hand-laid sectional track”

Track - handlaid

Nn3 Overview
by Tom Knapp MMR#101

August 2015

156

Nn3 Track is typically “hand-laid” the following ways:

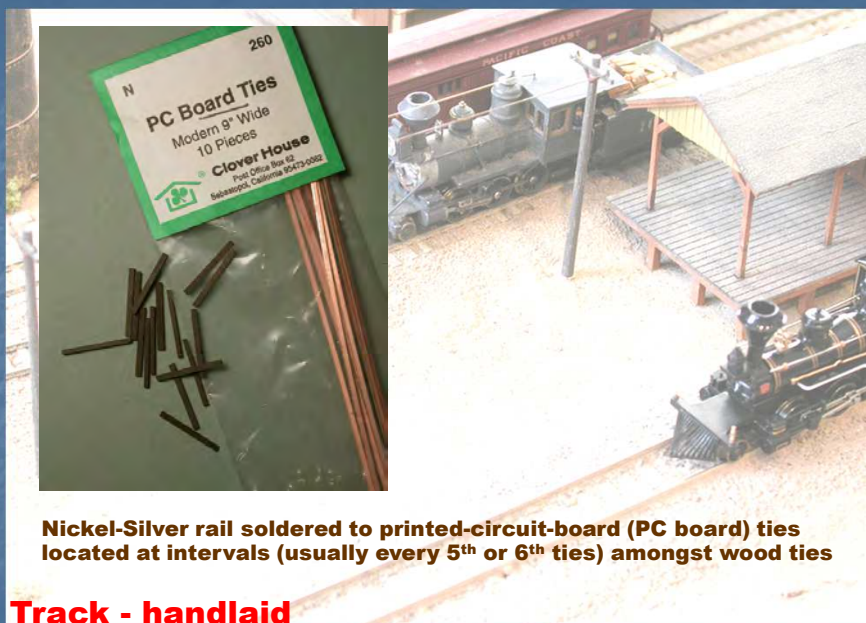
- ~~1. Nickel-Silver rail bonded to wood ties using Pliobond glue and heat~~
2. Nickel-Silver rail soldered to printed-circuit-board (PC board) ties located at intervals (usually every 5th or 6th ties) amongst wood ties
3. Nickel-Silver rail soldered to printed-circuit-board (PC board) ties, no wood ties. Sometimes this is prepared in a jig, then transferred to the layout, becoming “hand-laid sectional track”

Track - handlaid

August 2015

Nn3 Overview
by Tom Knapp MMR#101

157



Nickel-Silver rail soldered to printed-circuit-board (PC board) ties located at intervals (usually every 5th or 6th ties) amongst wood ties

Track - handlaid

August 2015

Nn3 Overview
by Tom Knapp MMR#101

158



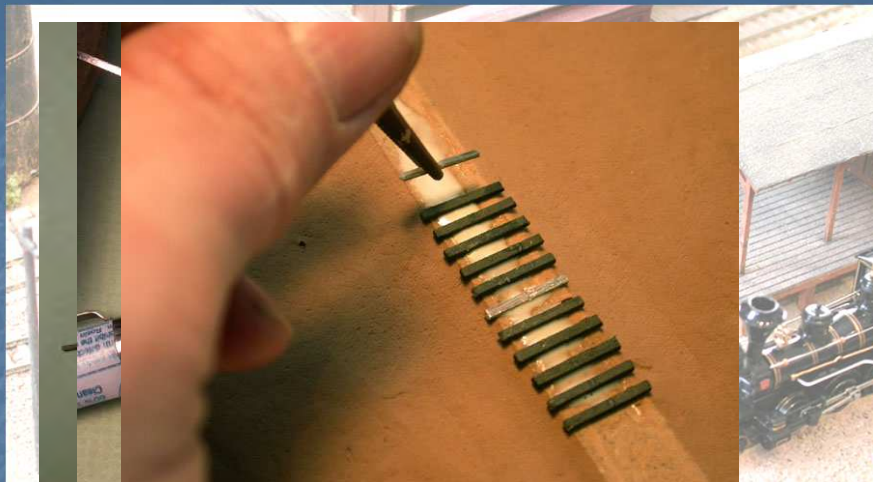
Nickel-Silver rail soldered to printed-circuit-board (PC board) ties located at intervals (usually every 5th or 6th ties) amongst wood ties

Track - handlaid

August 2015

Nn3 Overview
by Tom Knapp MMR#101

159



Nickel-Silver rail soldered to printed-circuit-board (PC board) ties located at intervals (usually every 5th or 6th ties) amongst wood ties

Track - handlaid

August 2015

Nn3 Overview
by Tom Knapp MMR#101

160



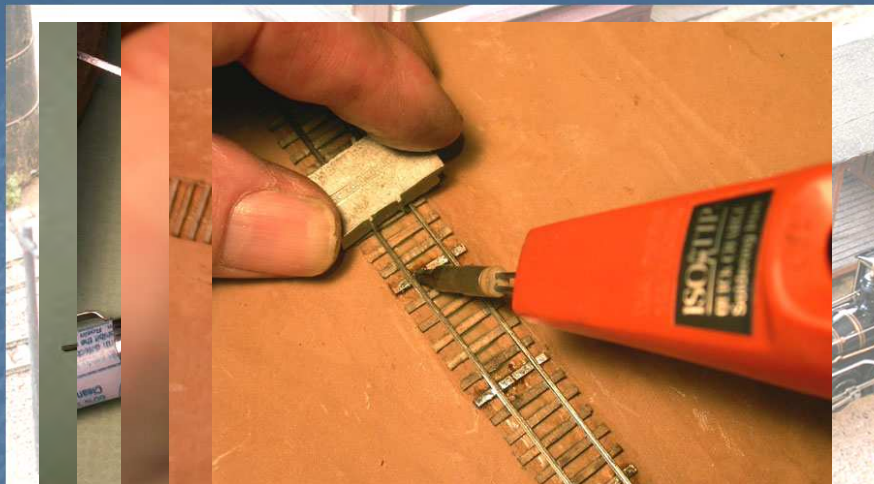
Nickel-Silver rail soldered to printed-circuit-board (PC board) ties located at intervals (usually every 5th or 6th ties) amongst wood ties

Track - handlaid

August 2015

Nn3 Overview
by Tom Knapp MMR#101

161



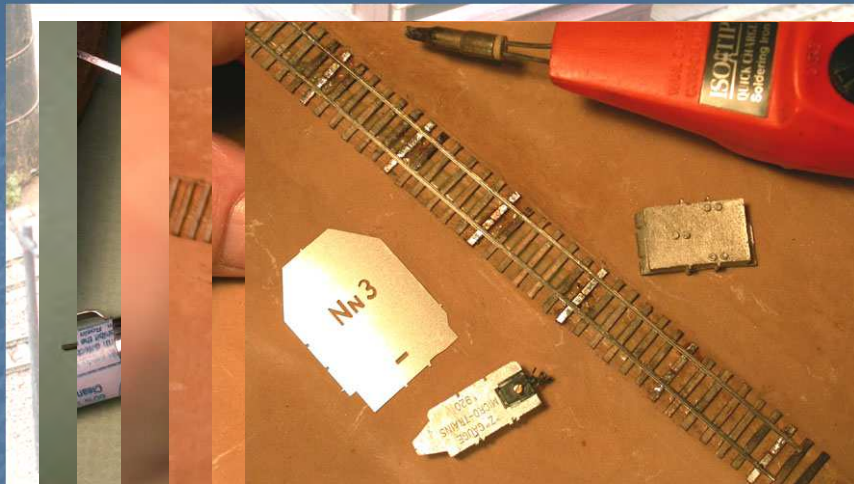
Nickel-Silver rail soldered to printed-circuit-board (PC board) ties located at intervals (usually every 5th or 6th ties) amongst wood ties

Track - handlaid

August 2015

Nn3 Overview
by Tom Knapp MMR#101

162



Nickel-Silver rail soldered to printed-circuit-board (PC board) ties located at intervals (usually every 5th or 6th ties) amongst wood ties

Track - handlaid

Nn3 Overview

August 2015

by Tom Knapp MMR#101

163



Track - handlaid

Nn3 Overview

August 2015

by Tom Knapp MMR#101

164

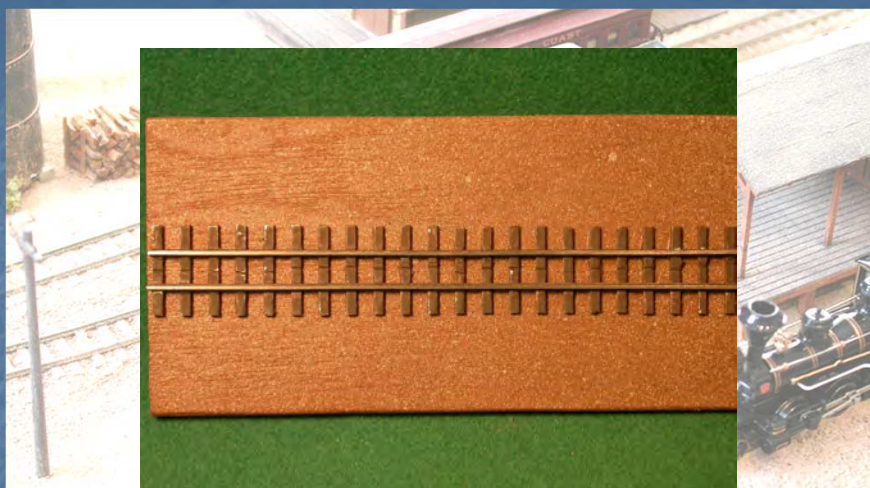


Track - handlaid

Nn3 Overview
by Tom Knapp MMR#101

August 2015

165



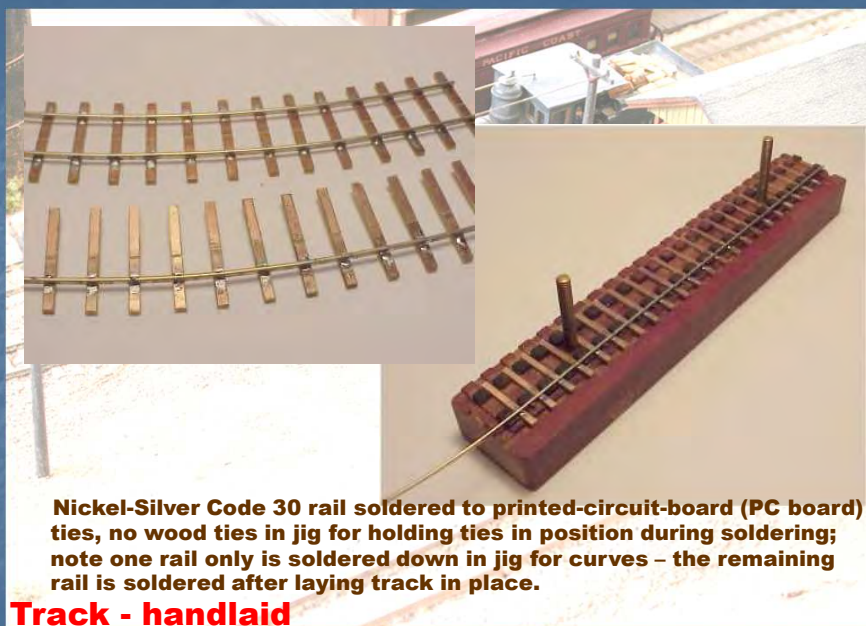
Nickel-Silver rail soldered to printed-circuit-board (PC board) ties, no wood ties. (4.5mm gauge – modeling 2-foot gauge)

Track - handlaid

Nn3 Overview
by Tom Knapp MMR#101

August 2015

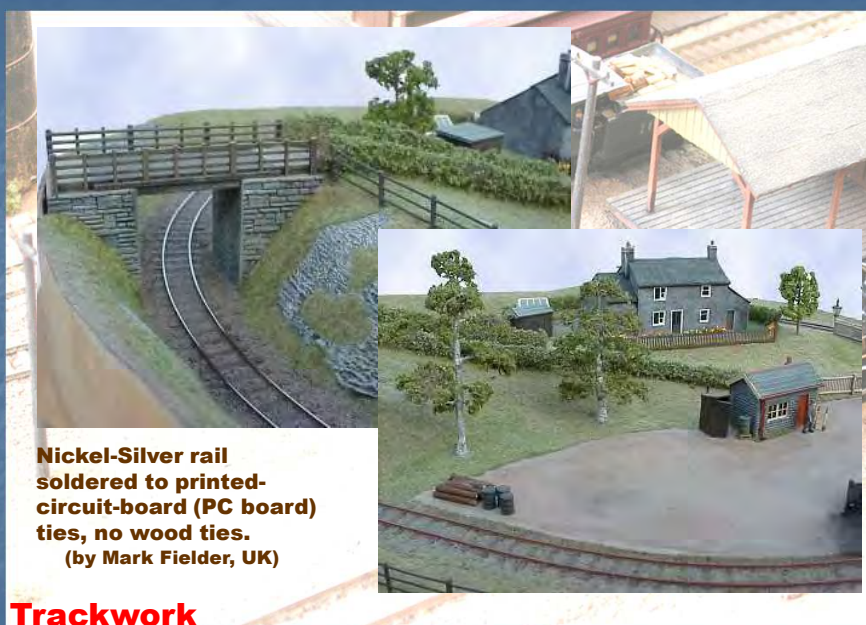
166



August 2015

Nn3 Overview
by Tom Knapp MMR#101

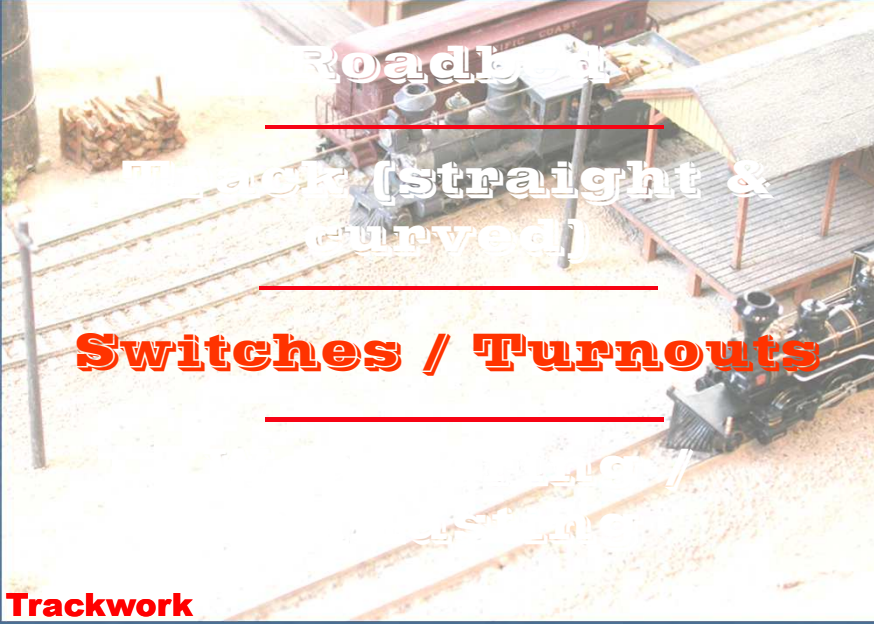
167



August 2015

Nn3 Overview
by Tom Knapp MMR#101

168



Roadbed

Trackwork (Straight & Curved)

Switches / Turnouts

Trackwork

August 2015

Nn3 Overview
by Tom Knapp MMR#101

169



Nn3 Switches can be generally categorized into the following:

- 1. Pre-Fabricated (R-T-R)**
- 2. "Skeleton" Kits**
- 3. Jig-Built Hand-Laid**
- 4. Hand-Laid**

Switches

August 2015

Nn3 Overview
by Tom Knapp MMR#101

170



Switch Machine Cover

Switch machine cover removed & replaced by ground throw

S.S. strips in flange-ways

**Marklin
Nickel-Silver rail in plastic tie strip; plastic frog**

Switches – prefabricated “R-T-R”

Nn3 Overview
by Tom Knapp MMR#101

August 2015 171



Insulated throw-bar

Stained wood ties

Metal frog

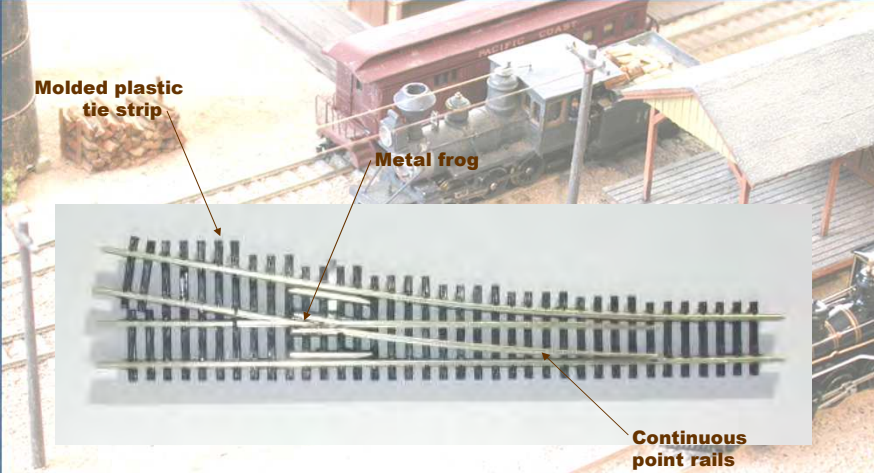
Continuous point rails

**JHM (Aspen)
Nickel-Silver rail bonded to laser-cut wood tie strips
– both 6.5mm and 4.5mm gauge.**

Switches – prefabricated “R-T-R”

Nn3 Overview
by Tom Knapp MMR#101

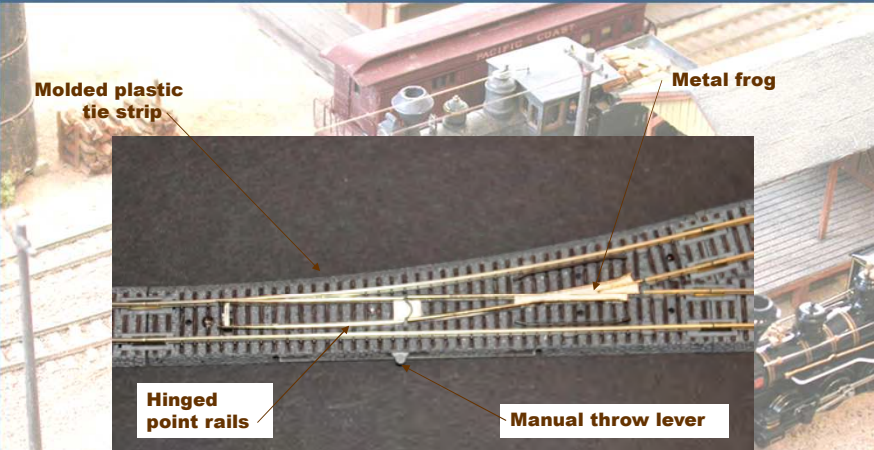
August 2015 172



Peter Wright
Nickel-Silver rail in molded plastic ties strips, compatible with PECO flex track

Switches – prefabricated “R-T-R”

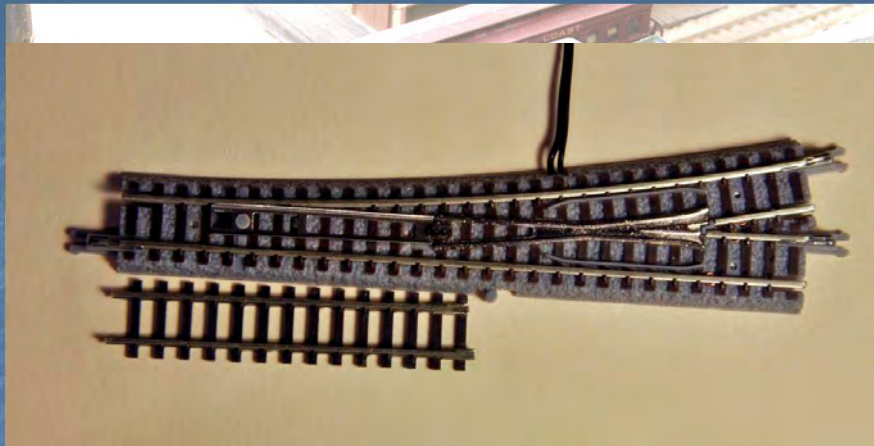
August 2015 Nn3 Overview by Tom Knapp MMR#101 173



Micro Trains Line
Nickel-Silver, molded plastic ties strips (Code 60+), ballast section

Switches – prefabricated “R-T-R”

August 2015 Nn3 Overview by Tom Knapp MMR#101 174



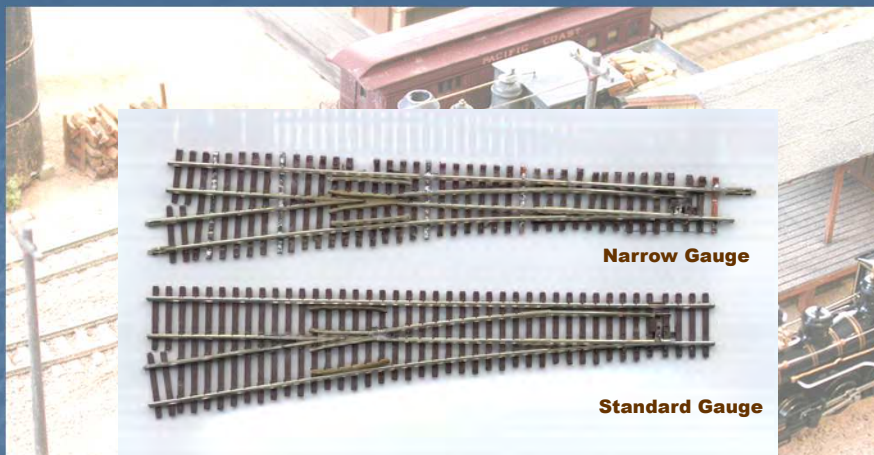
ROKUHAN (Japan) – Available through ZTrack Magazine's Shop
 Nickel-Silver, molded plastic ties strips (Code 60+), ballast section
 (Note: ties size and spacing is a match for PECO N6.5 flex track)

Switches – pre-fabricated “R-T-R”

August 2015

Nn3 Overview
 by Tom Knapp MMR#101

175



**Micro Engineering Code 55, converted to Nn3 by
 Garth Hamilton**
 Nickel-Silver rail in molded plastic tie strips

Switches – prefabricated - ALMOST “R-T-R”

August 2015

Nn3 Overview
 by Tom Knapp MMR#101

176



**Republic Locomotive Works
Weathered Code 40 Nickel-Silver rail**

Switches – “skeleton” kits

August 2015

Nn3 Overview
by Tom Knapp MMR#101

177



**BK Industries
Code 40 & 55 Nickel-Silver rail**

Switches – “skeleton” kits

August 2015

Nn3 Overview
by Tom Knapp MMR#101

178

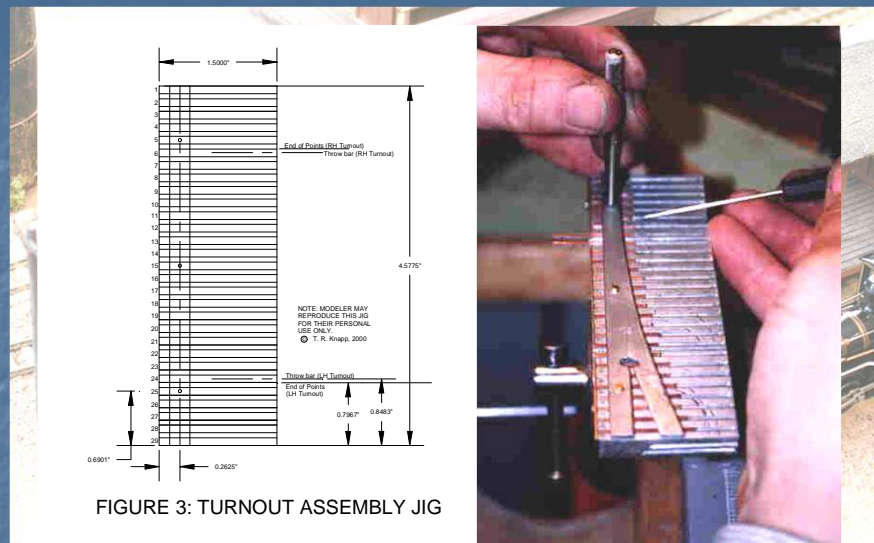


FIGURE 3: TURNOUT ASSEMBLY JIG

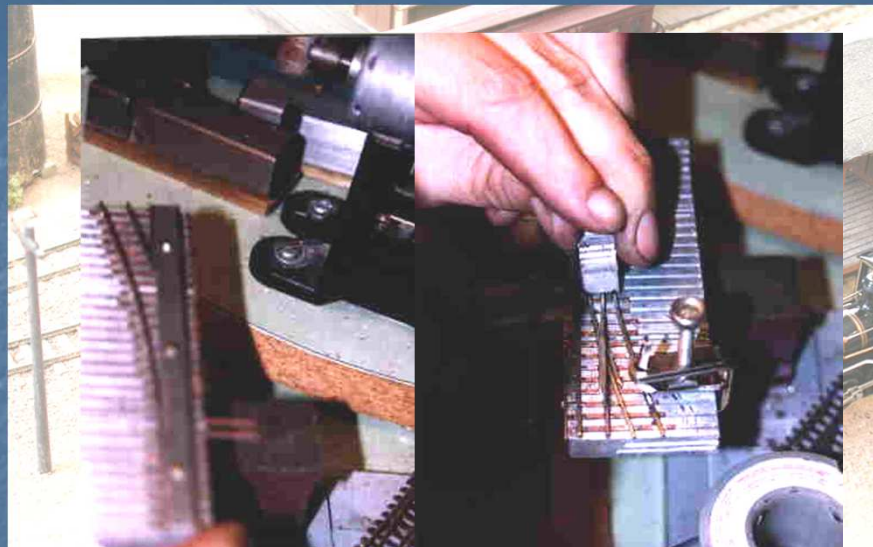
Switches – jig-built hand-laid

Nn3 Overview

August 2015

by Tom Knapp MMR#101

179



Switches – jig-built hand-laid

Nn3 Overview

August 2015

by Tom Knapp MMR#101

180



Switches – jig-built hand-laid

Nn3 Overview

by Tom Knapp MMR#101

August 2015

181



Nickel-Silver rail soldered to printed-circuit-board (PC board) ties in a jig, then transferred to the layout.
(Welsh narrow gauge, by Mark Fielder, UK.)

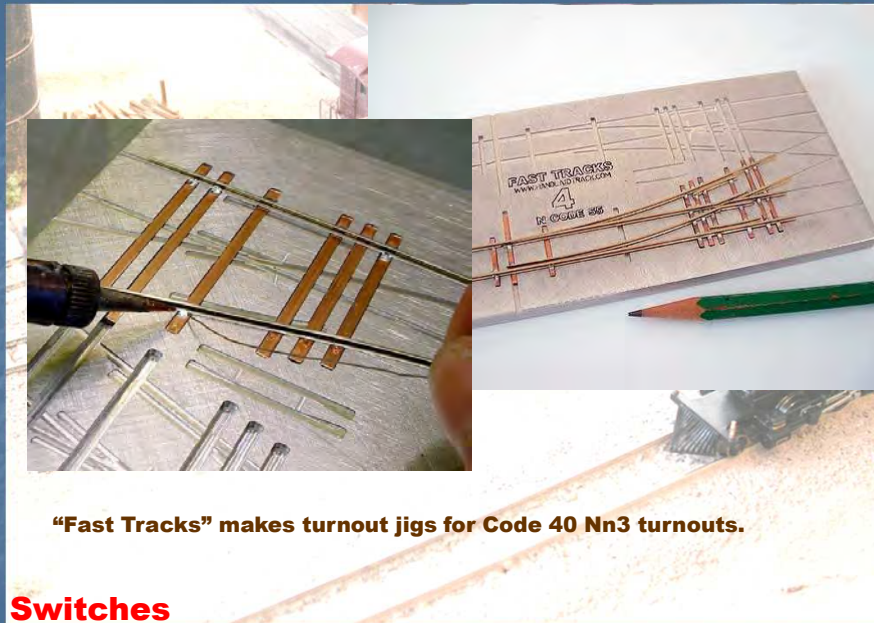
Switches – jig-built hand-laid

Nn3 Overview

by Tom Knapp MMR#101

August 2015

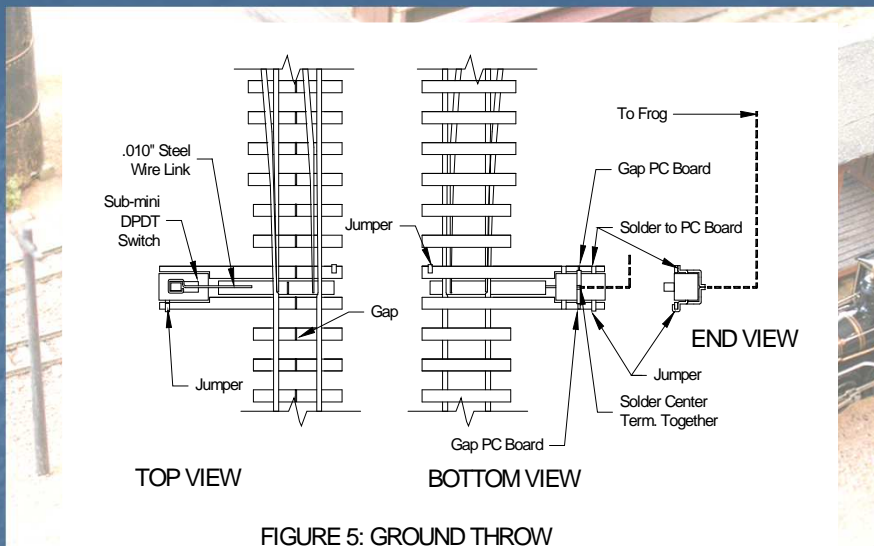
182



August 2015

Nn3 Overview
by Tom Knapp MMR#101

183

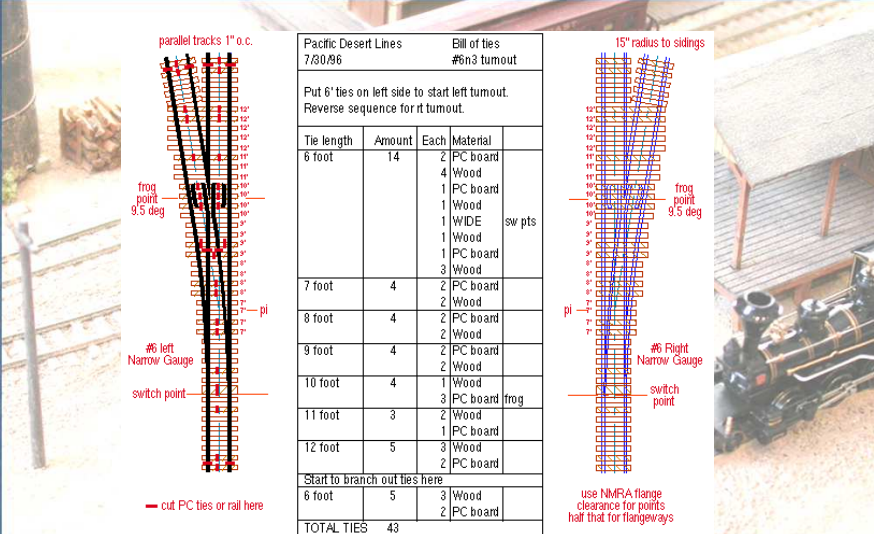


Switches – ground throws

August 2015

Nn3 Overview
by Tom Knapp MMR#101

184



parallel tracks 1" o.c.

frog point 9.5 deg

#6 left Narrow Gauge

switch point

cut PC ties or rail here

Pacific Desert Lines
7/30/96

Bill of ties
#N3 turnout

Put 6' ties on left side to start left turnout.
Reverse sequence for right turnout.

Tie length	Amount	Each	Material
6 foot	14	2	PC board
		4	Wood
		1	PC board
		1	Wood
		1	WIDE
		1	Wood
		1	PC board
		3	Wood
7 foot	4	2	PC board
		2	Wood
8 foot	4	2	PC board
		2	Wood
9 foot	4	2	PC board
		2	Wood
10 foot	4	1	Wood
		3	PC board
11 foot	3	2	Wood
		1	PC board
12 foot	5	3	Wood
		2	PC board
Start to branch out ties here			
6 foot	5	3	Wood
		2	PC board
TOTAL TIES 43			

15" radius to sidings

frog point 9.5 deg

#6 Right Narrow Gauge

switch point


use NMRA flange clearance for points half that for flangeways

<http://www.urbaneagle.com/slim/./data/RRturnouts.html>

Switches – hand-laid

Nn3 Overview
by Tom Knapp MMR#101

August 2015 185



Roadbed

Track (straight & curved)

Switches / Turnouts

Weathering / Ballasting

Trackwork

Nn3 Overview
by Tom Knapp MMR#101

August 2015 186



Mask adjacent terrain and spray both rail and ties with Testor's Master Modelers Light Earth or Floquil Rail Brown

Weathering / Ballasting

Nn3 Overview

August 2015

by Tom Knapp MMR#101

187



Spread ballast over track, then carefully brush ballast away from rail sides and tops of ties, then "tamp" ballast with finger tips.

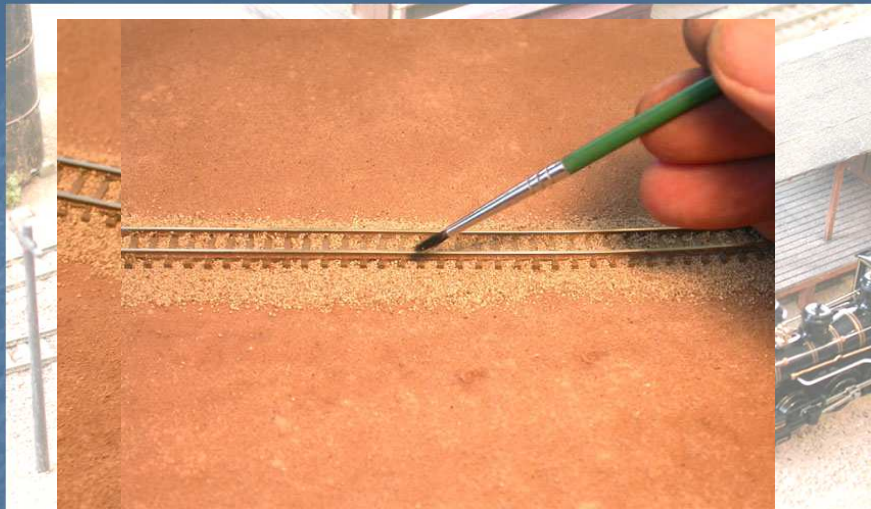
Weathering / Ballasting

Nn3 Overview

August 2015

by Tom Knapp MMR#101

188



Spread ballast over track, then carefully brush ballast away from rail sides and tops of ties, then "tamp" ballast with finger tips.

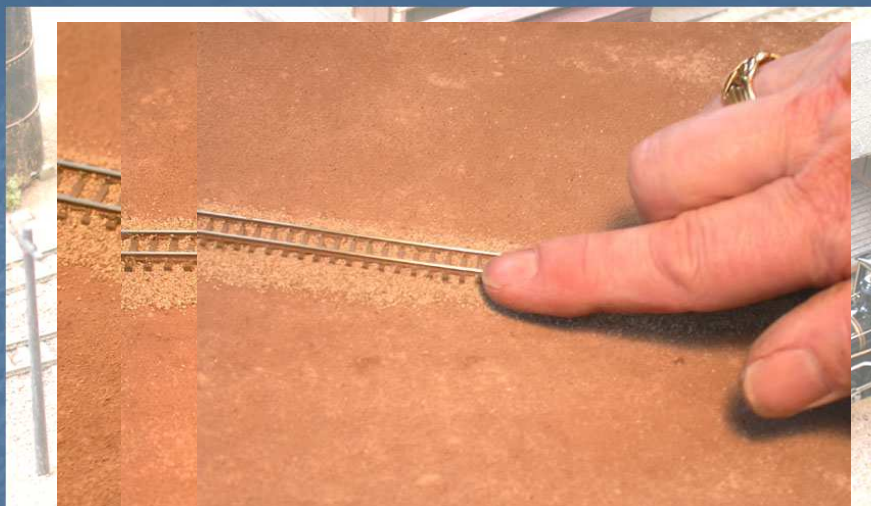
Weathering / Ballasting

Nn3 Overview

August 2015

by Tom Knapp MMR#101

189



Spread ballast over track, then carefully brush ballast away from rail sides and tops of ties, then "tamp" ballast with finger tips.

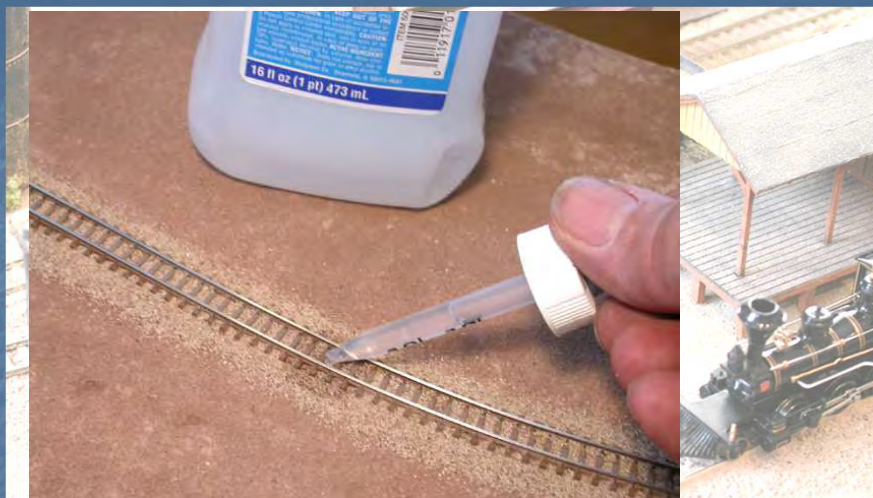
Weathering / Ballasting

Nn3 Overview

August 2015

by Tom Knapp MMR#101

190



Wet ballast with rubbing alcohol, apply a mixture of acrylic matte medium, alcohol and water. Pick off any stray bits of ballast after everything is dry.

Weathering / Ballasting

Nn3 Overview

August 2015

by Tom Knapp MMR#101

191



Wet ballast with rubbing alcohol, apply a mixture of acrylic matte medium, alcohol and water. Pick off any stray bits of ballast after everything is dry.

Weathering / Ballasting

Nn3 Overview

August 2015

by Tom Knapp MMR#101

192



Wet ballast with rubbing alcohol, apply a mixture of acrylic matte medium, alcohol and water. Pick off any stray bits of ballast after everything is dry.

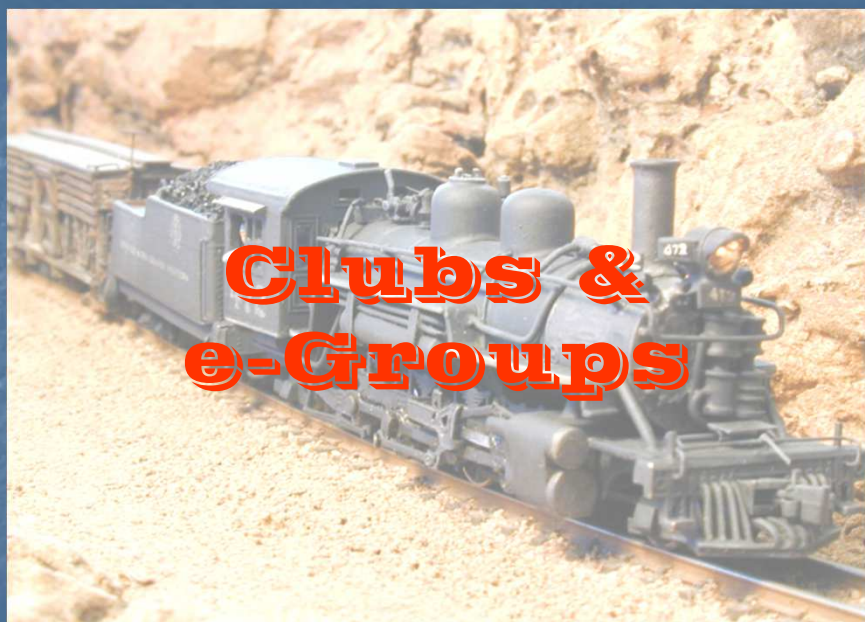
Weathering / Ballasting

Nn3 Overview

August 2015

by Tom Knapp MMR#101

193



Clubs & e-Groups

Nn3 Overview

August 2015

by Tom Knapp MMR#101

194

The Nn3 Alliance

An Internet-based international alliance of
over 800 small-scale narrow gauge modelers
Nn3@yahoogroups.com
NorCalNn3@yahoogroups.com (USA west coast)
www.Nn3.org

2MM Scale Association

2MMNn3@yahoogroups.com
www.2mm.org.uk/

NTRAK

Many local chapters worldwide
NVNTRAK (USA east coast)
www.NVNTRAK.org and follow links to

British N Gauge Society

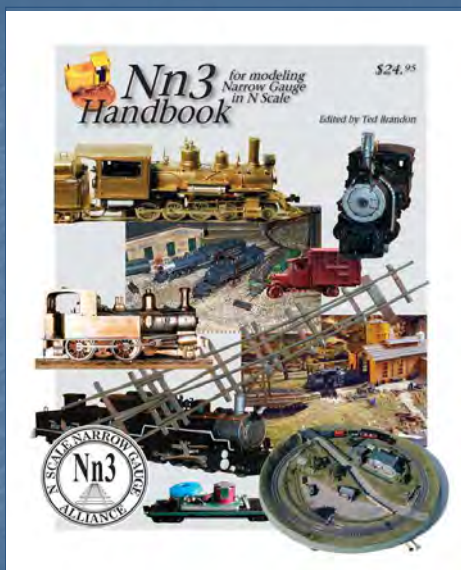
This group also has a narrow gauge special interest group

German "N Tram" modeling groups

August 2015

Nn3 Overview
by Tom Knapp MMR#101

195



The Nn3 Handbook

**By The Nn3
Alliance**

**The definitive
source of modeling
information for N
Scale Narrow
Gauge**

(available through Republic
Locomotive Works)

August 2015

Nn3 Overview
by Tom Knapp MMR#101

196



August 2015

Nn3 Overview
by Tom Knapp MMR#101

197

NTRAK:

NTRAK has provided “right-of-way” in their module standards for Nn3 at two interface locations and two elevations since NTRAK’s inception in 1973.

oNeTRAK-style:

example: NorCal Division’s Nn3 modular layout

Sectional Layout:

NVNTRAK’s Nn3 layout

FREE-MO:

example: NorCal Division’s Nn3 modular layout

Stand-alone display layouts

Paul Sturtz’s layout in the lobby at this convention is an excellent example

August 2015

Nn3 Overview
by Tom Knapp MMR#101

198



NorCal Division

Nn3 Overview
by Tom Knapp MMR#101

August 2015

199



NorCal Division

Nn3 Overview
by Tom Knapp MMR#101

August 2015

200



NorCal Division

Nn3 Overview
by Tom Knapp MMR#101

August 2015

201



NorCal Division

Nn3 Overview
by Tom Knapp MMR#101

August 2015

202



NorCal Division

Nn3 Overview
by Tom Knapp MMR#101

August 2015

203



NorCal Division

Nn3 Overview
by Tom Knapp MMR#101

August 2015

204



NorCal Division

Nn3 Overview
by Tom Knapp MMR#101

August 2015

205



NorCal Division

Nn3 Overview
by Tom Knapp MMR#101

August 2015

206



NorCal Division

Nn3 Overview
by Tom Knapp MMR#101

August 2015 207



NorCal Division

Nn3 Overview
by Tom Knapp MMR#101

August 2015 208



NorCal Division

Nn3 Overview
by Tom Knapp MMR#101

August 2015

209



NorCal Division

Nn3 Overview
by Tom Knapp MMR#101

August 2015

210



NorCal Division

Nn3 Overview
by Tom Knapp MMR#101

August 2015

211



NorCal Division

Nn3 Overview
by Tom Knapp MMR#101

August 2015

212



NorCal Division

Nn3 Overview
by Tom Knapp MMR#101

August 2015

213



NorCal Division

Nn3 Overview
by Tom Knapp MMR#101

August 2015

214



NorCal Division

Nn3 Overview
by Tom Knapp MMR#101

August 2015215



NorCal Division

Nn3 Overview
by Tom Knapp MMR#101

August 2015216



Questions & Discussion

August 2015

Nn3 Overview
by Tom Knapp MMR#101

217